698 – 6000 MHz
Base Station Antennas, Filters, Combiners and Amplifiers for Mobile Communications

Catalogue 2012

KATHREIN

Antennen · Electronic

Photo on title page: Kathrein offers a full range of products for Mobile Communication Networks over the current used frequency ranges.

Catalogue Issue 01/2012

All data published in previous catalog issues hereby becomes invalid.
We reserve the right to make alterations in accordance with the requirements of our customers, therefore for binding datas please check valid data sheets on our homepage: www.kathrein.de!

Please note:

As a result of more stringent legal regulations and judgements regarding product liability, we are obliged to point out certain risks that may arise when products are used under extraordinary operating conditions.

The mechanical design is based on the environmental conditions as stipulated in ETS 300 019-1-4 and thereby respects the static mechanical load imposed on an antenna by wind at maximum velocity.

Extraordinary operating conditions, such as heavy icing or exceptional dynamic stress (e.g. strain caused by oscillating support structures), may result in the breakage of an antenna or even cause it to fall to the ground.

These facts must be considered during the site planning process.

The details given in our data sheets have to be followed carefully when installing the antennas and accessories.

In addition, please use our information brochure about mounting configurations.

The installation team must be properly qualified and also be familiar with the relevant national safety regulations.

Calculation of Wind Loading on Kathrein Base Station Antennas

In 1998 the co-ordinating committee of the Standardisation Group for Building Standards decided that during the harmonisation process of European standards, the DIN-Standards shall be modified and republished based on the European Pre-Standards.

As a result of this harmonisation process the new edition of DIN 1055 Part 4 was finally published in 2005. This standard defines the worst case loading example created by natural wind forces on bearing structures and their individual elements. The standard thereby defines the principles for calculating the maximum loading and for confirming the bearing capacity of structures in general.

One of the major changes in the calculation of the wind load under DIN 1055-4 is the definition of the value cf0. Due to these changes in the calculation formula within the standard, the calculated wind load of some Base Station Antennas is higher than previously specified on earlier data sheets.

During 2009 Kathrein has migrated to calculating and specifying all wind loads in accordance with DIN 1055-4 (similar to the European Standard EN 1991-1-4) on the online data sheets. If the wind load has been calculated under the updated standard then this will be explicitly mentioned on the data sheet.

The physical dimensions of our products have not been modified unless otherwise specified, nor has the actual wind loading surface area of the antennas increased in any way.

“Quality leads the way”

As the world’s oldest and largest antenna manufacturer, we live up to claim “Quality leads the way” on a daily basis. One of the fundamental principies is to always be on the lookout for the best solution for our customers.

Our quality assurance system and our environmental management system apply to the entire company and are certified by TÜV according to EN ISO 9001 and EN ISO 14001.

Internet: www.kathrein.de

KATHREIN-Werke KG · Phone +49 80 31 184-0 · Fax +49 80 31 184-973
Anton-Kathrein-Straße 1 – 3 · P.O. Box 10 04 44 · D-83004 Rosenheim · Germany

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The catalogue is splitted into two parts.

Part 1: Antennas

Part 2: Filters, Combiners and Amplifiers

An actual list of Kathrein's current International Representatives

can be found on our homepage

www.kathrein.de

Please contact for

Sales queries, orders, catalogues or CD-ROM:
Fax: +49 80 31 184-820
E-Mail: central.sales@kathrein.de

Technical Information:
Fax: +49 80 31 184-973
E-Mail: mobilcom@kathrein.de

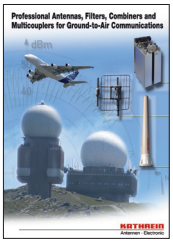
List of available Catalogues for Mobile Communication Antennas and Accessories

KATHREIN
Antennen · Electronic

698 – 6000 MHz Base Station Antennas, Filters, Combiners and Amplifiers for Mobile Communications

27 – 512 MHz KATHREIN-Antennas and Antenna Line Products

Professional Antennas, Filters, Combiners and Multicouplers for Ground-to-Air Communications

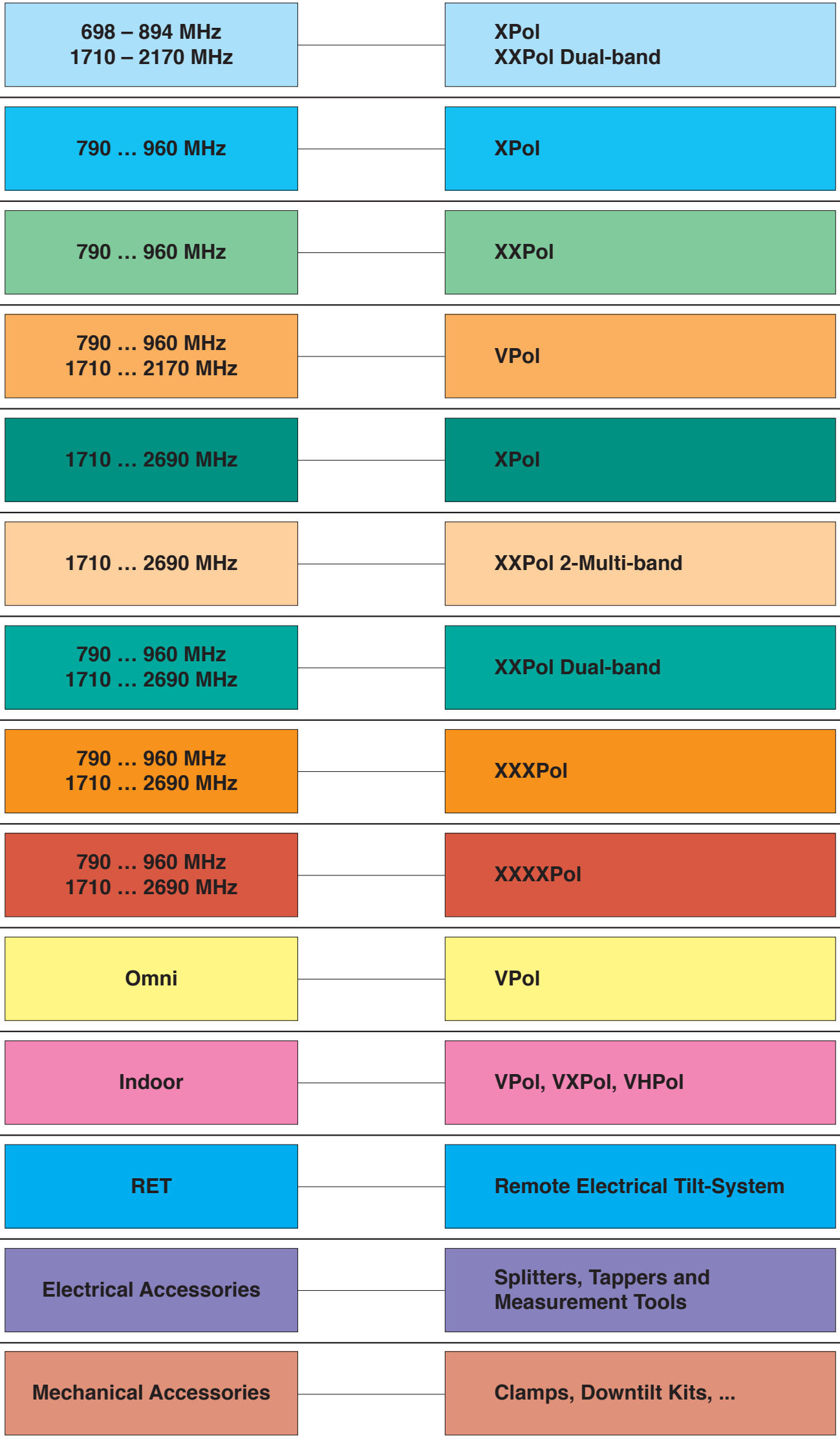


Antennas for Trains and Buses

The listed catalogues are also available on CD-ROM

Part 1:

Antennas for Mobile Communications


698 – 894 MHz
1710 – 2170 MHz
XPol
XXPol Dual-band
790 … 960 MHz
XPol
790 … 960 MHz
XXPol
790 … 960 MHz
1710 … 2170 MHz
VPol
1710 … 2690 MHz
XPol
1710 … 2690 MHz
XXPol 2-Multi-band
790 … 960 MHz
1710 … 2690 MHz
XXPol Dual-band
790 … 960 MHz
1710 … 2690 MHz
XXXPol
790 … 960 MHz
1710 … 2690 MHz
XXXXPol
Omni
VPol
Indoor
VPol, VXPol, VHPol
RET
Remote Electrical Tilt-System
Electrical Accessories
Splitters, Tappers and
Measurement Tools
Mechanical Accessories
Clamps, Downtilt Kits, ...

Summary of Antenna Types, RET-Products and Accessories

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The articles are listed by type number in numerical order. **New or changed product.**

Summary of Antenna Types, RET-Products and Accessories

KATHREIN
Antennen · Electronic

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Summary of Antenna Types, RET-Products and Accessories

KATHREIN
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The articles are listed by type number in numerical order. **New or changed product.**

Catalogue 2012 –>
Alterations to the Catalogue of 2011

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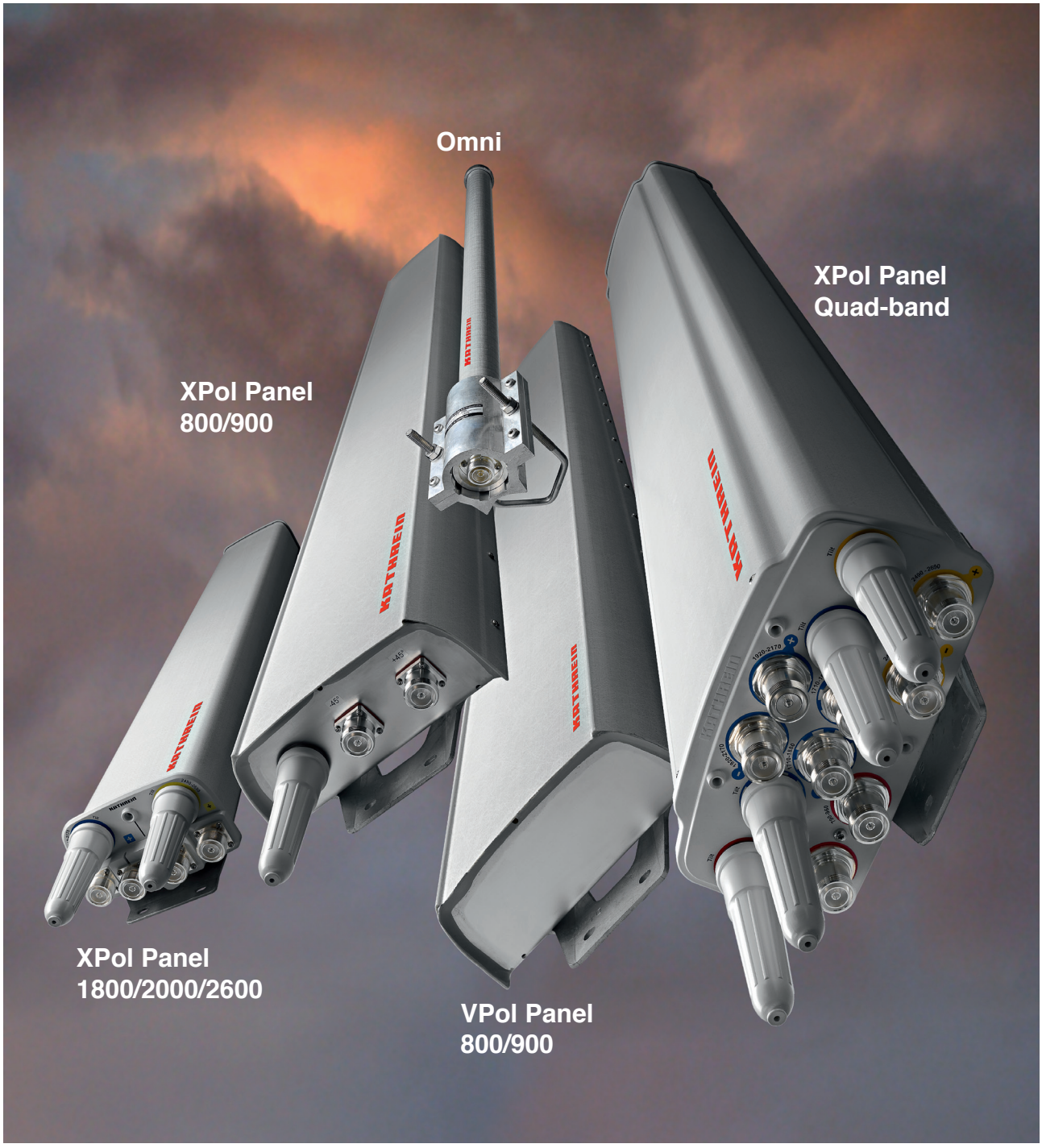
Removed from the 2012 catalogue	Status
698–894 MHz XPol / 1710–2170 MHz XXPol	
80010734 iRCU AISG 1.1	80010734V01 iRCU AISG 2.0
80010735 iRCU AISG 1.1	80010735V01 iRCU AISG 2.0
80010736 iRCU AISG 1.1	80010736V01 iRCU AISG 2.0
698–894 MHz XPol	
80010764 iRCU AISG 1.1	80010764V01 iRCU AISG 2.0
80010765 iRCU AISG 1.1	80010765V01 iRCU AISG 2.0
80010766 iRCU AISG 1.1	80010766V01 iRCU AISG 2.0
790…960 MHz XPol	
80010141	Replaced by 80010642
80010214V01	Available on request until end of 2012
80010218V01	Available on request until end of 2012
80010518V01	Available on request till end of 2012 / replaced by 80010817
790…960 MHz VPol / 1710…2170 MHz VPol	
80010658	Phased out
730677	Available on request until end of 2012
730368	Available on request until end of 2012
730691	Available on request until end of 2012
730376V01	730376V02
730378V01	730378V02
1710…2690 MHz XPol	
741623	Available on request until end of 2012
742186V01	Available on request until end of 2012
739710	Available on request until end of 2012
80010314	Available on request until end of 2012
790…960 MHz / 1710…2690 MHz XXPol Dual-band	
741327	Available on request until end of 2012
741322	Available on request until end of 2012
742047V01	Available on request until end of 2012
790…960 MHz / 1710…2690 MHz XXXPol	
80010292V02	80010292V03
80010670V01	Available on request until end of 2012
80010671V01	Available on request until end of 2012
80010672V01	Available on request until end of 2012
Indoor VPol	
80010433	Available on request until end of 2012
736854	Available on request until end of 2012
RET	
86010140	
86010141	
86010145	iRCU – Replaced by 86010149

Please note, new type numbers in the catalogue 2012 are shown and coloured in the respective register of the different antenna families.


Omni
XPol Panel
Quad-band
XPol Panel
800/900
XPol Panel
1800/2000/2600
VPol Panel
800/900

Directional Antenna Designs:
Special Directional Antennas
For Particular Applications

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Antennas for

– tunnel use

– railway use

– micro cells (street use)

– high gain link for repeaters

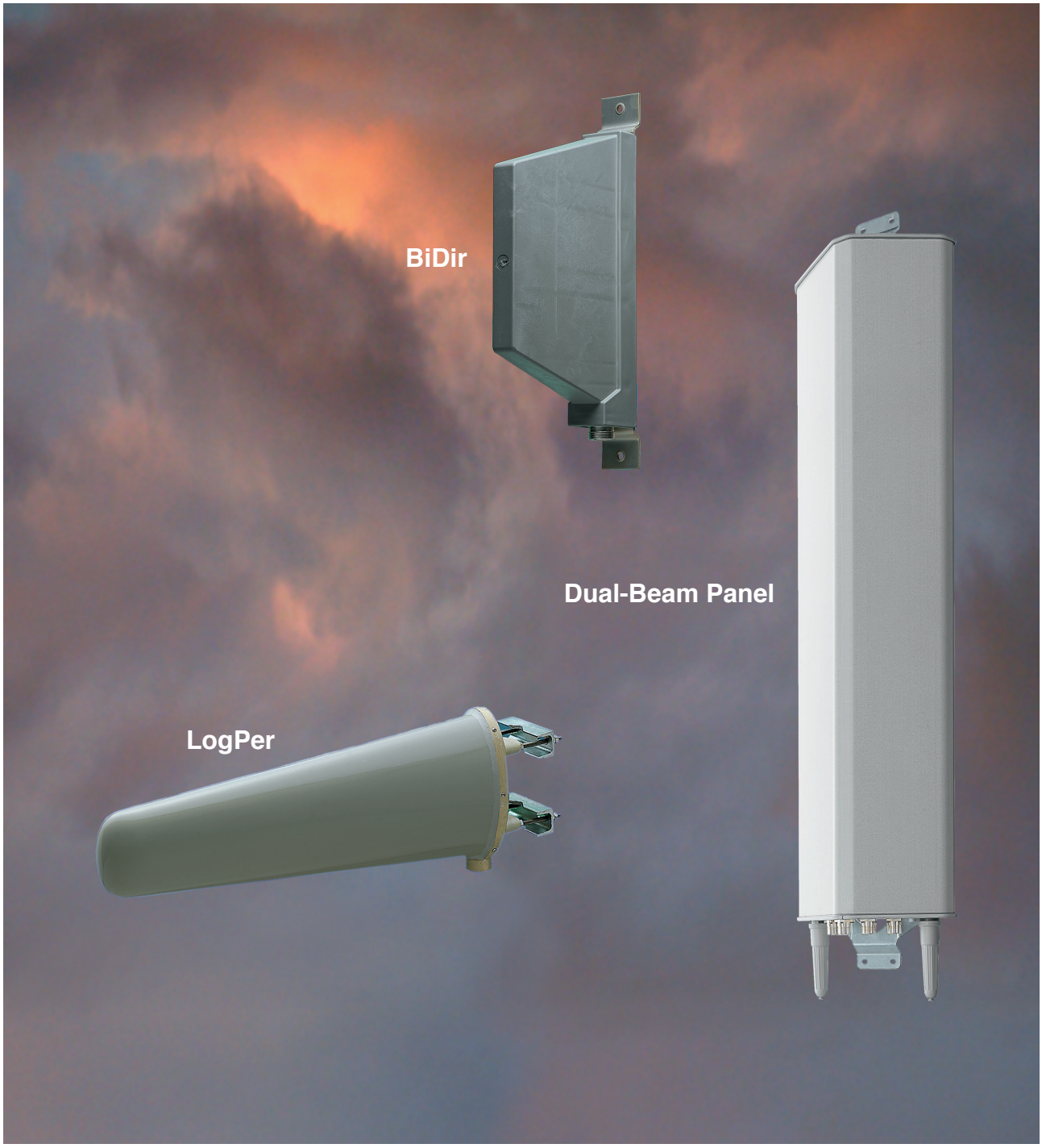
The distinguishing features of these special versions, e.g. parabolic panels or log. periodic antennas, are:

– very small half-power beam width (high gain)

– high sidelobe suppression

– also Dual-band and Multi-band versions

– bidirectional horizontal pattern.



Faini Telecommunication Systems

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faini telecommunication systems
a member of the KATHREIN-Group

Faini Telecommunication Systems is an Italian Company originated in 1995 as an outsource, with the name of Faini Antenne s.r.l., of the Antenna Division of the former Siemens Telecomunicazioni.

Since March 2007 Faini Telecommunication Systems is a member of the worldwide known German Kathrein Group.

The Company is located in Milano area nearby the major microwave and mobile network system Radio manufacturers and is specialized in the design and fabrication of a full range of Antennas for Point to Point (PTP) and Point to Multi Point Radio Links as well as for special custom oriented applications.

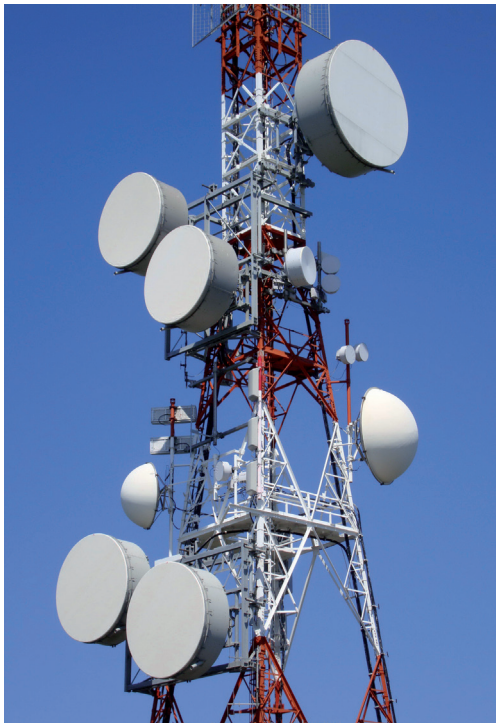
In-house capabilities offer design services for special versions of antennas to be integrated to the Customer Radio Equipment according to their needs.

For further information, please contact:

Faini Telecommunication Systems S.r.l.
Via Firenze, 11
20063 Cernusco s/n (MI) – Italy

Tel. +39 02 929042.1
Fax.+39 02 929042.219

http://fainitelecommunication.com
info@fainitelecommunication.com



Microwave Antennas and Couplers

Antenna Designs:
Antenna Families / RET-system
Distinguishing features

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Design	Compact size and elegant design are the distinguishing features of Kathrein's antenna families.
Radome	The radomes cover the internal antenna components. The fiberglass material guarantees optimum performance with regards to stability, strength, UV resistance, painting and weather protection.
Environmental influences	Kathrein antenna designs are based on fundamental engineering knowledge and also on our decades of practical experience, during which the various constructions and materials used have proved their outstanding reliability.
Environmental conditions	Kathrein cellular antennas are designed to operate under the environmental conditions as described in ETS 300 019-1-4 class 4.1 E. The antennas exceed this standard with regards to the following items: – Low temperature: –55 °C – High temperature (dry): +60 °C
Impedance	Standard Impedance for all products is 50 Ω unless otherwise stated.
Great variety of half-power beam width, gain values, electrical downtilt	According to the antenna type selected, customer can choose from different half-power beam widths. Gain values up to 22.5 dBi and electrical downtilts up to 15° for panel antennas are available. Downtilts are either fixed or adjustable or even controlled by remote electrical tilt system (RET).
Low intermodulation products (typically –150 dBc)	After many years of experience in the construction of antennas and after intensive research into the effects of intermodulation, we have been able to optimize the material and technology used for antennas (the given value refers to 3rd order products measured with 2 carriers of 20 W each).
Excellent tracking	Tracking states the symmetry between the +45° and –45° polarized horizontal pattern. Bad tracking values lead to interferences in the network and reduced diversity performance. Kathreins special Tracking compensation reduces the average value measured at ±60° to < 2 dB.
Superior squint	Squint, also often referred to as "Pattern Symmetry", gives the symmetry of the pattern over the whole frequency range measured at the 3 dB points. Interferences and nulls in the network may be the result of bad values. In contrast to the vertical squint which is usually good, excellent squint values of the horizontal pattern are hard to reach. Kathreins superior values of ± 5 % of the half-power beam width are in line with the requirements from system suppliers.
Multi-band design	Depending on antenna family broad-band, multi-band, dual-band and triple-band versions can be offered. Therefore the varity of antennas used can be kept to a minimum.
Excellent grounding	The antennas are DC grounded according EN 50083-1.
Multi-functional installation hardware	Depending on the type, the antennas are equipped with up to 2 attachment points. Panels can be wall-mounted without any additional hardware. For mast-mounting, brackets and mechanical downtilt kits are available. To assist the installation technicians in aligning the panels, an azimuth adjustment tool can be supplied (see Mechanical Accessories).
MTBF Statement	Traditionally passive components like antennas cannot be well calculated due to the lack of a sufficient number of components in the MTBF library. Unfortunately this constraint results in a very inaccurate calculation. Thus such results are technically questionable and unrealistic. In essence, antennas are made out of mechnical parts that do not show any failure rates. Only available failure rates can be calculated into an MTBF value. Consequently such components cannot be listed in any MTBF library.
Remote Electical Tilt System AISG Compliancy	Kathrein hereby states that RET devices, as far as the functionality and features are described within the AISG / 3 GPP standard, are compliant with the standard.

Mechanical downtilt

For further technical information please see “Mechanical Accessories”, page 205.

Electrical downtilt

Description of the adjustment mechanism (protective cap removed):

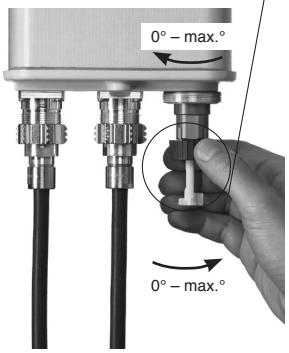
① Adjustment wheel with twist-lock function.
② Downtilt spindle with integrated scale.

① Thread for fixing the protective cap or the RCU (Remote Control Unit).
② Gearwheel for RCU power drive.

To set the downtilt angle exactly, you must look horizontally at the scale. The lower edge of the gearwheel must be used for alignment.

Manual adjustment procedure:

Remove the protective cap.



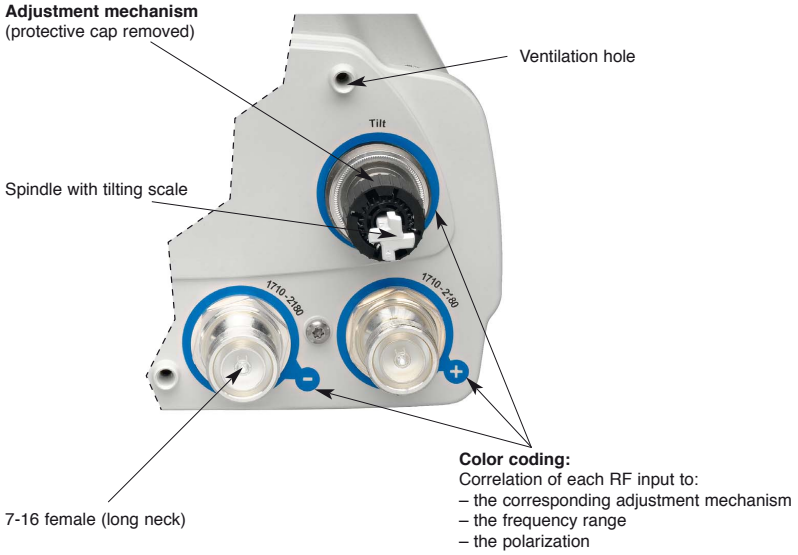
Set downtilt angle by rotating the adjustment wheel.

Screw on the protective cap again.

Remote Electrical Tilt (RET)

For further technical information please see “RET”, pages 180 and 181.

Description of bottom end cap (exemplary picture):



Kathrein Antennas
Product Description (Type)

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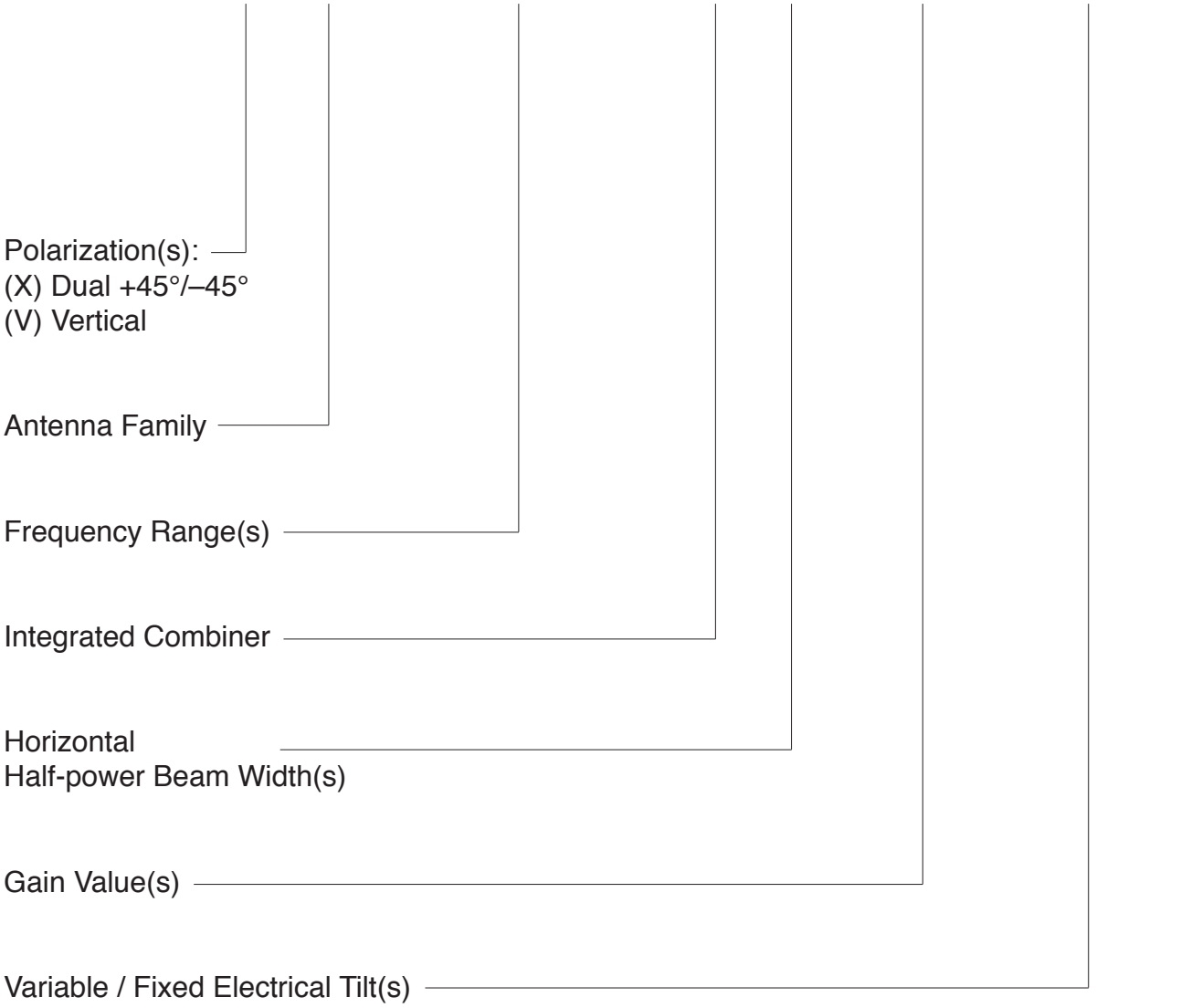
XXPol Panel 870–960/1710–1880 C 65°/60° 17/18dBi 2°–8°T/2°T



Characteristical Horizontal and Vertical Antenna Patterns

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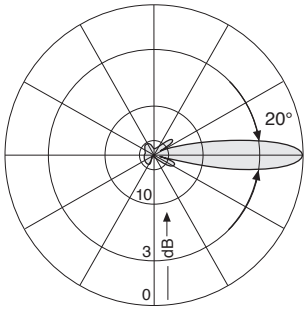
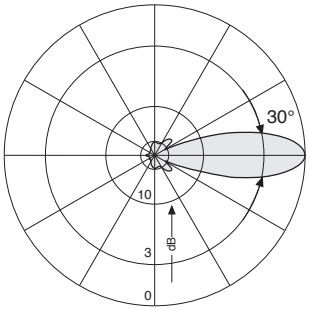
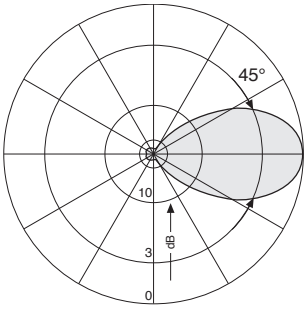
Horizontal Patterns:



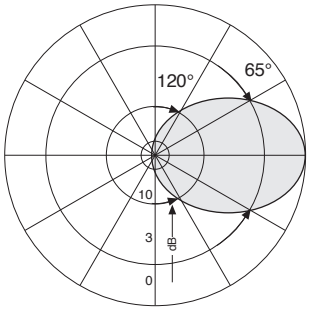
20°



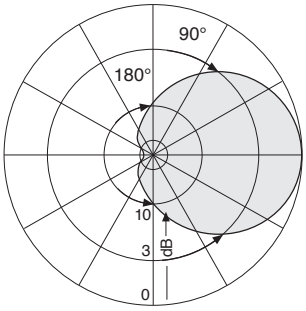
30°/33°



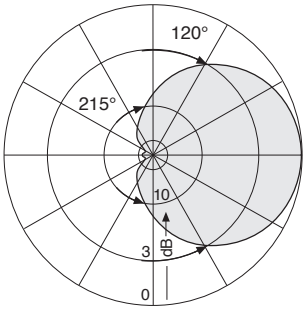
45°



60°/65°

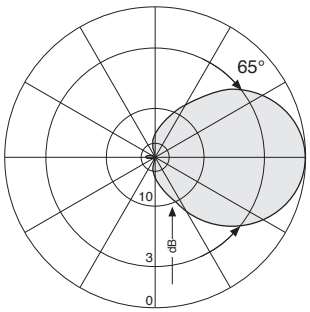


88°/90°

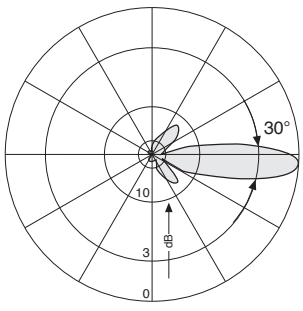


120°

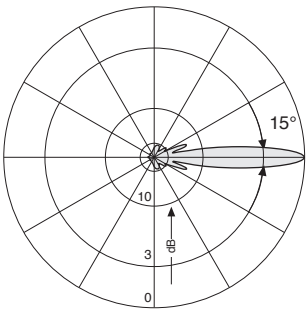
Vertical Patterns:



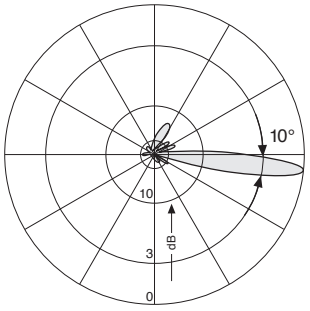
65°



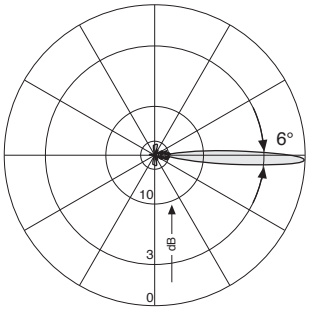
30°



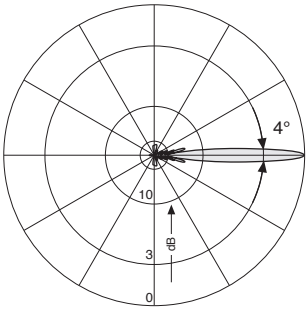
15°



10°



6°



4°

Summary – Directional Antennas
Dual Polarization +45°/–45°
700/800 / 700/1800–2000

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XPol – 700/800

Type					Type No.	Height [mm]	Connector position	Page
XPol Panel iRCU	698–894	65°	15dBi	0°–16°T	80010734V01	1355	bottom	20
XPol Panel iRCU	698–894	65°	16dBi	0°–10°T	80010735V01	1934	bottom	21
XPol Panel iRCU	698–894	65°	17dBi	0°–10°T	80010736V01	2438	bottom	22

XXPol – 700/1800–2000

XXPol Panel iRCU	698–894	65°	15dBi	0°–16°T	80010764V01	1403	bottom	23
	1710–2170	65°	17.5dBI	0°–10°T				
XXPol Panel iRCU	698–894	65°	16dBi	0°–10°T	80010765V01	1918	bottom	24
	1710–2170	65°	18.5dBi	0°–10°T				
XXPol Panel iRCU	698–894	65°	17dBi	0°–10°T	80010766V01	2438	bottom	25
	1710–2170	65°	18.5dBi	0°–10°T				
XXPol Panel iRCU	698–894	85°	14dBi	0°–16°T	80010721V01	1394	bottom	26
	1710–2170	85°	16.5dBi	0°–10°T				
XXPol Panel iRCU	698–894	85°	15dBi	0°–10°T	80010722V01	1828	bottom	27
	1710–2170	85°	17.5dBi	0°–10°T				
XXPol Panel iRCU	698–894	85°	16dBi	0°–10°T	80010723V01	2368	bottom	28
	1710–2170	85°	17.5dBi	0°–10°T				

New or changed product

iRCU specifications (86010149) see page 29

Multi-band Panel

Dual Polarization	**X**
Half-power Beam Width	**65°**
Integrated replaceable Remote Control Unit	**iRCU**
Adjustable Electrical Downtilt	**0°–16°**

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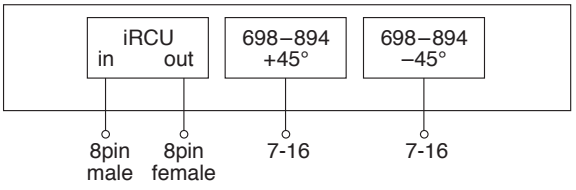
AISG Antenna Interface Standards Group
3GPP A GLOBAL INITIATIVE

XPol Panel iRCU 698–894 65° 15dBi 0°–16°T

Type No.	**80010734V01** clamps included	
A) Antenna specifications		
	698–894	
Frequency range	698 – 806 MHz	824 – 894 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	12.05 dBd / 14.2 dBi	12.65 dBd / 14.8 dBi
Horizontal Pattern:		
Half-power beam width	68°	65°
Front-to-back ratio	Copolar: > 30 dB Average: 32 dB	Copolar: > 30 dB Average: 33 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: > 24 dB > 10 dB, Avg. 15 dB	Typically: > 23 dB > 10 dB, Avg. 16 dB
Vertical Pattern:		
Half-power beam width	16°	14.8°
Electrical tilt	0°–16°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam: Average:	0° ... 8° ... 16° T 16 ... 17 ... 17 dB 16 ... 19 ... 20 dB	0° ... 8° ... 16° T 18 ... 17 ... 16 dB 20 ... 20 ... 20 dB
Impedance	50 Ω	
VSWR	< 1.5	
Isolation, between ports	> 30 dB	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	
Input	2 x 7-16 female iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female	
Connector position	Bottom	
Wind load	Frontal: 620 N (at 150 km/h) 1550 N (at 150 mph) Lateral: 200 N (at 150 km/h) 500 N (at 150 mph) Rearside: 710 N (at 150 km/h) 1770 N (at 150 mph)	
Max. wind velocity	241 km/h (150 mph)	
Height/width/depth	1355 / 303 / 99 mm (53.3 / 11.9 / 3.9 inches)	
Category of mounting hardware	M (Medium)	
Weight	11 kg (24 lbs) / 13 kg (27 lbs) (clamps incl.)	
Packing size	1430 x 315 x 115 mm (56.3 x 12.4 x 4.5 inches)	
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter	

iRCU specifications (86010149) see page 29



For more information about additional mounting accessories please refer to page 205

Multi-band Panel

Dual Polarization — X

Half-power Beam Width — 65°

Integrated replaceable Remote Control Unit — iRCU

Adjustable Electrical Downtilt — 0°–10°

698–894

KATHREIN
Antennen · Electronic

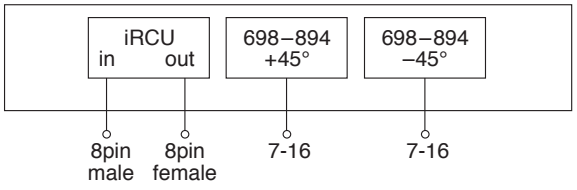
AISG Antenna Interface Standards Group

3GPP A GLOBAL INITIATIVE

XPol Panel iRCU 698–894 65° 16dBi 0°–10°T

Type No.	80010735V01 (clamps included)	
A) Antenna specifications		
	698–894	
Frequency range	698 – 806 MHz	824 – 894 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	13.35 dBd / 15.5 dBi	13.85 dBd / 16 dBi
Horizontal Pattern:		
Half-power beam width	67°	65°
Front-to-back ratio	Copolar: > 30 dB Average: 35 dB	Copolar: > 30 dB Average: 35 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: > 25 dB > 11 dB, Avg. 15 dB	Typically: > 25 dB > 11 dB, Avg. 15 dB
Vertical Pattern:		
Half-power beam width	11.3°	10°
Electrical tilt	0°–10°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam: Average:	0° ... 5° ... 10° T 16 ... 17 ... 17 dB 16 ... 19 ... 20 dB	0° ... 5° ... 10° T 18 ... 17 ... 16 dB 20 ... 20 ... 20 dB
Impedance	50 Ω	
VSWR	< 1.5	
Isolation, between ports	> 30 dB	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	
Input	2 x 7-16 female iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female	
Connector position	Bottom	
Wind load	Frontal: 900 N (at 150 km/h) 2260 N (at 150 mph) Lateral: 310 N (at 150 km/h) 760 N (at 150 mph) Rearside: 1030 N (at 150 km/h) 2580 N (at 150 mph)	
Max. wind velocity	241 km/h (150 mph)	
Height/width/depth	1934 / 303 / 99 mm (76.1 / 11.9 / 3.9 inches)	
Category of mounting hardware	H (Heavy)	
Weight	13 kg (28.7 lbs) / 15 kg (33 lbs) (clamps incl.)	
Packing size	2060 x 315 x 115 mm (81.1 x 12.4 x 4.5 inches)	
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter	

iRCU specifications (86010149) see page 29



Multi-band Panel 698–894

Dual Polarization X

Half-power Beam Width 65°

Integrated replaceable Remote Control Unit iRCU

Adjustable Electrical Downtilt 0°–10°

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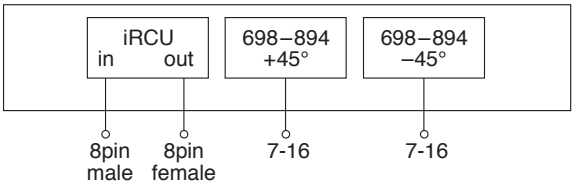
XPol Panel iRCU 698–894 65° 17dBi 0°–10°T

Type No.	80010736V01 (clamps included)	
A) Antenna specifications		
	698–894	
Frequency range	698 – 806 MHz	824 – 894 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	14.25 dBd / 16.4 dBi	14.85 dBd / 17 dBi
Horizontal Pattern:		
Half-power beam width	67°	68°
Front-to-back ratio	Copolar: > 30 dB Average: 35 dB	Copolar: > 30 dB Average: 35 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: > 25 dB > 11 dB, Avg. 15 dB	Typically: > 20 dB > 11 dB, Avg. 15 dB
Vertical Pattern:		
Half-power beam width	9.5°	8.6°
Electrical tilt	0.5°–9.5°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam: Average:	0.5° ... 5° ... 9.5° T 16 ... 16 ... 16 dB 18 ... 18 ... 17 dB	0.5° ... 5° ... 9.5° T 18 ... 18 ... 17 dB 20 ... 20 ... 20 dB
Impedance	50 Ω	
VSWR	< 1.5	
Isolation, between ports	> 30 dB	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	
Input	2 x 7-16 female iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female	
Connector position	Bottom	
Wind load	Frontal: 1160 N (at 150 km/h) 2900 N (at 150 mph) Lateral: 390 N (at 150 km/h) 970 N (at 150 mph) Rearside: 1380 N (at 150 km/h) 3450 N (at 150 mph)	
Max. wind velocity	241 km/h (150 mph)	
Height/width/depth	2438 / 303 / 99 mm (96 / 11.9 / 3.9 inches)	
Category of mounting hardware	H (Heavy)	
Weight	16.7 kg (36.8 lbs) / 18.5 kg (40.8 lbs) (clamps incl.)	
Packing size	2600 x 315 x 115 mm (102.4 x 12.4 x 4.5 inches)	
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter	

iRCU specifications (86010149) see page 29



For more information about additional mounting accessories please refer to page 205

Multi-band Panel

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	698–894	1710–2170
Dual Polarization	X	X
Half-power Beam Width	65°	65°
Integrated replaceable Remote Control Unit	iRCU	iRCU
Adjustable Electrical Downtilt	0°–16°	0°–10°

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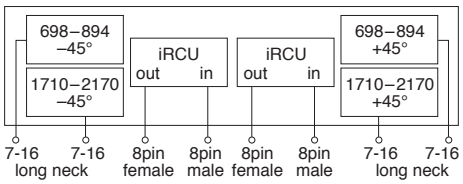
XXPol Panel iRCU 698–894/1710–2170 65°/65° 15/17.5dBi 0°–16°/0°–10°T

clamps included

Type No.	80010764V01			
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	12.15 dBd / 14.3 dBi	12.65 dBd / 14.8 dBi	17.3 dBi	17.5 dBi
Horizontal Pattern:				
Half-power beam width	68°	65°	61°	60°
Front-to-back ratio	Copolar: > 30 dB Average: 32 dB	Copolar: > 27 dB Average: 30 dB	Copolar: > 30 dB Average: 34 dB	Copolar: > 30 dB Average: 34 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: > 25 dB > 10 dB, Avg. 15 dB	Typically: > 25 dB > 8 dB, Avg. 14 dB	Typically: > 25 dB > 8 dB, Avg. 14 dB	Typically: > 25 dB > 10 dB, Avg. 16 dB
Tracking, Avg.	1.5 dB	1.5 dB	2.0 dB	1.0 dB
Squint	±2.5°	±4.0°	±4.0°	±1.5°
Vertical Pattern:				
Half-power beam width	15°	13.5°	7.5°	7.5°
Electrical tilt	0°–16°, continuously adjustable		0°–10°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam: Average:	0° ... 8° ... 16° T 17 ... 16 ... 16 dB 19 ... 19 ... 18 dB	0° ... 8° ... 16° T 18 ... 16 ... 16 dB 22 ... 20 ... 20 dB	0° ... 5° ... 10° T 18 ... 18 ... 17 dB 20 ... 20 ... 20 dB	0° ... 5° ... 10° T 18 ... 18 ... 17 dB 20 ... 20 ... 20 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female (long neck) iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female			
Connector position	Bottom			
Wind load	Frontal: 690 N (at 150 km/h) 1710 N (at 150 mph) Lateral: 260 N (at 150 km/h) 640 N (at 150 mph) Rearside: 710 N (at 150 km/h) 1770 N (at 150 mph)			
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	1403 / 300 / 152 mm (55.2 / 11.8 / 6 inches)			
Category of mounting hardware	M (Medium)			
Weight	18.5 kg (40.8 lbs) / 20.5 kg (45.2 lbs) (clamps incl.)			
Packing size	1646 x 322 x 190 mm (64.8 x 12.7 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			

iRCU specifications (86010149) see page 29



Multi-band Panel

	698–894	1710–2170
Dual Polarization	X	X
Half-power Beam Width	65°	65°
Integrated replaceable Remote Control Unit	iRCU	iRCU
Adjustable Electrical Downtilt	0°–10°	0°–10°

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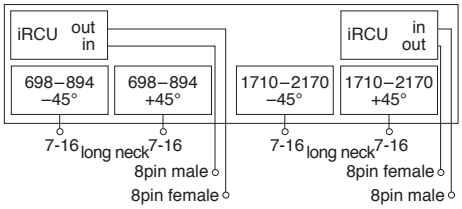
XXPol Panel iRCU 698–894/1710–2170 65°/65° 16/18.5dBi 0°–10°/0°–10°T

clamps included

Type No.	80010765V01			
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	13.15 dBd / 15.3 dBi	13.65 dBd / 15.8 dBi	18 dBi	18.5 dBi
Horizontal Pattern:				
Half-power beam width	68°	65°	63°	62°
Front-to-back ratio	Copolar: > 30 dB Average: 34 dB	Copolar: > 30 dB Average: 34 dB	Copolar: > 27 dB Average: 34 dB	Copolar: > 27 dB Average: 34 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: > 25 dB > 10 dB, Avg. 16 dB	Typically: > 20 dB > 10 dB, Avg. 14 dB	Typically: > 25 dB > 8 dB, Avg. 15 dB	Typically: > 30 dB > 10 dB, Avg. 15 dB
Tracking, Avg.	1.0 dB	1.5 dB	1.5 dB	1.0 dB
Squint	±2.5°	±3.0°	±3.0°	±2.5°
Vertical Pattern:				
Half-power beam width	11.8°	10.8°	5.8°	5.8°
Electrical tilt	0°–10°, continuously adjustable		0°–10°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam: Average:	0° ... 5° ... 10° T 16 ... 16 ... 18 dB 18 ... 20 ... 20 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB 20 ... 22 ... 20 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB 20 ... 22 ... 20 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB 20 ... 22 ... 20 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female (long neck) iRCU in: 2 x 8pin male iRCU out: 2 x 8pin female			
Connector position	Bottom			
Wind load	Frontal: 950 N (at 150 km/h) 2380 N (at 150 mph) Lateral: 360 N (at 150 km/h) 890 N (at 150 mph) Rearside: 980 N (at 150 km/h) 2460 N (at 150 mph)			
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	1918 / 300 / 152 mm (75.5 / 11.8 / 6.0 inches)			
Category of mounting hardware	H (Heavy)			
Weight	23.5 kg (51.8 lbs) / 25.5 kg (56.2 lbs) (clamps incl.)			
Packing size	2166 x 322 x 190 mm (85.3 x 12.7 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			

iRCU specifications (86010149) see page 29



For more information about additional mounting accessories please refer to page 205

Multi-band Panel

	698–894	1710–2170
Dual Polarization	X	X
Half-power Beam Width	65°	65°
Integrated replaceable Remote Control Unit	iRCU	iRCU
Adjustable Electrical Downtilt	0°–10°	0°–10°

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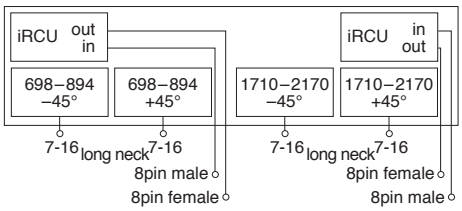
XXPol Panel iRCU 698–894/1710–2170 65°/65° 17/18.5dBi 0°–10°/0°–10°T

clamps included

Type No.	80010766V01			
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	14.25 dBd / 16.4 dBi	14.65 dBd / 16.8 dBi	18 dBi	18.5 dBi
Horizontal Pattern:				
Half-power beam width	68°	65°	63°	62°
Front-to-back ratio	Copolar: > 30 dB Average: 34 dB	Copolar: > 30 dB Average: 34 dB	Copolar: > 27 dB Average: 34 dB	Copolar: > 27 dB Average: 34 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: > 25 dB > 10 dB, Avg. 15 dB	Typically: > 20 dB > 10 dB, Avg. 12 dB	Typically: > 25 dB > 8 dB, Avg. 15 dB	Typically: > 30 dB > 10 dB, Avg. 15 dB
Tracking, Avg.	1.0 dB		1.5 dB	
Squint	±2.5°		±3.0°	
Vertical Pattern:				
Half-power beam width	9.5°	8.7°	5.8°	5.8°
Electrical tilt	0°–10°, continuously adjustable		0°–10°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam: Average:	0° ... 5° ... 10° T 16 ... 16 ... 16 dB 18 ... 20 ... 18 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB 20 ... 20 ... 20 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB 20 ... 22 ... 20 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB 20 ... 22 ... 20 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female (long neck) iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female			
Connector position	Bottom			
Wind load	Frontal: 1270 N (at 150 km/h) 3170 N (at 150 mph) Lateral: 470 N (at 150 km/h) 1160 N (at 150 mph) Rearside: 1320 N (at 150 km/h) 3310 N (at 150 mph)			
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	2438 / 300 / 152 mm (96 / 11.8 / 6.0 inches)			
Category of mounting hardware	H (Heavy)			
Weight	26.5 kg (58.3 lbs) / 28.5 kg (62.7 lbs) (clamps incl.)			
Packing size	2656 x 320 x 190 mm (99.88 x 12.6 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			

iRCU specifications (86010149) see page 29



Multi-band Panel

	698–894	1710–2170
Dual Polarization	X	X
Half-power Beam Width	85°	85°
Integrated replaceable Remote Control Unit	iRCU	iRCU
Adjustable Electrical Downtilt	0°–16°	0°–10°

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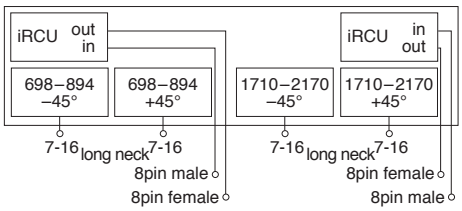
XXPol Panel iRCU 698–894/1710–2170 85°/85° 14/16.5dBi 0°–16°/0°–10°T

clamps included

Type No.	80010721V01			
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	11.35 dBd / 13.5 dBi	11.85 dBd / 14 dBi	16.5 dBi	16.5 dBi
Horizontal Pattern:				
Half-power beam width	85°	85°	88°	85°
Front-to-back ratio	Copolar: > 25 dB Average: 32 dB	Copolar: > 25 dB Average: 28 dB	Copolar: > 25 dB Average: 26 dB	Copolar: > 25 dB Average: 27 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: > 20 dB > 10 dB, Avg. 14 dB	Typically: > 22 dB > 10 dB, Avg. 15 dB	Typically: > 15 dB > 10 dB, Avg. 12 dB	Typically: > 15 dB > 8 dB, Avg. 12 dB
Tracking, Avg.	1.5 dB		0.5 dB	
Squint	±4.5°		±4.0°	
Vertical Pattern:				
Half-power beam width	16.5°	15.1°	6.7°	6.7°
Electrical tilt	0°–16°, continuously adjustable		0°–10°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam: Average:	0° ... 8° ... 16° T 18 ... 16 ... 18 dB 20 ... 19 ... 19 dB	0° ... 8° ... 16° T 18 ... 18 ... 17 dB 22 ... 20 ... 20 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB 22 ... 22 ... 19 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB 22 ... 22 ... 22 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female (long neck) iRCU in: 2 x 8pin male iRCU out: 2 x 8pin female			
Connector position	Bottom			
Wind load	Frontal: 670 N (at 150 km/h) 1680 N (at 150 mph) Lateral: 250 N (at 150 km/h) 610 N (at 150 mph) Rearside: 700 N (at 150 km/h) 1740 N (at 150 mph			
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	1394 / 300 / 152 mm (54.9 / 11.8 / 6.0 inches)			
Category of mounting hardware	M (Medium)			
Weight	21 kg (46.2 lbs) / 23 kg (50.6 lbs) (clamps incl.)			
Packing size	1616 x 322 x 190 mm (63.6 x 12.6 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			

iRCU specifications (86010149) see page 29



For more information about additional mounting accessories please refer to page 205

Multi-band Panel

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	698–894	1710–2170
Dual Polarization	X	X
Half-power Beam Width	85°	85°
Integrated replaceable Remote Control Unit	iRCU	iRCU
Adjustable Electrical Downtilt	0°–10°	0°–10°

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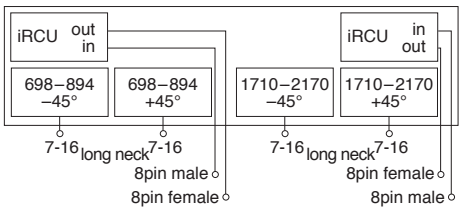
XXPol Panel iRCU 698–894/1710–2170 85°/85° 15/17.5dBi 0°–10°/0°–10°T

clamps included

Type No.	80010722V01			
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	12.5 dBd / 14.65 dBi	13 dBd / 15.15 dBi	17 dBi	17.5 dBi
Horizontal Pattern:				
Half-power beam width	85°	85°	85°	85°
Front-to-back ratio	Copolar: > 28 dB Average: 31 dB	Copolar: > 27 dB Average: 29 dB	Copolar: > 25 dB Average: 28 dB	Copolar: > 25 dB Average: 28 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: > 22 dB > 10 dB, Avg. 16 dB	Typically: > 24 dB > 10 dB, Avg. 16 dB	Typically: > 18 dB > 10 dB, Avg. 12 dB	Typically: > 18 dB > 8 dB, Avg. 12 dB
Tracking, Avg.	0.5 dB		0.5 dB	
Squint	±4.0°		±4.5°	
Vertical Pattern:				
Half-power beam width	12.1°	11°	5.5°	5.5°
Electrical tilt	0°–10°, continuously adjustable		0°–10°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam: Average:	0° ... 5° ... 10° T 16 ... 16 ... 18 dB 17 ... 19 ... 21 dB	0° ... 5° ... 10° T 15 ... 18 ... 18 dB 16 ... 19 ... 22 dB	0° ... 5° ... 10° T 16 ... 16 ... 16 dB 18 ... 18 ... 18 dB	0° ... 5° ... 10° T 16 ... 16 ... 16 dB 17 ... 17 ... 18 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female (long neck) iRCU in: 2 x 8pin male iRCU out: 2 x 8pin female			
Connector position	Bottom			
Wind load	Frontal: 900 N (at 150 km/h) 2260 N (at 150 mph) Lateral: 330 N (at 150 km/h) 830 N (at 150 mph) Rearside: 940 N (at 150 km/h) 2350 N (at 150 mph)			
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	1828 / 300 / 152 mm (71.9 / 11.8 / 6.0 inches)			
Category of mounting hardware	H (Heavy)			
Weight	26 kg (57.3 lbs) / 28 kg (61.7 lbs) (clamps incl.)			
Packing size	2050 x 322 x 190 mm (80.7 x 12.6 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			

iRCU specifications (86010149) see page 29



Multi-band Panel

	698–894	1710–2170
Dual Polarization	X	X
Half-power Beam Width	85°	85°
Integrated replaceable Remote Control Unit	iRCU	iRCU
Adjustable Electrical Downtilt	0°–10°	0°–10°

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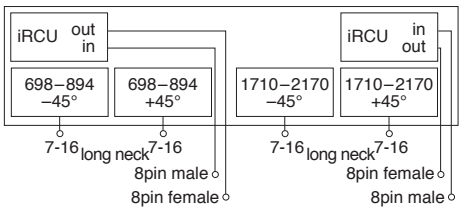
XXPol Panel iRCU 698–894/1710–2170 85°/85° 16/17.5dBi 0°–10°/0°–10°T

clamps included

Type No.	80010723V01			
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	13.5 dBd / 15.65 dBi	14 dBd / 16.15 dBi	17.5 dBi	17.5 dBi
Horizontal Pattern:				
Half-power beam width	85°	85°	85°	85°
Front-to-back ratio	Copolar: > 28 dB Average: 31 dB	Copolar: > 27 dB Average: 29 dB	Copolar: > 25 dB Average: 28 dB	Copolar: > 25 dB Average: 28 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: > 22 dB > 10 dB, Avg. 16 dB	Typically: > 24 dB > 10 dB, Avg. 16 dB	Typically: > 18 dB > 10 dB, Avg. 12 dB	Typically: > 18 dB > 8 dB, Avg. 12 dB
Tracking, Avg.	0.5 dB		0.5 dB	
Squint	±4.0°		±4.5°	
Vertical Pattern:				
Half-power beam width	9.5°	8.5°	5.5°	5.5°
Electrical tilt	0°–10°, continuously adjustable		0°–10°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam: Average:	0° ... 5° ... 10° T 16 ... 16 ... 18 dB 17 ... 19 ... 21 dB	0° ... 5° ... 10° T 15 ... 18 ... 18 dB 16 ... 19 ... 22 dB	0° ... 5° ... 10° T 16 ... 16 ... 16 dB 18 ... 18 ... 18 dB	0° ... 5° ... 10° T 16 ... 16 ... 16 dB 17 ... 17 ... 18 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female (long neck) iRCU in: 2 x 8pin male iRCU out: 2 x 8pin female			
Connector position	Bottom			
Wind load	Frontal: 1210 N (at 150 km/h) 3040 N (at 150 mph) Lateral: 450 N (at 150 km/h) 1130 N (at 150 mph) Rearside: 1270 N (at 150 km/h) 3170 N (at 150 mph			
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	2368 / 300 / 152 mm (93.2 / 11.8 / 6.0 inches)			
Category of mounting hardware	H (Heavy)			
Weight	31 kg (68.2 lbs) / 33 kg (72.6 lbs) (clamps incl.)			
Packing size	2596 x 322 x 190 mm (102.2 x 12.6 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			

iRCU specifications (86010149) see page 29



For more information about additional mounting accessories please refer to page 205

Integrable Remote Control Unit (iRCU)

KATHREIN
Antennen · Electronic

Kathrein's 86010149 integrable Remote Control Unit (iRCU) allow operators to control the electrical tilt of compatible antennas without direct access to the antenna.

- Compliant to AISG 1.1 and 3GPP/AISG 2.0
- Field replaceable without dismantling the antenna
- Daisy Chain feasibility
- Allow control of the antenna either locally through a laptop computer, on site desktop computer, the optional central control unit; remotely via an ethernet network or over the internet

Type No.	86010149
Protocols	Compliant to AISG 1.1 and 3GPP/AISG 2.0
Logical interface ex factory [1)]	AISG 2.0/3GPP
Input voltage range	10 ... 30 V (pin 1, pin 6)
Power consumption	< 1 W (stand by); < 10 W (motor activated)
Connectors [2)]	2 x 8 pin connector according to IEC 60130-9; according to AISG Daisy chain in: male; Daisy chain out: female
Hardware interfaces	RS 485A/B (pin 5, pin 3); power supply (pin 1, pin 6); DC return (pin 7); according to AISG / 3GPP
Adjustment time (full range)	40 sec (typically, depending on antenna type)
Adjustment cycles	> 50,000
Temperature range	–40 °C … +60 °C
Protection class	IP 24
Lightning protection	AISG interface (each pin); 2.5 kA (10/350μs); 8 kA (8/20μs)
Weight	480 g (1.16 lbs), 1.0 G lbs
Packing size	245 x 93 x 102 mm, (9.6 x 3.6 x 4 inches)
Dimensions (H x W x D)	170 x 68.5 x 66 mm, (6.68 x 2.7 x 2.6 inches)

[1)] The protocol of the logical interface can be switched from 3GPP/AISG 2.0 to AISG 1.1 and vice versa with a vendor specific command.

Please note:
If the Primary of the RET system doesn't support the standard of the 'logical interface ex factory', the iRCU must be switched to the appropriate standard of the Primary before installation. Please contact Kathrein for further information.

[2)] The tightning torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened'). The connector should be tightened by hand only!

Standards EN 60950-1 (Safety)
EN 55022 (Emission)
EN 55024 (Immunity)
ETS 300019-1-4 (Environmental)

Certification: CE, FCC15.107 class B

Scope of supply: Integrable Remote Control Unit

For more information about additional mounting accessories please refer to page 205

Summary – Directional Antennas
Dual Polarization +45°/–45°
800/900

KATHREIN
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Dual Polarization +45°/–45°

Type					Type No.	Height [mm]	Connector position	Page
XPol Panel	790–960	30°	18dBi	0°T	80010642	1298	rearside	32
XPol Panel	790–960	30°	21dBi	0°T	80010643	2254	rearside	32
XPol Panel	790–960	30°	20.5dBi	0°–10°T	80010456V02	2254	rearside	33
XPol Panel	806–960	65°	9dBi	0°T	739619	256	bottom or top	34
XPol Panel	806–960	65°	12.5dBi	0°T	739620	656	bottom or top	34
XPol Panel	790–960	65°	15dBi	0°T	80010202V02	1294	bottom	35
XPol Panel	790–960	65°	15dBi	6°T	80010207V01	1294	bottom	35
XPol Panel	790–960	65°	15dBi	0°–14°T	80010303V02	1294	bottom	36
XPol Panel	790–960	65°	17dBi	0°T	80010203V02	1934	rearside	36
XPol Panel	790–960	65°	17dBi	6°T	80010294V02	1934	rearside	37
XPol Panel	790–960	65°	16.5dBi	0°–10°T	80010634V01	1934	rearside	37
XPol Panel	790–960	65°	18dBi	0°T	80010204V02	2254	rearside	38
XPol Panel	790–960	65°	17.5dBi	0°–8°T	80010305V02	2254	rearside	38
XPol Panel	790–960	65°	18dBi	0°T	80010215V01	2574	rearside	39
XPol Panel	790–960	65°	18dBi	6°T	80010208V01	2574	rearside	39
XPol Panel	790–960	65°	17.5dBi	0°–10°T	80010306V02	2574	bottom	40
XPol Panel	790–960	65°	18dBi	0°–10°T	80010307V01	2574	rearside	40
XPol Panel	790–960	85°	13.5dBi	0°–14°T	80010308V01	1294	bottom	41
XPol Panel	790–960	85°	15dBi	0°–10°T	80010309V01	1934	bottom	41
XPol Panel	790–960	85°	17dBi	0°T	80010217V01	2574	rearside	42
XPol Panel	790–960	85°	16dBi	0°–10°T	80010310V01	2574	bottom	42
XPol Panel	790–960	85°	16.5dBi	0°–10°T	80010300V01	2574	rearside	43

New or changed product

Panel
Dual Polarization
Half-power Beam Width

790–960
X
30°

KATHREIN
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XPol Panel 790–960 30° 18dBi 0°T

Type No.	80010642		clamps included
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 17.5 dBi	2 x 17.6 dBi	2 x 18 dBi
Horizontal Pattern:			
Half-power beam width	33°	32°	30°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0°	25 dB	25 dB	25 dB
Tracking, Avg.	1.0 dB		
Squint	±1.0°		
Vertical Pattern:			
Half-power beam width	14.5°	14.0°	12.8°
Sidelobe suppression for first sidelobe above main beam	≥ 14 dB	≥ 13 dB	≥ 12 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 970 / 180 / 1160 N		
Height/width/depth	1298 / 576 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	13 kg / 15 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

XPol Panel 790–960 30° 21dBi 0°T

Type No.	80010643		clamps included
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° T	2 x 20.2 dBi	2 x 20.4 dBi	2 x 20.8 dBi
Horizontal Pattern:			
Half-power beam width	33°	32°	30°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0°	Typically: 30 dB	Typically: 26 dB	Typically: 23 dB
Tracking, Avg.	2.0 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	8..4°	8.2°	7.4°
Sidelobe suppression for first sidelobe above main beam	> 15 dB	> 15 dB	> 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1760 / 330 / 2040 N		
Height/width/depth	2254 / 576 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	20.5 kg / 22.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960
X
30°

KATHREIN
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XPol Panel 790–960 30° 20.5dBi 0°–10°T

Type No.	80010456V02 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° T	2 x 20.0 dBi	2 x 20.2 dBi	2 x 20.5 dBi
Horizontal Pattern:			
Half-power beam width	33°	32°	30°
Front-to-back ratio, copolar	> 28 dB	> 29 dB	> 30 dB
Cross polar ratio Maindirection 0°	Typically: 25 dB	Typically: 23 dB	Typically: 20 dB
Tracking, Avg.	2.5 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	9.1°	8.8°	8.5°
Electrical tilt	0.5°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T > 16 ... 13 ... 13 dB	0° ... 5° ... 10° T > 18 ... 18 ... 17 dB	0° ... 5° ... 10° T > 18 ... 16 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1760 / 330 / 2040 N		
Height/width/depth	2254 / 576 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	22 kg / 24 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

806–960
X
65°

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XPol Panel 806–960 65° 9dBi

Type No.	739619	
Frequency range	806–960	
	806 – 880 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	2 x 8.5 dBi	2 x 9 dBi
Half-power beam width Copolar +45°/–45°	Horizontal: 70° Vertical: 70°	Horizontal: 65° Vertical: 68°
Front-to-back ratio, copolar	> 27 dB	> 27 dB
Cross polar ratio Maindirection 0° Sector ±60°	 Typically: 25 dB > 10 dB	 Typically: 25 dB > 10 dB
Isolation	> 30 dB	
VSWR	< 1.5	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	350 W (at 50 °C ambient temperature)	
Input	2 x 7-16 female	
Connector position	Bottom or top	
Weight	3 kg	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 40 / 25 / 90 N	
Height/width/depth	256 / 262 / 116 mm	

XPol Panel 806–960 65° 12.5dBi

Type No.	739620	
Frequency range	806–960	
	806 – 880 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	2 x 12 dBi	2 x 12.5 dBi
Half-power beam width Copolar +45°/–45°	Horizontal: 68° Vertical: 29°	Horizontal: 65° Vertical: 27°
Front-to-back ratio, copolar	> 30 dB	
Isolation	> 30 dB	
VSWR	< 1.5	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	
Input	2 x 7-16 female	
Connector position	Bottom or top	
Weight	6 kg	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 110 / 60 / 240 N	
Height/width/depth	656 / 262 / 116 mm	

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960
X
65°

KATHREIN
Antennen · Electronic

XPol Panel 790–960 65° 15dBi 0°T

Type No.	80010202V02 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 14.5 dBi	2 x 14.7 dBi	2 x 15 dBi
Horizontal Pattern:			
Half-power beam width	69°	68°	65°
Front-to-back ratio (180°±30°)	> 23 dB	> 24 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 > 20 dB > 11 dB	 > 20 dB > 11 dB	 > 20 dB > 11 dB
Tracking, Avg.	0.5 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	14.7°	14.3°	13.2°
Sidelobe suppression for first sidelobe above horizon	> 14 dB	> 15 dB	> 14 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 430 / 200 / 600 N		
Height/width/depth	1294 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	6.5 kg / 8.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 790–960 65° 15dBi 6°T

Type No.	80010207V02 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 14.5 dBi	2 x 14.7 dBi	2 x 15 dBi
Horizontal Pattern:			
Half-power beam width	66°	65°	63°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	 Typically: > 20 dB Typically: > 10 dB	 Typically: > 20 dB Typically: > 10 dB	 Typically: > 20 dB Typically: > 10 dB
Vertical Pattern:			
Half-power beam width	16°	15.7°	14.6°
Electrical tilt	6°, fixed		
Sidelobe suppression for: first sidelobe above horizon sector 0°–30° above horizon	 > 13 dB > 13 dB	 > 14 dB > 14 dB	 > 16 dB > 14 dB
VSWR	< 1.4	< 1.3	
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 790 / 370 / 1090 N		
Height/width/depth	1294 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	7.5 kg / 9.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960
X
65°

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XPol Panel 790–960 65° 15dBi 0°–14°T

Type No.	80010303V02 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	14.5 ... 14.4 ... 14.3 0° ... 7° ... 14°	14.7 ... 14.5 ... 14.4 0° ... 7° ... 14°	15 ... 14.8 ... 14.7 0° ... 7° ... 14°
Horizontal Pattern:			
Half-power beam width	67°	66°	65°
Front-to-back ratio, copolar	> 24 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 Typically: 25 dB > 10 dB	 Typically: 25 dB > 10 dB	 Typically: 25 dB > 10 dB
Vertical Pattern:			
Half-power beam width	15.7°	15.5°	15°
Electrical tilt	0°–14°, continuously adjustable		
Sidelobe suppression for first sidelobe above horizon	0° ... 7° ... 14° T 15 ... 14 ... 15 dB	0° ... 7° ... 14° T 18 ... 15 ... 15 dB	0° ... 7° ... 14° T 18 ... 15 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	400 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 440 / 210 /610 N		
Height/width/depth	1294 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	8.5 kg / 10.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 790–960 65° 17dBi 0°T

Type No.	80010203V02 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 16.4 dBi	2 x 16.6 dBi	2 x 16.9 dBi
Horizontal Pattern:			
Half-power beam width	69°	67°	65°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±30° Sector ±60°	 > 22 dB > 18 dB > 14 dB	 > 22 dB > 18 dB > 14 dB	 > 22 dB > 18 dB > 14 dB
Tracking, Avg.	0.5 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	9.9°	9.5°	8.9°
Sidelobe suppression for first sidelobe above horizon	> 13 dB	> 15 dB	> 15 dB
VSWR	< 1.5	< 1.5	< 1.4
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 690 / 310 / 910 N		
Height/width/depth	1934 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	9.5 kg / 11.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960
X
65°

KATHREIN
Antennen · Electronic

XPol Panel 790–960 65° 17dBi 6°T

Type No.	80010294V02 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 16.2 dBi	2 x 16.5 dBi	2 x 16.9 dBi
Horizontal Pattern:			
Half-power beam width	69°	68°	65°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 Typ. > 20 dB Typ. > 10 dB	 Typ. > 20 dB Typ. > 10 dB	 Typ. > 20 dB Typ. > 10 dB
Tracking, Avg.	1.0 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	9.4°	9.3°	8.8°
Electrical tilt	6°, fixed		
Sidelobe suppression for first sidelobe above horizon	> 14 dB	> 15 dB	> 15 dB
VSWR	< 1.5	< 1.4	< 1.3
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 690 / 310 / 910 N		
Height/width/depth	1934 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	9.5 kg / 11.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 790–960 65° 16.5dBi 0°–10°T

Type No.	80010634V01 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	16.2 ... 16.4 ... 16.2 0° ... 5° ... 10°	16.3 ... 16.6 ... 16.3 0° ... 5° ... 10°	16.6 ... 16.8 ... 16.6 0° ... 5° ... 10°
Horizontal Pattern:			
Half-power beam width	69°	68°	65°
Front-to-back ratio (180°±30°)	> 24 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 Typically: 20 dB > 10 dB	 Typically: 20 dB > 10 dB	 Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	10°	9.9°	9.7°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T 18 ... 18 ... 18 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	400 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 680 / 310 / 900 N		
Height/width/depth	1934 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	11 kg / 13 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960
X
65°

KATHREIN
Antennen · Electronic

XPol Panel 790–960 65° 18dBi 0°T

Type No.	80010204V02 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17.2 dBi	2 x 17.5 dBi	2 x 17.8 dBi
Horizontal Pattern:			
Half-power beam width	69°	67°	65°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 > 25 dB > 14 dB	 > 25 dB > 14 dB	 > 25 dB > 14 dB
Tracking, Avg.	1.0 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	8.5°	8.3°	7.8°
Sidelobe suppression for first sidelobe above horizon	> 13 dB	> 14 dB	> 15 dB
VSWR	< 1.5	< 1.4	< 1.4
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 790 / 370 / 1090 N		
Height/width/depth	2254 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	11 kg / 13 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 790–960 65° 17.5dBi 0°–8°T

Type No.	80010305V02 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.8 ... 17 ... 16.7 0° ... 4° ... 8°	16.9 ... 17.1 ... 16.9 0° ... 4° ... 8°	17.2 ... 17.4 ... 17.0 0° ... 4° ... 8°
Horizontal Pattern:			
Half-power beam width	69°	67°	65°
Front-to-back ratio, copolar	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 Typically: 25 dB Typically: > 10 dB	 Typically: 25 dB Typically: > 10 dB	 Typically: 25 dB Typically: > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±2.5°		
Vertical Pattern:			
Half-power beam width	9.1°	8.8°	8.5°
Electrical tilt	0°–8°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 2° ... 4° ... 8° T 18 ... 18 ... 18 ... 16 dB	0° ... 2° ... 4° ... 8° T 18 ... 18 ... 18 ... 16 dB	0° ... 2° ... 4° ... 8° T 20 ... 18 ... 17 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 800 / 390 / 1090 N		
Height/width/depth	2254 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	11.5 kg / 13.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 790–960 65° 18dBi 0°T

Type No.	80010215V01	clamps included	
		790–960	
Frequency range	790 – 866 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17.7 dBi	2 x 17.9 dBi	2 x 18 dBi
Horizontal Pattern:			
Half-power beam width	69°	67°	65°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio 0° Sector ±60°	> 25 dB > 12 dB	> 25 dB > 12 dB	> 25 dB > 12 dB
Tracking, Avg.	0.5 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	7.4°	7.2°	6.8°
Sidelobe suppression for first sidelobe above main beam	≥ 14 dB	≥ 15 dB	≥ 15 dB
Null-fill	Typically: –25 dB		
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 940 / 420 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

XPol Panel 790–960 65° 18dBi 6°T

Type No.	80010208V01	clamps included	
		790–960	
Frequency range	790 – 866 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17.7 dBi	2 x 17.9 dBi	2 x 18 dBi
Horizontal Pattern:			
Half-power beam width	69°	67°	65°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio 0° Sector ±60°	> 25 dB > 10 dB	> 25 dB > 10 dB	> 25 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±2.5°		
Vertical Pattern:			
Half-power beam width	7.4°	7.2°	6.8°
Electrical tilt	6°, fixed		
Sidelobe suppression for first sidelobe above main beam	≥ 16 dB	≥ 17 dB	≥ 17 dB
Null-fill	Typically: –25 dB		
Impedance	50 Ω		
VSWR	< 1.4		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 940 / 420 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960
X
65°

KATHREIN
Antennen · Electronic

XPol Panel 790–960 65° 17.5dBi 0°–10°T

Type No.	80010306V02 (clamps included)		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	17.0 ... 17.1 ... 17.0 0.5° ... 5° ... 9.5°	17.1 ... 17.2 ... 17.1 0.5° ... 5° ... 9.5°	17.3 ... 17.4 ... 17.3 0.5° ... 5° ... 9.5°
Horizontal Pattern:			
Half-power beam width	68°	66°	65°
Front-to-back ratio (180°±30°)	> 24 dB	> 25 dB	> 25 dB
Cross polar ratio 0° Sector ±60°	Typically: 23 dB Typically: > 10 dB	Typically: 23 dB Typically: > 10 dB	Typically: 25 dB Typically: > 10 dB
Tracking, Avg.	1.0 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	7.7°	7.5°	7.3°
Electrical tilt	0.5°–9.5°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T ≥ 17 ... 14 ... 14 dB	0.5° ... 5° ... 9.5° T ≥ 18 ... 15 ... 15 dB	0.5° ... 5° ... 9.5° T ≥ 20 ... 18 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female (long neck)		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 940 / 440 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	14 kg / 16 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

XPol Panel 790–960 65° 18dBi 0°–10°T

Type No.	80010307V01 (clamps included)		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	17.4 ... 17.5 ... 17.4 0.5° ... 5° ... 9.5°	17.5 ... 17.6 ... 17.5 0.5° ... 5° ... 9.5°	17.7 ... 17.9 ... 17.7 0.5° ... 5° ... 9.5°
Horizontal Pattern:			
Half-power beam width	68°	67°	65°
Front-to-back ratio (180°±30°)	> 24 dB	> 25 dB	> 25 dB
Cross polar ratio 0° Sector ±60°	Typically: 22 dB Typically: > 10 dB	Typically: 23 dB Typically: > 10 dB	Typically: 25 dB Typically: > 10 dB
Tracking, Avg.	1.0 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	7.7°	7.5°	7.3°
Electrical tilt	0.5°–9.5°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T ≥ 18 ... 15 ... 15 dB	0.5° ... 5° ... 9.5° T ≥ 18 ... 15 ... 15 dB	0.5° ... 5° ... 9.5° T ≥ 18 ... 16 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 940 / 420 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	13 kg / 15 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960
X
85°

KATHREIN
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XPol Panel 790–960 85° 13.5dBi 0°–14°T

Type No.	80010308V01 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	13.2 ... 13.3 ... 13.2 0° ... 7° ... 14°	13.3 ... 13.4 ... 13.3 0° ... 7° ... 14°	13.4 ... 13.5 ... 13.4 0° ... 7° ... 14°
Horizontal Pattern:			
Half-power beam width	86°	85°	83°
Front-to-back ratio (180°±0°)	> 24 dB	> 24 dB	> 26 dB
Front-to-back ratio (180°±30°)	> 20 dB	> 22 dB	> 24 dB
Cross polar ratio 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	16°	15.5°	15°
Electrical tilt	0°–14°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 7° ... 14° T ≥ 17 ... 16 ... 15 dB	0° ... 7° ... 14° T ≥ 17 ... 17 ... 16 dB	0° ... 7° ... 14° T ≥ 17 ... 16 ... 16 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 430 / 200 / 590 N		
Height/width/depth	1294 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	9 kg / 11 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 790–960 85° 15dBi 0°–10°T

Type No.	80010309V01 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average Gain (dBi) Tilt	14.8 ... 15.0 ... 14.6 0° ... 5° ... 10°	14.9 ... 15.1 ... 14.7 0° ... 5° ... 10°	14.8 ... 15.2 ... 15.0 0° ... 5° ... 10°
Horizontal Pattern:			
Half-power beam width	85°	85°	83°
Front-to-back ratio (180°±0°)	> 25 dB	> 25 dB	> 26 dB
Front-to-back ratio (180°±30°)	> 21 dB	> 21 dB	> 21 dB
Cross polar ratio 0° Sector ±60°	Typically: 23 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±3.0°		
Vertical Pattern:			
Half-power beam width	10.1°	9.8°	9.6°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam: Avg.:	0° ... 5° ... 10° T ≥ 15 ... 15 ... 14 dB ≥ 19 ... 19 ... 19 dB	0° ... 5° ... 10° T ≥ 15 ... 15 ... 15 dB ≥ 20 ... 20 ... 20 dB	0° ... 5° ... 10° T ≥ 18 ... 18 ... 18 dB ≥ 22 ... 22 ... 22 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	400 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load	Frontal / lateral / rearside: 680 / 310 / 900 N (at 150 km/h)		
Height/width/depth	1934 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	11.5 kg / 13.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960
X
85°

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XPol Panel 790–960 85° 17dBi 0°T

Type No.	80010217V01 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	16.6 dBi	16.7 dBi	16.8 dBi
Horizontal Pattern:			
Half-power beam width	86°	85°	83°
Front-to-back ratio (180°±0°)	> 25 dB	> 25 dB	> 25 dB
Front-to-back ratio (180°±30°)	> 23 dB	> 24 dB	> 24 dB
Cross polar ratio 0° Sector ±60°	> 20 dB > 15 dB	> 20 dB > 15 dB	> 20 dB > 13 dB
Tracking, Avg.	1.0 dB		
Squint	±4.5°		
Vertical Pattern:			
Half-power beam width	7.5°	7.3°	7.0°
Sidelobe suppression for first sidelobe above main beam	16 dB	17 dB	16 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 940 / 420 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

XPol Panel 790–960 85° 16dBi 0°–10°T

Type No.	80010310V01 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	15.8 ... 15.6 ... 15.4 0.5° ... 5° ... 9.5°	16.0 ... 15.9 ... 15.8 0.5° ... 5° ... 9.5°	16.2 ... 16.2 ... 16.2 0.5° ... 5° ... 9.5°
Horizontal Pattern:			
Half-power beam width	86°	85°	83°
Front-to-back ratio (180°±0°)	> 24 dB	> 24 dB	> 26 dB
Front-to-back ratio (180°±30°)	> 20 dB	> 22 dB	> 24 dB
Cross polar ratio 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±3.5°		
Vertical Pattern:			
Half-power beam width	8.1°	7.9°	7.6°
Electrical tilt	0.5°–9.5°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T ≥ 18 ... 14 ... 14 dB	0.5° ... 5° ... 9.5° T ≥ 18 ... 17 ... 16 dB	0.5° ... 5° ... 9.5° T ≥ 17 ... 16 ... 16 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 950 / 420 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	14 kg / 16 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960
X
85°

KATHREIN
Antennen · Electronic

XPol Panel 790–960 85° 16.5dBi 0°–10°T

Type No.	80010300V01 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.2 ... 16.2 ... 15.8 0.5° ... 5° ... 9.5°	16.3 ... 16.3 ... 16.1 0.5° ... 5° ... 9.5°	16.5 ... 16.6 ... 16.5 0.5° ... 5° ... 9.5°
Horizontal Pattern:			
Half-power beam width	85°	85°	83°
Front-to-back ratio (180°±0°)	> 24 dB	> 25 dB	> 26 dB
Front-to-back ratio (180°±30°)	> 21 dB	> 23 dB	> 24 dB
Cross polar ratio 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±3.5°		
Vertical Pattern:			
Half-power beam width	8°	7.8°	7.6°
Electrical tilt	0.5°–9.5°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T ≥ 18 ... 15 ... 14 dB	0.5° ... 5° ... 9.5° T ≥ 18 ... 17 ... 16 dB	0.5° ... 5° ... 9.5° T ≥ 18 ... 16 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 940 / 420 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	14 kg / 16 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Summary – Directional Antennas
2-Broad-band
800/900

KATHREIN
Antennen · Electronic

Dual Polarization +45°/–45°

Type					Type No.	Height [mm]	Connector position	Page
XXPol Panel	790–862 880–960	65° 65°	14.5dBi 15dBi	0°–12°T 0°–12°T	80010667	1355	bottom	46
XXPol Panel	790–862 880–960	65° 65°	16dBi 16.5dBi	0°–10°T 0°–10°T	80010668	1934	bottom	47
XXPol Panel	790–862 880–960	65° 65°	17dBi 17.5dBi	0°–8°T 0°–8°T	**80010669**	2574	bottom	48
XXPol Panel	824–960 824–960	60° 60°	16dBi 16dBi	0°–10°T 0°–10°T	80010516V01	2024	rearside	49
XXPol Panel	790–960 790–960	65° 65°	17.5dBi 17.5dBi	0°–8°T 0°–8°T	80010647V01	2254	rearside	50
XXPol Panel	824–960 824–960	65° 65°	17dBi 17dBi	0°–8°T 0°–8°T	80010517V01	2631	rearside	51
XXPol Panel	790–960 790–960	90° 90°	15dBi 15dBi	0°–10°T 0°–10°T	**80010816**	1934	rearside	52
XXPol Panel	790–960 790–960	90° 90°	16dBi 16dBi	0°–8°T 0°–8°T	**80010817**	2896	rearside	53

New or changed product

When deploying 2-Broad-band Antennas, please also consider using special Hybrid Combiners (see page 277)

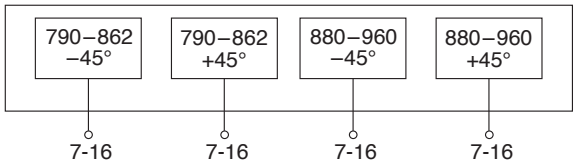
Dual-band Panel
Dual Polarization
Half-power Beam Width

790–862	880–960
X	X
65°	65°

KATHREIN
Antennen · Electronic

XXPol Panel 790–862/880–960 65°/65° 14.5/15dBi 0°–12°/0°–12°T

Type No.	80010667 clamps included	
	790–862	880–960
Frequency range	790 – 862 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	14.3 ... 14.4 ... 14.1 0° ... 6° ... 12°	14.8 ... 15.0 ... 14.6 0° ... 6° ... 12°
Horizontal Pattern:		
Half-power beam width	68°	64°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 20 dB > 10 dB	 20 dB > 10 dB
Vertical Pattern:		
Half-power beam width	15.2°	13.9°
Electrical tilt, continuously adjustable	0°–12°	0°–12°
Sidelobe suppression for first sidelobe above main beam	0° ... 6° ... 12° T ≥ 17 ... 16 ... 15 dB	0° ... 6° ... 12° T ≥ 17 ... 15 ... 15 dB
VSWR	< 1.5	
Isolation: Intrasystem	> 28 dB, Typ. > 30 dB	
Isolation: Intersystem	> 28 dB, Typ. > 30 dB (790–862 // 880–960 MHz)	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	350 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 630 / 220 / 730 N	
Height/width/depth	1355 / 303 / 99 mm	
Category of mounting hardware	M (Medium)	
Weight	14 kg / 16 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter	



For more information about additional mounting accessories please refer to page 205

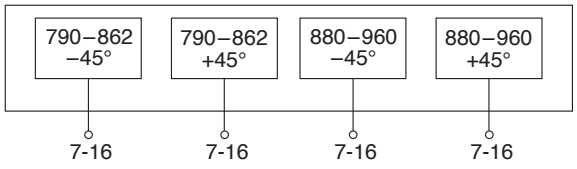
Dual-band Panel
Dual Polarization
Half-power Beam Width

790–862	880–960
X	X
65°	65°

KATHREIN
Antennen · Electronic

XXPol Panel 790–862/880–960 65°/65° 16/16.5dBi 0°–10°/0°–10°T

Type No.	80010668 (clamps included)	
	790–862	880–960
Frequency range	790 – 862 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	15.9 ... 16.0 ... 15.8 0° ... 5° ... 10°	16.3 ... 16.6 ... 16.1 0° ... 5° ... 10°
Horizontal Pattern:		
Half-power beam width	67°	63°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 23 dB > 10 dB	 25 dB > 10 dB
Vertical Pattern:		
Half-power beam width	10°	9.7°
Electrical tilt, continuously adjustable	0°–10°	0°–10°
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T ≥ 17 ... 16 ... 16 dB	0° ... 5° ... 10° T ≥ 18 ... 16 ... 16 dB
VSWR	< 1.5	
Isolation: Intrasystem	> 28 dB, Typ. > 30 dB	
Isolation: Intersystem	> 28 dB, Typ. > 30 dB (790–862 // 880–960 MHz)	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	400 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 920 / 320 / 1050 N	
Height/width/depth	1934 / 303 / 99 mm	
Category of mounting hardware	M (Medium)	
Weight	18.5 kg / 20.5 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter	



For more information about additional mounting accessories please refer to page 205

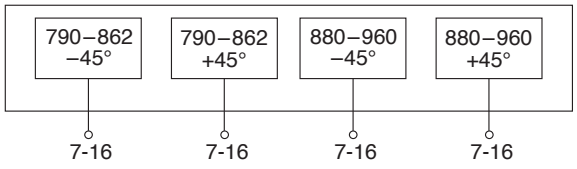
Dual-band Panel
Dual Polarization
Half-power Beam Width

790–862	880–960
X	X
65°	65°

KATHREIN
Antennen · Electronic

XXPol Panel 790–862/880–960 65°/65° 17/17.5dBi 0°–8°/0°–8°T

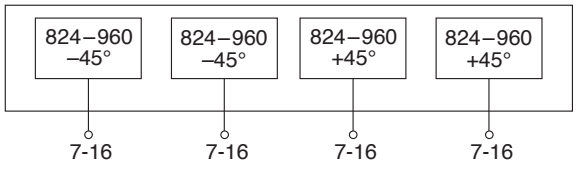
Type No.	80010669 clamps included	
	790–862	880–960
Frequency range	790 – 862 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.6 ... 16.9 ... 16.6 0° ... 4° ... 8°	17.1 ... 17.4 ... 17.1 0° ... 4° ... 8°
Horizontal Pattern:		
Half-power beam width	67°	63°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 > 25 dB > 10 dB	 > 23 dB > 10 dB
Vertical Pattern:		
Half-power beam width	7.7°	7.2°
Electrical tilt, continuously adjustable	0°–8°	0°–8°
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° T ≥ 18 ... 15 ... 15 dB	0° ... 4° ... 8° T ≥ 18 ... 16 ... 15 dB
VSWR	< 1.5	
Isolation: Intrasystem	> 28 dB, Typ. > 30 dB	
Isolation: Intersystem	> 28 dB, Typ. > 30 dB (790–862 // 880–960 MHz)	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	350 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1270 / 430 / 1430 N	
Height/width/depth	2574 / 303 / 99 mm	
Category of mounting hardware	H (Heavy)	
Weight	18 kg / 20 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter	



For more information about additional mounting accessories please refer to page 205

XXPol Panel 824–960/824–960 60°/60° 16/16dBi 0°–10°/0°–10°T

Type No.	80010516V01 clamps included	
	824–960	
Frequency range	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain at 0° tilt	4 x 15.5 dBi	4 x 15.7 dBi
Horizontal Pattern:		
Half-power beam width	60°	58°
Front-to-back ratio	> 25 dB	> 25 dB
Cross polar ratio 0° Sector ±60°	Typically: 15 dB > 10 dB	Typically: 16 dB > 10 dB
Vertical Pattern:		
Half-power beam width	9.8°	9.3°
Electrical tilt	0°–10°, continuously adjustable	
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T ≥ 14 ... 15 ... 15 dB	0° ... 5° ... 10° T ≥ 14 ... 15 ... 15 dB
VSWR	< 1.5	
Isolation, between ports	Typically: > 25 dB	Typically: > 28 dB
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female	
Connector position	Rearside, pointing downwards	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 910 / 300 / 1150 N	
Height/width/depth	2024 / 374 / 169 mm	
Category of mounting hardware	H (Heavy)	
Weight	23 kg / 25 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter	



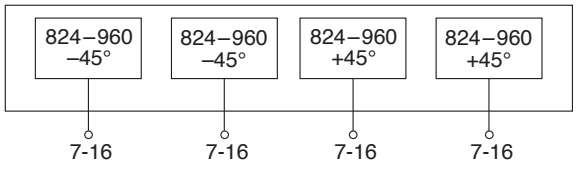
2-Multi-band Panel
Dual Polarization
Half-power Beam Width

790–960	790–960
X	X
65°	65°

KATHREIN
Antennen · Electronic

XXPol Panel 790–960/790–960 65°/65° 17.5/17.5dBi 0°–8°/0°–8°T

Type No.	80010647V01 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.9 ... 17.1 ... 17.0 0° ... 4° ... 8°	17.0 ... 17.2 ... 17.1 0° ... 4° ... 8°	17.3 ... 17.4 ... 17.1 0° ... 4° ... 8°
Horizontal Pattern:			
Half-power beam width	66°	65°	64°
Front-to-back ratio, copolar	> 27 dB	> 27 dB	> 27 dB
Cross polar ratio Maindirection 0° Sector ±60°	 Typically: 25 dB Typically: > 10 dB	 Typically: 25 dB Typically: > 10 dB	 Typically: 25 dB Typically: > 10 dB
Tracking, Avg.	1.0 dB		
Squint	±2.5°		
Vertical Pattern:			
Half-power beam width	9.1°	9.0°	8.5°
Electrical tilt	0°–8°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 3° ... 6° ... 8° T 18 ... 18 ... 16 ... 15 dB	0° ... 3° ... 6° ... 8° T 18 ... 18 ... 16 ... 15 dB	0° ... 3° ... 6° ... 8° T 18 ... 18 ... 16 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	400 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1760 / 330 / 2040 N		
Height/width/depth	2254 / 576 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	24 kg / 26 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



For more information about additional mounting accessories please refer to page 205

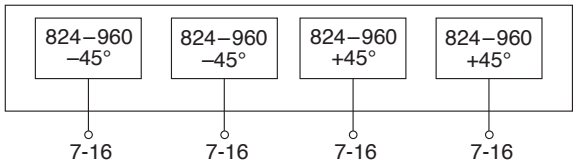
2-Multi-band Panel
Dual Polarization
Half-power Beam Width

824–960	824–960
X	X
65°	65°

KATHREIN
Antennen · Electronic

XXPol Panel 824–960/824–960 65°/65° 17/17dBi 0°–8°/0°–8°T

Type No.	80010517V01 clamps included	
	824–960	
Frequency range	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain at 0° tilt	4 x 16.5 dBi	4 x 16.7 dBi
Horizontal Pattern:		
Half-power beam width	66°	61°
Front-to-back ratio	> 25 dB	> 25 dB
Cross polar ratio 0° Sector ±60°	Typically: 16 dB > 8 dB	Typically: 17 dB > 10 dB
Vertical Pattern:		
Half-power beam width	7.2°	6.8°
Electrical tilt	0°–8°, continuously adjustable	
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° T ≥ 15 ... 15 ... 15 dB	0° ... 4° ... 8° T ≥ 15 ... 16 ... 15 dB
VSWR	< 1.5	
Isolation, between ports	Typically: > 25 dB	> 28 dB
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female	
Connector position	Rearside, pointing downwards	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1210 / 400 / 1540 N	
Height/width/depth	2631 / 374 / 169 mm	
Category of mounting hardware	H (Heavy)	
Weight	28 kg / 30 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter	



For more information about additional mounting accessories please refer to page 205

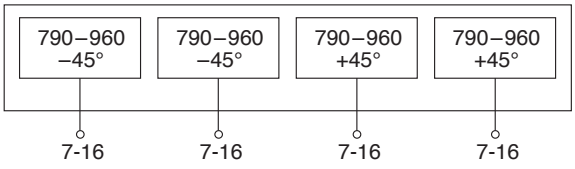
Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	790–960
X	X
90°	90°

KATHREIN
Antennen · Electronic

XXPol Panel 790–960/790–960 90°/90° 15/15dBi 0°–10°/0°–10°T

Type No.	80010816 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	14.5 ... 14.5 ... 14.3 0° ... 5° ... 10°	14.6 ... 14.8 ... 14.5 0° ... 5° ... 10°	14.8 ... 15.0 ... 14.8 0° ... 5° ... 10°
Horizontal Pattern:			
Half-power beam width	93°	90°	87°
Front-to-back ratio (180°±0°)	> 24 dB	> 24 dB	> 25 dB
Front-to-back ratio (180°±30°)	> 20 dB	> 21 dB	> 22 dB
Cross polar ratio 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 18 dB > 10 dB
Vertical Pattern:			
Half-power beam width	10.5°	10.2°	10°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T ≥ 18 ... 15 ... 14 dB	0° ... 5° ... 10° T ≥ 18 ... 17 ... 16 dB	0° ... 5° ... 10° T ≥ 18 ... 16 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	Intrasystem: > 28 dB, Intersystem: > 26 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	400 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (approx.) (at 150 km/h)	Frontal / lateral / rearside: 910 / 380 / 1150 N		
Height/width/depth	1934 / 374 / 106 mm		
Category of mounting hardware	H (Heavy)		
Weight (approx.)	17 kg / 19 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



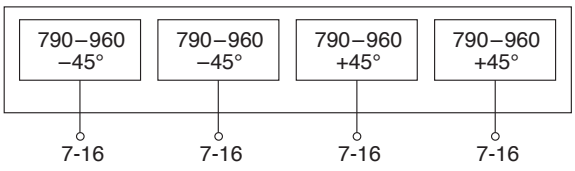
For more information about additional mounting accessories please refer to page 205

Dual-band Panel	790–960	790–960
Dual Polarization	X	X
Half-power Beam Width	90°	90°

KATHREIN
Antennen · Electronic

XXPol Panel 790–960/790–960 90°/90° 16/16dBi 0°–8°/0°–8°T

Type No.	80010817 (clamps included)		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	15.4 ... 15.4 ... 15.0 0° ... 4° ... 8°	15.7 ... 15.7 ... 15.4 0° ... 4° ... 8°	16.0 ... 16.1 ... 15.9 0° ... 4° ... 8°
Horizontal Pattern:			
Half-power beam width	93°	90°	87°
Front-to-back ratio (180°±0°)	> 24 dB	> 24 dB	> 25 dB
Front-to-back ratio (180°±30°)	> 20 dB	> 21 dB	> 22 dB
Cross polar ratio 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 18 dB > 10 dB
Vertical Pattern:			
Half-power beam width	7.4°	7.2°	6.9°
Electrical tilt	0°–8°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° T ≥ 17 ... 17 ... 15 dB	0° ... 4° ... 8° T ≥ 17 ... 17 ... 15 dB	0° ... 4° ... 8° T ≥ 17 ... 17 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	Intrasystem: > 27 dB, Intersystem: > 27 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	400 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1270 / 400 / 1710 N		
Height/width/depth	2631 / 374 / 106 mm		
Category of mounting hardware	H (Heavy)		
Weight	24 kg / 26 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



For more information about additional mounting accessories please refer to page 205

Summary – Directional Antennas
Vertical Polarization
800/900 / 1800/1900/2000

KATHREIN
Antennen · Electronic

VPol – 800/900

Type					Type No.	Height [mm]	Connector position	Page
VPol Panel	870–960	20°	16.5dBi	0°T	735727	492	bottom	56
VPol BiDir	790–960 / 1710–2170	65°	5dBi	0°T	738445	312		57
VPol BiDir	790–960 / 1710–2170	65°	5dBi	0°T	738446	312		57
VPol LogPer	790–2690	65°	11dBi	0°T	742192V01	300	bottom	58
VPol Panel	790–960	65°	18.5dBi	0°T	730376V02	2574	rearside	59
VPol Panel	872–960	90°	7.5dBi	0°T	736854	262	bottom or top	60
VPol Panel	790–960	90°	17dBi	0°T	730378V02	2574	rearside	60
VPol Panel	870–960	120°	16dBi	0°T	730382	2574	rearside	61

VPol – 800/900 / 1800/1900/2000

VPol Panel	1710–2180	12°	18.5dBi	0°T	80010368	299	side	62
VPol BiDir	790–960 / 1710–2170	65°	5dBi	0°T	738445	312		57
VPol BiDir	790–960 / 1710–2170	65°	5dBi	0°T	738446	312		57
VPol LogPer	790–2690	65°	11dBi	0°T	742192V01	300	bottom	58

VVPol – 800/900 / 1800/1900/2000

VVPol Panel	824–960	C	90°	7dBi	0°T	742290	328	bottom or top	63
	1710–2170		82°	7dBi	0°T			
VVPol Panel	824–960	C	90°	10dBi	0°T	80010046	662	bottom or top	63
	1710–2170		82°	11dBi	0°T			

C = integrated Combiner New or changed product

Additional versions on request

Panel
Vertical Polarization
Half-power Beam Width

870–960

V

20°

KATHREIN
Antennen · Electronic

VPol Panel 870–960 20° 16.5dBi

Type No.	735727
Frequency range	870 – 960 MHz
Polarization	Vertical
Gain	16.5 dBi
Half-power beam width	H-plane: 20° E-plane: 33°
Impedance	50 Ω
VSWR	< 1.3
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power per input	500 W (at 50 °C ambient temperature)
Input	7-16 female
Connector position	Rearside
Wind load (at 150 km/h)	Frontal / lateral / rearside: 500 / 70 / 715 N
Height/width/depth	492 / 992 / 190 mm
Category of mounting hardware	M (Medium)
Packing size	1010 x 630 x 265 mm

Material: Radiator: Aluminum. Reflector screen: Weather-proof aluminum.
Radome: Fiberglass, color: White.
All screws and nuts: Stainless steel.

Ice protection: Ice protection: Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

Grounding: The metal parts of the antenna including the mounting kit and the inner conductors are DC grounded.

Accessories (order separately)

Type No.	Description	Remarks	Weight approx.	Units per antenna
731651	1 clamp	Mast: 28 – 60 mm diameter	0.8 kg	2
738546	1 clamp	Mast: 50 – 115 mm diameter	1.0 kg	2
85010002	1 clamp	Mast: 110 – 220 mm diameter	2.7 kg	2
85010003	1 clamp	Mast: 210 – 380 mm diameter	4.8 kg	2

Multi-band Bidirectional Antenna 790–960/1710–2170
Vertical Polarization V
Half-power Beam Width 65°

KATHREIN
Antennen · Electronic

VPol BiDir 790–960/1710–2170 65° 5dBi

Type No.	738445	738446
Input	1 x 7-16 female	1 x N female
Frequency range	790 – 960 MHz, 1710 – 2170 MHz	
VSWR	790 – 806 MHz: < 2.2 806 – 824 MHz: < 1.7 824 – 960 / 1710 – 2170 MHz: < 1.5	
Gain	790 – 960 MHz: 5 dBi 1710 – 1880 MHz: 5.5 dBi 1880 – 2170 MHz: 6.5 dBi	
Impedance	50 Ω	
Polarization	Vertical	
Max. power (total)	200 W (at 50 °C ambient temperature)	
Weight	0.8 kg	
Half-power beam width	Frontal: 25 N (at 150 km/h) Lateral: 65 N (at 150 km/h) Rearside: 35 N (at 150 km/h)	
Max. wind velocity	200 km/h	
Packing size	422 x 212 x 95 mm	
Height/width/depth	312 / 55 / 188 mm	

Material:	Radiator: Tin-plated copper. Reflector: Weather-proof aluminum. Radome: High impact plastic, colour: Grey. All screws and nuts: Stainless steel.
Mounting:	Wall mounting: No additional mounting kit needed. For pipe mast mounting use clamps listed below (order separately).
Ice protection:	The radiating system is protected by the radome. Due to its very sturdy construction, the antenna remains operational even under icy conditions.
Grounding:	All metal parts of the antenna as well as the inner conductor are DC grounded.

Accessories (order separately)

Type No.	Description	Remarks	Weight approx.	Units per antenna
734360	2 clamps	Mast: 34 – 60 mm diameter	60 g	1
734361	2 clamps	Mast: 60 – 80 mm diameter	70 g	1
734362	2 clamps	Mast: 80 – 100 mm diameter	80 g	1
734363	2 clamps	Mast: 100 – 120 mm diameter	90 g	1
734364	2 clamps	Mast: 120 – 140 mm diameter	110 g	1
734365	2 clamps	Mast: 45 – 125 mm diameter	80 g	1

Logarithmic Periodic
Vertical Polarization
Half-power Beam Width

790–2690

V

65°

KATHREIN
Antennen · Electronic

VPol LogPer 790–2690 65° 11dBi

Type No.	742192V01				
Frequency range	790 – 960 MHz	960 – 1710 MHz	1710 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
VSWR	< 1.5	< 1.5	< 1.5	< 1.5	< 1.6
Gain	10.8 dBi	11.0 dBi	11.2 dBi	11.0 dBi	10.8 dBi
Impedance	50 Ω	50 Ω	50 Ω	50 Ω	50 Ω
Polarization	Vertical	Vertical	Vertical	Vertical	Vertical
Front-to-back ratio	> 25 dB	> 25 dB	> 25 dB	> 22 dB	> 25 dB
Half-power beam width horizontal vertical	 65° 53°	 60° 50°	 55° 47°	 50° 45°	 50° 45°
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc	< –150 dBc	< –150 dBc	< –150 dBc
Max. power Total power	300 W	250 W 500 W (at 50 °C ambient temperature)	200 W	170 W	150 W
Input	1 x 7-16 female				
Connector position	Bottom				
Weight	5.5 kg				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 20 / 210 / 30 N				
Height/width/depth	300 / 155 / 785 mm				

Material: Radiator: Tin-plated copper. Reflector screen: Weather-proof aluminum.
Radome: Fiberglass, color: Grey.
All screws and nuts: Stainless steel

Mounting: The antenna can be mounted on tubular mast with a diameter of
30 – 70 mm with supplied clamps.

Ice protection: Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

Grounding: All metal parts of the antenna as well as the inner conductor are DC grounded.

Panel
Vertical Polarization
Half-power Beam Width

790–960

V

65°

KATHREIN
Antennen · Electronic

VPol Panel 790–960 65° 18.5dBi

Type No.	730376V02		clamps included
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization		Vertical	
Gain	17.8 dBi	18.0 dBi	18.4 dBi
Horizontal Pattern:			
Half-power beam width	68°	67°	65°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB
Vertical Pattern:			
Half-power beam width	7.4°	7.2°	6.8°
Sidelobe suppression for first sidelobe above horizon	> 17 dB	> 17 dB	> 18 dB
VSWR	< 1.5		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 740 / 330 / 1270 N (at 150 km/h)		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel 790/872...960
Vertical Polarization V
Half-power Beam Width 90°

KATHREIN
Antennen · Electronic

VPol Panel 872–960 90° 7.5dBi

Type No.	736854
Frequency range	872 – 960 MHz
Polarization	Vertical
Gain	7.5 dBi
Half-power beam width	H-plane: 90° E-plane: 70°
Front-to-back ratio	> 20 dB
VSWR	< 1.5
Intermodulation IM3	< –140 dBc (2 x 43 dBm carrier)
Max. power	350 W (at 50 °C ambient temperature)
Input	N female
Connector position	Bottom or top
Weight	1.5 kg
Wind load (at 150 km/h)	Frontal / lateral / rearside: 45 / 20 / 60 N
Height/width/depth	262 / 155 / 49 mm

VPol Panel 790–960 90° 17dBi

Type No.	730378V02 clamps included		
		790–960	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	Vertical		
Gain	16.6 dBi	16.7 dBi	17.0 dBi
Horizontal Pattern:			
Half-power beam width	90°	90°	90°
Front-to-back ratio (180°±30°)	> 22 dB	> 22 dB	> 22 dB
Vertical Pattern:			
Half-power beam width	7.1°	6.9°	6.6°
Sidelobe suppression for first sidelobe above horizon	> 12 dB	> 12 dB	> 12 dB
Impedance	50 Ω		
VSWR	< 1.5		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 930 / 410 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Panel
Vertical Polarization
Half-power Beam Width

870–960

V

120°

KATHREIN
Antennen · Electronic

VPol Panel 870–960 120° 16dBi

Type No.	730382
Frequency range	870 – 960 MHz
Polarization	Vertical
Gain	16 dBi
Half-power beam width	H-plane: 120° E-plane: 6.5°
Front-to-back ratio	> 20 dB
VSWR	< 1.3
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	500 W (at 50 °C ambient temperature)
Input	7-16 female
Connector position	Rearside
Weight	12 kg
Wind load (at 150 km/h)	Frontal / lateral / rearside: 740 / 330 / 1270 N
Height/width/depth	2574 / 258 / 103 mm

For more information about additional mounting accessories please refer to page 205

Multi-band Antenna
Vertical Polarization
Half-power Beam Width

1710–2180

V

12°

KATHREIN
Antennen · Electronic

VPol Panel 1710–2180 12° 18.5dBi 0°T

Type No.	80010368		
		1710–2180	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	Vertical	Vertical	Vertical
Gain	18.1 dBi	18.4 dBi	18.7 dBi
Horizontal Pattern:			
Half-power beam width	13.3°	12.8°	12°
Front-to-back ratio (180°±30°)	> 30 dB	> 30 dB	> 30 dB
Sidelobe suppression	> 18 dB	> 18 dB	> 17 dB
Vertical Pattern:			
Half-power beam width	37°	36°	36°
Electrical tilt	0°, fixed		
Sidelobe supression for first sidelobe above main beam	> 18 dB	> 18 dB	> 18 dB
VSWR	< 1.5		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	1 x 7-16 female		
Connector position	Side (see picture)		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 340 / 25 / 400 N		
Height/width/depth	299 / 743 / 69 mm		
Weight	9 kg		

For more information about additional mounting accessories please refer to page 205

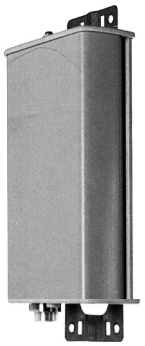
Dual-band Panel
Vertical Polarization
Half-power Beam Width

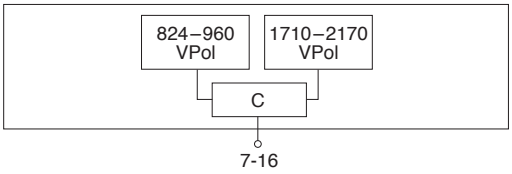
824–960	1710–2170
V	V
90°	82°

KATHREIN
Antennen · Electronic

VVPol Panel 824–960/1710–2170 C 90°/82° 7/7dBi

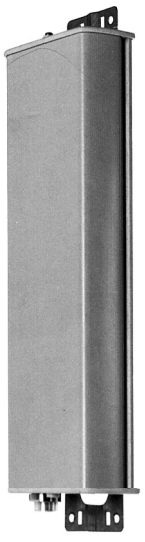
Type No.	742290	
Frequency range	824 – 960 MHz	1710 – 2170 MHz
Polarization	Vertical	Vertical
Gain	7 dBi	7 dBi
Half-power beam width	Horizontal: 90° Vertical: 60°	Horizontal: 82° Vertical: 70°
Front-to-back ratio	> 18 dB	> 20 dB
VSWR	< 1.7 (824 – 960 MHz) < 1.5 (870 – 960 MHz)	< 1.7 (1710 – 2170 MHz) < 1.5 (1710 – 1990 MHz)
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc
Max. power	100 W (at 50 °C ambient temperature)	
Input	1 x 7-16 female	
Connector position	Bottom or top	
Weight	2.8 kg	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 90 / 23 / 100 N	
Height/width/depth	328 / 155 / 69 mm	

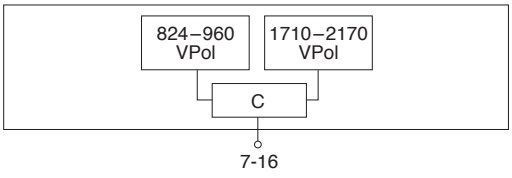




VVPol Panel 824–960/1710–2170 C 90°/82° 10/11dBi

Type No.	80010046	
Frequency range	824 – 960 MHz	1710 – 2170 MHz
Polarization	Vertical	Vertical
Gain	10 dBi	11 dBi
Half-power beam width	Horizontal: 90° Vertical: 33°	Horizontal: 82° Vertical: 19°
Front-to-back ratio	> 18 dB	> 20 dB
VSWR	< 1.7 (824 – 960 MHz) < 1.5 (870 – 960 MHz)	< 1.5
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc
Max. power	100 W (at 50 °C ambient temperature)	
Input	1 x 7-16 female	
Connector position	Bottom or top	
Weight	5 kg	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 175 / 47 / 200 N	
Height/width/depth	662 / 155 / 69 mm	





For more information about additional mounting accessories please refer to page 205

Summary – Directional Antennas
Dual Polarization +45°/–45°
1800/1900/2000/2600

KATHREIN
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Dual Polarization +45°/–45°

Type						Type No.	Height [mm]	Connector position	Page
XPol Panel	1710–2170	30°	20dBi	0°–12°T		80010251V01	1032	bottom	66
XPol Panel	1710–2170	30°	21dBi	0°–8°T		742351V01	1304	bottom	66
XPol Panel	1710–2170	45°	19.5dBi	0°–8°T		742218V01	1306	bottom	67
XPol Panel	1710–2170	45°	21.5dBi	0°–6°T		742219V01	1946	bottom	67
XPol Panel	1710–2170	65°	9dBi	0°T		742210V01	155	bottom or top	68
XPol Panel	1710–2170	65°	12dBi	2°T		739489V01	342	bottom	68
XPol Panel	1710–2690	65°	12dBi	4°T		80010761	278	bottom	69
XPol Panel	1710–2170	65°	16dBi	0°T		742196V01	735	bottom or top	69
XPol Panel	1710–2200	65°	15.5dBi	0°–12°T		80010247V01	735	bottom	70
XPol Panel	1710–2690	65°	16.5dBi	0°–12°T		80010681	851	bottom	71
XPol Panel	1710–2200	65°	18.3dBi	0°T		80010425V01	1302	bottom	72
XPol Panel	1710–2200	65°	18.3dBi	2°T		80010426V01	1302	bottom	72
XPol Panel	1710–2200	65°	18dBi	6°T		80010428V01	1302	bottom	73
XPol Panel	1710–2170	65°	18dBi	0°–8°T		742214V01	1142	bottom	73
XPol Panel	1710–2200	65°	18dBi	0°–10°T		742215V01	1314	bottom	74
XPol Panel	1710–2200	65°	18dBi	2°–10°T	ESLS	80010614V01	1314	bottom	74
XPol Panel	1710–2200	65°	18dBi	0°–15°T	ESLS	80010504V01	1387	bottom	75
XPol Panel	1710–2690	65°	18dBi	0°–12°T	ESLS	80010621V01	1410	bottom	76
XPol Panel	1710–2200	65°	19.5dBi	0°–6°T		742213V01	1954	bottom	77
XPol Panel	1710–2200	65°	19dBi	0°–10°T	ESLS	80010505V01	1984	bottom	78
XPol Panel	1710–2200	62°	19dBi	0°–8°T	HE	80010636	1407	bottom	79
XPol Panel	1710–2690	65°	19dBi	0°–6°T		80010651	1670	bottom	80
XPol Panel	1710–2200	65°	21dBi	0°T	HE	80010439V01	2172	bottom or top	81
XPol Panel	1710–2200	62°	21.2dBi	0°–6°T	HE	80010378	2548	bottom	81
XPol Panel	1710–2170	90°	11.5dBi	0°T		741984V01	342	bottom or top	82
XPol Panel	1710–2170	90°	14dBi	0°–10°T		741988V01	662	bottom	82
XPol Panel	1710–2200	90°	17dBi	0°–8°T		741989V01	1302	bottom	83
XPol Panel	1710–2170	90°	18dBi	0°–6°T		741990V01	1942	bottom	83

Antennas with Dual-Beam

XXPol Panel	1710–2200	40° (–30°)	17dBi	2°–14°T	80010605	698	bottom	84
	1710–2200	40° (+30°)	17dBi	2°–14°T				
XXPol Panel	1710–2200	45° (–30°)	19.5dBi	0°–10°T	80010606V01	1314	bottom	85
	1710–2200	45° (+30°)	19.5dBi	0°–10°T				

New or changed product

Abbreviations:
ESLS: Enhanced Side Lobe Suppression (above or below horizon)
HE: High Efficiency (Antennas with high gain compared to length)

Summary – Directional Antennas
Dual Polarization +45°/–45°
1800/1900/2000/2600

KATHREIN
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Antennas with integrated RET

Type					Type No.	Height [mm]	Connector position	Page
XPol Panel IRT	1710–2200	65°	18dBi	0°–10°T	80010618V01	1302	bottom	86

Tri-Sector Pipe Antenna

XPol Tri-Sector Pipe	1710–2170	65°	15.5dBi	0°–12°T	80010375	1241	bottom	87
XPol Tri-Sector Pipe	1710–2170	65°	18dBi	0°–10°T	80010360	1823	bottom	88
Flexible Sealing Frame					85010010			89

Further types on request.
Please contact:
mobilcom@kathrein.de

Abbreviations:
IRT: Integrated Remote Tilt Unit

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2170

X

30°

KATHREIN
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XPol Panel 1710–2170 30° 20dBi 0°–12°T

Type No.	80010251V01 clamps included		
		1710–2170	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 19.2 dBi	2 x 19.5 dBi	2 x 19.8
Horizontal Pattern:			
Half-power beam width	36°	35°	33°
Front-to-back ratio, copolar (180°±30°)	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Sidelobe suppression	> 18 dB	> 17 dB	> 15 dB
Tracking, Avg.	1.0 dB		
Squint	±1.0°		
Vertical Pattern:			
Half-power beam width	9.2°	9°	8.5°
Electrical tilt	0°–12°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	0° ... 6° ... 12° T 15 ... 17 ... 17 dB	0° ... 6° ... 12° T 15 ... 17 ... 17 dB	0° ... 6° ... 12° T 15 ... 17 ... 17 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 420 / 110 / 520 N		
Height/width/depth	1032 / 299 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 1710–2170 30° 21dBi 0°–8°T

Type No.	742351V01 clamps included		
		1710–2170	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 20.2 dBi	2 x 20.5 dBi	2 x 20.7
Horizontal Pattern:			
Half-power beam width	36°	35°	33°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Sidelobe suppression	> 14 dB	> 14 dB	> 14 dB
Tracking, Avg.	0.5 dB		
Squint	±1.0°		
Vertical Pattern:			
Half-power beam width	7.4°	7.0°	6.7°
Electrical tilt	0°–8°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	0° ... 4° ... 8° T 18 ... 17 ... 16 dB	0° ... 4° ... 8° T 18 ... 18 ... 17 dB	0° ... 4° ... 8° T 18 ... 17 ... 16 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 540 / 135 / 640 N		
Height/width/depth	1304 / 299 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	14 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2170

X

45°

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XPol Panel 1710–2170 45° 19.5dBi 0°–8°T

Type No.	742218V01 clamps included		
		1710–2170	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 19 dBi	2 x 19.5 dBi	2 x 19.6 dBi
Horizontal Pattern:			
Half-power beam width	47°	45°	44°
Front-to-back ratio (180°±30°)	Copolar: > 27 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 27 dB Total power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±30°	 Typically: 18 dB > 13 dB	 Typically: 18 dB > 13 dB	 Typically: 18 dB > 13 dB
Sidelobe suppression	> 18 dB	> 18 dB	> 18 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	7.3°	7.0°	6.7°
Electrical tilt	0°–8°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	0° ... 2° ... 5° ... 8° T 17 ... 17 ... 15 ... 15 dB	0° ... 2° ... 5° ... 8° T 18 ... 18 ... 17 ... 17 dB	0° ... 2° ... 5° ... 8° T 18 ... 18 ... 15 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 450 / 145 / 490 N		
Height/width/depth	1306 / 199 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	11 kg / 13 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 1710–2170 45° 21.5dBi 0°–6°T

Type No.	742219V01 clamps included		
		1710–2170	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	20.5 ... 20.6 ... 20.3 0° ... 3° ... 6°	20.9 ... 21.1 ... 20.9 0° ... 3° ... 6°	21 ... 21.4 ... 21 0° ... 3° ... 6°
Horizontal Pattern:			
Half-power beam width	48°	45°	44°
Front-to-back ratio (180°±30°)	Copolar: > 28 dB Total power: > 25 dB	Copolar: > 27 dB Total power: > 25 dB	Copolar: > 25 dB Total power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±30°	 Typically: 19 dB > 13 dB	 Typically: 18 dB > 13 dB	 Typically: 17 dB > 13 dB
Sidelobe suppression	> 18 dB	> 18 dB	> 18 dB
Tracking, Avg.	1.0 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	4.7°	4.5°	4.4°
Electrical tilt	0°–6°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 16 ... 16 dB	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 17 ... 16 dB	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 17 ... 16 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 700 / 220 / 740 N		
Height/width/depth	1946 / 199 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	14 kg / 16 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2170
X
65°

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XPol Panel 1710–2170 65° 9dBi 0°T

Type No.	742210V01 clamps included		
	1710–2170		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 8.5 dBi	2 x 8.6 dBi	2 x 8.7 dBi
Horizontal Pattern:			
Half-power beam width	70°	68°	65°
Front-to-back ratio, copolar	> 25 dB	> 30 dB	> 27 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB		
Squint	±3.0°		
Vertical Pattern:			
Half-power beam width	65°	65°	63°
Electrical tilt	0°, fixed	0°, fixed	0°, fixed
VSWR	< 1.4		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	150 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom or top		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 50 / 13 / 55 N		
Height/width/depth	155 / 155 / 69 mm		
Category of mounting hardware	L (Light)		
Weight	1.5 kg (tension bands incl.)		
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter		

XPol Panel 1710–2170 65° 12dBi 2°T

Type No.	739489V01 clamps included		
	1710–2170		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 11.5 dBi	2 x 12 dBi	2 x 12 dBi
Horizontal Pattern:			
Half-power beam width	67°	65°	63°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 27 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	32°	30°	28°
Electrical tilt	3°, fixed	2°, fixed	0°, fixed
VSWR	< 1.4		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	150 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 90 / 27 / 105 N		
Height/width/depth	342 / 155 / 69 mm		
Category of mounting hardware	L (Light)		
Weight	2.2 kg (tension bands incl.)		
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710...2690

X

65°

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XPol Panel 1710–2690 65° 12dBi 4°T

Type No.	80010761 clamps included			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 11 dBi	2 x 11.5 dBi	2 x 12.2 dBi	2 x 12.7 dBi
Horizontal Pattern:				
Half-power beam width	67°	65°	60°	58°
Front-to-back ratio, copolar	> 30 dB	> 28 dB	> 28 dB	> 28 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: > 20 dB > 8 dB	Typically: > 20 dB > 8 dB	Typically: > 20 dB > 8 dB	Typically: > 20 dB > 8 dB
Vertical Pattern:				
Half-power beam width	36°	31°	25°	25°
Electrical tilt	3°, fixed	3°, fixed	4°, fixed	4°, fixed
VSWR	< 1.5			
Isolation, between ports	> 28 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	150 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 75 / 17 / 75 N			
Height/width/depth	278 / 154 / 69 mm			
Category of mounting hardware	L (Light)			
Weight	0.4 kg (tension bands incl.)			
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter			

XPol Panel 1710–2170 65° 16dBi 0°T

Type No.	742196V01 clamps included		
	1710–2170		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 15.3 dBi	2 x 15.6 dBi	2 x 15.8 dBi
Horizontal Pattern:			
Half-power beam width	67°	66°	64°
Front-to-back ratio (180°±30°)	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	12.6°	11.8°	11°
Sidelobe suppression for first sidelobe above horizon	> 14 dB	> 16 dB	> 14 dB
VSWR	< 1.4		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom or top		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 185 / 65 / 220 N		
Height/width/depth	735 / 155 / 69 mm		
Category of mounting hardware	L (Light)		
Weight	4.5 kg (tension bands incl.)		
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2200

X

65°

KATHREIN
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XPol Panel 1710–2200 65° 15.5dBi 0°–12°T

Type No.	80010247V01 clamps included		
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain per input (dBi)	0° ... 4° ... 8° ... 12° T 15.5 ... 15.4 ... 15.3 ... 15.1	0° ... 4° ... 8° ... 12° T 15.6 ... 15.5 ... 15.4 ... 15.0	0° ... 4° ... 8° ... 12° T 15.8 ... 15.7 ... 15.5 ... 14.9
Horizontal Pattern:			
Half-power beam width	67°	66°	64°
Front-to-back ratio	Copolar: > 27 dB	Copolar: > 27 dB	Copolar: > 27 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	12.9°	12.3°	11.5°
Electrical tilt	0°–12°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° ... 12° T > 14 ... 14 ... 14 ... 14 dB	0° ... 4° ... 8° ... 12° T > 14 ... 14 ... 14 ... 14 dB	0° ... 4° ... 8° ... 12° T > 14 ... 14 ... 14 ... 14 dB
Impedance	50 Ω		
VSWR	< 1.4		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 195 / 70 / 220 N		
Height/width/depth	735 / 155 / 69 mm		
Category of mounting hardware	L (Light)		
Weight	4.5 kg (tension bands incl.)		
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2690

X

65°

KATHREIN
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XPol Panel 1710–2690 65° 16.5dBi 0°–12°T

Type No.	80010681 (clamps included)			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 15.5 dBi	2 x 16.3 dBi	2 x 16.7 dBi	2 x 16.7 dBi
Horizontal Pattern:				
Half-power beam width	67°	64°	60°	60°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 23 dB	> 23 dB
Cross polar ratio 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 28 dB > 8 dB	Typically: 28 dB > 8 dB	Typically: 28 dB > 11 dB
Vertical Pattern:				
Half-power beam width	10.8°	9.9°	8.8°	8.4°
Electrical tilt	0°–12°, continuously adjustable			
Sidelobe suppression – for first sidelobe above main beam	0° ... 6° ... 12° T ≥ 12 ... 13 ... 15 dB	0° ... 6° ... 12° T ≥ 13 ... 14 ... 15 dB	0° ... 6° ... 12° T ≥ 13 ... 14 ... 16 dB	0° ... 6° ... 12° T ≥ 15 ... 15 ... 17 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	250 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 210 / 60 / 220 N			
Height/width/depth	851 / 155 / 70 mm			
Category of mounting hardware	L (Light)			
Weight	5 kg / 5.2 kg (clamps incl.)			
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter			

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2200

X

65°

KATHREIN
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XPol Panel 1710–2200 65° 18.3dBi 0°T

Type No.	80010425V01 clamps included		
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17.9 dBi	2 x 18.1 dBi	2 x 18.3 dBi
Horizontal Pattern:			
Half-power beam width	67°	66°	64°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	6.6°	6.2°	5.8°
Electrical tilt	0°, fixed		
Sidelobe supression for first sidelobe above main beam	> 14 dB	> 15 dB	> 16 dB
First null-fill below main beam	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB
VSWR	< 1.4		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 330 / 115 / 390 N		
Height/width/depth	1302 / 155 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	7 kg / 9 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 1710–2200 65° 18.3dBi 2°T

Type No.	80010426V01 clamps included		
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17.9 dBi	2 x 18.1 dBi	2 x 18.3 dBi
Horizontal Pattern:			
Half-power beam width	66°	65°	63°
Front-to-back ratio, copolar	> 28 dB	> 30 dB	> 33 dB
Cross polar ratio 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	6.6°	6.2°	5.8°
Electrical tilt	2°, fixed		
Sidelobe supression for first sidelobe above main beam	> 14 dB	> 15 dB	> 15 dB
First null-fill below main beam	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB
VSWR	< 1.4		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 330 / 115 / 390 N		
Height/width/depth	1302 / 155 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	7 kg / 9 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710...2200

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2200 65° 18dBi 6°T

Type No.	80010428V01 clamps included		
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17.7 dBi	2 x 17.9 dBi	2 x 18.1 dBi
Horizontal Pattern:			
Half-power beam width	67°	65°	63°
Front-to-back ratio, copolar	> 27 dB	> 33 dB	> 33 dB
Cross polar ratio 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	6.7°	6.3°	5.8°
Electrical tilt	6°, fixed		
Sidelobe supression for first sidelobe above main beam	> 14 dB	> 14 dB	> 15 dB
First null-fill below main beam	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB
VSWR	< 1.3		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 330 / 115 / 390 N		
Height/width/depth	1302 / 155 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	7 kg / 9 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 1710–2170 65° 18dBi 0°–8°T

Type No.	742214V01 clamps included		
		1710–2170	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 17.5 dBi	2 x 17.7 dBi	2 x 18 dBi
Horizontal Pattern:			
Half-power beam width	66°	64°	62°
Front-to-back ratio	Copolar: 30 dB	Copolar: 30 dB	Copolar: 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Avg.: 25 dB > 10 dB	Avg.: 25 dB > 10 dB	Avg.: 28 dB > 10 dB
Tracking, Avg.	1.0 dB		
Squint	±2.5°		
Vertical Pattern:			
Half-power beam width	8.3°	7.8°	7.4°
Electrical tilt	0°–8°, continuously adjustable		
Sidelobe supression for first sidelobe above horizon, Avg.	0° ... 4° ... 8° T 20 ... 20 ... 20 dB	0° ... 4° ... 8° T 20 ... 20 ... 20 dB	0° ... 4° ... 8° T 20 ... 20 ... 20 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 290 / 80 / 300 N		
Height/width/depth	1142 / 155 / 70 mm		
Category of mounting hardware	L (Light)		
Weight	4.5 kg / 6.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2200

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2200 65° 18dBi 0°–10°T

Type No.	742215V01 (clamps included)		
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	17.7 ... 17.8 ... 17.6 0° ... 5° ... 10°	18.0 ... 18.2 ... 17.9 0° ... 5° ... 10°	18.1 ... 18.2 ... 18.0 0° ... 5° ... 10°
Horizontal Pattern:			
Half-power beam width	68°	66°	64°
Front-to-back ratio (180°±30°)	Copolar: > 30 dB Totel power: > 25 dB	Copolar: > 30 dB Totel power: > 25 dB	Copolar: > 30 dB Totel power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	7.1°	6.8°	6.4°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	0° ... 4° ... 8° ... 10° T 18 ... 18 ... 17 ... 17 dB	0° ... 4° ... 8° ... 10° T 18 ... 18 ... 17 ... 17 dB	0° ... 4° ... 8° ... 10° T 18 ... 18 ... 17 ... 17 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 330 / 90 / 340 N		
Height/width/depth	1314 / 154 / 70 mm		
Category of mounting hardware	L (Light)		
Weight	5.2 kg / 7.2 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 1710–2200 65° 18dBi 2°–10°T ESLS

Type No.	80010614V01 (clamps included)		
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 17.3 dBi	2 x 17.7 dBi	2 x 18
Horizontal Pattern:			
Half-power beam width	66°	64°	62°
Front-to-back ratio (180°±30°)	≥ 25 dB	≥ 25 dB	≥ 25 dB
Cross polar ratio 0° Sector ±60°	25 dB ≥ 10 dB	25 dB ≥ 10 dB	25 dB ≥ 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	7.9°	7.5°	7.2°
Electrical tilt	2°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	> 15 dB	> 17 dB	> 18 dB
Sidelobe suppression in the sector 40°–180° below horizon for TX-Frequencies	> 23 dB	> 24 dB	> 25 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 330 / 90 / 340 N		
Height/width/depth	1314 / 155 / 70 mm		
Category of mounting hardware	L (Light)		
Weight	7 kg / 9 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2200
X
65°

KATHREIN
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XPol Panel 1710–2200 65° 18dBi 0°–15°T ESLS

Type No.	80010504V01 (clamps included)			
	1710–2200			
Frequency range	1710 – 1880 MHz	1880 – 1990 MHz	1920 – 2170 MHz	2000 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 17.5 dBi	2 x 17.6 dBi	2 x 17.7 dBi	2 x 17.8 dBi
Horizontal Pattern:				
Half-power beam width	68°	66°	64°	62°
Front-to-back ratio (180°±30°)	≥ 25 dB	≥ 25 dB	≥ 25 dB	≥ 25 dB
Cross polar ratio 0° Sector ±60°	22 dB ≥ 10 dB	22 dB ≥ 10 dB	24 dB ≥ 10 dB	26 dB ≥ 10 dB
Tracking, Avg.	1.0 dB			
Squint	±2.0°			
Vertical Pattern:				
Half-power beam width	7.9°	7.5°	7.2°	7.0°
Electrical tilt	0°–15°, continuously adjustable			
Sidelobe suppression – for first sidelobe above main beam – within 0°–20° sector above horizon	0° ... 5° ... 10° ... 15° T ≥ 17 ... 20 ... 18 ... 17 dB ≥ 16 ... 18 ... 18 ... 16 dB	0° ... 5° ... 10° ... 15° T ≥ 16 ... 20 ... 18 ... 17 dB ≥ 16 ... 18 ... 17 ... 16 dB	0° ... 5° ... 10° ... 15° T ≥ 16 ... 20 ... 18 ... 17 dB ≥ 15 ... 18 ... 17 ... 16 dB	0° ... 5° ... 10° ... 15° T ≥ 15 ... 20 ... 18 ... 15 dB ≥ 15 ... 16 ... 16 ... 15 dB
Null-fill at 0° tilt	21 dB	20 dB	19 dB	18 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1 x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 360 / 100 / 370 N			
Height/width/depth	1387 / 155 / 69 mm			
Category of mounting hardware	L (Light)			
Weight	6.5 kg / 8.5 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2690

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2690 65° 18dBi 0°–12°T ESLS

Type No.	80010621V01 (clamps included)			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	17.4 ... 17.4 ... 17.3 0° ... 6° ... 12°	18.2 ... 18.0 ... 17.9 0° ... 6° ... 12°	18.2 ... 18.1 ... 17.7 0° ... 6° ... 12°	18.3 ... 18.0 ... 17.6 0° ... 6° ... 12°
Horizontal Pattern:				
Half-power beam width	68°	64°	61°	60°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB			
Vertical Pattern:				
Half-power beam width	7.1°	6.5°	5.9°	5.7°
Electrical tilt	0°–12°, continuously adjustable			
Sidelobe suppression – for first sidelobe above main beam – within 0°–20° sector above horizon	0° ... 6° ... 12° T ≥ 18 ... 18 ... 18 dB ≥ 17 ... 17 ... 16 dB	0° ... 6° ... 12° T ≥ 18 ... 18 ... 18 dB ≥ 17 ... 17 ... 16 dB	0° ... 6° ... 12° T ≥ 18 ... 18 ... 18 dB ≥ 16 ... 18 ... 17 dB	0° ... 6° ... 12° T ≥ 18 ... 18 ... 18 dB ≥ 17 ... 17 ... 17 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	400 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1x, Position bottom continuously adjustable			
Wind loa (at 150 km/h)	Frontal / lateral / rearside: 370 / 135 / 420 N			
Height/width/depth	1410 / 164 / 70 mm			
Category of mounting hardware	M (Medium)			
Weight	6.5 kg / 8.5 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2200

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2200 65° 19.5dBi 0°–6°T

Type No.	742213V01 clamps included		
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 19 dBi	2 x 19.2 dBi	2 x 19.5 dBi
Horizontal Pattern:			
Half-power beam width	67°	65°	63°
Front-to-back ratio (180°±30°)	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	4.7°	4.5°	4.3°
Electrical tilt	0°–6°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 16 ... 15 dB	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 17 ... 16 dB	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 18 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 510 / 140 / 510 N		
Height/width/depth	1954 / 155 / 70 mm		
Category of mounting hardware	M (Medium)		
Weight	9 kg / 11 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2200

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2200 65° 19dBi 0°–10°T ESLS

Type No.	80010505V01 (clamps included)			
	1710–2200			
Frequency range	1710 – 1880 MHz	1880 – 1990 MHz	1920 – 2170 MHz	2000 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average Gain (dBi) Tilt	18.5 ... 18.7 ... 18.5 0° ... 5° ... 10°	18.7 ... 19.0 ... 18.5 0° ... 5° ... 10°	18.7 ... 19.0 ... 18.4 0° ... 5° ... 10°	18.7 ... 18.9 ... 18.3 0° ... 5° ... 10°
Horizontal Pattern:				
Half-power beam width	67°	65°	64°	63°
Front-to-back ratio (180°±30°)	≥ 30 dB	≥ 30 dB	≥ 27 dB	≥ 26 dB
Cross polar ratio 0° Sector ±60°	Typically: 25 dB ≥ 11 dB	Typically: 22 dB ≥ 11 dB	Typically: 22 dB ≥ 11 dB	Typically: 22 dB ≥ 10 dB
Tracking, Avg.	0.5 dB			
Squint	±2.5°			
Vertical Pattern:				
Half-power beam width	5.0°	4.8°	4.6°	4.4°
Electrical tilt	0°–10°, continuously adjustable			
Sidelobe suppression – for first sidelobe above main beam – within 0°–20° sector above horizon	0° ... 4° ... 8° ... 10° T ≥ 20 ... 20 ... 18 ... 18 dB ≥ 18 ... 18 ... 17 ... 17 dB	0° ... 4° ... 8° ... 10° T ≥ 20 ... 20 ... 18 ... 18 dB ≥ 17 ... 18 ... 17 ... 15 dB	0° ... 4° ... 8° ... 10° T ≥ 19 ... 20 ... 18 ... 18 dB ≥ 17 ... 17 ... 17 ... 15 dB	0° ... 4° ... 8° ... 10° T ≥ 18 ... 20 ... 18 ... 18 dB ≥ 17 ... 17 ... 14 ... 12 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1 x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 520 / 190 / 630 N			
Height/width/depth	1984 / 155 / 69 mm			
Category of mounting hardware	M (Medium)			
Weight	11 kg / 13 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2200

X

62°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2200 62° 19dBi 0°–8°T

Type No.	80010636 clamps included		
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 18.3 dBi	2 x 18.7 dBi	2 x 19
Horizontal Pattern:			
Half-power beam width	65°	62°	59°
Front-to-back ratio (180°±30°)	> 30 dB	> 30 dB	> 28 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	6.6°	6.2°	5.9°
Electrical tilt	0°–8°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	0° ... 4° ... 8° T 18 ... 14 ... 14 dB	0° ... 4° ... 8° T 18 ... 15 ... 15 dB	0° ... 4° ... 8° T 18 ... 15 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 360 / 100 / 370 N		
Height/width/depth	1407 / 155 / 70 mm		
Category of mounting hardware	L (Light)		
Weight	7 kg / 9 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2690

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2690 65° 19dBi 0°–6°T

clamps included

Type No.	80010651			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2170 MHz	2170 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 18.5 dBi	2 x 19.0 dBi	2 x 19.4 dBi	2 x 19.5 dBi
Horizontal Pattern:				
Half-power beam width	67°	63°	60°	58°
Front-to-back ratio (180°±30°)	> 28 dB	> 28 dB	> 25 dB	> 25 dB
Cross polar ratio 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 28 dB > 10 dB
Tracking, Avg.	1.5 dB			
Squint	±3°			
Vertical Pattern:				
Half-power beam width	5.4°	4.9°	4.3°	4.0°
Electrical tilt	0°–6°, continuously adjustable			
Sidelobe supression for first sidelobe above main beam	0° ... 3° ... 6° T ≥ 18 ... 18 ... 17 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 17 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 430 / 115 / 440 N			
Height/width/depth	1670 / 155 / 70 mm			
Category of mounting hardware	M (Medium)			
Weight	7 kg / 9 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			

For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

1710–2200

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2200 65° 21dBi 0°T

Type No.	80010439V01 clamps included			
	1710–2200			
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2000 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 20.5 dBi	2 x 20.8 dBi	2 x 21.1 dBi	2 x 21.2 dBi
Horizontal Pattern:				
Half-power beam width	66°	63°	60°	58°
Front-to-back ratio (180°±30°)	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio 0° Sector ±60°	25 dB > 12 dB	23 dB > 12 dB	23 dB > 10 dB	23 dB > 10 dB
Tracking, Avg.	0.5 dB			
Squint	±1.5°			
Vertical Pattern:				
Half-power beam width	4.2°	4°	3.7°	3.6°
Electrical tilt	0°, fixed			
Sidelobe suppression – for first sidelobe above main beam – within 0°—30° sector above horizon	 > 15 dB > 15 dB			
First null-fill below main beam	< 20 dB			
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom or top			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 550 / 210 / 610 N			
Height/width/depth	2172 / 155 / 89 mm			
Category of mounting hardware	M (Medium)			
Weight	11.5 kg / 13.5 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			

XPol Panel 1710–2200 62° 21.2dBi 0°–6°T

Type No.	80010378 clamps included		
	1710–2200		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 20.6 dBi	2 x 21.1 dBi	2 x 21.2
Horizontal Pattern:			
Half-power beam width	65°	62°	60°
Front-to-back ratio (180°±30°)	> 30 dB	> 28 dB	> 28 dB
Cross polar ratio 0° Sector ±60°	25 dB > 10 dB	23 dB > 10 dB	23 dB > 10 dB
Tracking, Avg.	1.0 dB		
Squint	±2.5°		
Vertical Pattern:			
Half-power beam width	3.7°	3.5°	3.3°
Electrical tilt	0°–6°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	0° ... 3° ... 6° T 18 ... 18 ... 17 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 17 ... 17 ... 17 dB
Null-fill at 0° tilt	20 dB	20 dB	20 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 660 / 260 / 730 N		
Height/width/depth	2548 / 155 / 89 mm		
Category of mounting hardware	M (Medium)		
Weight	13 kg / 15 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2170

X

90°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2170 90° 11.5dBi

Type No.	741984V01 clamps included		
	1710–2170		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 11.3 dBi	2 x 11.5 dBi	2 x 11.6 dBi
Horizontal Pattern:			
Half-power beam width	86°	87°	88°
Front-to-back ratio (180°±30°)	Copolar: > 23 dB Total power: > 23 dB	Copolar: > 23 dB Total power: > 23 dB	Copolar: > 23 dB Total power: > 23 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 20 dB > 18 dB	Typically: 25 dB > 18 dB	Typically: 20 dB > 15 dB
Tracking, Avg.	0.5 dB		
Squint	±3.0°		
Vertical Pattern:			
Half-power beam width	28°	26°	26°
Sidelobe supression vertical sector ±45°	> 20 dB	> 20 dB	> 20 dB
VSWR	< 1.4		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	150 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom or top		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 90 / 27 / 105 N		
Height/width/depth	342 / 155 / 69 mm		
Category of mounting hardware	L (Light)		
Weight	2 kg (tension bands incl.)		
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter		

XPol Panel 1710–2170 90° 14dBi 0°–10°T

Type No.	741988V01 clamps included		
	1710–2170		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 13.7 dBi	2 x 14 dBi	2 x 14.1
Horizontal Pattern:			
Half-power beam width	88°	88°	88°
Front-to-back ratio, copolar total power	> 25 dB > 25 dB	> 25 dB > 25 dB	> 25 dB > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±3.5°		
Vertical Pattern:			
Half-power beam width	14.7°	14°	13°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° ... 10° T 18 ... 18 ... 18 ... 18 dB	0° ... 4° ... 8° ... 10° T 18 ... 18 ... 18 ... 18 dB	0° ... 4° ... 8° ... 10° T 18 ... 18 ... 18 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 175 / 65 / 200 N		
Height/width/depth	662 / 155 / 69 mm		
Category of mounting hardware	L (Light)		
Weight	4.2 kg (tension bands incl.)		
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710...2200

X

90°

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XPol Panel 1710–2200 90° 17dBi 0°–8°T

Type No.	741989V01 clamps included		
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 16.5 dBi	2 x 16.8 dBi	2 x 16.7
Horizontal Pattern:			
Half-power beam width	88°	88°	88°
Front-to-back ratio (180°±30°)	Copolar: > 25 dB Total power: > 25 dB	Copolar: > 25 dB Total power: > 25 dB	Copolar: > 24 dB Total power: > 24 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	7°	6.7°	6.5°
Electrical tilt	0°–8°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	0° ... 2° ... 5° ... 8° T 18 ... 18 ... 16 ... 14 dB	0° ... 2° ... 5° ... 8° T 20 ... 20 ... 18 ... 17 dB	0° ... 2° ... 5° ... 8° T 18 ... 18 ... 18 ... 17 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 350 / 125 / 400 N		
Height/width/depth	1302 / 155 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	7.5 kg / 9.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

XPol Panel 1710–2170 90° 18dBi 0°–6°T

Type No.	741990V01 clamps included		
		1710–2170	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17.7 dBi	2 x 18 dBi	2 x 18.2 dBi
Horizontal Pattern:			
Half-power beam width	88°	88°	88°
Front-to-back ratio, copolar total power	> 25 dB > 25 dB	> 25 dB > 25 dB	> 25 dB > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±2.5°		
Vertical Pattern:			
Half-power beam width	4.9°	4.7°	4.5°
Electrical tilt	0°–6°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	0° ... 2° ... 4° ... 6° T 17 ... 17 ... 17 ... 17 dB	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 18 ... 18 dB	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 18 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 510 / 185 / 610 N		
Height/width/depth	1942 / 155 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	11 kg / 13 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Dual-Beam Panel
Dual Polarization
Half-power Beam Width

1710–2200	1710–2200
X	X
40°	40°

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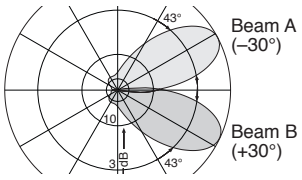
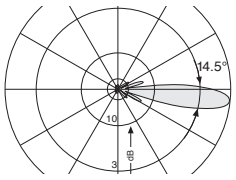
XXPol Panel 1710–2200/1710–2200 40°(–30°)/40°(+30°) 17/17dBi 2°–14°/2°–14°T

Type No.	80010605 clamps included		
	1710–2200		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Azimuth direction	Beam A (–30°), Beam B (+30°)		
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain	2° ... 7° ... 14° T 16.5 ... 16.5 ... 16.2 dBi	2° ... 7° ... 14° T 17.0 ... 16.8 ... 16.5 dBi	2° ... 7° ... 14° T 17.5 ... 17.4 ... 16.8 dBi
Horizontal Pattern:			
Half-power beam width (offset beams ±30°)	43°	40°	37°
Front-to-back ratio	Copolar: > 30 dB Total power: > 25 dB		
Cross polar ratio Maindirection –30°; +30° Sector –60°; 0°; 0°; +60°	Typically: 15 dB > 8 dB	Typically: 15 dB > 8 dB	Typically: 15 dB > 8 dB
Sidelobe suppression for sidelobes beside main beam	> 18 dB		
Vertical Pattern:			
Half-power beam width	14.5°	14°	13°
Electrical tilt	2°–14°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	> 16 dB		
VSWR	< 1.5		
Isolation, between ports	> 28 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	200 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 400 / 115 / 450 N		
Height/width/depth	698 / 380 / 150 mm		
Category of mounting hardware	M (Medium)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

1710 – 1880 MHz

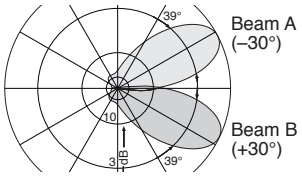


Horizontal Pattern

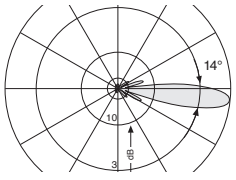


Vertical Pattern
Beam A (–30°), Beam B (+30°)
2°–14° electrical downtilt

1850 – 1990 MHz

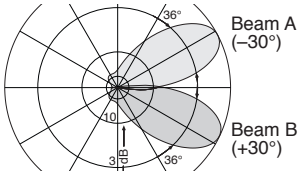


Horizontal Pattern

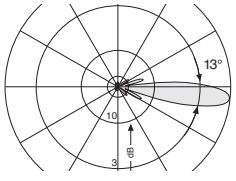


Vertical Pattern
Beam A (–30°), Beam B (+30°)
2°–14° electrical downtilt

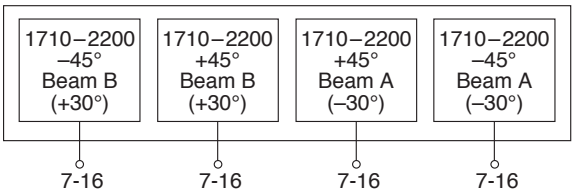
1920 – 2200 MHz



Horizontal Pattern



Vertical Pattern
Beam A (–30°), Beam B (+30°)
2°–14° electrical downtilt



For more information about additional mounting accessories please refer to page 205

Dual-Beam Panel
Dual Polarization
Half-power Beam Width

1710–2200	1710–2200
X	X
45°	45°

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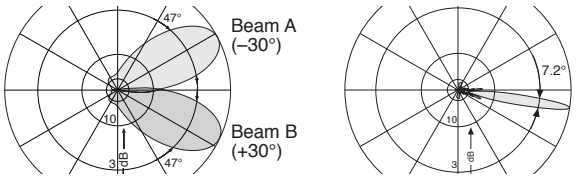
XXPol Panel 1710–2200/1710–2200 45°(–30°)/45°(+30°) 19.5/19.5dBi 0°–10°/0°–10°T

Type No.	80010606V01 clamps included		
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Azimuth direction	Beam A (– 30°), Beam B (+30°)		
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain	4 x 19 dBi	4 x 19.3 dBi	4 x 19.5 dBi
Horizontal Pattern:			
Half-power beam width (offset beams ±30°)	47°	41°	43°
Front-to-back ratio	Copolar: > 30 dB Total power: > 25 dB		
Cross polar ratio Maindirection –30°; +30° Sector –60°; 0°; 0°; +60°	Typically: 18 dB > 13 dB	Typically: 17 dB > 13 dB	Typically: 16 dB > 13 dB
Sidelobe suppression for sidelobes beside main beam	> 18 dB		
Vertical Pattern:			
Half-power beam width	7.2°	7.1°	6.8°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	> 18 dB		
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	200 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 710 / 200 / 820 N		
Height/width/depth	1314 / 380 / 150 mm		
Category of mounting hardware	M (Medium)		
Weight	19 kg / 21 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

1800/1900/200/2600 XPol

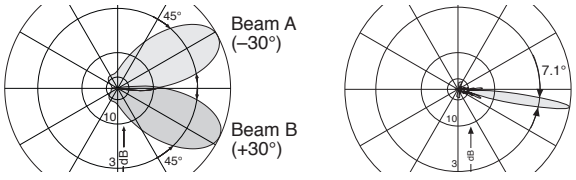
1710 – 1880 MHz



Horizontal Pattern

Vertical Pattern
Beam A (–30°), Beam B (+30°)
0°–10° electrical downtilt

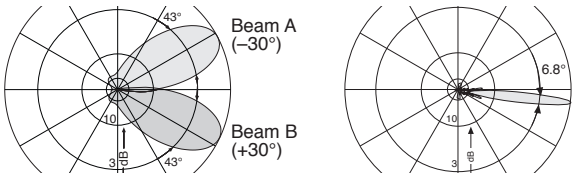
1850 – 1990 MHz



Horizontal Pattern

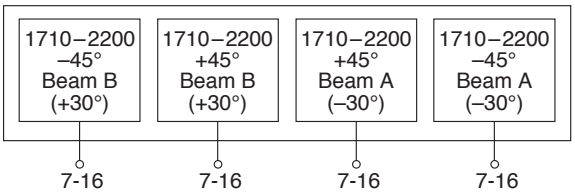
Vertical Pattern
Beam A (–30°), Beam B (+30°)
0°–10° electrical downtilt

1920 – 2200 MHz



Horizontal Pattern

Vertical Pattern
Beam A (–30°), Beam B (+30°)
0°–10° electrical downtilt



For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2200

X

65°

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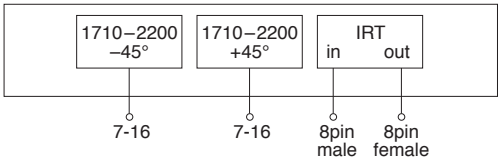
XPol Panel IRT 1710–2200 65° 18dBi 0°–10°T

Type No.	80010618V01 clamps included		
A) Antenna specifications			
		1710–2200	
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17.7 dBi	2 x 17.9 dBi	2 x 18 dBi
Horizontal Pattern:			
Half-power beam width	67°	66°	65°
Front-to-back ratio	Copolar: > 30dB Total power: > 25 dB	Copolar: > 30dB Total power: > 25 dB	Copolar: > 30dB Total power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:			
Half-power beam width	7.1°	6.8°	6.6°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	> 15 dB	> 17 dB	> 18 dB
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8°... 10° T 16 ... 16 ... 16 ...16 dB	0° ... 4° ... 8°... 10° T 17 ... 17 ... 17 ...17 dB	0° ... 4° ... 8°... 10° T 17 ... 17 ... 17 ...17 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	120 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female		
Connector position	Bottom		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 330 / 115 / 390 N		
Hight/width/depth	1302 / 155 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	7.5 kg / 9.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter		

B) iRCU specifications	80010618V01
Logical interface ex factory[1)]	3GPP/AISG 2.0
Protocols	Compliant to AISG 1.1 and 3GPP/AISG 2.0
Hardware interface[2)]	2 x 8pin connector acc. IEC 60130-9; according to AISG: – iRCU in (male): Control / Daisy chain in – iRCU out (female): Daisy chain out
Power supply	10 ... 30 V
Power consumption	< 1 W (stand by) < 8.5 W (motor activated)
Adjustment time (full range)	40 sec.
Adjustement cycles	> 50,000



[1)] The protocol of the logical interface can be switched from AISG 1.1 to 3GPP/AISG 2.0 and vice versa with a vendor specific command. Start-up operation of the 80010314V01 is only possible with a primary station supporting AISG 1.1 and start-up operation of the 80010618V01 is only possible with a primary station supporting 3GPP/AISG 2.0!
Please note: The used Primary-SW has to be able to handle also integrated remote tilt units, like Kathrein CCU with firmware 1.29 or higher and the Kathrein PCA with SW 2.0 or higher. If the Primary of the system doesn't support the standard of the 'logical interface ex factory', the IRT must be switched to the appropriate standard of the Primary before installation. Please contact Kathrein for further information.

[2)] The tightning torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened'). The connector should be tightened by hand only!

For more information about additional mounting accessories please refer to page 205

Tri-Sector Pipe Antenna	0°	120°	240°
Frequency Range	1710–2170	1710–2170	1710–2170
Dual Polarization	X	X	X
Half-power Beam Width	65°	65°	65°
Adjust. Electr. Downtilt	0°–12°	0°–12°	0°–12°

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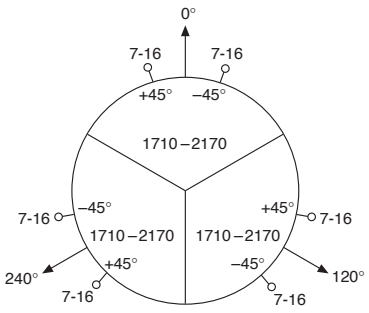
set by hand or by optional RCUs (Remote Control Units)

XPol Tri-Sector Pipe 1710–2170 65° 15.5dBi 0°–12°T

Type No.	80010375		Electrical datas per sector
Frequency range	1710–2170		
	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain per Input (dBi)	0° ... 4° ... 8° … 12° T 15.4 ... 15.2 ... 15.0 ... 14.8	0° ... 4° ... 8° … 12° T 15.5 ... 15.4 ... 15.3 ... 14.9	0° ... 4° ... 8° … 12° T 15.7 ... 15.6 ... 15.4 ... 14.9
Half-power beam width Copolar +45°/–45°	Horizontal: 67° Vertical: 12.7°	Horizontal: 65° Vertical: 12°	Horizontal: 62° Vertical: 11.2°
Electrical tilt continuously adjustable	0°–12°	0°–12°	0°–12°
Sidelobe suppression for first sidelobe above horizon	0° ... 4° ... 8° … 12° T 16 ... 16 ... 15 ... 15 dB	0° ... 4° ... 8° … 12° T 18 ... 17 ... 17 ... 16 dB	0° ... 4° ... 8° … 12° T 18 ... 18 ... 16 ... 16 dB
Front-to-back ratio	Copolar: > 25 dB	Copolar: > 25 dB	Copolar: > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 Typically: 20 dB Typically: > 10 dB	 Typically: 20 dB Typically: > 10 dB	 Typically: 20 dB Typically: > 10 dB
Isolation: Intrasystem Isolation: Intersystem	> 30 dB > 40 dB	> 30 dB > 40 dB	> 30 dB > 40 dB
Impedance	50 Ω	50 Ω	50 Ω
VSWR	< 1.5	< 1.5	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	250 W (at 50 °C ambient temperature)		



Mechanical specifications	
Input	3 x 2 x 7-16 female
Connector position	Bottom – inside service area
Adjustment mechanism	3 x 1, Position bottom continuously adjustable inside service area
Weight	32 kg
Wind load	205 N (at 150 km/h)
Max. wind velocity	200 km/h
Natural frequency	45 – 47 Hz
Damping ratio	0.032
Mechanical interface	Flange connection 12 x 12M at a graduated diameter of 208 mm 0°–360° continuously adjustable (for further details see application note)
Packing size	1395 x 315 x 330 mm
Height / diameter	1241 / 230 and 280 mm

For more information about additional mounting accessories please refer to page 205

Tri-Sector Pipe Antenna

	0°	120°	240°
Frequency Range	1710–2170	1710–2170	1710–2170
Dual Polarization	X	X	X
Half-power Beam Width	65°	65°	65°
Adjust. Electr. Downtilt	0°–10°	0°–10°	0°–10°

set by hand or by optional RCUs (Remote Control Units)

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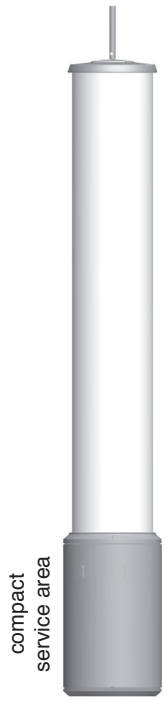
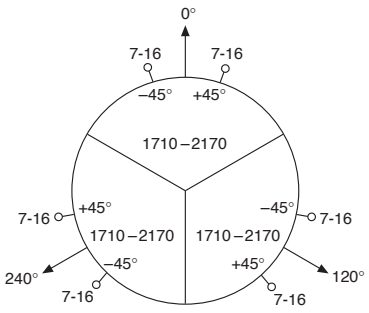
XPol Tri-Sector Pipe 1710–2170 65° 18dBi 0°–10°T

Type No.	80010360		Electrical datas per sector
Frequency range	1710–2170		
	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	17.2 ... 17.5 ... 17.2 0° ... 5° ... 10°	17.6 ... 17.8 ... 17.6 0° ... 5° ... 10°	17.8 ... 17.9 ... 17.4 0° ... 5° ... 10°
Half-power beam width Copolar +45°/–45°	Horizontal: 66° Vertical: 7°	Horizontal: 63° Vertical: 6.7°	Horizontal: 60° Vertical: 6.4°
Electrical tilt continuously adjustable	0°–10°	0°–10°	0°–10°
Sidelobe suppression for first sidelobe above horizon	0° ... 5° ... 10° T 17 ... 15 ... 15 dB	0° ... 5° ... 10° T 17 ... 17 ... 15 dB	0° ... 5° ... 10° T 17 ... 17 ... 15 dB
Front-to-back ratio (180° ± 30°)	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB Typically: > 10 dB	Typically: 20 dB Typically: > 10 dB	Typically: 20 dB Typically: > 10 dB
Isolation: Intrasystem Isolation: Intersystem	> 30 dB > 45 dB	> 30 dB > 42 dB	> 30 dB > 42 dB
Impedance	50 Ω	50 Ω	50 Ω
VSWR	< 1.5	< 1.5	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		





Mechanical specifications	
Input	3 x 2 x 7-16 female
Connector position	Bottom – inside service area
Adjustment mechanism	3 x 1, Position bottom continuously adjustable inside service area
Weight	56 kg
Wind load	320 N (at 150 km/h)
Max. wind velocity	200 km/h
Natural frequency	19 – 21 Hz
Damping ratio	0.032
Mechanical interface	Flange connection 12 x 12M at a graduated diameter of 208 mm 0°–360° continuously adjustable (for further details see application note)
Packing size	2030 x 400 x 400 mm
Height / diameter	1823 / 230 and 280 mm

For more information about additional mounting accessories please refer to page 205

Additional Options for Tri-Sector-Antennas

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Accessories delivered with the Tri-Sector-Pipe Antenna:

1. Clamping ring for mounting the antenna on the customer-supplied base
2. Lightning conductor rod
3. Ring bolt as attachment possibility for lifting aid
4. Wrench (SW41 + SW27) for attaching the RCU

Optional Accessories:

The following components may be ordered separately

1. 86010147 86010148	Remote Control Unit (RCU)
2. 85010010	Flexible Sealing Frame (Roxtec frame to seal connection between the mast and the antenna, see below
3. 738440	Azimuth Adjustment Tool, see page 220
4. 86010103	3-way power splitter for optional omni pattern

Flexible Sealing Frame

Type No.	85010010
Outer diameter	180 mm
Cable diameter (6x)	15 – 42 mm
Cable diameter (3x)	3.5 – 10.5 mm
Frame-Material	Stainless steel
Sealing-Material	Halogen free cross linkable compound on
	ethylene-propylene rubber (EPDM)
Material of screws	Stainless steel
Accessories	Mounting lubricant
Required assembly tools	Socket wrench size 6 mm
Weight (without packaging)	1.8 kg
Packing size (L x W x H)	approx. 208 x 208 x 68 mm

For further information please refer to separate application note under: www.kathrein.de/en/mcs/index.htm

Summary – Directional Antennas
2-Multi-band
1800/1900/2000/2600

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Dual Polarization +45°/–45°

Type						Type No.	Height [mm]	Connector position	Page
XXPol Panel	1710–2170 1710–2170	65° 65°	15dBi 15dBi	0°–10°T 0°–10°T		742233V01	679	bottom	92
XXPol Panel	1710–2690 1710–2690	65° 65°	16.5dBi 16.5dBi	0°–12°T 0°–12°T		80010682	855	bottom	93
XXPol Panel	1710–1880 1920–2170	65° 60°	17.5dBi 18dBi	2°–10°T 2°–10°T		80010744	1410	bottom	94
XXPol Panel	1710–2170 1710–2170	65° 65°	18dBi 18dBi	0°–8°T 0°–8°T		742237	1147	bottom	94
XXPol Panel	1710–2170 2490–2690	65° 60°	18dBi 18dBi	0°–10°T 0°–10°T		80010644	1410	bottom	95
XXPol Panel	1710–2200 1710–2200	65° 65°	18dBi 18dBi	0°–10°T 0°–10°T		742236V01	1319	bottom	95
XXPol Panel	1710–2690 1710–2690	65° 65°	18dBi 18dBi	0°–12°T 0°–12°T	ESLS	80010622	1415	bottom	96
XXPol Panel	1710–2200 1710–2200	65° 65°	18dBi 18dBi	0°–15°T 0°–15°T	ESLS	80010510V01	1389	bottom	97
XXPol Panel	1710–2170 1710–2170	65° 65°	19.5dBi 19.5dBi	0°–6°T 0°–6°T		742235V01	1959	bottom	98
XXPol Panel	1710–2690 1710–2690	65° 65°	19dBi 19dBi	0°–10°T 0°–10°T		80010652	1688	bottom	99
XXPol Panel	1710–2200 1710–2200	65° 65°	19dBi 19dBi	0°–10°T 0°–10°T	ESLS	80010511V01	1999	bottom	100
XXPol Panel	1710–2180 1710–2180	90° 90°	16.5dBi 16.5dBi	0°–10°T 0°–10°T		742352V01	1319	bottom	101

New or changed product

When deploying 2-Multi-band Antennas, please also consider using special Dual-band Combiners (see pages 240 and 241)

Abbreviations:
ESLS: Enhanced Side Lobe Suppression (above or below horizon)

2-Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2170	1710–2170
X	X
65°	65°

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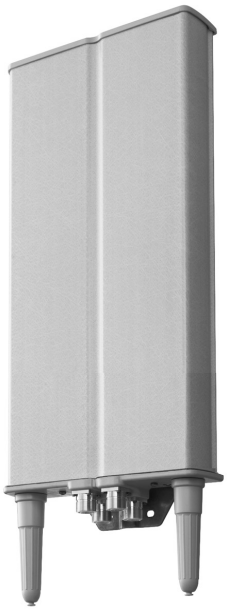
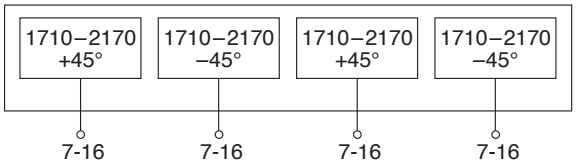
XXPol Panel 1710–2170/1710–2170 65°/65° 15/15dBi 0°–10°/0°–10°T

Type No.	742233V01 (clamps included)		
	1710–2170		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain	4 x 15 dBi	4 x 15.2 dBi	4 x 15.3 dBi
Horizontal Pattern:			
Half-power beam width	67°	65°	62°
Front-to-back ratio	Copolar: > 25 dB Total power: > 25 dB	Copolar: > 25 dB Total power: > 25 dB	Copolar: > 25 dB Total power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	 Typically: 20 dB Typically: 10 dB	 Typically: 20 dB Typically: 10 dB	 Typically: 20 dB Typically: 10 dB
Vertical Pattern:			
Half-power beam width	14°	13.7°	13°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° ... 10° T 16 ... 16 ... 15 ... 15 dB	0° ... 4° ... 8° ... 10° T 16 ... 16 ... 16 ... 16 dB	0° ... 4° ... 8° ... 10° T 16 ... 16 ... 16 ... 16 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	250 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 350 / 85 / 370 N		
Height/width/depth	679 / 323 / 71 mm		
Category of mounting hardware	M (Medium)		
Weight	11 kg / 13 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		





For more information about additional mounting accessories please refer to page 205

Multi-band Panel	1710–2690	1710–2690
Dual Polarization	X	X
Half-power Beam Width	65°	65°

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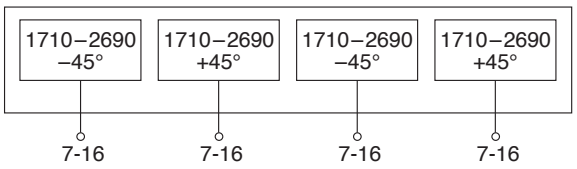
XXPol Panel 1710–2690/1710–2690 65°/65° 16.5/16.5dBi 0°–12°/0°–12°T

Type No.	80010682 (clamps included)			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	4 x 15.8 dBi	4 x 16.2 dBi	4 x 16.6 dBi	4 x 16.7 dBi
Horizontal Pattern:				
Half-power beam width	65°	64°	60°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 28 dB
Cross polar ratio 0° Sector ±60°	Typically: 25 dB > 8 dB	Typically: 25 dB > 8 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:				
Half-power beam width	11°	10°	9°	8.7°
Electrical tilt	0°–12°, continuously adjustable			
Sidelobe supression for first sidelobe above main beam	0° ... 6° ... 12° T ≥ 12 ... 13 ... 15 dB	0° ... 6° ... 12° T ≥ 13 ... 14 ... 16 dB	0° ... 6° ... 12° T ≥ 13 ... 15 ... 16 dB	0° ... 6° ... 12° T ≥ 15 ... 15 ... 17 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	250 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	2x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 440 / 100 / 460 N			
Height/width/depth	855 / 323 / 71 mm			
Category of mounting hardware	M (Medium)			
Weight	11 kg / 13 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			



For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710...(1880)...2170	1710...(1920)...2170
X	X
65°	60°

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XXPol Panel 1710–1880/1920–2170 65°/60° 17.5/18dBi 2°–10°/2°–10°T

Type No.	80010744 clamps included	
	1710–1880	1920–2170
Frequency range	1710 – 1880 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	2 x 17.5 dBi	2 x 18 dBi
Horizontal Pattern:		
Half-power beam width	65°	59°
Front-to-back ratio (180°±30°)	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 28 dB Total power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	0.5 dB	0.5 dB
Squint	±1.5°	±1.5°
Vertical Pattern:		
Half-power beam width	6.6°	5.9°
Electrical tilt, continuously adjustable	2°–10°	2°–10°
Sidelobe suppression for first sidelobe above main beam	2° ... 6° ... 10° T 18 ... 16 ... 16 dB	2° ... 6° ... 10° T 18 ... 16 ... 15 dB
VSWR	< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB	> 30 dB
Isolation: Intersystem	> 30 dB	
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc
Max. power per input	200 W*	200 W*
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 370 / 145 / 370 N	
Height/width/depth	1410 / 155 / 89 mm	
Category of mounting hardware	M (Medium)	
Weight	10 kg / 12 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter	

* (at 50 °C ambient temperature)

XXPol Panel 1710–2170/1710–2170 65°/65° 18/18dBi 0°–8°/0°–8°T

Type No.	742237 clamps included		
	1710–2170		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain	4 x 17.5 dBi	4 x 17.7 dBi	4 x 18 dBi
Horizontal Pattern:			
Half-power beam width	65°	63°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Avg.: 25 dB > 10 dB	Avg.: 25 dB > 10 dB	Avg.: 25 dB > 10 dB
Vertical Pattern:			
Half-power beam width	8.3°	8°	7.5°
Electrical tilt	0°–8°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam, Avg.	0° ... 4° ... 8° T 20 ... 20 ... 18 dB	0° ... 4° ... 8° T 20 ... 20 ... 18 dB	0° ... 4° ... 8° T 20 ... 20 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	250 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 590 / 135 / 610 N		
Height/width/depth	1147 / 323 / 71 mm		
Category of mounting hardware	M (Medium)		
Weight	12.5 kg / 14.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710…2200	1710…(2490)…2690
X	X
65°	65°

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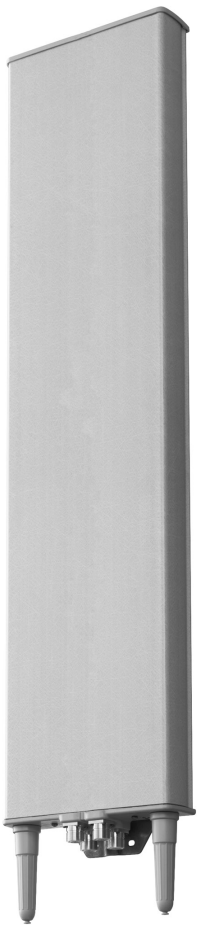
XXPol Panel 1710–2170/2490–2690 65°/60° 18/18dBi 0°–10°/0°–10°T

Type No.	80010644 clamps included		
	1710–2180		2490–2690
Frequency range	1710 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 17.5 dBi	2 x 17.7 dBi	2 x 18.0 dBi
Horizontal Pattern:			
Half-power beam width	68°	65°	61°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio 0° Sector ±60°	Typically: 25 dB > 8 dB	Typically: 25 dB > 8 dB	Typically: 25 dB > 10 dB
Vertical Pattern:			
Half-power beam width	6.7°	6.3°	5.4°
Electrical tilt, continuously adjustable	0°–10°		0°–10°
Sidelobe supression for first sidelobe above main beam	0° ... 5° ... 10° T ≥ 17 ... 17 ... 16 dB	0° ... 5° ... 10° T ≥ 17 ... 17 ... 16 dB	0° ... 5° ... 10° T ≥ 17 ... 17 ... 16 dB
VSWR	< 1.5		< 1.5
Isolation: Intrasystem	> 30 dB		> 30 dB
Isolation: Intersystem	> 29 dB		> 29 dB
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		< –150 dBc (2 x 43 dBm carrier)
Max. power per input Total power	200 W* 400 W*		200 W* 400 W*
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 370 / 145 / 400 N		
Height/width/depth	1410 / 155 / 89 mm		
Category of mounting hardware	M (Medium)		
Weight	10 kg / 12 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

*(at 50 °C ambient temperature)

XXPol Panel 1710–2200/1710–2200 65°/65° 18/18dBi 0°–10°/0°–10°T

Type No.	742236V01 clamps included		
	1710–2200		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain	4 x 17.6 dBi	4 x 17.8 dBi	4 x 18 dBi
Horizontal Pattern:			
Half-power beam width	64°	64°	62°
Front-to-back ratio	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:			
Half-power beam width	7°	6.8°	6.5°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T 20 ... 18 ... 16 dB	0° ... 5° ... 10° T 20 ... 18 ... 16 dB	0° ... 5° ... 10° T 16 ... 18 ... 16 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 660 / 155 / 690 N		
Height/width/depth	1319 / 323 / 71 mm		
Category of mounting hardware	M (Medium)		
Weight	15 kg / 17 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		



For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2690	1710–2690
X	X
65°	65°

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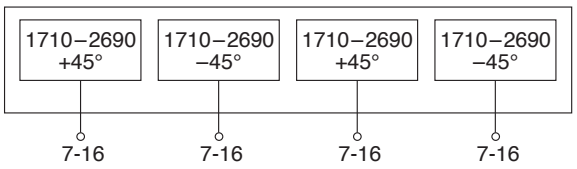
XXPol Panel 1710–2690/1710–2690 65°/65° 18/18dBi 0°–12°/0°–12°T ESLS

Type No.	80010622 clamps included			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°°
Gain (dBi) Tilt	17.4 ... 17.4 ... 17.3 0° ... 6° ... 12°	17.8 ... 17.6 ... 17.5 0° ... 6° ... 12°	18.0 ... 17.9 ... 17.5 0° ... 6° ... 12°	18.0 ... 17.7 ... 17.3 0° ... 6° ... 12°
Horizontal Pattern:				
Half-power beam width	65°	65°	61°	61°
Front-to-back ratio (180°±30°)	> 25 dB, avg. 28 dB	> 26 dB, avg. 28 dB	> 25 dB, avg. 27 dB	> 25 dB, avg. 27 dB
Cross polar ratio 0° Sector ±60°	Typically: 30 dB > 10 dB	Typically: 30 dB > 10 dB	Typically: 25 dB > 8 dB	Typically: 25 dB > 10 dB
Vertical Pattern:				
Half-power beam width	7.1°	6.5°	5.9°	5.7°
Electrical tilt	0°–12°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	0° ... 6° ... 12° T ≥ 18 ... 18 ... 18 dB	0° ... 6° ... 12° T ≥ 18 ... 18 ... 18 dB	0° ... 6° ... 12° T ≥ 18 ... 17 ... 17 dB	0° ... 6° ... 12° T ≥ 18 ... 18 ... 17 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	2x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 720 / 165 / 740 N			
Height/width/depth	1415 / 323 / 71 mm			
Category of mounting hardware	M (Medium)			
Weight	18 kg / 20 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			



For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2200	1710–2200
X	X
65°	65°

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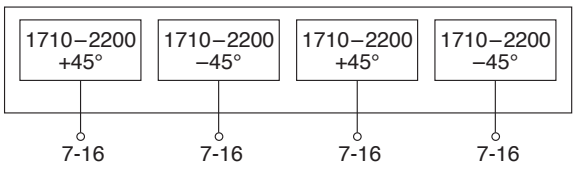
XXPol Panel 1710–2200/1710–2200 65°/65° 18/18dBi 0°–15°/0°–15°T ESLS

Type No.	80010510V01 clamps included			
	1710–2200			
Frequency range	1710 – 1880 MHz	1880 – 1990 MHz	1920 – 2170 MHz	2000 – 2200 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain at 0° tilt	4 x 17.5 dBi	4 x 17.6 dBi	4 x 17.7 dBi	4 x 17.8 dBi
Horizontal Pattern:				
Half-power beam width	65°	63°	62°	62°
Front-to-back ratio (180°±30°)	≥ 30 dB	≥ 30 dB	≥ 30 dB	≥ 28 dB
Cross polar ratio 0° Sector ±60°	24 dB ≥ 9 dB	24 dB ≥ 9 dB	24 dB > 10 dB	26 dB ≥ 10 dB
Vertical Pattern:				
Half-power beam width	7.9°	7.5°	7.2°	7.0°
Electrical tilt	0°–15°, continuously adjustable			
Sidelobe suppression – for first sidelobe above main beam – within 0°–20° sector above horizon	0° ... 5° ... 10° ... 15° T ≥ 17 ... 20 ... 18 ... 17 dB ≥ 16 ... 18 ... 18 ... 16 dB	0° ... 5° ... 10° ... 15° T ≥ 16 ... 20 ... 18 ... 18 dB ≥ 16 ... 17 ... 17 ... 16 dB	0° ... 5° ... 10° ... 15° T ≥ 15 ... 19 ... 18 ... 17 dB ≥ 15 ... 17 ... 17 ... 16 dB	0° ... 5° ... 10° ... 15° T ≥ 14 ... 18 ... 18 ... 16 dB ≥ 14 ... 16 ... 16 ... 15 dB
Null-fill at 0° tilt	23 dB	22 dB	21 dB	20 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	2x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 700 / 160 / 720 N			
Height/width/depth	1389 / 323 / 71 mm			
Category of mounting hardware	M (Medium)			
Weight	17 kg / 19 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			



For more information about additional mounting accessories please refer to page 205

2-Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2170	1710–2170
X	X
65°	65°

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XXPol Panel 1710–2170/1710–2170 65°/65° 19.5/19.5dBi 0°–6°/0°–6°T

Type No.	742235V01 (clamps included)		
	1710–2170		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain	4 x 19 dBi	4 x 19.2 dBi	4 x 19.5 dBi
Horizontal Pattern:			
Half-power beam width	65°	64°	63°
Front-to-back ratio	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 24 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±2.5°		
Vertical Pattern:			
Half-power beam width	4.6°	4.4°	4.2°
Electrical tilt	0°–6°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 2° ... 4° ... 6° T 17 ... 17 ... 14 ... 14 dB	0° ... 2° ... 4° ... 6° T 17 ... 17 ... 15 ... 15 dB	0° ... 2° ... 4° ... 6° T 17 ... 17 ... 15 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1010 / 220 / 1040 N		
Height/width/depth	1959 / 323 / 71 mm		
Category of mounting hardware	M (Medium)		
Weight	18 kg / 20 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		

For more information about additional mounting accessories please refer to page 205

Multi-band Panel	1710–2690	1710–2690
Dual Polarization	X	X
Half-power Beam Width	65°	65°

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XXPol Panel 1710–2690/1710–2690 65°/65° 19/19dBi 0°–10°/0°–10°T

Type No.	80010652 (clamps included)			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°°
Gain (dBi) Tilt	18.2 ... 18.4 ... 18.0 0° ... 5° ... 10°	18.7 ... 18.9 ... 18.4 0° ... 5° ... 10°	18.8 ... 19.0 ... 18.3 0° ... 5° ... 10°	18.7 ... 19.0 ... 18.3 0° ... 5° ... 10°
Horizontal Pattern:				
Half-power beam width	65°	65°	62°	63°
Front-to-back ratio, copolar	> 30 dB	> 26 dB	> 28 dB	> 26 dB
Cross polar ratio 0° Sector ±60°	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 20 dB > 10 dB
Vertical Pattern:				
Half-power beam width	5.5°	5.0°	4.3°	4.0°
Electrical tilt	0°–10°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T ≥ 18 ... 16 ... 15 dB	0° ... 5° ... 10° T ≥ 18 ... 16 ... 15 dB	0° ... 5° ... 10° T ≥ 18 ... 16 ... 15 dB	0° ... 5° ... 10° T ≥ 18 ... 15 ... 15 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	2x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 830 / 320 / 880 N			
Height/width/depth	Approx. 1668 / 323 / 71 mm			
Category of mounting hardware	M (Medium)			
Weight	18 kg / 20 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			

For more information about additional mounting accessories please refer to page 205

Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2200	1710–2200
X	X
65°	65°

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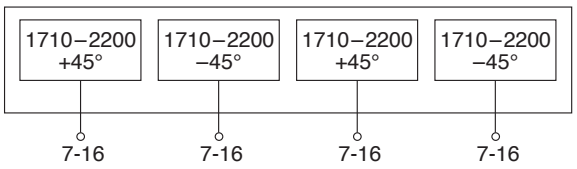
XXPol Panel 1710–2200/1710–2200 65°/65° 19/19dBi 0°–10°/0°–10°T ESLS

Type No.	80010511V01 (clamps included)			
	1710–2200			
Frequency range	1710 – 1880 MHz	1880 – 1990 MHz	1920 – 2170 MHz	2000 – 2200 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain (dBi) Tilt	18.5 ... 18.7 ... 18.5 0° ... 5° ... 10°	18.7 ... 19.0 ... 18.5 0° ... 5° ... 10°	18.7 ... 19.0 ... 18.4 0° ... 5° ... 10°	18.7 ... 18.9 ... 18.3 0° ... 5° ... 10°
Horizontal Pattern:				
Half-power beam width	66°	65°	65°	63°
Front-to-back ratio (180°±30°)	≥ 30 dB	≥ 30 dB	≥ 30 dB	≥ 28 dB
Cross polar ratio 0° Sector ±60°	Typically: 22 dB ≥ 10 dB	Typically: 22 dB ≥ 10 dB	Typically: 22 dB ≥ 10 dB	Typically: 22 dB ≥ 10 dB
Vertical Pattern:				
Half-power beam width	5.0°	4.8°	4.6°	4.4°
Electrical tilt	0°–10°, continuously adjustable			
Sidelobe suppression – for first sidelobe above main beam – within 0°–20° sector above horizon	0° ... 4° ... 8° ... 10° T ≥ 20 ... 20 ... 18 ... 18 dB ≥ 18 ... 18 ... 17 ... 17 dB	0° ... 4° ... 8° ... 10° T ≥ 20 ... 20 ... 18 ... 18 dB ≥ 17 ... 18 ... 17 ... 15 dB	0° ... 4° ... 8° ... 10° T ≥ 19 ... 20 ... 18 ... 18 dB ≥ 17 ... 17 ... 17 ... 15 dB	0° ... 4° ... 8° ... 10° T ≥ 18 ... 20 ... 18 ... 18 dB ≥ 17 ... 17 ... 14 ... 12 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	2x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1020 / 230 / 1080 N			
Height/width/depth	1999 / 323 / 71 mm			
Category of mounting hardware	M (Medium)			
Weight	18 kg / 20 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			



For more information about additional mounting accessories please refer to page 205

2-Multi-band Panel
Dual Polarization
Half-power Beam Width

1710–2180	1710–2180
X	X
90°	90°

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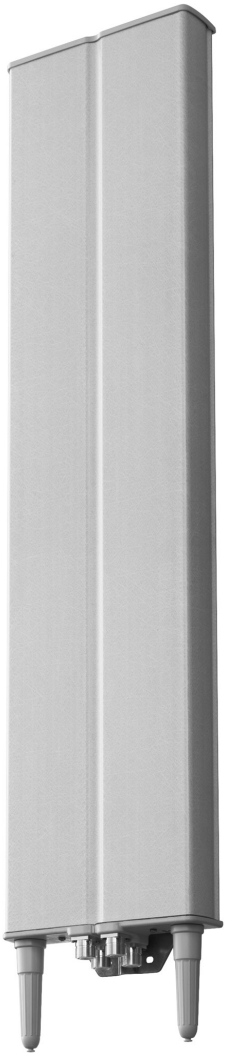
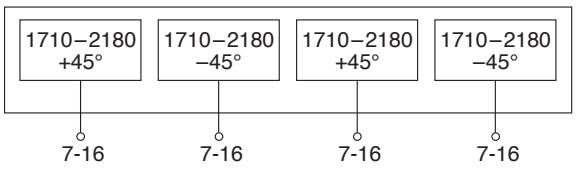
XXPol Panel 1710–2180/1710–2180 90°/90° 16.5/16.5dBi 0°–10°/0°–10°T

Type No.	742352V01 (clamps included)		
	1710–2180		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain (average) Tilt	16.1 ... 16.3 ... 16.0 dBi 0° ... 5° ... 10°	16.2 ... 16.4 ... 16.1 dBi 0° ... 5° ... 10°	16.5 ... 16.7 ... 16.2 dBi 0° ... 5° ... 10°
Horizontal Pattern:			
Half-power beam width	88°	90°	88°
Front-to-back ratio	Copolar: > 24 dB Total power: > 24 dB	Copolar: > 24 dB Total power: > 24 dB	Copolar: > 24 dB Total power: > 24 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 15 dB > 8 dB	Typically: 15 dB > 7.5 dB	Typically: 15 dB > 7 dB
Tracking, Avg.	0.5 dB		
Squint	2.5°		
Vertical Pattern:			
Half-power beam width	7.4°	7°	6.5°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° ... 10° T 18 ... 17 ... 16 ... 15 dB	0° ... 4° ... 8° ... 10° T 18 ... 17 ... 16 ... 15 dB	0° ... 4° ... 8° ... 10° T 17 ... 17 ... 16 ... 15 dB
VSWR	< 1.5		
Isolation: Intrasystem	> 30 dB		
Isolation: Intersystem	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 660 / 155 / 690 N		
Height/width/depth	1319 / 323 / 71 mm		
Category of mounting hardware	M (Medium)		
Weight	17 kg / 19 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		





For more information about additional mounting accessories please refer to page 205

Summary – Directional Antennas
Dual-band
800/900 – 1800/2000/2600

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Dual Polarization +45°/–45°

Type						Type No.	Height [mm]	Connector position	Page
XXPol Panel	806–960 1710–2180	C	65° 60°	8.5dBi 9.5dBi	0°T 0°T	80010454V01	270	bottom or top	104
XXPol Panel	790–960 1710–2170		65° 60°	12dBi 14dBi	0°T 0°T	742226V01	579	bottom or top	105
XXPol Panel	790–960 1710–2170	C	65° 60°	12dBi 14dBi	0°T 0°T	742222V01	579	bottom or top	106
XXPol Panel	790–960 1710–2180		65° 65°	14.5dBi 17.5dBi	0°–14°T 0°–8°T	742264V02	1334	bottom	107
XXPol Panel	790–960 1710–2180	C	65° 65°	14.5dBi 17.5dBi	0°–14°T 0°–8°T	742223V02	1334	bottom	108
XXPol Panel	790–960 1710–2690		65° 65°	15dBi 17.5dBi	0°–16°T 2°–10°T	80010664	1399	bottom	109
XXPol Panel	790–960 1710–2180		65° 65°	16dBi 18.5dBi	0°–10°T 0°–6°T	742265V02	1933	bottom	110
XXPol Panel	790–960 1710–2180		65° 65°	16dBi 18.5dBi	0°–10°T 0°–6°T	80010771	1934	rearside	111
XXPol Panel	790–960 1710–2180		65° 65°	16.5dBi 18.5dBi	2°–14°T 4°–10°T	80010485V01	2038	bottom	112
XXPol Panel	790–960 1710–2180	C	65° 65°	16dBi 18.5dBi	0°–10°T 0°–6°T	742224V02	1933	bottom	113
XXPol Panel	790–960 1710–2690		65° 65°	16dBi 18.5dBi	0°–10°T 0°–6°T	80010665	1997	bottom	114
XXPol Panel	790–960 1710–2180		65° 65°	17dBi 18.5dBi	0°–7°T 0°–6°T	742266V02	2533	bottom	115
XXPol Panel	790–960 1710–2180		65° 65°	17dBi 18.5dBi	0°–8°T 0°–6°T	80010772	2399	rearside	116
XXPol Panel	790–960 1710–2690		65° 65°	17dBi 18.5dBi	0°–10°T 0°–6°T	80010666	2622	bottom	117
XXPol Panel	790–960 1710–2180		65° 65°	17.5dBi 18.5dBi	4°–12°T 4°–14°T	80010486V01	2516	bottom	118
XXPol Panel	790–960 1710–2180	C	65° 65°	17dBi 18.5dBi	0°–7°T 0°–6°T	742225V02	2533	bottom	119
XXPol Panel	790–960 1710–2180		90° 90°	13.5dBi 16.5dBi	0°–13°T 0°–10°T	80010121V01	1384	bottom	120
XXPol Panel	790–960 1710–2180		90° 90°	15.2dBi 18dBi	0°–10°T 0°–6°T	80010122V01	1917	bottom	121
XXPol Panel	790–960 1710–2180		90° 90°	16.5dBi 18dBi	0°–7°T 0°–6°T	80010123V03	2635	bottom	122

C = integrated Combiner

New or changed product

When deploying Dual-band Antennas, please also consider using special Dual-band Combiners (see pages 240 and 241)

Dual-band Panel
Dual Polarization
Half-power Beam Width

	806–960	1710–2180
Dual Polarization	X	X
Half-power Beam Width	65°	65°

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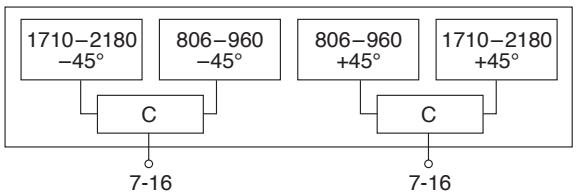
XXPol Panel 806–960/1710–2180 C 65°/65° 8.5/9.5dBi

Type No.	80010454V01 (clamps included)					
		806–960			1710–2180	
Frequency range	806 – 866 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain	2 x 8.5 dBi	2 x 8.5 dBi	2 x 8.5 dBi	2 x 9.5 dBi	2 x 9.5 dBi	2 x 9.5 dBi
Horizontal Pattern:						
Half-power beam width	67°	67°	65°	60°	63°	68°
Front-to-back ratio [dB] [dB]	Copolar: > 25 Total power: > 20	Copolar: > 25 Total power: > 20	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 19 dB > 10 dB	Typically: 20 dB > 10 dB
Vertical Pattern:						
Half-power beam width	68°	68°	69°	64°	62°	60°

VSWR	< 1.5
Isolation: Intrasystem	> 30 dB
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	250 W (at 50 °C ambient temperature) / 100 W (at 50 °C ambient temperature)
Max. power per combined input	350 W (at 50 °C ambient temperature)
Input	2 x 7-16 female
Connector position	Bottom or top
Wind load (at 150 km/h)	Frontal / lateral / rearside: 95 / 35 / 130 N
Height/width/depth	270 / 262 / 116 mm
Category of mounting hardware	M (Medium)
Weight	4.5 kg / 6.5 kg (clamps incl.)
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter
Integrated combiner	The insertion loss is included in the given antenna gain values.



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2170
X	X
65°	65°

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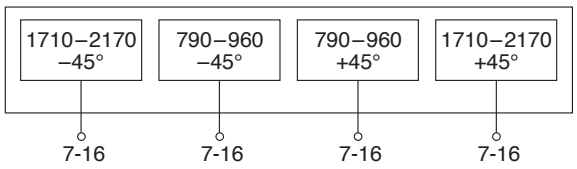
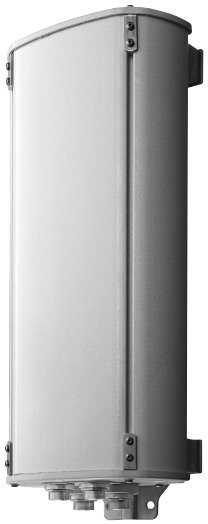
XXPol Panel 790–960/1710–2170 65°/60° 12/14dBi 0°/0°T

Type No.	742226V01 (clamps included)					
		790–960			1710–2170	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 11.1 dBi	2 x 11.4 dBi	2 x 11.8 dBi	2 x 12.8 dBi	2 x 13.3 dBi	2 x 13.6 dBi
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	66°	60°	60°
Front-to-back ratio [dB] (180°±30°) [dB]	Copolar: > 23 Total power: > 20	Copolar: > 23 Total power: > 20	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 16 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	1.0 dB			0.5 dB		
Squint	±3.0°			±1.5°		
Vertical Pattern:						
Half-power beam width	34°	33°	30°	20°	18°	17.5°
Electrical tilt	0°, fixed			0°, fixed		
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Isolation: Intersystem	> 42 dB (790–960 // 1710–2170 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power	250 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female					
Connector position	Bottom or top					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 200 / 90 / 250 N					
Height/width/depth	579 / 262 / 139 mm					
Category of mounting hardware	M (Medium)					
Weight	7.5 kg / 9.5 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					





For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

	790–960	1710–2170
Dual Polarization	X	X
Half-power Beam Width	65°	65°

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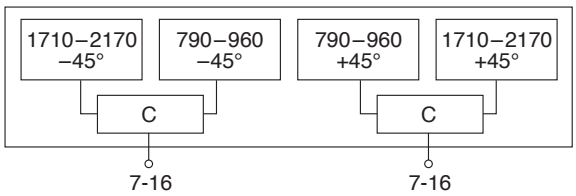
XXPol Panel 790–960/1710–2170 C 65°/60° 12/14dBi 0°/0°T

Type No.	742222V01 (clamps included)					
		790–960			1710–2170	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 11.1 dBi	2 x 11.4 dBi	2 x 11.8 dBi	2 x 12.5 dBi	2 x 13.3 dBi	2 x 13.6 dBi
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	66°	60°	60°
Front-to-back ratio [dB] (180°±30°) [dB]	Copolar: > 23 Total power: > 20	Copolar: > 23 Total power: > 20	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 20 dB > 10 dB
Vertical Pattern:						
Half-power beam width	34°	33°	30°	20°	18°	17.5°
Electrical tilt	0°, fixed			0°, fixed		
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power	250 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female					
Connector position	Bottom or top					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 200 / 90 / 250 N					
Height/width/depth	579 / 262 / 139 mm					
Category of mounting hardware	M (Medium)					
Weight	7.5 kg / 9.5 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					
Integrated combiner	The insertion loss is included in the given antenna gain values.					



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

	790–960	1710–2180
Dual Polarization	X	X
Half-power Beam Width	65°	65°

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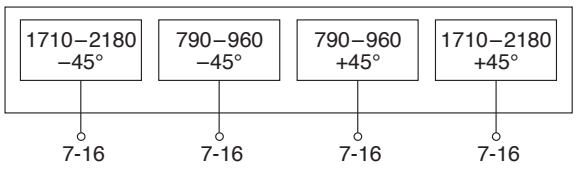
XXPol Panel 790–960/1710–2180 65°/65° 14.5/17.5dBi 0°–14°/0°–8°T

Type No.	742264V02 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	14.1 ... 14.1 ... 13.7 0° ... 7° ... 14°	14.3 ... 14.2 ... 13.8 0° ... 7° ... 14°	14.5 ... 14.4 ... 13.9 0° ... 7° ... 14°	17.1 ... 17.3 ... 17.1 0° ... 4° ... 8°	17.2 ... 17.4 ... 17.1 0° ... 4° ... 8°	17.3 ... 17.5 ... 17.2 0° ... 4° ... 8°
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	65°	62°	61°
Front-to-back ratio, copalar	> 30 dB	> 30 dB	> 30 dB	> 32 dB	> 32 dB	> 32 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB			0.5 dB		
Squint	±2.0°			±3.0°		
Vertical Pattern:						
Half-power beam width	16.5°	16°	15.3°	7.4°	7.1°	6.7°
Electrical tilt	0°–14°, continuously adjustable			0°–8°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam avg.	0° ... 7° ... 14° T 17 ... 16 ... 15 dB	0° ... 7° ... 14° T 19 ... 18 ... 18 dB	0° ... 7° ... 14° T 17 ... 18 ... 17 dB	0° ... 4° ... 8° T 17 ... 17 ... 16 dB	0° ... 4° ... 8° T 15 ... 15 ... 15 dB	0° ... 4° ... 8° T 16 ... 16 ... 15 dB
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Isolation: Intersystem	> 45 dB, Typ. > 50 dB (790–960 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	2x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 560 / 260 / 600 N					
Height/width/depth	1334 / 261 / 146 mm					
Category of mounting hardware	M (Medium)					
Weight	15.5 kg / 17.5 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2180
X	X
65°	65°

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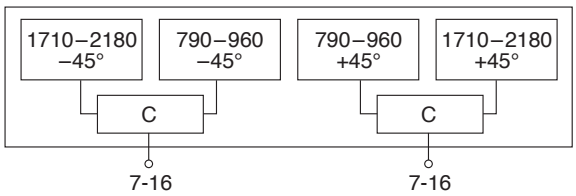
XXPol Panel 790–960/1710–2180 C 65°/65° 14.5/17.5dBi 0°–14°/0°–8°T

Type No.	742223V02 (clamps included)				
	790–960		1710–2180		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	14.1 ... 14.1 ... 13.7 0° ... 7° ... 14°	14.5 ... 14.4 ... 13.9 0° ... 7° ... 14°	17.1 ... 17.3 ... 17.1 0° ... 4° ... 8°	17.2 ... 17.4 ... 17.1 0° ... 4° ... 8°	17.3 ... 17.5 ... 17.2 0° ... 4° ... 8°
Horizontal Pattern:					
Half-power beam width	68°	65°	65°	62°	61°
Front-to-back ratio, copalar	> 30 dB	> 30 dB	> 32 dB	> 32 dB	> 32 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB		0.5 dB		
Squint	±2.0°		±3.0°		
Vertical Pattern:					
Half-power beam width	16.5°	15.3°	7.4°	7.1°	6.7°
Electrical tilt	0°–14°, continuously adjustable		0°–8°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam avg.	0° ... 7° ... 14° T 17 ... 16 ... 15 dB	0° ... 7° ... 14° T 17 ... 18 ... 17 dB	0° ... 4° ... 8° T 17 ... 17 ... 16 dB	0° ... 4° ... 8° T 15 ... 15 ... 15 dB	0° ... 4° ... 8° T 16 ... 16 ... 15 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 30 dB				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	250 W*		200 W*		
Total power per combined input	450 W*				
Input	4 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	2x, Position bottom continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 560 / 260 / 600 N				
Height/width/depth	1334 / 261 / 146 mm				
Category of mounting hardware	M (Medium)				
Weight	15.5 kg / 17.5 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter				
Integrated combiner	The insertion loss is included in the given antenna gain values.				

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2690
X	X
65°	65°

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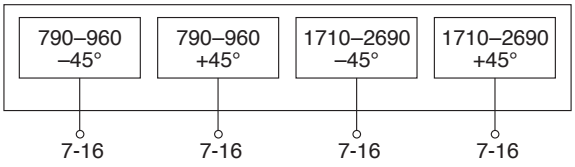
XXPol Panel 790–960/1710–2690 65°/65° 15/17.5dBi 0°–16°/2°–10°T

Type No.	80010664 (clamps included)						
		790–960			1710–2690		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	14.5 ... 14.4 ... 14.2 0° ... 8° ... 16°	14.6 ... 14.5 ... 14.3 0° ... 8° ... 16°	14.8 ... 14.6 ... 14.4 0° ... 8° ... 16°	17.2 ... 17.3 ... 16.8 2° ... 5° ... 10°	17.4 ... 17.4 ... 16.9 2° ... 5° ... 10°	17.6 ... 17.7 ... 17.0 2° ... 5° ... 10°	17.2 ... 17.3 ... 16.7 2° ... 5° ... 10°
Horizontal Pattern:							
Half-power beam width	69°	68°	67°	63°	64°	66°	65°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 28 dB	> 28 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 9 dB	Typically: 25 dB > 8 dB	Typically: 18 dB > 9 dB	20 dB > 10 dB	20 dB > 10 dB	23 dB > 8 dB
Vertical Pattern:							
Half-power beam width	16.5°	16.0°	15.5°	6.2°	5.8°	5.2°	4.8°
Electrical tilt	0°–16°, continuously adjustable			2°–10°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	0° ... 8° ... 16° T 16 ... 15 ... 15 dB	0° ... 8° ... 16° T 16 ... 15 ... 15 dB	0° ... 8° ... 16° T 15 ... 15 ... 14 dB	2° ... 5° ... 10° T 14 ... 15 ... 16 dB	2° ... 5° ... 10° T 14 ... 15 ... 17 dB	2° ... 5° ... 10° T 15 ... 16 ... 17 dB	2° ... 5° ... 10° T 15 ... 17 ... 18 dB
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB			> 28 dB			< 30 dB
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female						
Connector position	Bottom						
Adjustment mechanism	2x, Position bottom continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 650 / 240 / 700 N						
Height/width/depth	1399 / 300 / 152 mm						
Category of mounting hardware	M (Medium)						
Weight	18 kg / 20 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2180
X	X
65°	65°

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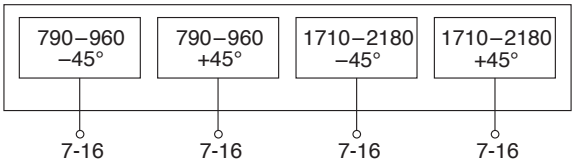
XXPol Panel 790–960/1710–2180 65°/65° 16/18.5dBi 0°–10°/0°–6°T

Type No.	742265V02 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	15.6 ... 15.5 ... 15.3 0.5° ... 5° ... 9.5°	15.9 ... 15.8 ... 15.5 0.5° ... 5° ... 9.5°	16.1 ... 16.0 ... 15.6 0.5° ... 5° ... 9.5°	18.2 ... 18.5 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	65°	65°	61°
Front-to-back ratio, copalar	> 27 dB	> 28 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.5 dB			0.5 dB		
Squint	±2.5°			±2.5°		
Vertical Pattern:						
Half-power beam width	10.9°	10.6°	10°	5.0°	4.8°	4.6°
Electrical tilt	0.5°–9.5°, continuously adjustable			0°–6°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam avg.	0.5° ... 5° ... 9.5° T ≥ 15 ... 16 ... 17 dB	0.5° ... 5° ... 9.5° T ≥ 15 ... 17 ... 19 dB	0.5° ... 5° ... 9.5° T ≥ 15 ... 18 ... 19 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Isolation: Intersystem	> 45 dB, Typ. > 50 dB (790–960 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	2x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 850 / 380 / 910 N					
Height/width/depth	1933 / 261 / 146 mm					
Category of mounting hardware	M (Medium)					
Weight	20 kg / 22 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

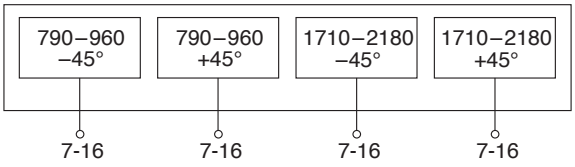
Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2180
X	X
65°	65°

KATHREIN
Antennen · Electronic

XXPol Panel 790–960/1710–2180 65°/65° 16/18.5dBi 0°–10°/0°–6°T

Type No.	80010771 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	15.4 ... 15.5 ... 15.2 0° ... 5° ... 10°	15.5 ... 15.8 ... 15.3 0° ... 5° ... 10°	15.8 ... 16.0 ... 15.4 0° ... 5° ... 10°	18.3 ... 18.5 ... 18.2 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°	18.2 ... 18.6 ... 18.2 0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	69°	67°	65°	65°	62°	62°
Front-to-back ratio, copalar	> 27 dB	> 28 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.5 dB			0.5 dB		
Squint	±3.0°			±2.5°		
Vertical Pattern:						
Half-power beam width	11°	10.7°	10°	5.0°	4.8°	4.6°
Electrical tilt	0°–10°, continuously adjustable			0°–6°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 5° ... 10° ≥ 17 ... 17 ... 17 dB	0° ... 5° ... 10° ≥ 17 ... 17 ... 18 dB	0° ... 5° ... 10° ≥ 17 ... 17 ... 16 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB
VSWR	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Isolation: Intersystem	> 30 dB (790–960 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power per input Max. power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female					
Connector position	Rearside					
Adjustment mechanism	2x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 680 / 380 / 890 N					
Height/width/depth	1934 / 260 / 140 mm					
Category of mounting hardware	M (Medium)					
Weight	15 kg / 17 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

	790–960	1710–2180
Dual Polarization	X	X
Half-power Beam Width	65°	65°

KATHREIN
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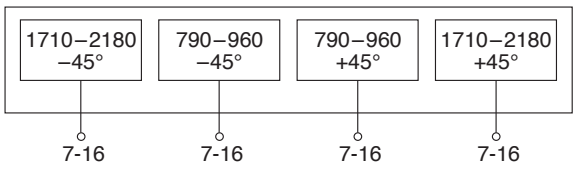
XXPol Panel 790–960/1710–2180 65°/65° 16.5/18.5dBi 2°–14°/4°–10°T

Type No.	80010485V01 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.2 ... 16.0 ... 15.7 2° ... 8° ... 14°	16.3 ... 16.1 ... 15.8 2° ... 8° ... 14°	16.4 ... 16.2 ... 15.8 2° ... 8° ... 14°	18.0 ... 18.2 ... 17.7 4° ... 9° ... 14°	18.4 ... 18.5 ... 17.8 4° ... 9° ... 14°	18.7 ... 18.6 ... 18.0 4° ... 9° ... 14°
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	66°	64°	60°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 21 dB > 10 dB
Vertical Pattern:						
Half-power beam width	10°	9.7°	9.3°	5°	4.7°	4.5°
Electrical tilt	2°–14°, continuously adjustable			4°–14°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam	2° ... 8° ... 14° T 17 ... 17 ... 15 dB	2° ... 8° ... 14° T 17 ... 17 ... 16 dB	2° ... 8° ... 14° T 17 ... 17 ... 16 dB	4° ... 9° ... 14° T 20 ... 18 ... 15 dB	4° ... 9° ... 14° T 19 ... 18 ... 15 dB	4° ... 9° ... 14° T 18 ... 17 ... 15 dB

Impedance	50 Ω	
VSWR	< 1.5	
Isolation: Intrasystem	> 30 dB	
Isolation: Intersystem	> 35 dB (790–960 // 1710–2180 MHz)	
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)	
Max. power per input Total power	400 W (at 50 °C ambient temperature) 800 W (at 50 °C ambient temperature)	250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)
Input	4 x 7-16 female (long neck)	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 750 / 380 / 900 N	
Height/width/depth	2038 / 262 / 139 mm	
Category of mounting hardware	M (Medium)	
Weight	24 kg / 26 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter	



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2180
X	X
65°	65°

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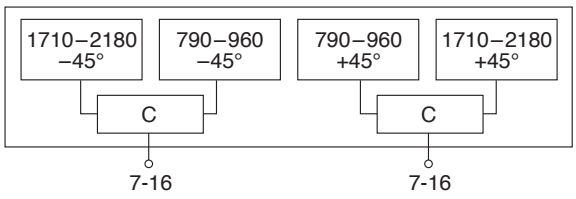
XXPol Panel 790–960/1710–2180 C 65°/65° 16/18.5dBi 0°–10°/0°–6°T

Type No.	742224V02 (clamps included)				
	790–960		1710–2180		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	15.6 ... 15.5 ... 15.3 0.5° ... 5° ... 9.5°	16.1 ... 16.0 ... 15.6 0.5° ... 5° ... 9.5°	18.2 ... 18.5 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°
Horizontal Pattern:					
Half-power beam width	68°	65°	65°	65°	61°
Front-to-back ratio, copolar	> 27 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.5 dB		0.5 dB		
Squint	±2.5°		±2.5°		
Vertical Pattern:					
Half-power beam width	10.9°	10°	5.0°	4.8°	4.6°
Electrical tilt	0.5°–9.5°, continuously adjustable		0°–6°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam avg.	0.5° ... 5° ... 9.5° T ≥ 15 ... 16 ... 17 dB	0.5° ... 5° ... 9.5° T ≥ 15 ... 18 ... 19 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 30 dB				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	250 W*		200 W*		
Total power per combined input	450 W*				
Input	4 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	2x, Position bottom continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 850 / 380 / 910 N				
Height/width/depth	1933 / 261 / 146 mm				
Category of mounting hardware	M (Medium)				
Weight	20 kg / 22 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter				
Integrated combiner	The insertion loss is included in the given antenna gain values.				

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2690
X	X
65°	65°

KATHREIN
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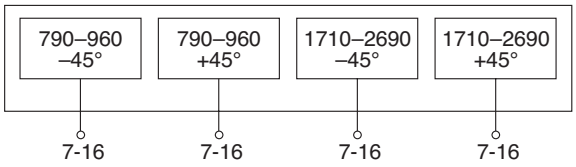
XXPol Panel 790–960/1710–2690 65°/65° 16/18.5dBi 0°–10°/0°–6°T

clamps included

Type No.	80010665						
	790–960			1710–2690			
Frequency range	790 – 866 MHz	824 – 896 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.0 ... 16.0 ... 15.5 0° ... 5° ... 10°	16.1 ... 16.1 ... 15.6 0° ... 5° ... 10°	16.0 ... 16.2 ... 15.6 0° ... 5° ... 10°	18.5 ... 18.4 ... 18.1 0° ... 3° ... 6°	18.5 ... 18.4 ... 18.1 0° ... 3° ... 6°	18.8 ... 18.7 ... 18.2 0° ... 3° ... 6°	18.2 ... 18.3 ... 18.0 0° ... 3° ... 6°
Horizontal Pattern:							
Half-power beam width	68°	67°	65°	62°	63°	62°	63°
Front-to-back ratio, copalar (180°±30°)	> 27 dB	> 27 dB	> 27 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 23 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:							
Half-power beam width	10.3°	10.1°	9.8°	4.5°	4.4°	4.1°	3.5°
Electrical tilt	0°–10°, continuously adjustable			0°–6°, continuously adjustable			
Min. sidelobe supression for first sidelobe above main beam	0° ... 5° ... 10° T 18 ... 17 ... 15 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 17 ... 16 ... 16 dB	0° ... 3° ... 6° T 18 ... 18 ... 17 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 18 ... 18 ... 17 dB
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB			> 28 dB			
Isolation: Intersystem	> 30 dB (790–960 // 1710–2690 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature) 400 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	2x, Position bottom continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 990 / 380 / 1030 N						
Height/width/depth	1997 / 300 / 152 mm						
Category of mounting hardware	M (Medium)						
Weight	24 kg / 26 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter						



For more information about additional mounting accessories please refer to page 205

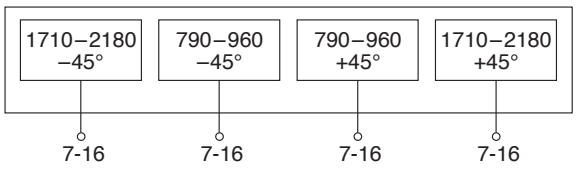
Dual-band Panel
Dual Polarization
Half-power Beam Width

	790–960	1710–2180
Dual Polarization	X	X
Half-power Beam Width	65°	65°

KATHREIN
Antennen · Electronic

XXPol Panel 790–960/1710–2180 65°/65° 17/18.5dBi 0°–7°/0°–6°T

Type No.	742266V02 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	16.6 ... 16.6 ... 16.5 0° ... 3° ... 7°	17.0 ... 16.9 ... 16.7 0° ... 3° ... 7°	17.0 ... 17.1 ... 16.9 0° ... 3° ... 7°	18.2 ... 18.5 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	65°	65°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 30 dB > 10 dB	Typically: 30 dB > 10 dB	Typically: 30 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB			0.5 dB		
Squint	±2.5°			±2.5°		
Vertical Pattern:						
Half-power beam width	8.0°	7.7°	7.2°	5.0°	4.8°	4.6°
Electrical tilt	0°–7°, continuously adjustable			0°–6°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam avg.	0° ... 3° ... 7° T ≥ 17 ... 17 ... 15 dB	0° ... 3° ... 7° T ≥ 17 ... 17 ... 15 dB	0° ... 3° ... 7° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Isolation: Intersystem	> 45 dB, Typ. > 50 dB (790–960 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	2x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1160 / 500 / 1210 N					
Height/width/depth	2533 / 261 / 146 mm					
Category of mounting hardware	H (Heavy)					
Weight	24 kg / 26 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2180
X	X
65°	65°

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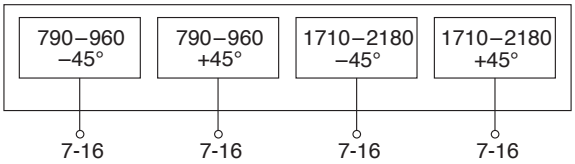
XXPol Panel 790–960/1710–2180 65°/65° 17/18.5dBi 0°–8°/0°–6°T

Type No.	80010772 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	16.6 ... 16.8 ... 16.6 0° ... 4° ... 8°	16.8 ... 17.0 ... 16.7 0° ... 4° ... 8°	16.8 ... 17.0 ... 16.7 0° ... 4° ... 8°	18.4 ... 18.5 ... 18.0 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.1 0° ... 3° ... 6°	18.4 ... 18.6 ... 18.0 0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	65°	62°	62°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.5 dB			0.5 dB		
Squint	±3.0°			±2.5°		
Vertical Pattern:						
Half-power beam width	8.0°	7.9°	7.6°	5.0°	4.8°	4.6°
Electrical tilt	0°–8°, continuously adjustable			0°–6°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 4° ... 8° ≥ 16 ... 17 ... 16 dB	0° ... 4° ... 8° ≥ 15 ... 17 ... 18 dB	0° ... 4° ... 8° ≥ 15 ... 17 ... 18 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Isolation: Intersystem	> 30 dB (790–960 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power per input Max. power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female					
Connector position	Rearside					
Adjustment mechanism	2x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 840 / 480 / 1160 N					
Height/width/depth	2399 / 260 / 140 mm					
Category of mounting hardware	H (Heavy)					
Weight	17 kg / 19 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2690
X	X
65°	65°

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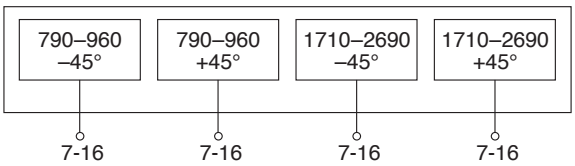
XXPol Panel 790–960/1710–2690 65°/65° 17/18.5dBi 0°–10°/0°–6°T

clamps included

Type No.	80010666						
	790–960			1710–2690			
Frequency range	790 – 866 MHz	824 – 896 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.8 ... 16.7 ... 16.5 0.5° ... 5° ... 9.5°	17.0 ... 17.0 ... 16.8 0.5° ... 5° ... 9.5°	17.1 ... 17.2 ... 17.0 0.5° ... 5° ... 9.5°	18.5 ... 18.4 ... 18.1 0° ... 3° ... 6°	18.5 ... 18.4 ... 18.1 0° ... 3° ... 6°	18.8 ... 18.7 ... 18.2 0° ... 3° ... 6°	18.2 ... 18.3 ... 18.0 0° ... 3° ... 6°
Horizontal Pattern:							
Half-power beam width	68°	67°	65°	62°	63°	62°	63°
Front-to-back ratio, copalar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 24 dB > 10 dB	Typically: 23 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 23 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:							
Half-power beam width	7.5°	7.4°	7.1°	4.5°	4.4°	4.1°	3.5°
Electrical tilt	0.5°–9.5°, continuously adjustable			0°–6°, continuously adjustable			
Min. sidelobe supression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T 18 ... 16 ... 14 dB	0.5° ... 5° ... 9.5° T 18 ... 17 ... 15 dB	0.5° ... 5° ... 9.5° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 17 ... 16 ... 16 dB	0° ... 3° ... 6° T 18 ... 18 ... 17 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 18 ... 18 ... 17 dB
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB			> 28 dB			
Isolation: Intersystem	> 30 dB (790–960 // 1710–2690 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature) 400 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	2x, Position bottom continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1270 /490 / 1320 N						
Height/width/depth	2622 / 300 / 152 mm						
Category of mounting hardware	H (Heavy)						
Weight	29 kg / 31 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2180
X	X
65°	65°

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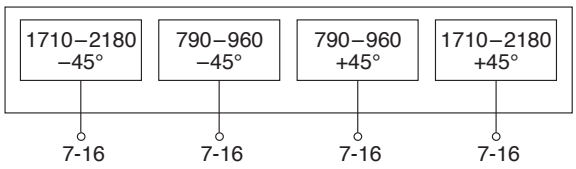
XXPol Panel 790–960/1710–2180 65°/65° 17.5/18.5dBi 4°–12°/4°–14°T

Type No.	80010486V01 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.8 ... 16.7 ... 16.6 4° ... 8° ... 12°	17.0 ... 16.8 ... 16.8 4° ... 8° ... 12°	17.2 ... 17.0 ... 16.8 4° ... 8° ... 12°	17.8 ... 18.1 ... 17.5 4° ... 9° ... 14°	18.3 ... 18.3 ... 17.8 4° ... 9° ... 14°	18.7 ... 18.7 ... 18.0 4° ... 9° ... 14°
Horizontal Pattern:						
Half-power beam width	68°	67°	66°	66°	64°	61°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 23 dB > 10 dB	Typically: 24 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 20 dB > 10 dB
Vertical Pattern:						
Half-power beam width	7.5°	7.4°	7.2°	5°	4.8°	4.6°
Electrical tilt	4°–12°, continuously adjustable			4°–14°, continuously adjustable		
Sidelobe supression – for first sidelobe above main beam – within 0°–20° sector above horizon	4° ... 8° ... 12° T 18 ... 17 ... 16 dB 15 ... 15 ... 14 dB	4° ... 8° ... 12° T 19 ... 18 ... 18 dB 16 ... 15 ... 14 dB	4° ... 8° ... 12° T 19 ... 18 ... 18 dB 16 ... 15 ... 14 dB	4° ... 9° ... 14° T 20 ... 18 ... 16 dB 17 ... 17 ... 15 dB	4° ... 9° ... 14° T 19 ... 19 ... 16 dB 17 ... 17 ... 15 dB	4° ... 9° ... 14° T 18 ... 18 ... 18 dB 17 ... 17 ... 15 dB
VSWR	< 1.5					
Isolation: Intrasystem	> 30 dB					
Isolation: Intersystem	> 45 dB (790–960 // 1710–2180 MHz)					
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)					
Max. power per input Total power	400 W (at 50 °C ambient temperature) 800 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	2x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 920 / 460 / 1150 N					
Height/width/depth	2516 / 262 / 139 mm					
Category of mounting hardware	H (Heavy)					
Weight	28 kg / 30 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2180
X	X
65°	65°

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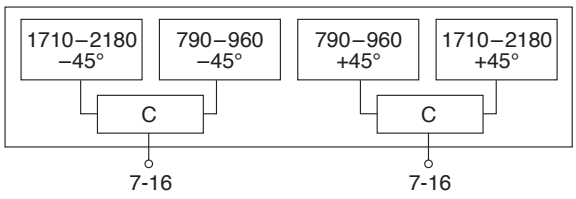
XXPol Panel 790–960/1710–2180 C 65°/65° 17/18.5dBi 0°–7°/0°–6°T

Type No.	742225V02 (clamps included)				
	790–960		1710–2180		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	16.6 ... 16.6 ... 16.5 0° ... 3° ... 7°	17.0 ... 17.1 ... 16.9 0° ... 3° ... 7°	18.2 ... 18.5 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°
Horizontal Pattern:					
Half-power beam width	68°	65°	65°	65°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 30 dB > 10 dB	Typically: 30 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB		0.5 dB		
Squint	±2.5°		±2.5°		
Vertical Pattern:					
Half-power beam width	7.7°	7.2°	5.0°	4.8°	4.6°
Electrical tilt	0°–7°, continuously adjustable		0°–6°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam avg.	0° ... 4° ... 7° T ≥ 17 ... 17 ... 15 dB	0° ... 4° ... 7° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 30 dB				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	250 W*		200 W*		
Total power per combined input	450 W*				
Input	4 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	2x, Position bottom continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1160 / 500 / 1210 N				
Height/width/depth	2533 / 261 / 146 mm				
Category of mounting hardware	H (Heavy)				
Weight	24 kg / 26 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter				
Integrated combiner	The insertion loss is included in the given antenna gain values.				

* (at 50 °C ambient temperature)



Dual-band Panel
Dual Polarization
Half-power Beam Width

	790–960	1710–2180
Dual Polarization	X	X
Half-power Beam Width	90°	90°

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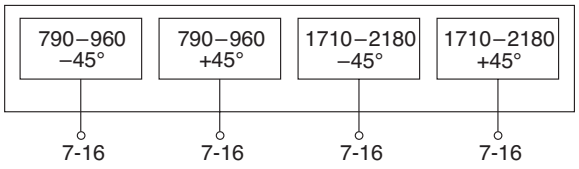
XXPol Panel 790–960/1710–2180 90°/90° 13.5/16.5dBi 0°–13°/0°–10°T

Type No.	80010121V01 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	13.4 ... 13.4 ... 13.1 0.5° ... 6° ... 12.5°	13.6 ... 13.6 ... 13.4 0.5° ... 6° ... 12.5°	13.9 ... 13.8 ... 13.5 0.5° ... 6° ... 12.5°	16.4 ... 16.4 ... 16.2 0.5° ... 5° ... 10°	16.4 ... 16.5 ... 16.0 0.5° ... 5° ... 10°	16.4 ... 15.9 ... 15.3 0.5° ... 5° ... 10°
Horizontal Pattern:						
Half-power beam width	88°	86°	88°	82°	85°	90°
Front-to-back ratio, copolar	> 23 dB	> 23 dB	> 23 dB	> 23 dB	> 23 dB	> 23 dB
Cross polar ratio Maindirection 0° Sector ±60° ±60°	Typically: 17 dB > 10 dB avg. 16 dB	Typically: 18 dB > 10 dB avg. 16 dB	Typically: 20 dB > 13 dB avg. 19 dB	Typically: 17 dB > 10 dB avg. 17 dB	Typically: 16 dB > 12 dB avg. 19 dB	Typically: 15 dB > 10 dB avg. 19 dB
Vertical Pattern:						
Half-power beam width	15.0°	14.5°	14.0°	7.0°	6.6°	6.4°
Electrical tilt	0.5°–12.5°, continuously adjustable			0.5°–10°, continuously adjustable		
Min. sidelobe supression for first sidelobe above main beam: average:	0.5° ... 6° ... 12.5° T 16 ... 14 ... 14 dB 20 ... 19 ... 16 dB	0.5° ... 6° ... 12.5° T 16 ... 15 ... 14 dB 20 ... 18 ... 17 dB	0.5° ... 6° ... 12.5° T 18 ... 16 ... 16 dB 22 ... 20 ... 20 dB	0.5° ... 5° ... 10° T 17 ... 17 ... 16 dB 20 ... 20 ... 18 dB	0.5° ... 5° ... 10° T 17 ... 18 ... 16 dB 21 ... 22 ... 17 dB	0.5° ... 5° ... 10° T 18 ... 16 ... 16 dB 20 ... 20 ... 16 dB
VSWR	< 1.5					
Isolation: Intrasystem	> 30 dB					
Isolation: Intersystem	> 42 dB (790–960 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)					
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	2x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 420 / 260 / 620 N					
Height/width/depth	1384 / 262 / 149 mm					
Category of mounting hardware	M (Medium)					
Weight	21 kg / 23 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

	790–960	1710–2180
Dual Polarization	X	X
Half-power Beam Width	90°	90°

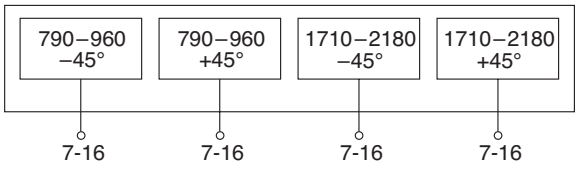
KATHREIN
Antennen · Electronic

XXPol Panel 790–960/1710–2180 90°/90° 15/18dBi 0°–10°/0°–6°T

clamps included

Type No.	80010122V01					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 896 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	14.8 ... 14.8 ... 14.8 0° ... 5° ... 10°	14.8 ... 15.0 ... 14.8 0° ... 5° ... 10°	14.9 ... 15.1 ... 14.9 0° ... 5° ... 10°	17.7 ... 17.8 ... 17.7 0° ... 3° ... 6°	17.7 ... 18.0 ... 17.6 0° ... 3° ... 6°	17.6 ... 17.8 ... 17.4 0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	88°	87°	88°	82°	85°	90°
Front-to-back ratio (180°±30°)	> 23 dB	> 23 dB	> 23 dB	> 23 dB	> 23 dB	> 23 dB
Cross polar ratio Maindirection 0° Sector ±60° ±60°	Typically: 18 dB > 10 dB avg. 16 dB	Typically: 18 dB > 10 dB avg. 16 dB	Typically: 20 dB > 13 dB avg. 19 dB	Typically: 17 dB > 10 dB avg. 17 dB	Typically: 16 dB > 12 dB avg. 19 dB	Typically: 15 dB > 10 dB avg. 19 dB
Vertical Pattern:						
Half-power beam width	11.0°	10.9°	10.5°	5.5°	5.2°	5.0°
Electrical tilt	0°–10°, continuously adjustable			0°–6°, continuously adjustable		
Min. sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T 18 ... 16 ... 14 dB	0° ... 5° ... 10° T 16 ... 16 ... 15 dB	0° ... 5° ... 10° T 16 ... 16 ... 15 dB	0° ... 3° ... 6° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 18 ... 16 ... 16 dB

VSWR	< 1.5	
Isolation: Intrasystem	> 30 dB	
Isolation: Intersystem	> 42 dB (790–960 // 1710–2180 MHz)	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)	250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)
Input	4 x 7-16 female (long neck)	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 580 / 360 / 870 N	
Height/width/depth	1917 / 262 / 149 mm	
Category of mounting hardware	M (Medium)	
Weight	27 kg / 29 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter	



For more information about additional mounting accessories please refer to page 205

Dual-band Panel
Dual Polarization
Half-power Beam Width

	790–960	1710–2180
Dual Polarization	X	X
Half-power Beam Width	90°	90°

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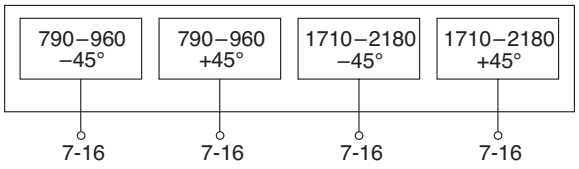
XXPol Panel 790–960/1710–2180 90°/90° 16.5/18dBi 0°–7°/0°–6°T

Type No.	80010123V03 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.1 ... 16.2 ... 16.1 0.5° ... 4° ... 7°	16.3 ... 16.4 ... 16.3 0.5° ... 4° ... 7°	16.5 ... 16.6 ... 16.5 0.5° ... 4° ... 7°	17.8 ... 17.7 ... 17.4 0° ... 3° ... 6°	18.0 ... 17.9 ... 17.4 0° ... 3° ... 6°	17.9 ... 17.8 ... 17.3 0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	86°	86°	86°	84°	85°	88°
Front-to-back ratio, copolar	> 25 dB	> 25 dB	> 25 dB	> 23 dB	> 23 dB	> 23 dB
Cross polar ratio Maindirection 0° Sector ±60° ±60°	Typically: 18 dB > 10 dB avg. 16 dB	Typically: 18 dB > 10 dB avg. 16 dB	Typically: 20 dB > 13 dB avg. 19 dB	Typically: 16 dB > 10 dB avg. 16 dB	Typically: 16 dB > 12 dB avg. 17 dB	Typically: 15 dB > 10 dB avg. 18 dB
Tracking, Avg.	0.5 dB			0.5 dB		
Squint	±3.0°			±3.0°		
Vertical Pattern:						
Half-power beam width	7.3°	7.2°	6.9°	4.8°	4.5°	4.2°
Electrical tilt	0.5°–7°, continuously adjustable			0°–6°, continuously adjustable		
Min. sidelobe supression for first sidelobe above main beam	0.5° ... 4° ... 7° T 15 ... 14 ... 14 dB	0.5° ... 4° ... 7° T 15 ... 14 ... 14 dB	0.5° ... 4° ... 7° T 15 ... 14 ... 15 dB	0° ... 3° ... 6° T 18 ... 17 ... 16 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 18 ... 16 ... 17 dB
VSWR	< 1.5					
Isolation: Intrasystem	> 30 dB					
Isolation: Intersystem	> 45 dB (790–960 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)					
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	2x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 840 / 510 / 1260 N					
Height/width/depth	2635 / 262 / 149 mm					
Category of mounting hardware	H (Heavy)					
Weight	33 kg / 35 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Summary – Directional Antennas
Triple-band
800/900 – 1800/2000/2600

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Dual Polarization +45°/–45°

Type						Type No.	Height [mm]	Connector position	Page
XXXPol Panel	790–862 880–960 1710–2180		65° 65° 65°	14dBi 14dBi 17dBi	0°–14°T 0°–14°T 0°–8°T	80010697	1332	bottom	126
XXXPol Panel	790–862 880–960 1710–2180		65° 65° 65°	15.5dBi 16dBi 18.5dBi	0°–10°T 0°–10°T 0°–6°T	80010698	1932	bottom	127
XXXPol Panel	790–862 880–960 1710–2180		65° 65° 65°	16.5dBi 17dBi 18.5dBi	0°–7°T 0°–7°T 0°–6°T	80010699	2532	bottom	128
XXXPol Panel	790–960 1710–1880 1920–2170		65° 65° 65°	15dBi 17dBi 17dBi	0°–14°T 0°–8°T 0°–8°T	742270V03	1384	bottom	129
XXXPol Panel	790–960 1710–1880 1920–2170	C	65° 65° 65°	15dBi 16.5dBi 17dBi	0°–12°T 0°–8°T 0°–8°T	80010670V01	1498	bottom	130
XXXPol Panel	806–960 1710–2180 1710–2180		65° 65° 65°	15dBi 15dBi 15dBi	0°–14°T 0°–14°T 0°–14°T	80010290V01	1540	bottom	131
XXXPol Panel	790–960 1710–1880 1920–2170		65° 65° 65°	16.5dBi 18dBi 18dBi	0°–10°T 0°–6°T 0°–6°T	742271V03	1933	bottom	132
XXXPol Panel	806–960 1710–1880 1920–2170	C	65° 65° 65°	16.5dBi 17.5dBi 18dBi	0°–10°T 0°–6°T 0°–6°T	80010671V01	2058	bottom	133
XXXPol Panel	790–960 1710–2180 1710–2180		65° 65° 65°	16.5dBi 16.5dBi 16.5dBi	2°–14°T 0°–14°T 0°–14°T	80010291V02	2058	bottom	134
XXXPol Panel	790–960 1710–2690 1710–2690		65° 65° 65°	17dBi 17dBi 17dBi	0°–10°T 0°–10°T 2°–10°T	80010692	2622	bottom	135
XXXPol Panel	790–960 1710–1880 1920–2170		65° 65° 65°	17.5dBi 18dBi 18dBi	0°–7°T 0°–6°T 0°–6°T	742272V03	2533	bottom	136
XXXPol Panel	790–960 1710–1880 1920–2170	C	65° 65° 65°	17.5dBi 17.5dBi 18dBi	0°–7°T 0°–6°T 0°–6°T	80010672V01	2628	bottom	137
XXXPol Panel	790–960 1710–2180 1710–2180		65° 65° 65°	17.5dBi 17.5dBi 17dBi	2°–10°T 0°–10°T 0°–10°T	80010292V03	2598	bottom	138
XXXPol Panel	790–960 1710–2180 1710–2180		65° 65° 65°	17.5dBi 17dBi 17dBi	4°–12°T 0°–14°T 0°–14°T	80010492V01	2694	bottom	139

C = integrated Combiner

New or changed product

Summary – Directional Antennas
Triple-band
800/900 – 1800/2000/2600

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Dual Polarization +45°/–45°

Type					Type No.	Height [mm]	Connector position	Page
XXXPol Panel	790–960	65°	15dBi	0°–16°T	80010674	1403	bottom	140
	1710–2170	65°	17dBi	2°–10°T				
	2490–2690	65°	16.5dBi	2°–10°T				
XXXPol Panel	790–960	65°	16dBi	0°–10°T	80010675	1997	bottom	141
	1710–2170	65°	18dBi	0°–6°T				
	2490–2690	65°	18dBi	0°–6°T				
XXXPol Panel	790–960	65°	17dBi	0°–10°T	80010676	2622	bottom	142
	1710–2170	65°	18dBi	0°–6°T				
	2490–2690	65°	18dBi	0°–6°T				
XXXPol Panel	790–960	65°	16dBi	0°–10°T	80010691	1997	bottom	143
	1710–2690	65°	16dBi	2°–12°T				
	1710–2690	65°	16dBi	2°–12°T				

C = integrated Combiner

New or changed product

When deploying Triple-band Antennas, please also consider using special Triple-band Combiners (see page 241)

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–862	880–960	1710–2180
X	X	X
65°	65°	65°

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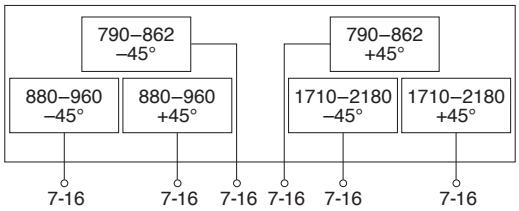
XXXPol Panel 790–862/880–960/1710–2180 65°/65°/65° 14/14/17dBi 0°–14°/0°–14°/0°–8°T

Type No.	80010697 (clamps included)				
	790–862	880–960	1710–2180		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	13.9 ... 13.9 ... 13.3 0° ... 7° ... 14°	14.2 ... 14.1 ... 13.5 0° ... 7° ... 14°	16.7 ... 16.9 ... 16.7 0° ... 4° ... 8°	16.9 ... 17.1 ... 16.7 0° ... 4° ... 8°	16.9 ... 17.1 ... 16.8 0° ... 4° ... 8°
Horizontal Pattern:					
Half-power beam width	68°	65°	64°	63°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 32 dB	> 32 dB	> 32 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:					
Half-power beam width	16.5°	15.4°	7.4°	7.1°	6.7°
Electrical tilt continuously adjustable	0°–14°	0°–14°	0°–8°		
Sidelobe suppression for first sidelobe above main beam: average:	0° ... 7° ... 14° T ≥ 17 ... 17 ... 15 dB	0° ... 7° ... 14° T ≥ 17 ... 17 ... 16 dB	0° ... 4° ... 8° T ≥ 17 ... 16 ... 15 dB	0° ... 4° ... 8° T ≥ 17 ... 17 ... 16 dB	0° ... 4° ... 8° T ≥ 17 ... 17 ... 16 dB
VSWR	< 1.5	< 1.5	< 1.5		
Isolation: Intrasystem	> 30 dB	> 30 dB	> 30 dB		
Isolation: Intersystem	> 38 dB (790...960 // 1710–2180 MHz) > 28 dB, Typ. > 30 dB (790–862 // 880–960MHz)				
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc	< –150 dBc		
Max. power per input Totel power	250 W* 500 W*	250 W* 500 W*	250 W* 500 W*		
Input	6 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	3x, Position bottom continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 670 / 260 / 700 N				
Height/width/depth	1332 / 300 / 152 mm				
Category of mounting hardware	M (Medium)				
Weight	21 kg / 23 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter				

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–862	880–960	1710–2180
X	X	X
65°	65°	65°

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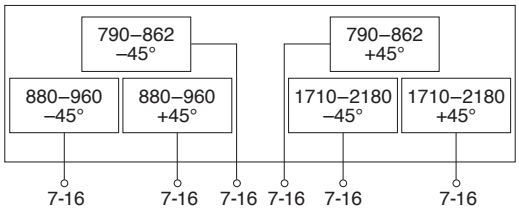
XXXPol Panel 790–862/880–960/1710–2180 65°/65°/65° 15.5/16/18.5dBi 0°–10°/0°–10°/0°–6°T

Type No.	80010698 clamps included				
	790–862	880–960	1710–2180		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	15.1 ... 15.4 ... 15.1 0° ... 5° ... 10°	15.6 ... 15.9 ... 15.4 0° ... 5° ... 10°	18.2 ... 18.5 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°
Horizontal Pattern:					
Half-power beam width	68°	65°	65°	65°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 27 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB	1.0 dB	0.5 dB		
Squint	±2.5°	±2.5°	±2.5°		
Vertical Pattern:					
Half-power beam width	11.5°	10.1°	5.0°	4.8°	4.6°
Electrical tilt, continuously adjustable	0°–10°	0°–10°	0°–6°		
Sidelobe suppression for first sidelobe above main beam: average:	0° ... 5° ... 10° T ≥ 17 ... 17 ... 17 dB	0° ... 5° ... 10° T ≥ 17 ... 17 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5	< 1.5	< 1.5		
Isolation: Intrasystem	> 30 dB	> 30 dB	> 30 dB		
Isolation: Intersystem	> 38 dB (790...960 // 1710–2180 MHz) > 28 dB, Typ. > 30 dB (790–862 // 880–960MHz)				
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc	< –150 dBc		
Max. power per input Totel power	250 W* 500 W*	250 W* 500 W*	250 W* 500 W*		
Input	6 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	3x, Position bottom continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 850 / 380 / 910 N				
Height/width/depth	1932 / 269 / 154 mm				
Category of mounting hardware	M (Medium)				
Weight	23 kg / 25 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter				

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–862	880–960	1710–2180
X	X	X
65°	65°	65°

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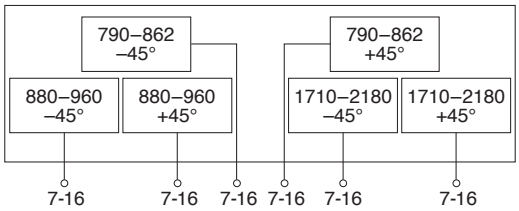
XXXPol Panel 790–862/880–960/1710–2180 65°/65°/65° 16.5/17/18.5dBi 0°–7°/0°–7°/0°–6°T

Type No.	80010699 (clamps included)				
	790–862	880–960	1710–2180		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	16.3 ... 16.4 ... 16.2 0° ... 4° ... 7°	16.7 ... 16.9 ... 16.6 0° ... 4° ... 7°	18.2 ... 18.5 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.3 0° ... 3° ... 6°
Horizontal Pattern:					
Half-power beam width	68°	65°	65°	65°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 27 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:					
Half-power beam width	8.3°	7.6°	5.0°	4.8°	4.6°
Electrical tilt, continuously adjustable	0°–7°	0°–7°	0°–6°		
Sidelobe suppression for first sidelobe above main beam: average:	0° ... 4° ... 7° T ≥ 17 ... 16 ... 16 dB	0° ... 4° ... 7° T ≥ 18 ... 17 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5	< 1.5	< 1.5		
Isolation: Intrasystem	> 30 dB	> 30 dB	> 30 dB		
Isolation: Intersystem	> 38 dB (790...960 // 1710–2180 MHz) > 28 dB, Typ. > 30 dB (790–862 // 880–960MHz)				
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc	< –150 dBc		
Max. power per input Totel power	250 W* 500 W*	250 W* 500 W*	250 W* 500 W*		
Input	6 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	3x, Position bottom continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1160 / 500 / 1210 N				
Height/width/depth	2532 / 269 / 154 mm				
Category of mounting hardware	H (Heavy)				
Weight	26 kg / 28 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter				

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–1880	1710–2170
X	X	X
65°	65°	65°

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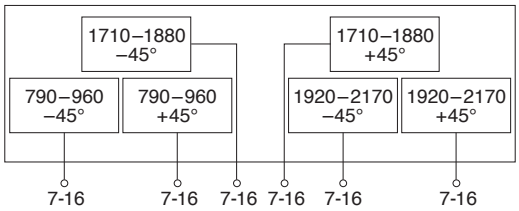
XXXPol Panel 790–960/1710–1880/1920–2170 65°/65°/65° 15/17/17dBi 0°–14°/0°–8°/0°–8°T

Type No.	742270V03 (clamps included)			
	790–960		1710–1880	1710–2170
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1170 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	14.4 ... 14.3 ... 14.0 0° ... 7° ... 14°	14.8 ... 14.7 ... 14.2 0° ... 7° ... 14°	16.8 ... 16.9 ... 16.6 0° ... 4° ... 8°	16.9 ... 17.0 ... 16.7 0° ... 4° ... 8°
Horizontal Pattern:				
Half-power beam width	68°	65°	65°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 32 dB	> 32 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB		0.5 dB	0.5 dB
Squint	±2.0°		±3.0°	±3.0°
Vertical Pattern:				
Half-power beam width	16.5°	15.3°	7.4°	6.7°
Electrical tilt, contin. adjust.	0°–14°		0°–8°	0°–8°
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 7° ... 14° T 17 ... 16 ... 15 dB	0° ... 7° ... 14° T 17 ... 18 ... 17 dB	0° ... 4° ... 8° T 17 ... 17 ... 16 dB	0° ... 4° ... 8° T 16 ... 16 ... 15 dB
VSWR	< 1.5		< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB		> 30 dB	> 30 dB
Isolation: Intersystem	Typically: > 50 dB (790–960 // 1710–1880 MHz) Typically: > 50 dB (790–960 // 1920–2170 MHz) > 30 dB (1710–1880 // 1920–2170 MHz)			
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc		< –150 dBc	< –150 dBc
Max. power per input Total power	500 W* 1000 W*		200 W* 400 W*	200 W* 400 W*
Input	6 x 7-16 female (long neck)			
Connector position	Bottom			
Adjustment mechanism	3x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 600 / 270 / 640 N			
Height/width/depth	1384 / 261 / 146 mm			
Category of mounting hardware	M (Medium)			
Weight	19 kg / 21 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–1880	1920–2170
X	X	X
65°	65°	65°

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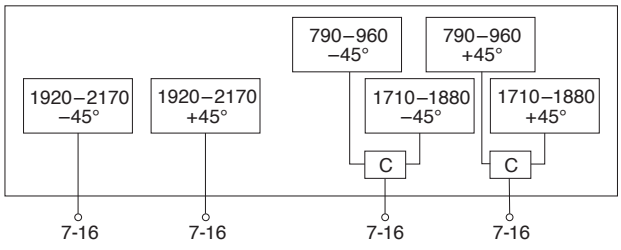
XXXPol Panel 790–960/1710–1880/1920–2170 C 65°/65°/65° 15/16.5/17dBi 0°–12°/0°–8°/0°–8°T

Type No.	80010670V01 clamps included				
		790–960		1710–1880	1920–2170
Frequency range	790 – 866 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 18800 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 14.8 dBi	2 x 15 dBi	2 x 15.2 dBi	2 x 16.5 dBi	2 x 17.2 dBi
Horizontal Pattern:					
Half-power beam width	69°	67°	65°	66°	65°
Front-to-back ratio, copolar	> 27 dB			> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB			Typically: 16 dB > 10 dB	Typically: 18 dB > 10 dB
Vertical Pattern:					
Half-power beam width	14°	13.6°	13°	6.7°	6.2°
Electrical tilt, contin. adjust.	0.5°–12°			0.5°–8°	0°–8°
Sidelobe suppression for first sidelobe above main beam	0° ... 6° ... 12° T 17 ... 17 ... 14 dB			0° ... 4° ... 8° T 18 ... 16 ... 14 dB	0° ... 4° ... 8° T 18 ... 16 ... 15 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 30 dB				
Isolation: Intersystem	Typically: > 50 dB (790–960 // 1920–2170 MHz) > 30 dB (1710–1880 // 1920–2170MHz)				
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc				< –150 dBc
Max. power per input	250 W			200 W	200 W
	(at 50 °C ambient temperature)				
Max. power per combined input	450 W (at 50 °C ambient temperature)				
Input	4 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	3x, Position bottom continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 460 / 290 / 680 N				
Height/width/depth	1498 / 262 / 149 mm				
Category of mounting hardware	M (Medium)				
Weight	21.5 kg / 23.5 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter				
Integrated combiner	The insertion loss is included in the given antenna gain values.				



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

806–960	1710–2180	1710–2180
X	X	X
65°	65°	65°

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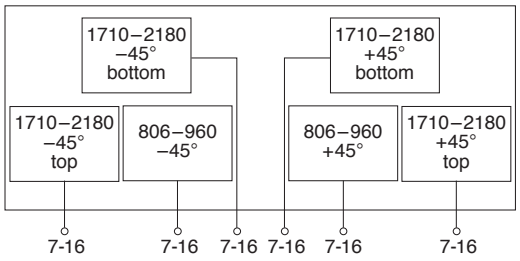
XXXPol Panel 806–960/1710–2180/1710–2180 65°/65°/65° 15/15/15dBi 0°–14°/0°–14°/0°–14°T

Type No.	80010290V01 (clamps included)					
		806–960			1710–2180	1710–2180
Frequency range	806 – 866 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi)	14.4 ... 14.3 ... 14.0	14.6 ... 14.4 ... 14.2	14.9 ... 14.7 ... 14.4			
1710–2180 MHz (Syst. bottom)				14.5 ... 14.5 ... 14.2	14.8 ... 14.8 ... 14.5	15.1 ... 14.8 ... 14.4
1710–2180 MHz (Syst. top)				14.0 ... 14.0 ... 13.7	14.4 ... 14.3 ... 13.9	14.9 ... 14.8 ... 14.2
Tilt	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°
Horizontal Pattern:						
Half-power beam width	69°	68°	67°	67°	63°	60°
Front-to-back ratio (180°±30°)		> 25 dB			> 25 dB	
Cross polar ratio		Typically:			Typically:	
Maindirection 0°		25 dB			20 dB	
Sector ±60°		> 10 dB			> 10 dB	
Vertical Pattern:						
Half-power beam width	14.7°	14.3°	13.9°	13.8°	13.2°	12.6°
Electrical tilt		0°–14°, continuously adjustable			Syst. bottom: 0°–14°, continuously adjustable Syst. top: 0°–14°, continuously adjustable	
Sidelobe suppression for first sidelobe above main beam	0° ... 7° ... 14° T 18 ... 16 ... 16 dB	0° ... 7° ... 14° T 18 ... 16 ... 16 dB	0° ... 7° ... 14° T 18 ... 17 ... 16 dB	0° ... 7° ... 14° T 18 ... 16 ... 15 dB	0° ... 7° ... 14° T 18 ... 17 ... 17 dB	0° ... 7° ... 14° T 18 ... 16 ... 17 dB
VSWR	< 1.5					
Isolation: Intrasystem	> 30 dB					
Isolation: Intersystem	> 35 dB (806–960 // 1710–2180 MHz) > 30 dB (1710–2180 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)					
Max. power per input	400 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)		
Input	6 x 7-16 female					
Connector position	Bottom					
Adjustment mechanism	3x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 480 / 300 / 700 N					
Height/width/depth	1540 / 262 / 149 mm					
Category of mounting hardware	M (Medium)					
Weight	21 kg / 23 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–1880	1920–2170
X	X	X
65°	65°	65°

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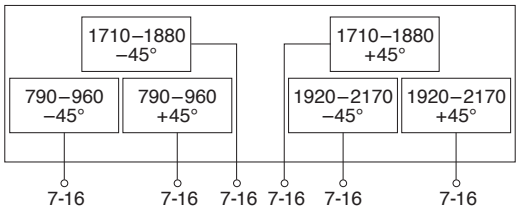
XXXPol Panel 790–960/1710–1880/1920–2170 65°/65°/65° 16.5/18/18dBi 0°–10°/0°–6°/0°–6°T

Type No.	742271V03 (clamps included)			
	790–960		1710–1880	1710–2170
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1170 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	15.9 ... 15.8 ... 15.6 0° ... 5° ... 10°	16.4 ... 16.3 ... 15.9 0° ... 5° ... 10°	17.8 ... 18.0 ... 17.8 0° ... 3° ... 6°	17.9 ... 18.2 ... 17.9 0° ... 3° ... 6°
Horizontal Pattern:				
Half-power beam width	68°	65°	65°	61°
Front-to-back ratio, copolar	> 27 dB	> 28 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.5 dB		0.5 dB	0.5 dB
Squint	±2.5°		±2.5°	±2.5°
Vertical Pattern:				
Half-power beam width	10.9°	10°	5.0°	4.6°
Electrical tilt, contin. adjust.	0°–10°		0°–6°	0°–6°
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 5° ... 10° T ≥ 15 ... 16 ... 17 dB	0° ... 5° ... 10° T ≥ 15 ... 18 ... 19 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5		< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB		> 30 dB	> 30 dB
Isolation: Intersystem	Typically: > 50 dB (790–960 // 1710–1880 MHz) Typically: > 50 dB (790–960 // 1920–2170 MHz) > 30 dB (1710–1880 // 1920–2170 MHz)			
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc		< –150 dBc	< –150 dBc
Max. power per input Total power	300 W* 600 W*		200 W* 400 W*	200 W* 400 W*
Input	6 x 7-16 female (long neck)			
Connector position	Bottom			
Adjustment mechanism	3x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 860 / 380 / 920 N			
Height/width/depth	1933 / 261 / 146 mm			
Category of mounting hardware	M (Medium)			
Weight	24 kg / 26 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

806–960	1710–1880	1920–2170
X	X	X
65°	65°	65°

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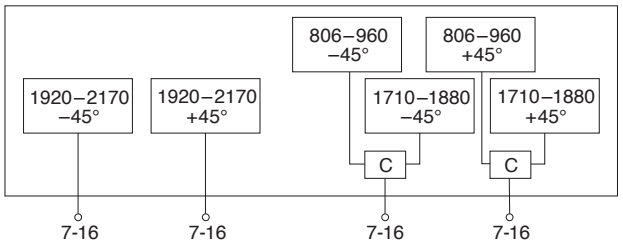
XXXPol Panel 806–960/1710–1880/1920–2170 C 65°/65°/65° 16.5/17.5/18dBi 0°–10°/0°–6°/0°–6°T

Type No.	80010671V01 clamps included				
		806–960		1710–1880	1920–2170
Frequency range	806 – 866 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 16 dBi	2 x 16.1 dBi	2 x 16.3 dBi	2 x 17.5 dBi	2 x 18 dBi
Horizontal Pattern:					
Half-power beam width	69°	68°	67°	65°	65°
Front-to-back ratio, copolar	> 25 dB			> 24 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB			Typically: 18 dB > 10 dB	Typically: 20 dB > 10 dB
Vertical Pattern:					
Half-power beam width	9.5°	9.3°	9.0°	4.7°	4.3°
Electrical tilt, contin. adjust.	0°–10°			0°–6°	0°–6°
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T 15 ... 15 ... 13 dB			0° ... 3° ... 6° T 18 ... 17 ... 16 dB	0° ... 3° ... 6° T 18 ... 16 ... 15 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 30 dB				
Isolation: Intersystem	Typically: > 50 dB (806–960 // 1920–2170 MHz) > 30 dB (1710–1880 // 1920–2170MHz)				
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc				< –150 dBc
Max. power per input	250 W			200 W	200 W
	(at 50 °C ambient temperature)				
Max. power per combined input	450 W (at 50 °C ambient temperature)				
Input	4 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	3x, Position bottom continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 640 / 400 / 950 N				
Height/width/depth	2058 / 262 / 149 mm				
Category of mounting hardware	M (Medium)				
Weight	28 kg / 30 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter				
Integrated combiner	The insertion loss is included in the given antenna gain values.				



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2180	1710–2180
X	X	X
65°	65°	65°

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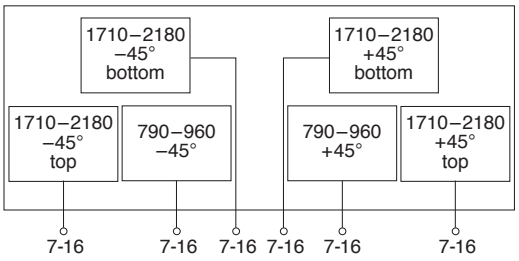
XXXPol Panel 790–960/1710–2180/1710–2180 65°/65°/65° 16.5/16.5/16.5dBi 2°–14°/0°–14°/0°–14°T

Type No.	80010291V02 (clamps included)					
		790–960			1710–2180	1710–2180
Frequency range	790 – 866 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi)	16.2 ... 16.0 ... 15.7	16.3 ... 16.1 ... 15.8	16.4 ... 16.2 ... 15.8			
1710–2180 MHz (Syst. bottom)				15.9 ... 15.9 ... 15.5	16.2 ... 16.2 ... 15.7	16.3 ... 16.3 ... 15.8
1710–2180 MHz (Syst. top)				15.8 ... 15.8 ... 15.4	16.1 ... 16.1 ... 15.4	16.3 ... 16.2 ... 15.5
Tilt	2° ... 8° ... 14°	2° ... 8° ... 14°	2° ... 8° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	65°	64°	60°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection 0°	25 dB	25 dB	25 dB	18 dB	19 dB	20 dB
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB
Tracking	1.0 dB			1.0 dB		
Vertical Pattern:						
Half-power beam width	10°	9.7°	9.3°	9.5°	9°	8.7°
Electrical tilt	2°–14°, continuously adjustable			0°–14°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	2° ... 8° ... 14° T 17 ... 17 ... 15 dB	2° ... 8° ... 14° T 17 ... 17 ... 16 dB	2° ... 8° ... 14° T 17 ... 17 ... 16 dB	0° ... 7° ... 14° T 18 ... 17 ... 17 dB	0° ... 7° ... 14° T 18 ... 17 ... 17 dB	0° ... 7° ... 14° T 18 ... 17 ... 17 dB
VSWR	< 1.5					
Isolation: Intrasystem	> 30 dB					
Isolation: Intersystem	> 35 dB (790–960 // 1710–2180 MHz) > 30 dB (1710–2180 // 1710–2180 MHz)					
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)					
Max. power per input	400 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)		
Input	6 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	3x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 640 / 400 / 950 N					
Height/width/depth	2058 / 262 / 149 mm					
Category of mounting hardware	M (Medium)					
Weight	27 kg / 29 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2690	1710–2690
X	X	X
65°	65°	65°

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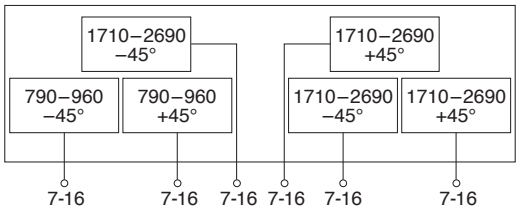
XXXPol Panel 790–960/1710–2690/1710–2690 65°/65°/65° 17/17/17dBi 0°–10°/0°–10°/2°–10°T

Type No.	80010692 (clamps included)						
		790–960			1710–2690	1710–2690	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi) 1710–2690 MHz (Syst. bottom) 1710–2690 MHz (Syst. top) Tilt	16.8 ... 16.7 ... 16.5 0.5° ... 5° ... 9.5°	17.0 ... 17.0 ... 16.8 0.5° ... 5° ... 9.5°	17.1 ... 17.2 ... 17.0 0.5° ... 5° ... 9.5°	0° ... 5° ... 10° 16.4 ... 16.4 ... 16.1 16.6 ... 16.6 ... 16.1 2° ... 6° ... 10°	0° ... 5° ... 10° 16.6 ... 16.7 ... 16.4 16.4 ... 16.4 ... 15.9 2° ... 6° ... 10°	0° ... 5° ... 10° 16.7 ... 16.9 ... 16.1 16.3 ... 16.4 ... 15.9 2° ... 6° ... 10°	0° ... 5° ... 10° 16.2 ... 16.9 ... 16.4 16.2 ... 17.0 ... 16.4 2° ... 6° ... 10°
Horizontal Pattern:							
Half-power beam width	68°	67°	65°	Syst. bottom: 64° Syst. top: 60°	Syst. bottom: 62° Syst. top: 63°	Syst. bottom: 60° Syst. top: 65°	Syst. bottom: 65° Syst. top: 67°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 24 dB > 10 dB	Typically: 23 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Vertical Pattern:							
Half-power beam width	7.5°	7.4°	7.1°	Syst. bottom: 7.7° Syst. top: 6.5°	Syst. bottom: 7.4° Syst. top: 6.3°	Syst. bottom: 7.0° Syst. top: 6.0°	Syst. bottom: 5.9° Syst. top: 5.0°
Electrical tilt	0.5°–9.5°, continuously adjustable			0°–10° (Syst. bottom), 2°–10° (Syst. top), continuously adjustable			
Min. sidelobe suppression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T 18 ... 16 ... 14 dB	0.5° ... 5° ... 9.5° T 18 ... 17 ... 15 dB	0.5° ... 5° ... 9.5° T 18 ... 18 ... 16 dB	Syst. bottom: 0° ... 5° ... 10° T 18 ... 15 ... 14 dB Syst. top: 2° ... 6° ... 10° T 14 ... 16 ... 18 dB	Syst. bottom: 0° ... 5° ... 10° T 18 ... 17 ... 16 dB Syst. top: 2° ... 6° ... 10° T 15 ... 17 ... 18 dB	Syst. bottom: 0° ... 5° ... 10° T 18 ... 18 ... 16 dB Syst. top: 2° ... 6° ... 10° T 17 ... 18 ... 18 dB	Syst. bottom: 0° ... 5° ... 10° T 18 ... 18 ... 16 dB Syst. top: 2° ... 6° ... 10° T 17 ... 18 ... 17 dB
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB			> 28 dB			
Isolation: Intersystem	> 36 dB (790–960 // 1710–2690 MHz) > 36 dB (1710–2690 // 1710–2690MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature) 400 W (at 50 °C ambient temperature)			
Input	6 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	3x, Position bottom continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1380 / 520 / 1490 N						
Height/width/depth	2622 / 300 / 152 mm						
Category of mounting hardware	H (Heavy)						
Weight	31 kg / 33 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–1880	1920–2170
X	X	X
65°	65°	65°

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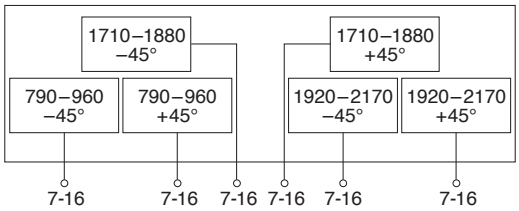
XXXPol Panel 790–960/1710–1880/1920–2170 65°/65°/65° 17.5/18/18dBi 0°–7°/0°–6°/0°–6°T

Type No.	742272V03 clamps included			
	790–960		1710–1880	1920–2170
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1170 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	16.9 ... 16.9 ... 16.8 0° ... 3° ... 7°	17.3 ... 17.4 ... 17.2 0° ... 3° ... 7°	17.8 ... 18.0 ... 17.8 0° ... 3° ... 6°	17.9 ... 18.2 ... 17.9 0° ... 3° ... 6°
Horizontal Pattern:				
Half-power beam width	68°	65°	65°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 30 dB > 10 dB	Typically: 30 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB		0.5 dB	0.5 dB
Squint	±2.5°		±2.5°	±2.5°
Vertical Pattern:				
Half-power beam width	8.0°	7.2°	5.0°	4.6°
Electrical tilt, contin. adjust.	0°–7°		0°–6°	0°–6°
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 4° ... 7° T ≥ 17 ... 17 ... 15 dB	0° ... 4° ... 7° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5		< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB		> 30 dB	> 30 dB
Isolation: Intersystem	Typically: > 50 dB (790–960 // 1710–1880 MHz) Typically: > 50 dB (790–960 // 1920–2170 MHz) > 30 dB (1710–1880 // 1920–2170 MHz)			
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc		< –150 dBc	< –150 dBc
Max. power per input Total power	500 W* 1000 W*		250 W* 500 W*	250 W* 500 W*
Input	6 x 7-16 female (long neck)			
Connector position	Bottom			
Adjustment mechanism	3x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1160 / 500 / 1210 N			
Height/width/depth	2533 / 261 / 146 mm			
Category of mounting hardware	H (Heavy)			
Weight	29 kg / 31 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–1880	1920–2170
X	X	X
65°	65°	65°

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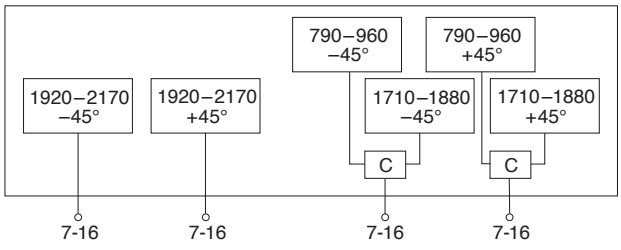
XXXPol Panel 790–960/1710–1880/1920–2170 C 65°/65°/65° 17.5/17.5/18dBi 0°–7°/0°–6°/0°–6°T

Type No.	80010672V01 clamps included				
		790–960		1710–1880	1920–2170
Frequency range	790 – 866 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17 dBi	2 x 17.2 dBi	2 x 17.5 dBi	2 x 17.5 dBi	2 x 18 dBi
Horizontal Pattern:					
Half-power beam width	69°	68°	66°	65°	63°
Front-to-back ratio, copolar	> 25 dB			> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB			Typically: 14 dB > 10 dB	Typically: 17 dB > 10 dB
Vertical Pattern:					
Half-power beam width	7.4°	7.2°	6.8°	4.7°	4.4°
Electrical tilt, contin. adjust.	0.5°–7°			0°–6°	0°–6°
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 7° T 15 ... 16 ... 16 dB			0° ... 3° ... 6° T 17 ... 17 ... 16 dB	0° ... 3° ... 6° T 17 ... 15 ... 14 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 30 dB				
Isolation: Intersystem	Typically: > 50 dB (790–960 // 1920–2170 MHz) > 30 dB (1710–1880 // 1920–2170MHz)				
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc				< –150 dBc
Max. power per input	250 W			200 W	200 W
	(at 50 °C ambient temperature)				
Max. power per combined input	450 W (at 50 °C ambient temperature)				
Input	4 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	3x, Position bottom continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 850 / 510 / 1270 N				
Height/width/depth	2628 / 262 / 149 mm				
Category of mounting hardware	H (Heavy)				
Weight	32 kg / 34 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter				
Integrated combiner	The insertion loss is included in the given antenna gain values.				



Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2180	1710–2180
X	X	X
65°	65°	65°

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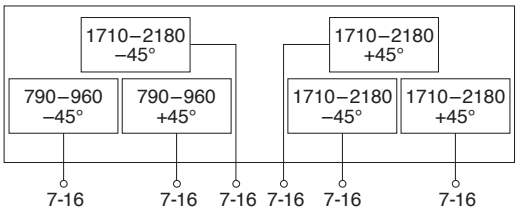
XXXPol Panel 790–960/1710–2180/1710–2180 65°/65°/65° 17.5/17.5/17dBi 2°–10°/0°–10°/0°–10°T

Type No.	80010292V03 (clamps included)					
		790–960			1710–2180	1710–2180
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi) 1710–2180 MHz (Syst. bottom) 1710–2180 MHz (Syst. top)	17.0 ... 17.0 ... 16.8	17.2 ... 17.2 ... 16.9	17.4 ... 17.4 ... 17.0	17.1 ... 17.2 ... 16.6 16.5 ... 16.7 ... 16.2	17.2 ... 17.4 ... 16.8 16.6 ... 16.8 ... 16.3	17.2 ... 17.3 ... 16.7 16.8 ... 17.0 ... 16.3
Tilt	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°
Horizontal Pattern:						
Half-power beam width	69°	68°	66°	65°	62°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60° ±60°	Typically: 25 dB > 10 dB avg. 20 dB	Typically: 25 dB > 10 dB avg. 20 dB	Typically: 25 dB > 10 dB avg. 17 dB	Typically: 25 dB > 10 dB avg. 16 dB	Typically: 25 dB > 10 dB avg. 16 dB	Typically: 25 dB > 10 dB avg. 16 dB
Tracking, Avg. 1710–2180 MHz (Syst. bottom) 1710–2180 MHz (Syst. top)	1.0 dB			1.0 dB 0.5 dB		
Squint	±3.5°			±3.5°		
Vertical Pattern:						
Half-power beam width	7.8°	7.6°	7.1°	7.6°	7.5°	6.8°
Electrical tilt	2°–10°, continuously adjustable			0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	2° ... 6° ... 10° T 17 ... 16 ... 14 dB	2° ... 6° ... 10° T 18 ... 16 ... 15 dB	2° ... 6° ... 10° T 18 ... 16 ... 15 dB	0° ... 5° ... 10° T 15 ... 16 ... 15 dB	0° ... 5° ... 10° T 16 ... 16 ... 15 dB	0° ... 5° ... 10° T 16 ... 16 ... 14 dB
VSWR	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Isolation: Intersystem	> 36 dB (790–960 // 1710–2180 MHz) > 36 dB (1710–2180 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	250 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature)		
Input	6 x 7-16 female					
Connector position	Bottom					
Adjustment mechanism	3x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1210 / 510 / 1270 N					
Height/width/depth	2598 / 261 / 146 mm					
Category of mounting hardware	H (Heavy)					
Weight	27 kg / 29 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2180	1710–2180
X	X	X
65°	65°	65°

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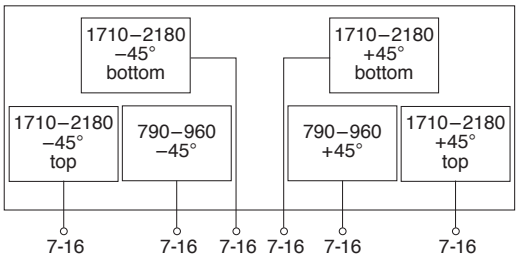
XXXPol Panel 790–960/1710–2180/1710–2180 65°/65°/65° 17.5/17/17dBi 4°–12°/0°–14°/0°–14°T

Type No.	80010492V01 (clamps included)					
	790–960			1710–2180	1710–2180	
Frequency range	790 – 866 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi)	16.6 ... 16.5 ... 16.3	17.0 ... 16.9 ... 16.5	17.2 ... 17.0 ... 16.7			
1710–2180 MHz (Syst. bottom)				16.1 ... 16.3 ... 16.0	16.7 ... 16.8 ... 16.3	17.0 ... 17.0 ... 16.6
1710–2180 MHz (Syst. top)				16.1 ... 16.1 ... 15.8	16.7 ... 16.5 ... 16.2	17.0 ... 16.9 ... 16.4
Tilt	4° ... 8° ... 12°	4° ... 8° ... 12°	4° ... 8° ... 12°	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°
Horizontal Pattern:						
Half-power beam width	68°	67°	66°	65°	63°	60°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection 0°	23 dB	24 dB	25 dB	18 dB	18 dB	19 dB
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB
Vertical Pattern:						
Half-power beam width	7.5°	7.4°	7.2°	7.8°	7.6°	7.2°
Electrical tilt	4°–12°, continuously adjustable			0°–14°, continuously adjustable		
Sidelobe suppression	4° ... 8° ... 12° T	4° ... 8° ... 12° T	4° ... 8° ... 12° T	0° ... 7° ... 14° T	0° ... 7° ... 14° T	0° ... 7° ... 14° T
– for firstsidelobe above main beam	19 ... 17 ... 16 dB	19 ... 18 ... 18 dB	19 ... 18 ... 18 dB	18 ... 17 ... 15 dB	18 ... 17 ... 15 dB	18 ... 17 ... 15 dB
– within 0°–20° sector above horizon	15 ... 15 ... 14 dB	16 ... 15 ... 14 dB	16 ... 15 ... 14 dB	18 ... 17 ... 15 dB	17 ... 17 ... 15 dB	15 ... 14 ... 14 dB

VSWR	< 1.5	
Isolation: Intrasystem	> 30 dB	
Isolation: Intersystem	> 36 dB (790–960 // 1710–2180 MHz) > 36 dB (1710–2180 // 1710–2180 MHz)	
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)	
Max. power per input	400 W (at 50 °C ambient temperature)	250 W (at 50 °C ambient temperature)
Input	6 x 7-16 female (long neck)	
Connector position	Bottom	
Adjustment mechanism	3x, Position bottom continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 870 / 520 / 1320 N	
Height/width/depth	2694 / 262 / 149 mm	
Category of mounting hardware	H (Heavy)	
Weight	34 kg / 36 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter	



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2170	2490–2690
X	X	X
65°	65°	65°

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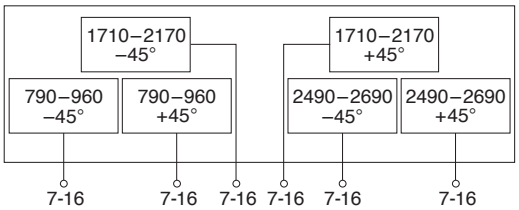
XXXPol Panel 790–960/1710–2170/2490–2690 65°/65°/65° 15/17/16.5dBi 0°–16°/2°–10°/2°–10°T

Type No.	80010674						clamps included
		790–960			1710–2170		2490–2690
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	14.5 ... 14.4 ... 14.2 0° ... 8° ... 16°	14.6 ... 14.5 ... 14.3 0° ... 8° ... 16°	14.8 ... 14.6 ... 14.4 0° ... 8° ... 16°	17.0 ... 17.0 ... 16.6 2° ... 5° ... 10°	17.2 ... 17.2 ... 16.8 2° ... 5° ... 10°	17.2 ... 17.2 ... 16.7 2° ... 5° ... 10°	16.3 ... 16.6 ... 15.8 2° ... 5° ... 10°
Horizontal Pattern:							
Half-power beam width	69°	68°	67°	63°	63°	65°	65°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 9 dB	Typically: 23 dB > 8 dB	Typically: 18 dB > 9 dB	Typically: 21 dB > 9 dB	Typically: 23 dB > 10 dB	Typically: 23 dB > 8 dB
Vertical Pattern:							
Half-power beam width	16.5°	16.0°	15°	6.2°	5.8°	5.7°	4.8°
Electrical tilt, continuously adjust.	0°–16°			2°–10°			2°–10°
Min. sidelobe suppression for first sidelobe above main beam	0° ... 8° ... 16° T 16 ... 15 ... 15 dB	0° ... 8° ... 16° T 16 ... 15 ... 15 dB	0° ... 8° ... 16° T 15 ... 15 ... 15 dB	2° ... 5° ... 10° T 14 ... 14 ... 15 dB	2° ... 5° ... 10° T 14 ... 15 ... 16 dB	2° ... 5° ... 10° T 14 ... 16 ... 17 dB	2° ... 5° ... 10° T 14 ... 16 ... 17 dB
VSWR	< 1.5			< 1.5			< 1.5
Isolation: Intrasystem	> 30 dB			> 28 dB			> 30 dB
Isolation: Intersystem	> 30 dB (790–960 // 1710–2170 // 2490–2690MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input Total power	500 W* 1000 W*			200 W* 400 W*			200 W* 400 W*
Input	6 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	3x, Position bottom continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 700 / 270 / 730 N						
Height/width/depth	1403 / 300 / 152 mm						
Category of mounting hardware	M (Medium)						
Weight	20 kg / 22 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2170	2490–2690
X	X	X
65°	65°	65°

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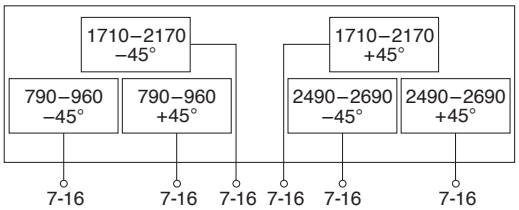
XXXPol Panel 790–960/1710–2170/2490–2690 65°/65°/65° 16/18/18dBi 0°–10°/0°–6°/0°–6°T

Type No.	80010675						clamps included
		790–960			1710–2170		2490–2690
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.0 ... 16.0 ... 15.5 0° ... 5° ... 10°	16.1 ... 16.1 ... 15.6 0° ... 5° ... 10°	16.0 ... 16.2 ... 15.6 0° ... 5° ... 10°	18.0 ... 18.0 ... 17.6 0° ... 3° ... 6°	18.0 ... 18.0 ... 17.5 0° ... 3° ... 6°	18.1 ... 18.1 ... 17.4 0° ... 3° ... 6°	17.8 ... 17.8 ... 17.6 0° ... 3° ... 6°
Horizontal Pattern:							
Half-power beam width	68°	67°	65°	62°	63°	62°	63°
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 27 dB	> 27 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 23 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:							
Half-power beam width	10.3°	10.1°	9.8°	4.8°	4.6°	4.4°	3.5°
Electrical tilt, continuously adjust.	0°–10°			0°–6°			0°–6°
Min. sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T 18 ... 17 ... 15 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 18 ... 16 ... 16 dB	0° ... 3° ... 6° T 18 ... 18 ... 17 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 18 ... 18 ... 18 dB
VSWR	< 1.5			< 1.5			< 1.5
Isolation: Intrasystem	> 30 dB			> 28 dB			> 28 dB
Isolation: Intersystem	> 30 dB (790–960 // 1710–2170 // 2490–2690MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input Total power	500 W* 1000 W*			200 W* 400 W*			200 W* 400 W*
Input	6 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	3x, Position bottom continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1020 / 390 / 1050 N						
Height/width/depth	1997 / 300 / 152 mm						
Category of mounting hardware	M (Medium)						
Weight	26 kg / 28 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter						

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2170	2490–2690
X	X	X
65°	65°	65°

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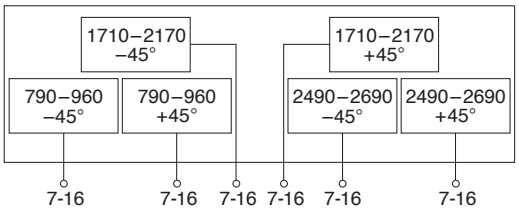
XXXPol Panel 790–960/1710–2170/2490–2690 65°/65°/65° 17/18/18dBi 0°–10°/0°–6°/0°–6°T

Type No.	80010676 (clamps included)						
		790–960			1710–2170		2490–2690
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	16.8 ... 16.7 ... 16.5	17.0 ... 17.0 ... 16.8	17.1 ... 17.2 ... 17.0	18.0 ... 18.0 ... 17.6	18.0 ... 18.0 ... 17.5	18.1 ... 18.1 ... 17.4	17.8 ... 17.8 ... 17.6
Tilt	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°
Horizontal Pattern:							
Half-power beam width	68°	67°	65°	62°	63°	62°	63°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection 0°	24 dB	23 dB	22 dB	18 dB	22 dB	23 dB	25 dB
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB
Vertical Pattern:							
Half-power beam width	7.5°	7.4°	7.1°	4.8°	4.6°	4.4°	3.5°
Electrical tilt, continuously adjust.	0.5°–9.5°			0°–6°			0°–6°
Min. sidelobe suppression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T 18 ... 16 ... 14 dB	0.5° ... 5° ... 9.5° T 18 ... 17 ... 15 dB	0.5° ... 5° ... 9.5° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 18 ... 16 ... 16 dB	0° ... 3° ... 6° T 18 ... 18 ... 17 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 18 ... 18 ... 18 dB
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB			> 28 dB			
Isolation: Intersystem	> 30 dB (790–960 // 1710–2170 // 2490–2690MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input	500 W*			200 W*			200 W*
Total power	1000 W*			400 W*			400 W*
Input	6 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	3x, Position bottom continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1380 / 520 / 1490 N						
Height/width/depth	2622 / 300 / 152 mm						
Category of mounting hardware	H (Heavy)						
Weight	31 kg / 33 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Triple-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2690	1710–2690
X	X	X
65°	65°	65°

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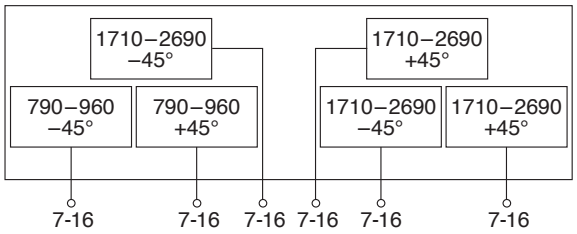
XXXPol Panel 790–960/1710–2690/1710–2690 65°/65°/65° 16/16/16dBi 0°–10°/2°–12°/2°–12°T

Type No.	80010691 (clamps included)						
	790–960			1710–2690		1710–2690	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi)	16.0 ... 16.0 ... 15.5	16.1 ... 16.1 ... 15.6	16.0 ... 16.2 ... 15.6				
1710–2690 MHz (Syst. bottom)				15.5 ... 15.4 ... 15.2	15.6 ... 15.5 ... 15.2	16.0 ... 15.9 ... 15.2	16.0 ... 16.1 ... 15.9
1710–2690 MHz (Syst. top)				15.3 ... 15.2 ... 14.9	15.4 ... 15.2 ... 14.9	15.9 ... 15.7 ... 15.0	15.7 ... 15.8 ... 15.4
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	2° ... 7° ... 12°	2° ... 7° ... 12°	2° ... 7° ... 12°	2° ... 7° ... 12°
Horizontal Pattern:							
Half-power beam width	68°	67°	65°	63°	62°	63°	62°
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 27 dB	> 27 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection 0°	22 dB	22 dB	22 dB	18 dB	22 dB	24 dB	20 dB
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 8 dB	> 9 dB	> 8 dB	> 8 dB
Vertical Pattern:							
Half-power beam width	10.3°	10.1°	9.8°	11°	10°	9.2°	7.8°
Electrical tilt	0°–10°, continuously adjustable			2°–12°, continuously adjustable			
Min. sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T 18 ... 17 ... 15 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB	2° ... 7° ... 12° T 17 ... 18 ... 17 dB	2° ... 7° ... 12° T 17 ... 16 ... 15 dB	2° ... 7° ... 12° T 17 ... 16 ... 15 dB	2° ... 7° ... 12° T 17 ... 16 ... 15 dB
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB			> 28 dB			
Isolation: Intersystem	> 30 dB (790–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input	500 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			400 W (at 50 °C ambient temperature)			
Input	6 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	3x, Position bottom continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1020 / 390 / 1050 N						
Height/width/depth	1997 / 300 / 152 mm						
Category of mounting hardware	M (Medium)						
Weight	26 kg / 28 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



For more information about additional mounting accessories please refer to page 205

Summary – Directional Antennas
Quad-band
800/900 – 1800/2000/2600

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Antennen · Electronic

Dual Polarization +45°/–45°

Type					Type No.	Height [mm]	Connector position	Page
XXXXPol Panel	790–960	65°	16dBi	0°–10°T	80010825	1934	bottom	146
	790–960	65°	16dBi	0°–10°T				
	1710–2180	65°	18.5dBi	0°–6°T				
	1710–2180	65°	18.5dBi	0°–6°T				
XXXXPol Panel	790–960	65°	17dBi	0°–10°T	80010826	2399	bottom	147
	790–960	65°	17dBi	0°–10°T				
	1710–2180	65°	18.5dBi	0°–6°T				
	1710–2180	65°	18.5dBi	0°–6°T				
XXXXPol Panel	790–862	65°	16dBi	0°–10°T	80010805	1997	bottom	148
	880–960	65°	16dBi	0°–10°T				
	1710–2170	65°	18dBi	2°–8°T				
	2490–2690	65°	18dBi	2°–8°T				
XXXXPol Panel	790–960	65°	16dBi	0°–10°T	80010685	1997	bottom	149
	1710–1880	65°	18dBi	0°–6°T				
	1920–2170	65°	18dBi	0°–6°T				
	2490–2690	65°	18dBi	0°–6°T				
XXXXPol Panel	790–960	65°	17dBi	0°–10°T	80010686	2622	bottom	150
	1710–1880	65°	18dBi	0°–6°T				
	1920–2170	65°	18dBi	0°–6°T				
	2490–2690	65°	18dBi	0°–6°T				

New or changed product

When deploying Quad-band Antennas, please also consider using special Quad-band Combiners (see page 241)

2-Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	790–960	1710–2180	1710–2180
X	X	X	X
65°	65°	60°	60°

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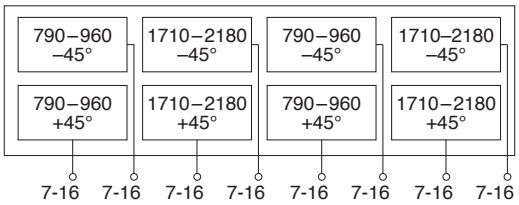
Antennen · Electronic

XXXXPol Panel 790–960/790–960/1710–2180/1710–2180 65°/65°/60°/60° 16/16/18.5/18.5dBi 0°–10°/0°–10°/0°–6°/0°–6°T

Type No.	80010825 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	15.4 ... 15.7 ... 15.3 0° ... 5° ... 10°	15.6 ... 16.0 ... 15.4 0° ... 5° ... 10°	15.9 ... 16.1 ... 15.4 0° ... 5° ... 10°	18.4 ... 18.5 ... 18.1 0° ... 3° ... 6°	18.5 ... 18.7 ... 18.1 0° ... 3° ... 6°	18.3 ... 18.5 ... 18.1 0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	67°	65°	63°	60°	60°	60°
Front-to-back ratio, copolar	> 27 dB	> 27 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.5 dB			0.5 dB		
Squint	±3.0°			±2.5°		
Vertical Pattern:						
Half-power beam width	11°	10.7°	10°	5.0°	4.8°	4.6°
Electrical tilt	0°–10°, continuously adjustable			0°–6°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam avg.	0° ... 5° ... 10° T ≥ 17 ... 17 ... 17 dB	0° ... 5° ... 10° T ≥ 17 ... 17 ... 18 dB	0° ... 5° ... 10° T ≥ 17 ... 17 ... 16 dB	0° ... 3° ... 6° T ≥ 16 ... 15 ... 14 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Isolation: Intersystem	> 30 dB (790–960 // 790–960 MHz) > 30 dB (790–960 // 1710–2180 MHz) > 30 dB (1710–2180 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)		
Input	8 x 7-16 female					
Connector position	Bottom					
Adjustment mechanism	4x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1540 / 330 / 1790 N					
Height/width/depth	1934 / 576 / 133 mm					
Category of mounting hardware	H (Heavy)					
Weight	36 kg / 38 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

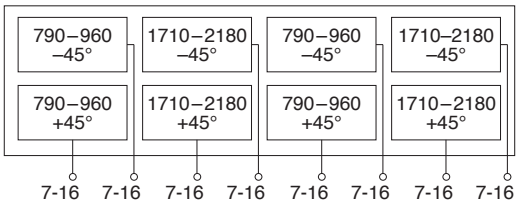
2-Dual-band Panel
Dual Polarization
Half-power Beam Width

790–960	790–960	1710–2180	1710–2180
X	X	X	X
65°	65°	60°	60°

KATHREIN
Antennen · Electronic

XXXXPol Panel 790–960/790–960/1710–2180/1710–2180 65°/65°/60°/60° 17/17/18.5/18.5dBi 0°–7°/0°–7°/0°–6°/0°–6°T

Type No.	80010826 (clamps included)					
		790–960			1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi) Tilt	16.3 ... 16.5 ... 16.2 0° ... 3° ... 7°	16.6 ... 16.8 ... 16.3 0° ... 3° ... 7°	16.6 ... 17.0 ... 16.4 0° ... 3° ... 7°	18.5 ... 18.5 ... 18.1 0° ... 3° ... 6°	18.5 ... 18.5 ... 18.1 0° ... 3° ... 6°	18.4 ... 18.5 ... 18.1 0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	67°	65°	63°	60°	60°	60°
Front-to-back ratio, copolar	> 27 dB	> 27 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.5 dB			0.5 dB		
Squint	±3.0°			±2.5°		
Vertical Pattern:						
Half-power beam width	7.7°	7.5°	7.2°	5.0°	4.8°	4.6°
Electrical tilt	0°–7°, continuously adjustable			0°–6°, continuously adjustable		
Sidelobe supression for first sidelobe above main beam avg.	0° ... 3° ... 7° T ≥ 16 ... 17 ... 16 dB	0° ... 3° ... 7° T ≥ 15 ... 17 ... 18 dB	0° ... 3° ... 7° T ≥ 15 ... 17 ... 18 dB	0° ... 3° ... 6° T ≥ 16 ... 15 ... 14 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Isolation: Intersystem	> 30 dB (790–960 // 790–960 MHz) > 30 dB (790–960 // 1710–2180 MHz) > 30 dB (1710–2180 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power per input Total power	500 W (at 50 °C ambient temperature) 1000 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature) 500 W (at 50 °C ambient temperature)		
Input	8 x 7-16 female					
Connector position	Bottom					
Adjustment mechanism	4x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1930 / 410 / 2200 N					
Height/width/depth	2399 / 576 / 133 mm					
Category of mounting hardware	H (Heavy)					
Weight	44 kg / 46 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					



For more information about additional mounting accessories please refer to page 205

Quad-band Panel
Dual Polarization
Half-power Beam Width

790–862	880–960	1710–2170	2490–2690
X	X	X	X
65°	65°	65°	65°

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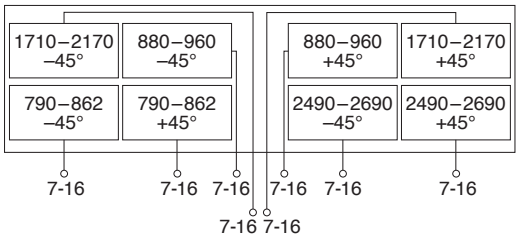
XXXXPol Panel 790–862/880–960/1710–2170/2490–2690 65°/65°/65°/65° 16/16/18/18dBi 0°–10°/0°–10°/2°–8°/2°–8°T

Type No.	80010805 (clamps included)					
	790–862	880–960	1710–2170			2490–2690
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	15.8 ... 15.8 ... 15.4 0° ... 5° ... 10°	15.7 ... 15.9 ... 15.3 0° ... 5° ... 10°	18.0 ... 18.0 ... 17.6 2° ... 4° ... 8°	18.0 ... 18.0 ... 17.5 2° ... 4° ... 8°	18.1 ... 18.1 ... 17.4 2° ... 4° ... 8°	17.8 ... 17.8 ... 17.6 2° ... 4° ... 8°
Horizontal Pattern:						
Half-power beam width	68°	65°	62°	63°	62°	63°
Front-to-back ratio, copalar (180°±30°)	> 27 dB	> 27 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 23 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:						
Half-power beam width	10.3°	9.8°	4.8°	4.6°	4.4°	3.5°
Electrical tilt, continuously adjust.	0°–10°	0°–10°	2°–8°			2°–8°
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° 18 ... 17 ... 15 dB	0° ... 5° ... 10° 18 ... 18 ... 16 dB	2° ... 4° ... 8° 18 ... 16 ... 16 dB	2° ... 4° ... 8° T 18 ... 18 ... 17 dB	2° ... 4° ... 8° T 18 ... 17 ... 17 dB	2° ... 4° ... 8° T 18 ... 18 ... 18 dB
VSWR	< 1.5	< 1.5	< 1.5			< 1.5
Isolation: Intrasystem	> 30 dB	> 30 dB	> 28 dB			> 28 dB
Isolation: Intersystem	> 30 dB (790–862 // 880–960 // 1710–2170 // 2490–2690 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)					
Max. power per input	250 W*	250 W*	200 W*			200 W*
Total power	500 W*	500 W*	400 W*			400 W*
Input	8 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	4x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1020 / 390 / 1050 N					
Height/width/depth	1997 / 300 / 152 mm					
Category of mounting hardware	M (Medium)					
Weight	29 kg / 31 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Quad-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–1880	1920–2170	2490–2690
X	X	X	X
65°	65°	65°	65°

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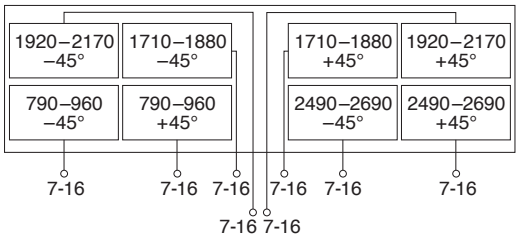
XXXXPol Panel 790–960/1710–1880/1920–2170/2490–2690 65°/65°/65°/65° 16/18/18/18dBi 0°–10°/0°–6°/0°–6°/0°–6°T

Type No.	80010685 (clamps included)					
		790–960		1710–1880	1920–2170	2490–2690
Frequency range	790 – 862 MHz	824 – 896 MHz	880 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.0 ... 16.0 ... 15.5 0° ... 5° ... 10°	16.1 ... 16.1 ... 15.6 0° ... 5° ... 10°	16.0 ... 16.2 ... 15.6 0° ... 5° ... 10°	17.8 ... 17.8 ... 17.5 0° ... 3° ... 6°	17.8 ... 17.8 ... 17.4 0° ... 3° ... 6°	17.8 ... 17.8 ... 17.6 0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	62°	62°	63°
Front-to-back ratio, copalar (180°±30°)	> 27 dB	> 27 dB	> 27 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	 18 dB > 10 dB	 23 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:						
Half-power beam width	10.3°	10.1°	9.8°	4.8°	4.4°	3.5°
Electrical tilt, continuously adjust.		0°–10°		0°–6°	0°–6°	0°–6°
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° 18 ... 17 ... 15 dB	0° ... 5° ... 10° 18 ... 18 ... 16 dB	0° ... 5° ... 10° 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 18 ... 16 ... 16 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 18 ... 18 ... 18 dB
VSWR		< 1.5		< 1.5	< 1.5	< 1.5
Isolation: Intrasystem		> 30 dB		> 28 dB	> 28 dB	> 28 dB
Isolation: Intersystem	> 30 dB (1710–1880 // 1920–2170 MHz) > 35 dB (790–960 // 1710–2170 MHz) > 38 dB (2490–2690 // 790–960 ... 1710–2170 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)					
Max. power per input		500 W*		200 W*	200 W*	200 W*
Total power		1000 W*			400 W*	
Input	8 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	4 x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1020 / 390 / 1050 N					
Height/width/depth	1997 / 300 / 152 mm					
Category of mounting hardware	M (Medium)					
Weight	29 kg / 31 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Quad-band Panel
Dual Polarization
Half-power Beam Width

790–960	1710–1880	1920–2170	2490–2690
X	X	X	X
65°	65°	65°	65°

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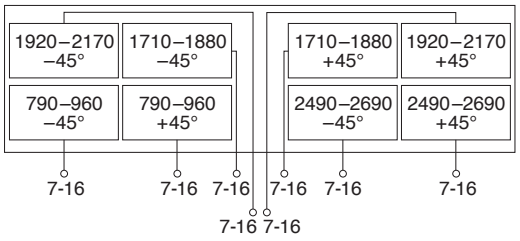
XXXXPol Panel 790–960/1710–1880/1920–2170/2490–2690 65°/65°/65°/65° 17/18/18/18dBi 0°–10°/0°–6°/0°–6°/0°–6°T

Type No.	**80010686** (clamps included)					
		790–960		**1710–1880**	**1920–2170**	**2490–2690**
Frequency range	790 – 862 MHz	824 – 896 MHz	880 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi) Tilt	16.8 ... 16.7 ... 16.5 0.5° ... 5° ... 9.5°	17.0 ... 17.0 ... 16.8 0.5° ... 5° ... 9.5°	17.1 ... 17.2 ... 17.0 0.5° ... 5° ... 9.5°	17.8 ... 17.8 ... 17.5 0° ... 3° ... 6°	17.8 ... 17.8 ... 17.4 0° ... 3° ... 6°	17.8 ... 17.8 ... 17.6 0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	62°	62°	63°
Front-to-back ratio, copalar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 24 dB > 10 dB	Typically: 23 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 23 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:						
Half-power beam width	7.5°	7.4°	7.1°	4.8°	4.4°	3.5°
Electrical tilt, continuously adjust.	0.5°–9.5°			0°–6°	0°–6°	0°–6°
Sidelobe suppression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T 18 ... 16 ... 14 dB	0.5° ... 5° ... 9.5° T 18 ... 17 ... 15 dB	0.5° ... 5° ... 9.5° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 18 ... 16 ... 16 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 18 ... 18 ... 18 dB
VSWR	< 1.5			< 1.5	< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB			> 28 dB	> 28 dB	> 28 dB
Isolation: Intersystem	> 30 dB (1710–1880 // 1920–2170 MHz) > 35 dB (790–960 // 1710–2170 MHz) > 38 dB (2490–2690 // 790–960 ... 1710–2170 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)					
Max. power per input	500 W*			200 W*	200 W*	200 W*
Total power	1000 W*			400 W*		
Input	8 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	4 x, Position bottom continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1380 / 520 / 1490 N					
Height/width/depth	2622 / 300 / 152 mm					
Category of mounting hardware	H (Heavy)					
Weight	34 kg / 36 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					

* (at 50 °C ambient temperature)



For more information about additional mounting accessories please refer to page 205

Summary – Omnidirectional Antennas 800/900/1800/2000

KATHREIN
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Vertical Polarization – 800/900

Type					Type No.	Connector female	Height [mm]	Remarks	Page
VPol Omni	870–960	360°	2dBi	0°T	738450	N	180	indoor/outdoor	152
VPol Omni	806–960	360°	2dBi	0°T	K751161	N	348		153
VPol Omni	890–960	360°	5dBi	0°T	K7515641	N	715		154
VPol Omni	870–960	360°	8dBi	0°T	736350	7-16	1543		155
VPol Omni	790–862	360°	11dBi	0°T	80010850	7-16	3237		156
VPol Omni	860–894	360°	11dBi	0°T	738192	7-16	3237		157
VPol Omni	870–960	360°	11dBi	0°T	736347	7-16	3033		158
VPol Omni	870–960	360°	10.5dBi	5°T	736349	7-16	2954		159

Vertical Polarization – Dual band

VVPol Omni	790–862 870–960	360° 360°	8dBi 9dBi	0°T 0°T	80010747	7-16	3237	separate inputs	160
VPol Omni	890–960/1710–1880	360°	2dBi	0°T	738449	N	216	indoor/outdoor	176
VPol Omni	824–960/1805–2170	360°	2dBi	0°T	80010147	N	216	indoor/outdoor	178
VVPol Omni	870–960 1920–2170	360° 360°	9dBi 10dBi	0°T 0°T	80010274	7-16	3033	separate inputs	161
VVPol Omni	870–960/1710–1880 1920–2170	360° 360°	2dBi 2dBi	0°T 0°T	80010111	N	493	separate inputs	162

Vertical Polarization – 1800

VPol Omni	1710–1880	360°	11dBi	0°T	738187	7-16	1568		163

Vertical Polarization – 1800/2000/2500/3500

VPol Omni	1710–2700	360°	2dBi	0°T	80010431	N	115		177
VPol Omni	1920–2170	360°	11dBi	0°T	741790	7-16	1387		164
VPol Omni	2500–2700	360°	11dBi	0°T	80010442	7-16	1132		165

New or changed product

Omnidirectional Antenna
Vertical Polarization

870–960

V

KATHREIN
Antennen · Electronic

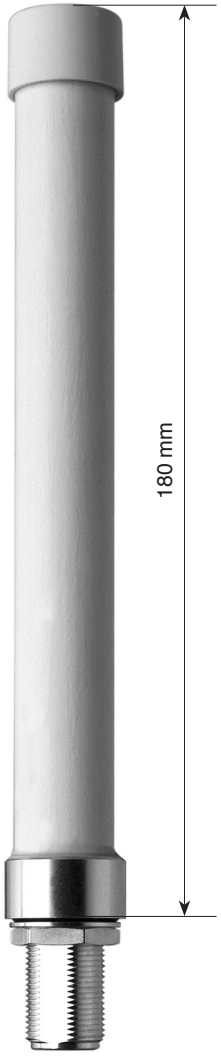
VPol Omni 870–960 360° 2dBi

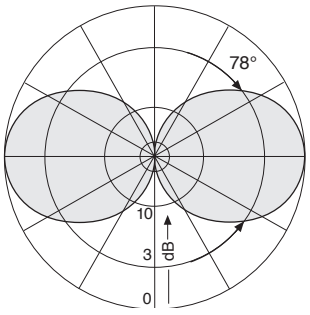
Type No.	738450
Input	N female
Connector position	Bottom or top
Frequency range	870 – 960 MHz
VSWR	< 1.5
Gain	2 dBi
Impedance	50 Ω
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Polarization	Vertical
Max. power	100 W (at 50 °C ambient temperature)
Weight	200 g
Radome diameter	20 mm
Height	180 mm

Material: Radiator: Brass.
Radome: Fiberglass, colour: White.

Mounting: One hole mounting (16 mm diameter) to surfaces of max. 10 mm thickness.

Grounding: All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded.





Vertical Pattern

Omnidirectional Antenna
Vertical Polarization

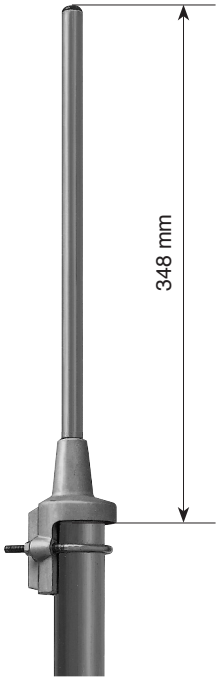
806–960

V

KATHREIN
Antennen · Electronic

VPol Omni 806–960 360° 2dBi

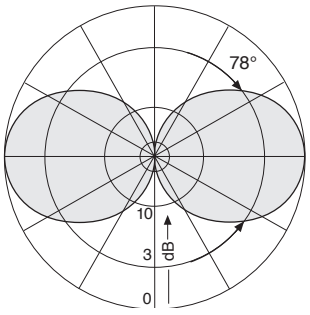
Type No.	K751161
Frequency range	806 – 960 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	100 W (at 50 °C ambient temperature)



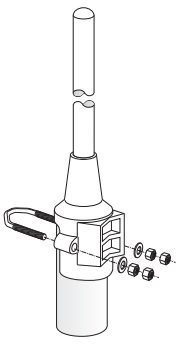
Mounting: The antenna can be attached in two ways with the supplied mounting kit:
1. On the tip of a tubular mast of 40 – 54 mm diameter (connecting cable runs inside the mast).
2. Laterally at the tip of a tubular mast of 20 – 54 mm diameter (connecting cable runs outside the mast).

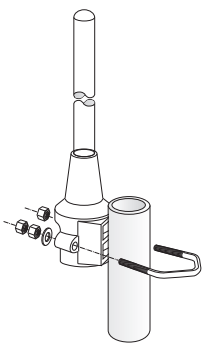
Material: Radiator: Brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Grounding: All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded.



Vertical Pattern


On the tip


Laterally at the tip

Mechanical specifications	
Input	N female
Connector position	Bottom
Weight	0.74 kg
Radome diameter	21 mm
Wind load	17 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	455 x 112 x 97 mm
Height	348 mm

Brackets for side mounting (see page 217 – 219)

Omnidirectional Antenna
Vertical Polarization

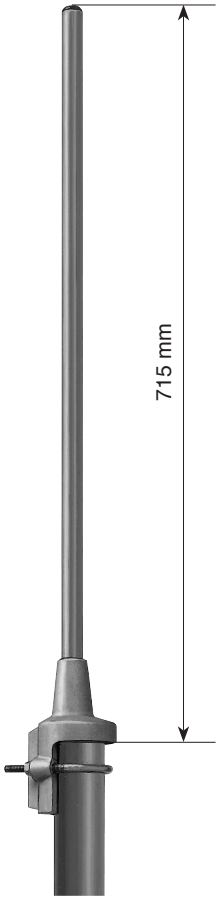
890–960

V

KATHREIN
Antennen · Electronic

VPol Omni 890–960 360° 5dBi

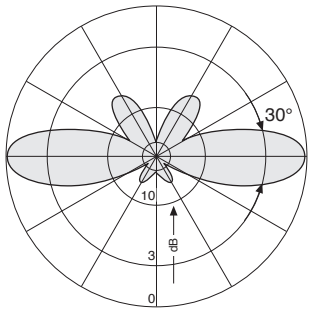
Type No.	K7515641
Frequency range	890 – 960 MHz
Polarization	Vertical
Gain	5 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	250 W (at 50 °C ambient temperature)



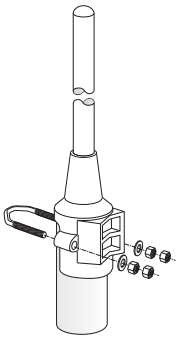
Mounting: The antenna can be attached in two ways with the supplied mounting kit:
1. On the tip of a tubular mast of 40 – 54 mm diameter (connecting cable runs inside the mast).
2. Laterally at the tip of a tubular mast of 20 – 54 mm diameter (connecting cable runs outside the mast).

Material: Radiator: Brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

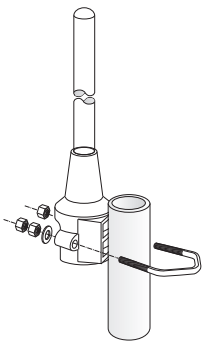
Grounding: All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded.



Vertical Pattern



On the tip



Laterally at the tip

Mechanical specifications	
Input	N female
Connector position	Bottom
Weight	0.90 kg
Radome diameter	21 mm
Wind load	20 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	825 x 112 x 97 mm
Height	715 mm

Brackets for side mounting (see page 217 – 219)

Omnidirectional Antenna
Vertical Polarization

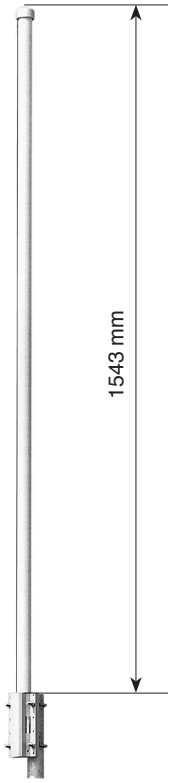
870–960

V

KATHREIN
Antennen · Electronic

VPol Omni 870–960 360° 8dBi

Type No.	736350
Frequency range	870 – 960 MHz
Polarization	Vertical
Gain	8 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	500 W (at 50 °C ambient temperature)

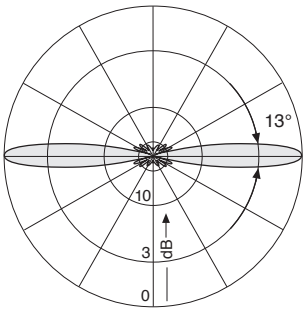


Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

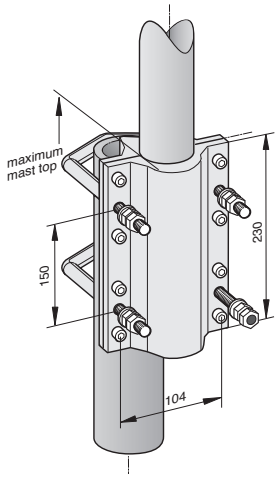
Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Anti-static protection: All metal parts of the antenna as well as the supplied clamp attachment are grounded.
The inner conductor is capacitively coupled.

Lightning protection: The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μs), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm^2 copper.



Vertical Pattern



Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Weight	5.5 kg
Radome diameter	51 mm
Wind load	130 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	1846 x 148 x 112 mm
Height	1543 mm

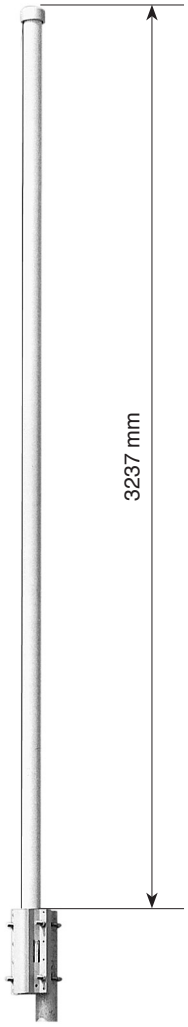
Brackets for side mounting (see page 217 – 219)

Omnidirectional Antenna
Vertical Polarization

790–862

V

KATHREIN
Antennen · Electronic



VPol Omni 790–894 360° 11dBi

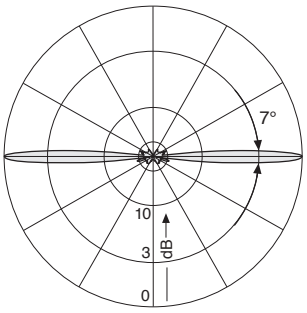
Type No.	80010850
Frequency range	790 – 862 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	500 W (at 50 °C ambient temperature)

Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

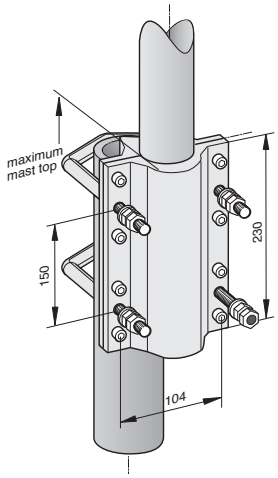
Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Anti-static protection: All metal parts of the antenna as well as the supplied clamp attachment are grounded.
The inner conductor is capacitively coupled.

Lightning protection: The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μs), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm^2 copper.



Vertical Pattern



Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Weight	8.5 kg
Radome diameter	51 mm
Wind load	230 N (at 150 km/h)
Max. wind velocity	180 km/h
Packing size	3516 x 148 x 112 mm
Height	3237 mm

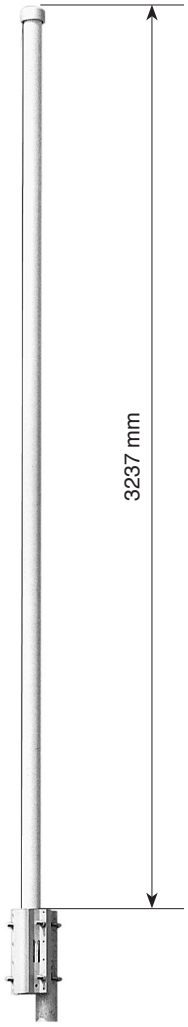
Brackets for side mounting (see page 217 – 219)

Omnidirectional Antenna
Vertical Polarization

806–894

V

KATHREIN
Antennen · Electronic



VPol Omni 806–894 360° 11dBi

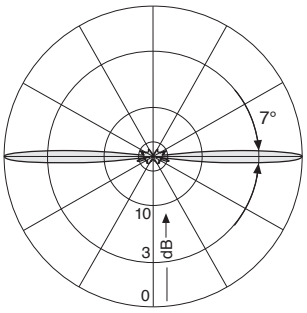
Type No.	738192
Frequency range	806 – 894 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	500 W (at 50 °C ambient temperature)

Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

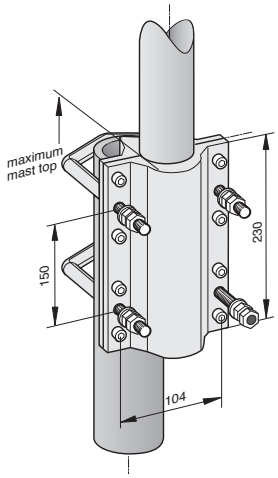
Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Anti-static protection: All metal parts of the antenna as well as the supplied clamp attachment are grounded.
The inner conductor is capacitively coupled.

Lightning protection: The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μs), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm^2 copper.



Vertical Pattern



Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Weight	8.5 kg
Radome diameter	51 mm
Wind load	230 N (at 150 km/h)
Max. wind velocity	180 km/h
Packing size	3516 x 148 x 112 mm
Height	3237 mm

Omni
VPol

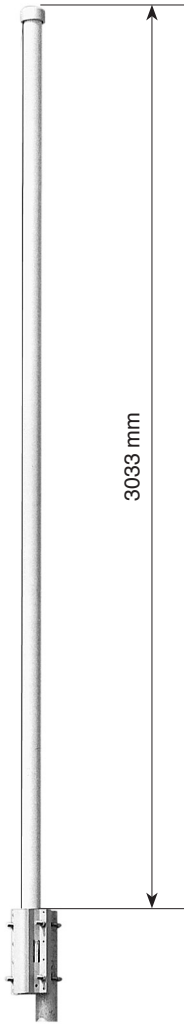
Brackets for side mounting (see page 217 – 219)

Omnidirectional Antenna Vertical Polarization

870–960

V

KATHREIN
Antennen · Electronic



VPol Omni 870–960 360° 11dBi

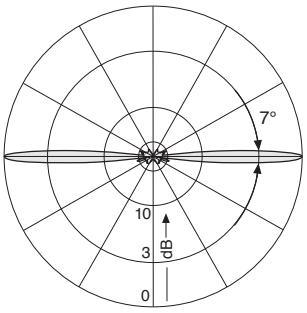
Type No.	736347
Frequency range	870 – 960 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	500 W (at 50 °C ambient temperature)

Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

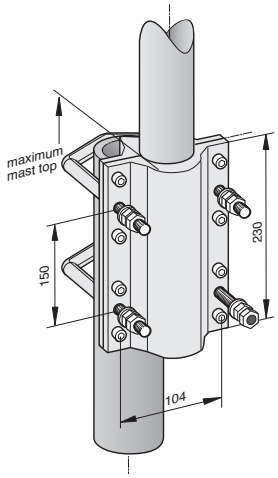
Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Anti-static protection: All metal parts of the antenna as well as the supplied clamp attachment are grounded.
The inner conductor is capacitively coupled.

Lightning protection: The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μs), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm^2 copper.



Vertical Pattern



Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Weight	8 kg
Radome diameter	51 mm
Wind load	210 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	3316 x 148 x 112 mm
Height	3033 mm

Brackets for side mounting (see page 217 – 219)

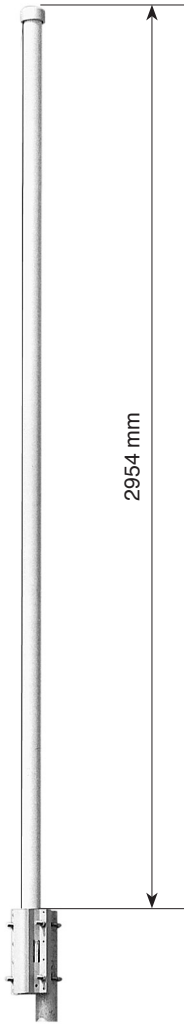
Omnidirectional Antenna
Vertical Polarization
Fixed Electrical Downtilt

870–960

V

5°

KATHREIN
Antennen · Electronic



VPol Omni 870–960 360° 10.5dBi 5°T

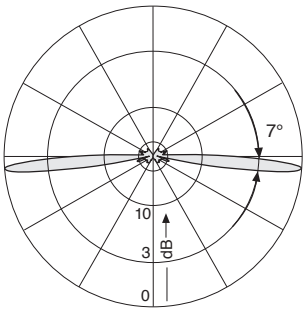
Type No.	736349
Frequency range	870 – 960 MHz
Polarization	Vertical
Gain	10.5 dBi
Electrical tilt	5°, fixed
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	500 W (at 50 °C ambient temperature)

Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

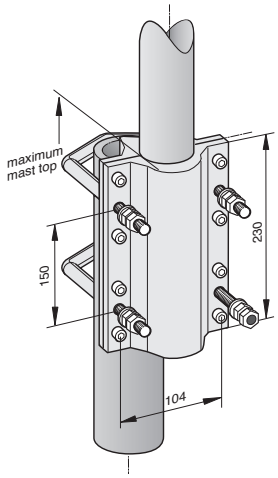
Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Anti-static protection: All metal parts of the antenna as well as the supplied clamp attachment are grounded.
The inner conductor is capacitively coupled.

Lightning protection: The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μs), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm^2 copper.



Vertical Pattern
5° electrical downtilt



Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Weight	8 kg
Radome diameter	51 mm
Wind load	210 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	3316 x 148 x 112 mm
Height	2954 mm

Brackets for side mounting (see page 217 – 219)

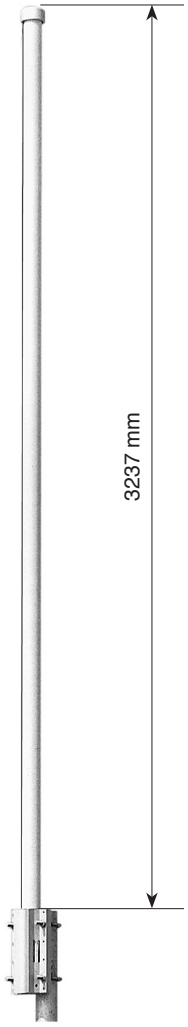
Dual-band Omni Antenna
Vertical Polarization

870–960	790–862
V	V

KATHREIN
Antennen · Electronic

VPol Omni 870–960/790–862 360°/360° 9/8dBi

Type No.	80010747	
Frequency range	Top system: 870 – 960 MHz	Bottom system: 790 – 862 MHz
Polarization	Vertical	Vertical
Gain	9 dBi	8 dBi
Half-power beam width	Horizontal: Omni Vertical: 11°	Horizontal: Omni Vertical: 16°
Isolation, between ports	> 30 dB	
Impedance	50 Ω	
VSWR	< 1.5	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	150 W (at 50 °C ambient temperature)	100 W



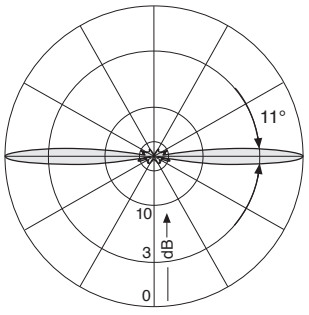
Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Anti-static protection: All metal parts of the antenna as well as the supplied clamp attachment are grounded. The inner conductors of both systems are coupled capacitively.

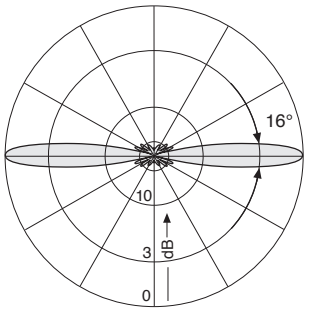
Lightning protection: The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μs), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm^2 copper.

870–960

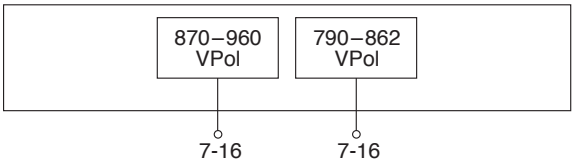


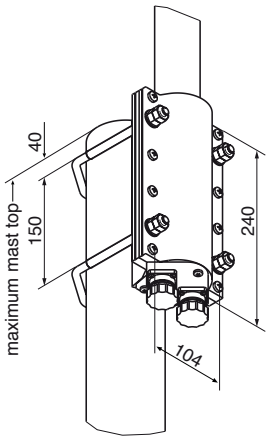
Vertical Pattern

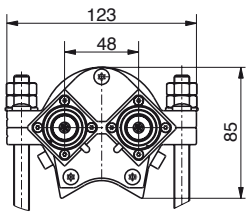
790–862



Vertical Pattern







Bottom view

Layout of interface

Mechanical specifications	
Input	2 x 7-16 female
Connector position	Bottom
Weight	8 kg
Wind load	230 N (at 150 km/h)
Max. wind velocity	180 km/h
Packing size	3516 x 148 x 112 mm
Height	3237 mm
Radome diameter	51 mm

Brackets for side mounting (see page 217 – 219)

Dual-band Omni Antenna
Vertical Polarization

870–960	1920–2170
V	V

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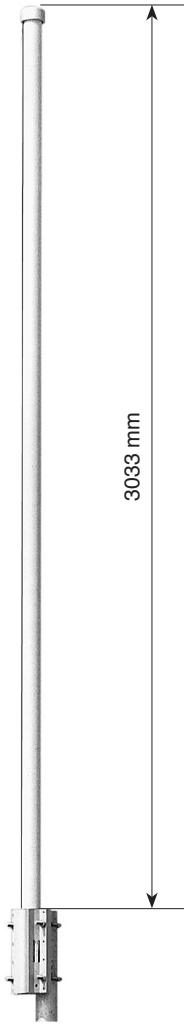
Antennen · Electronic

VPol Omni 870–960/1920–2170 360°/360° 9/10dBi

Type No.	80010274	
Frequency range	Top system: 870 – 960 MHz	Bottom system: 1920 – 2170 MHz
Polarization	Vertical	Vertical
Gain	9 dBi	10 dBi
Half-power beam width	Horizontal: Omni Vertical: 11°	Horizontal: Omni Vertical: 9°
Isolation, between ports	> 30 dB	
Impedance	50 Ω	
VSWR	< 1.5	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	150 W (at 50 °C ambient temperature)	100 W



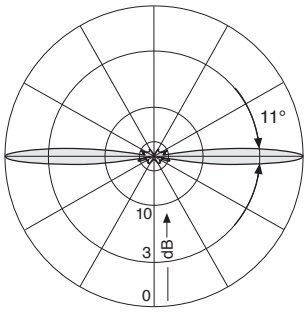
Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Anti-static protection: All metal parts of the antenna as well as the supplied clamp attachment are grounded. The inner conductors of both systems are coupled capacitively.

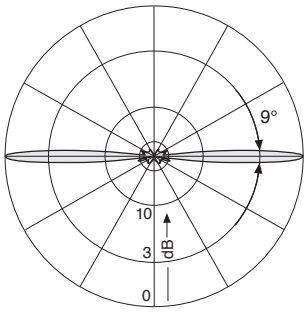
Lightning protection: The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μs), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm^2 copper.

870–960

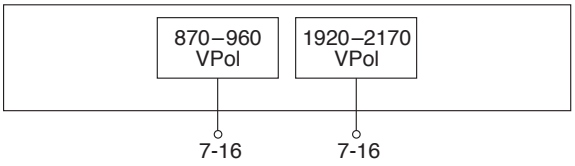


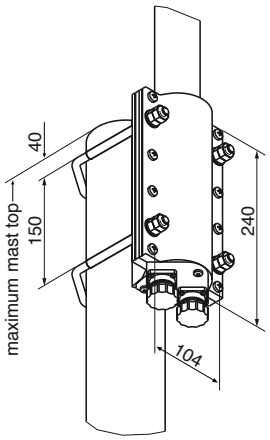
Vertical Pattern

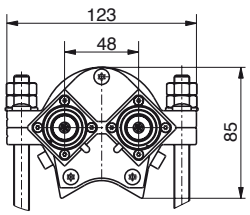
1920–2170



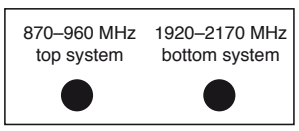
Vertical Pattern







Bottom view



Layout of interface

Mechanical specifications	
Input	2 x 7-16 female
Connector position	Bottom
Weight	8 kg
Wind load	230 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	3380 x 148 x 112 mm
Height	3033 mm
Radome diameter	51 mm

Brackets for side mounting (see page 217 – 219)

Multi-band Omni Antenna

870–960 1710–1880	1920–2170
V	V

Vertical Polarization

KATHREIN
Antennen · Electronic

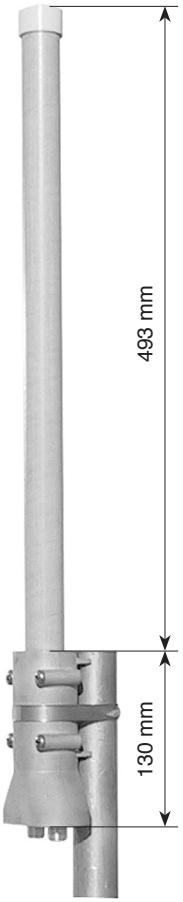
VVPol Omni 870–960/1710–1880/1920-2170 360°/360° 2/2dBi

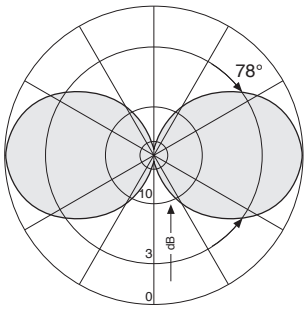
Type No.	80010111	
Frequency range	Top system: 870 – 960 MHz 1710 – 1880 MHz	Bottom system: 1920 – 2170 MHz
Polarization	Vertical	Vertical
Gain	2 dBi	2 dBi
Isolation, between ports	> 25 dB	> 25 dB
Impedance	50 Ω	50 Ω
VSWR	< 1.5	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	50 W (at 50 °C ambient temperature)	

Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

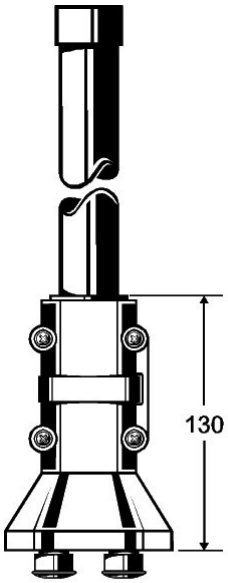
Mounting: The antenna can be attached laterally at the tip of a tubular mast of 40 – 70 mm diameter with a mounting clamp supplied with the antenna. The connecting cables (not supplied) run outside the mast.

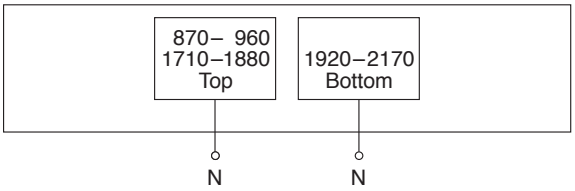
Excellent grounding: The metal parts of the antenna and the mounting kit (exclusive the inner conductor of the upper unit) are DC grounded.

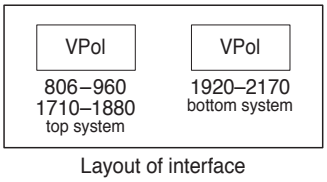




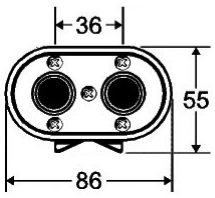
Vertical Pattern







Layout of interface



Bottom view

Mechanical specifications	
Input	2 x N female
Connector position	Bottom
Weight	0.85 kg
Wind load	30 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	665 x 112 x 97 mm
Height	493 mm
Radome diameter	30 mm

Brackets for side mounting (see page 217 – 219)

Omnidirectional Antenna
Vertical Polarization

1710–1880

V

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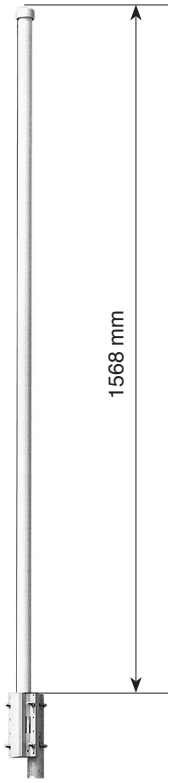
VPol Omni 1710–1880 360° 11dBi

Type No.	738187
Frequency range	1710 – 1880 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	200 W (at 50 °C ambient temperature)

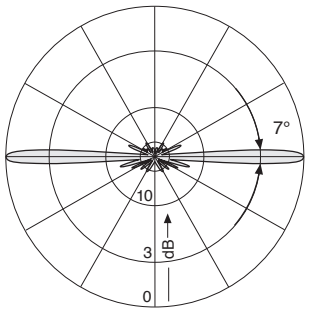


Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

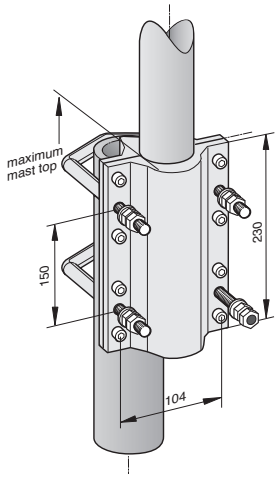
Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Anti-static protection: All metal parts of the antenna as well as the supplied clamp attachment are grounded.
The inner conductor is capacitively coupled.

Lightning protection: The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μs), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm^2 copper.



Vertical Pattern



Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Weight	5.5 kg
Radome diameter	51 mm
Wind load	130 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	1846 x 148 x 112 mm
Height	1568 mm

Brackets for side mounting (see page 217 – 219)

Omnidirectional Antenna
Vertical Polarization

1920–2170

V

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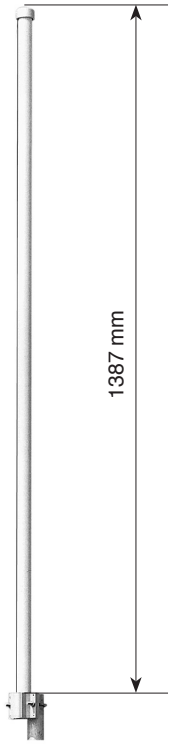
VPol Omni 1920–2170 360° 11dBi

Type No.	741790
Frequency range	1920 – 2170 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	150 W (at 50 °C ambient temperature)

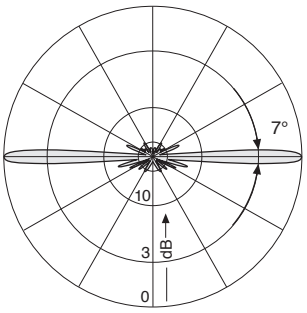


Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

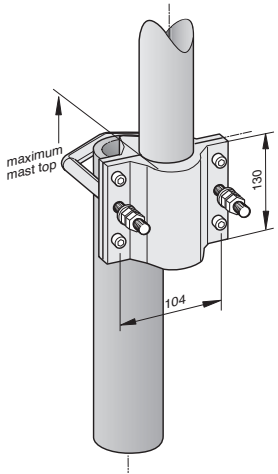
Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Anti-static protection: All metal parts of the antenna as well as the supplied clamp attachment are grounded.
The inner conductor is capacitively coupled.

Lightning protection: The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μs), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm^2 copper.



Vertical Pattern



Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Weight	5 kg
Radome diameter	51 mm
Wind load	120 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	1570 x 148 x 112 mm
Height	1387 mm

Brackets for side mounting (see page 217 – 219)

Omnidirectional Antenna
Vertical Polarization

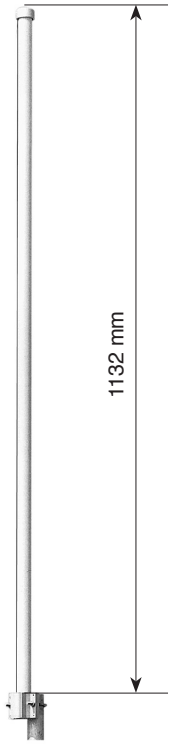
2500–2700

V

KATHREIN
Antennen · Electronic

VPol Omni 2500–2700 360° 11dBi 0°T

Type No.	80010442
Frequency range	1920 – 2170 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	200 W (at 50 °C ambient temperature)

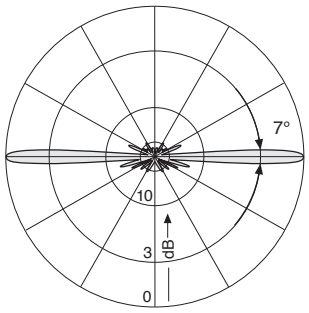


Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

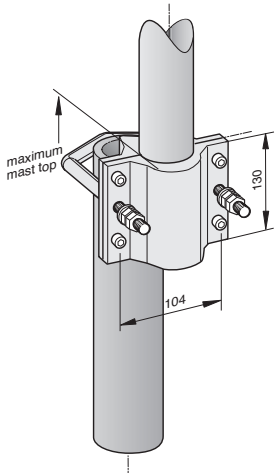
Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Anti-static protection: All metal parts of the antenna as well as the supplied clamp attachment are grounded.
The inner conductor is capacitively coupled.

Lightning protection: The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μs), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm^2 copper.



Vertical Pattern



Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Weight	4.5 kg
Radome diameter	51 mm
Wind load	110 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	1232 x 148 x 112 mm
Height	1132 mm

Brackets for side mounting (see page 217 – 219)

Summary – Indoor Antennas 790 … 6000

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Vertical Polarization
Indoor – Directional

Type				Type No.	Frequency range	Connector female	Page
VPol BiDir	65°		5dBi	738446	790–960/1710–2170	N	57
VVPol Indoor	90°		7dBi	80010465	790–960/1710–2700	N	168

Indoor – Directional Dual Polarization

VXPol Indoor	90°	C	7dBi	80010677	790–960/1710–2700	2 x N	169

Indoor – Multi-band Omnidirectional

VPol Indoor	360°		2dBi	80010748	876–960/1710–2700	N	170
VPol Indoor	360°		2dBi	80010749	876–960/1710–2700	N	171
VPol Indoor	360°		2dBi	80010249	790–960/1425–3800/5150–6000	N	172
VPol Indoor	360°		2dBi	741573	1710–2700	N	173
VPol Indoor	360°		2dBi	80010430	1710–6000	N	174

Indoor – Omnidirectional Dual Polarization

VHPol Indoor	360°		2dBi	80010709	790–960/1710–2700/2500–2700	2 x N	175

Indoor / Outdoor – Single-band

VPol Omni	360°		2dBi	738450	870–960	N	152

Indoor / Outdoor – Dual-band Multi-band

VPol Omni	360°		2dBi	738449	870–960/1710–1880	N	176
VPol Omni	360°		2dBi	80010431	1710–2700	N	177
VPol Omni	360°		2dBi	80010147	824–960/1805–2170	N	178

Indoor Multi-band Directional Antenna Vertical Polarization Half-power Beam Width Integrated Combiner

790–960	1710–2700
V	V
90°	90°
C	

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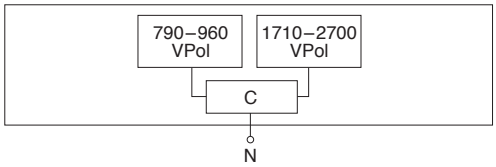
VVPol Indoor 790–960/1710–2700 C 90° 7dBi

Type No.	80010465
Frequency range	790 – 960 MHz / 1710 – 2700 MHz
Polarization	Vertical
Gain	Approx. 7 dBi
Half-power beam width	Horizontal: Approx. 90°
Impedance	50 Ω
VSWR	790 – 806 MHz: < 2.2 806 – 960 MHz: < 2.0 1710 – 2700 MHz: < 2.0
Max. power	50 W (at 50 °C ambient temperature)
Input	Cable RG 223/CU of 1m length, white, with N female connector
Protection class	IP 30
Weight	500 g
Packing size	363 x 152 x 62 mm
Height/width/depth	231 / 140 / 50 mm

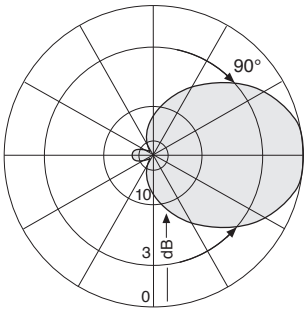


Material: Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.
Mounting plates: Stainless steel.

Mounting: Two holes of 6 mm diameter in the mounting plate. Screws are not supplied.
Avoid stressing the cable.
No stress on the hexagonal crimp.
Minimum cable bending radius: 30 mm without tensile load.

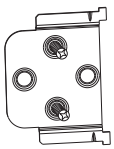
Grounding: All metal parts inclusive the inner conductor are DC grounded.

Available accessories: Broadband power splitters (694 – 3800 MHz) and tappers (790 – 2500 MHz).

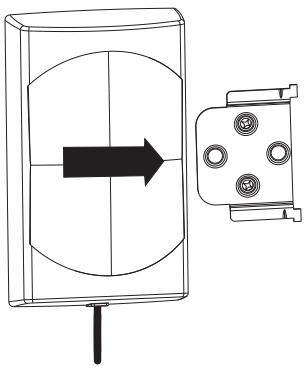


Horizontal Pattern

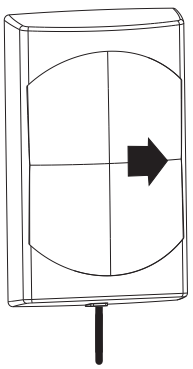
Mounting:



Mount the attachment plate to the wall using two screws of 4 mm diameter in the position as indicated.



Align the antenna over the attachment plate.



Pull the antenna to the stop.

Indoor Multi-band Directional Antenna Vertical / Dual Polarization Half-power Beam Width Integrated Combiner

	790–960	1710–2700	1710–2700
	V	X (–45°)	X (+45°)
	90°	90°	90°
	C		

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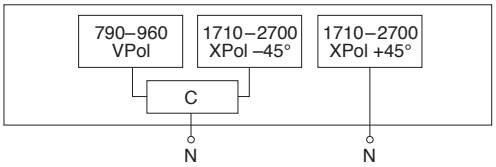
VXPol Indoor 790–960/1710–2700 C 90° 7dBi

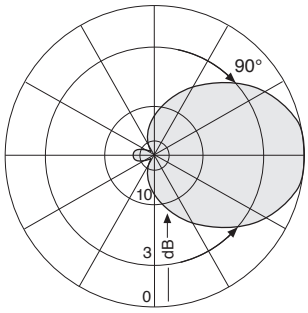
Type No.	80010677	
Frequency range	790 – 960 MHz	1710 – 2700 MHz
Polarization	Vertical	+45°, –45°
Gain	Approx. 7 dBi	Approx. 2 x 7 dBi
Half-power beam width	Horizontal: Approx. 90°	
Impedance	50 Ω	
VSWR	< 2.0	
Isolation, between ports	> 25 dB	
Max. power	50 W (at 50 °C ambient temperature)	
Input	2x Cable RG 223/CU of 1m length, white, with N female connector	
Protection class	IP 30	
Weight	600 g	
Packing size	363 x 152 x 62 mm	
Height/width/depth	232 / 140 / 50 mm	



Material: Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.
Mounting plates: Stainless steel.

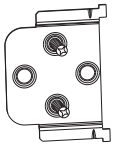
Mounting: Two holes of 6 mm diameter in the mounting plate. Screws are not supplied.
Avoid stressing the cable.
No stress on the hexagonal crimp.
Minimum cable bending radius: 30 mm without tensile load.

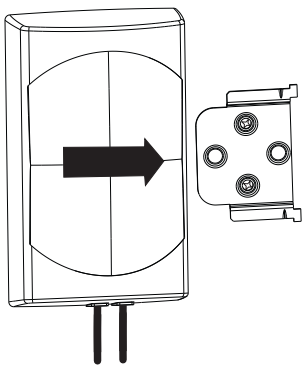
Available accessories: Broadband power splitters and tappers (790 – 2700 MHz).

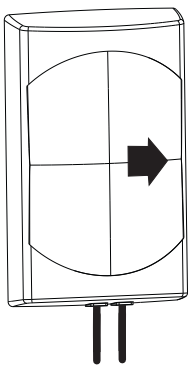


Horizontal Pattern

Mounting:


Mount the attachment plate to the wall using two screws of 4 mm diameter in the position as indicated.


Align the antenna over the attachment plate.


Pull the antenna to the stop.

Indoor Multi-band Omni Antenna Vertical Polarization

876–960 | 1710–2700 | V

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Antennen · Electronic

- The antenna needs no additional groundplane.

VPol Indoor 876–960/1710–2700 360° 2dBi

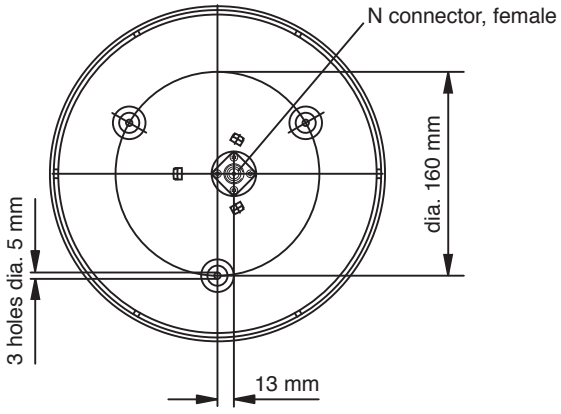
Type No.	80010748
Frequency range	876 – 960 MHz 1710 – 2700 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	876 – 890 MHz: < 2.0 890 – 960 MHz: < 1.7 1710 – 2170 MHz: < 1.6 2170 – 2700 MHz: < 2.0
Max. power	50 W (at 50 °C ambient temperature)
Input	1 x N female
Weight	300 g
Diameter	210 mm
Height	78 mm (without connector)

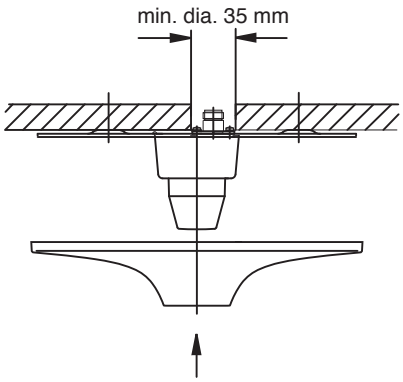
Material: Base: Aluminum.
Protective housing: High impact polystyrol, colour: White.
Additional painting is possible.

Mounting: Three holes in the base enable a mounting on the ceiling. Two types of screws are supplied. For the N connector a hole in the ceiling with a diameter of 35 mm is required.

Grounding: All metal parts including the inner conductor are DC grounded.

Available accessories: Broadband power splitters and tappers (800 – 2700 MHz).





Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

Indoor Multi-band Omni Antenna Vertical Polarization

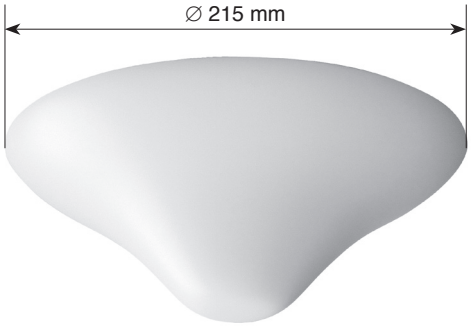
876–960 | 1710–2700 | V

KATHREIN
Antennen · Electronic

- The antenna needs no additional groundplane.

VPol Indoor 876–960/1710–2700 360° 2dBi

Type No.	80010749
Frequency range	876 – 960 MHz 1710 – 2700 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	876 – 890 MHz: < 2.0 890 – 960 MHz: < 1.7 1710 – 2170 MHz: < 1.6 2170 – 2700 MHz: < 2.0
Max. power	50 W (at 50 °C ambient temperature)
Input	1 x N female
Weight	340 g
Diameter	215 mm
Height	85 mm (without connector)

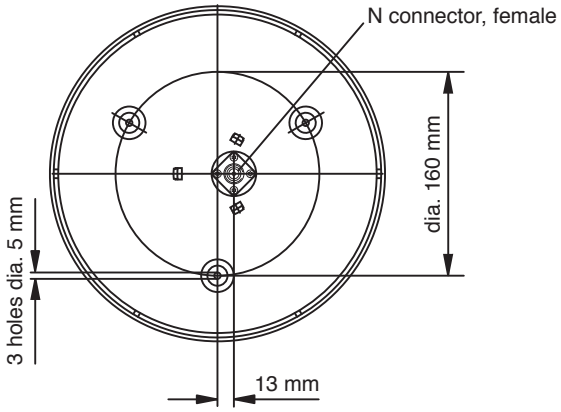


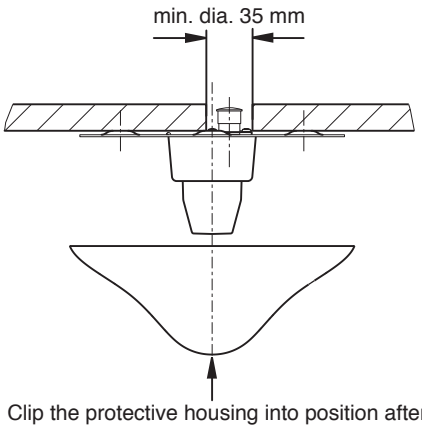
Material: Base: Aluminum.
Protective housing: High impact polystyrol, colour: White.
Additional painting is possible.

Mounting: Three holes in the base enable a mounting on the ceiling. Two types of screws are supplied. For the N connector a hole in the ceiling with a diameter of 35 mm is required.

Grounding: All metal parts including the inner conductor are DC grounded.

Available accessories: Broadband power splitters and tappers (800 – 2700 MHz).





Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

Indoor Multi-band Omni Antenna Vertical Polarization

790–960 | 1425–3800 | 5150–6000

V

KATHREIN
Antennen · Electronic

- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

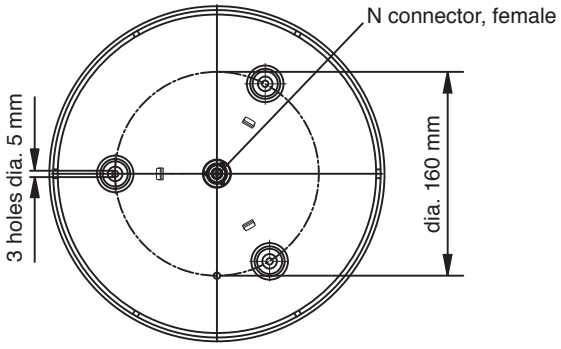
VPol Indoor 790–960/1425–3800/5150–6000 360° 2dBi

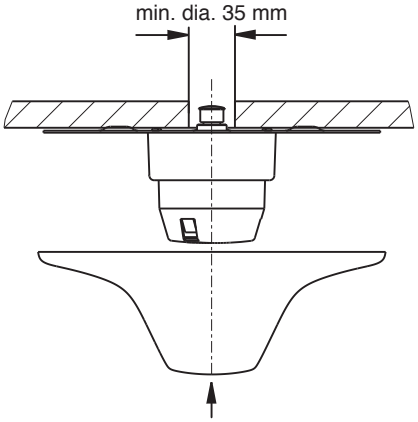
Type No.	80010249
Frequency range	790 – 960 MHz 1425 – 3800 MHz 5150 – 6000 MHz
Polarization	Vertical
Gain	≈ 2 dBi
Impedance	50 Ω
VSWR	790 – 806 MHz: < 1.7 806 – 960 MHz: < 1.5 1425 – 1710 MHz: < 20 1710 – 2200 MHz: < 1.4 2200 – 3800 MHz: < 1.6 5150 – 6000 MHz: < 2.2
Max. power	50 W (at 50 °C ambient temperature)
Input	1 x N female
Protection class	IP 30
Weight	466 g
Packing size	277 x 277 x 169 mm
Diameter	258 mm
Height	94 mm (without connector)

Material: Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.

Mounting: Three holes in the base enable a mounting on the ceiling. Two types of screws are supplied. For the N connector a hole in the ceiling with a diameter of 35 mm is required.

Available accessories: Broadband power splitters (694 – 3800 MHz) and tappers (790 – 2500 MHz).





Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

Indoor Omnidirectional Antenna Vertical Polarization

1710–2700

V

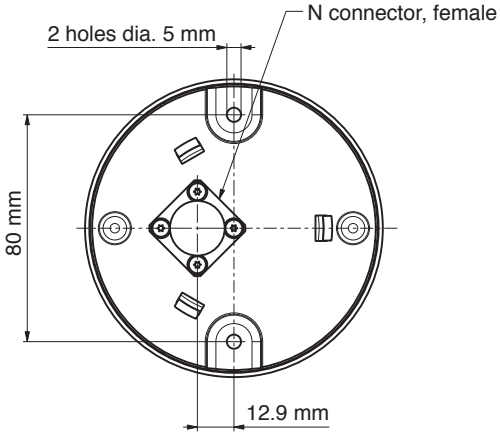
KATHREIN
Antennen · Electronic

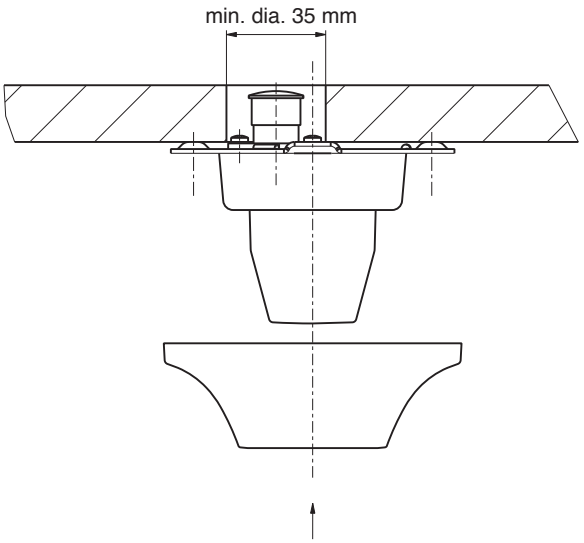
- The antenna can be operated in the total frequency range simultaneously.
- The antenna needs no additional groundplane.

VPol Indoor 1710–2700 360° 2dBi

Type No.	741573
Frequency range	1710 – 2700 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	1710 – 1880 MHz: < 1.6 1850 – 1990 MHz: < 1.6 1920 – 2170 MHz: < 1.6 2170 – 2500 MHz: < 2.0 2500 – 2700 MHz: < 2.2
Max. power	50 W (at 50 °C ambient temperature)
Input	1 x N female
Weight	150 g
Diameter	100 mm
Height	50 mm (without connector)

Material:	Base: Aluminum. Protective housing: High impact polystyrol, colour: White. Additional painting is possible.
Mounting:	Holes in the base enable a mounting on the ceiling. Screws are supplied. For the N connector a hole in the ceiling with a diameter of 35 mm is required.
Grounding:	All metal parts including the inner conductor are DC grounded.
Available accessories:	Broadband power splitters (694 – 3800 MHz) and tappers (790 – 2500 MHz).





Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

Indoor Omnidirectional Antenna Vertical Polarization

1710–6000

V

KATHREIN
Antennen · Electronic

- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

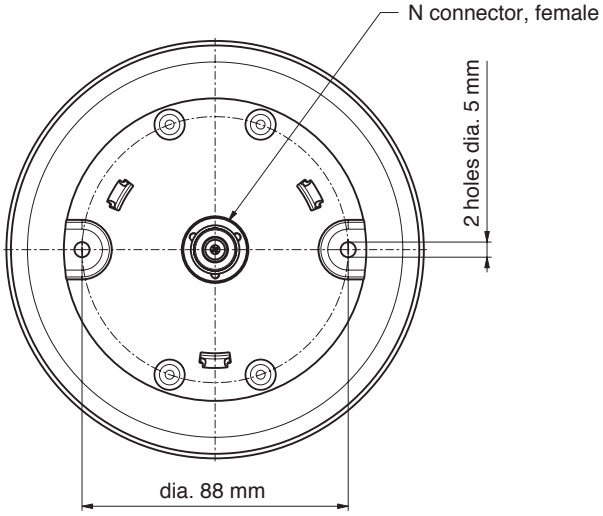
VPol Indoor 1710–6000 360° 2dBi

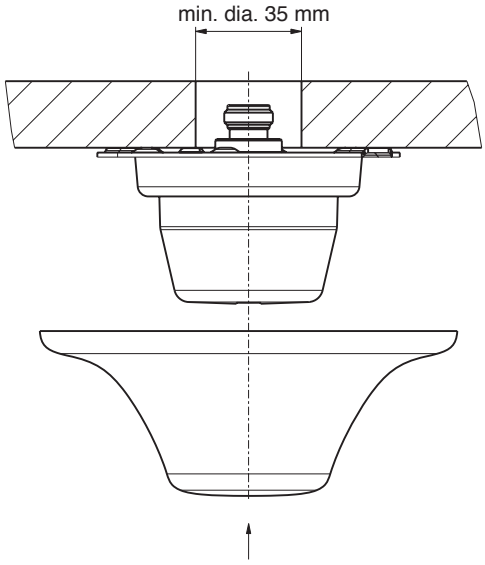
Type No.	80010430
Frequency range	1710 – 6000 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	< 1.5
Max. power	50 W (at 50 °C ambient temperature)
Input	1 x N female
Protection class	IP 30
Weight	133 g
Diameter	138 mm
Height	56 mm (without connector)

Material: Base: Aluminum.
Protective housing: High impact polystyrol, colour: White.
Additional painting is possible.

Mounting: Holes in the base enable a mounting on the ceiling. Screws are supplied.
For the N connector a hole in the ceiling with a diameter of 35 mm is required.

Available accessories: Broadband power splitters and tappers (800 – 2500 MHz).





Clip the protective housing into position after the antenna has been mounted with the help of two supplied screws.

Indoor Multi-band Omni Antenna Dual Polarization

790–960 | 1710–2700 | 2500–2700

V | H

KATHREIN
Antennen · Electronic

- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

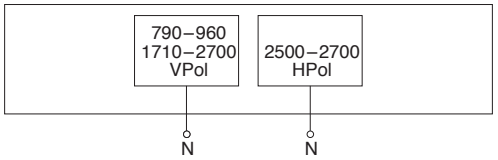
VHPol Indoor 790 – 960/1710–2700/2500–2700 360° 2dBi

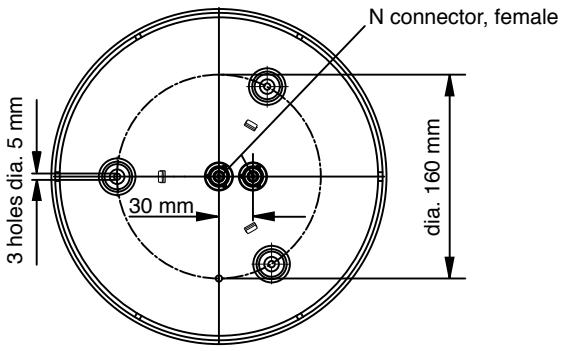
Type No.	80010709	
Frequency range	790 – 960 MHz 1710 – 2700 MHz	2500 – 2700 MHz
Polarization	Vertical	Horizontal
Gain	~ 2 dBi	
Impedance	50 Ω	
VSWR	790 – 960 MHz: < 2.0 1710 – 2700 MHz: < 2.0	2500 – 2700 MHz: < 2.0
Isolation	> 30 dB	
Max. power	50 W (at 50 °C ambient temperature)	
Input	2 x N female	
Protection class	IP 30	
Weight	Approx. 500 g	
Packing sizw	277 x 277 x 169 mm	
Diameter	258 mm	
Height	94 mm (without connector)	

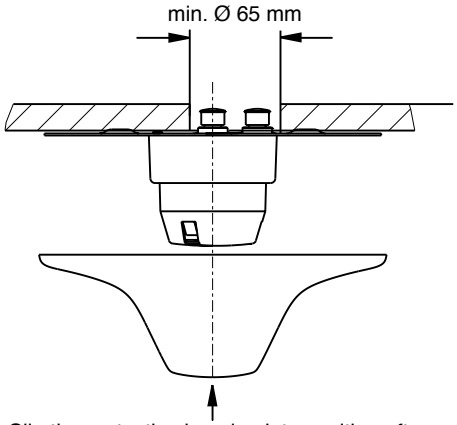
Material: Reflector: Aluminum.Radome: High impact polystyrol, colour: White. Additional painting is possible.

Mounting: Three holes in the base enable a mounting on the ceiling. Two types of screws are supplied. For the N connectors a hole in the ceiling is required.

Available accessories: Broadband power splitters (694 – 3800 MHz) and tappers (694 – 2700 MHz).







Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

Dual-band Omni Antenna 870–960/1710–1880
Vertical Polarization V
Indoor and outdoor use

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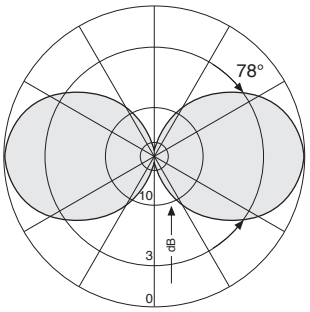
VPol Omni 870–960/1710–1880 360° 2dBi

Type No.	738449
Input	1 x N female
Connector position	Bottom or top
Frequency range	870 – 960 MHz / 1710 – 1880 MHz
VSWR	< 1.7
Gain	2 dBi
Impedance	50 Ω
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Polarization	Vertical
Max. power	50 W: 870 – 960 MHz 50 W: 1710 – 1880 MHz (at 50 °C ambient temperature)
Weight	250 g
Radome diameter	20 mm
Height	216 mm

Material: Radiator: Brass.
Radome: Fiberglass, colour: White.

Mounting: One hole mounting (16 mm diameter) to surfaces of max. 10 mm thickness.



Vertical Pattern

Omnidirectional Antenna
Vertical Polarization
Indoor and outdoor use

1710–2700

V

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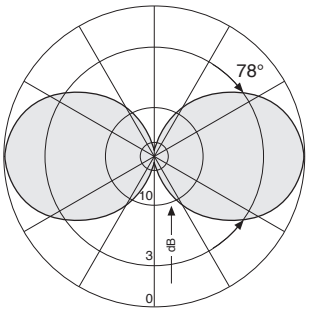
VPol Omni 1710–2700 360° 2dBi

Type No.	80010431
Input	N female
Connector position	Bottom or top
Frequency range	1710 – 2700 MHz
VSWR	< 1.8
Gain	2 dBi
Impedance	50 Ω
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Polarization	Vertical
Max. power	50 W (at 50 °C ambient temperature)
Weight	150 g
Radome diameter	20 mm
Height	115 mm

Material: Radiator: Brass.
Radome: Fiberglass, colour: White.

Mounting: One hole mounting (16 mm diameter) to surfaces of max. 10 mm thickness.

Grounding: All metal parts of the antenna and the mounting kit are DC grounded. The inner conductor is not DC grounded.



Vertical Pattern

Dual-band Omni Antenna
Vertical Polarization
Indoor and outdoor use

824–960/1805–2170

V

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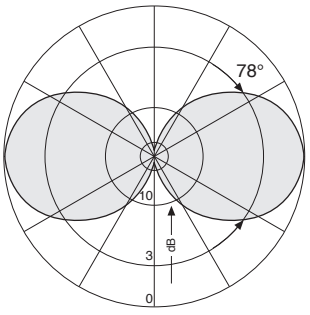
VPol Omni 824–960/1805–2170 360° 2dBi

Type No.	80010147
Input	1 x N female
Connector position	Bottom or top
Frequency range	824 – 960 MHz / 1805 – 2170 MHz
VSWR	< 2.0
Gain	2 dBi
Impedance	50 Ω
Polarization	Vertical
Max. power	50 W: 824 – 960 MHz 50 W: 1805 – 2170 MHz (at 50 °C ambient temperature)
Weight	250 g
Radome diameter	20 mm
Height	216 mm

Material: Radiator: Brass.
Radome: Fiberglass, colour: White.

Mounting: One hole mounting (16 mm diameter) to surfaces of max. 10 mm thickness.

Grounding: All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded.



Vertical Pattern

Summary – Remote Electrical Tilt (RET)

KATHREIN
Antennen · Electronic

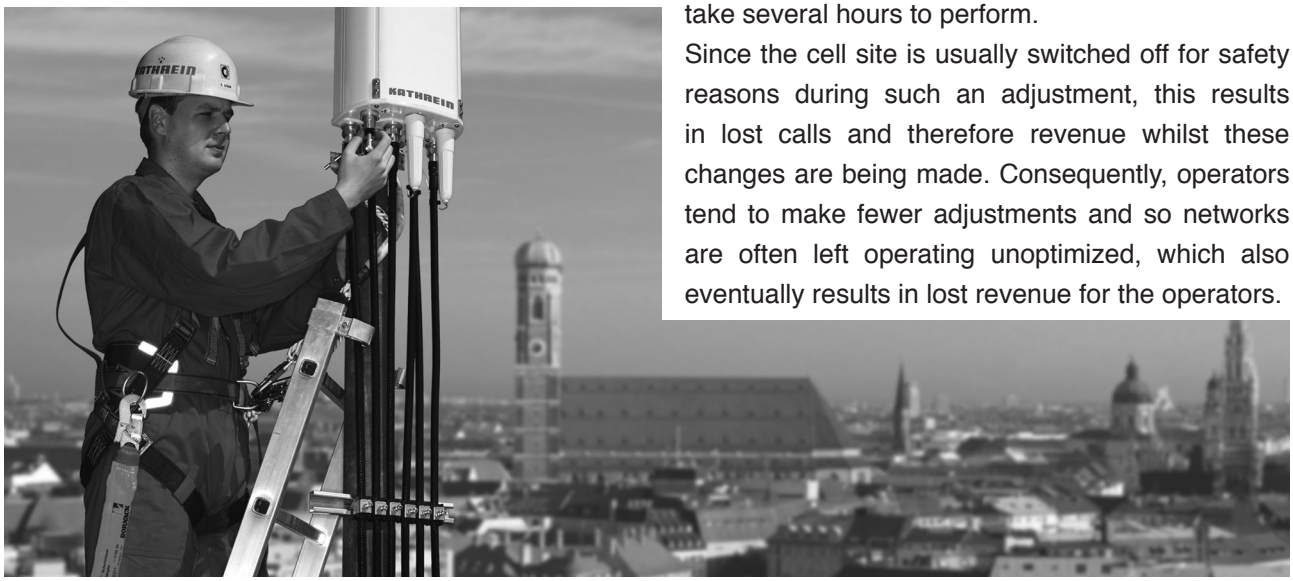
The answer to all current and future network demands

Network planning is becoming ever more complicated, especially with the advent of 3G and/or 4G (LTE).

The challenge for wireless network operators is to balance coverage, capacity, call quality and costs in order to gain maximum revenue from their network. Each of the above factors affects the others and so network engineers use many different techniques for establishing the right balance they are trying to achieve.

One of these methods is adjusting the antenna's downtilt. Here, the engineer must take into consideration certain facts, such as the weather, access to the cell site, availability of specialized installation teams and special equipment etc. Moreover, such an antenna adjustment can typically take several hours to perform.

Since the cell site is usually switched off for safety reasons during such an adjustment, this results in lost calls and therefore revenue whilst these changes are being made. Consequently, operators tend to make fewer adjustments and so networks are often left operating unoptimized, which also eventually results in lost revenue for the operators.



However, with Kathrein's Remote Electrical Tilt unit engineers can make the necessary adjustments without shutting down the whole system!

Further advantages of using Kathrein's Remote Electrical Tilt (RET) system:

- No need for specialized teams trained in altitude work or with special safety skills
- Limited site access and/or time restrictions are not so important
- No special platforms or other means of access to the antenna are required
- Adjustments can be made and the relevant measurements performed speedily
- Network alterations can be carried out irrespective of weather conditions
- No reduction in coverage – cells remain fully operational whilst changes are being made
- Operators estimate that approx. 20% of UMTS equipment can be saved by using such a RET system.

RET components

Kathrein's overall RET system works in accordance with the AISG (Antenna Interface Standards Group) standard and 3 GPP (3rd Generation Partnership Project).

Slimline RCU
(Remote Control Unit)

CCU (Central Control Unit)

PCA
(Portable Control Adapter)

DC Power and Signal Splitter

Optional:

Smart Bias Tee

Control Cable

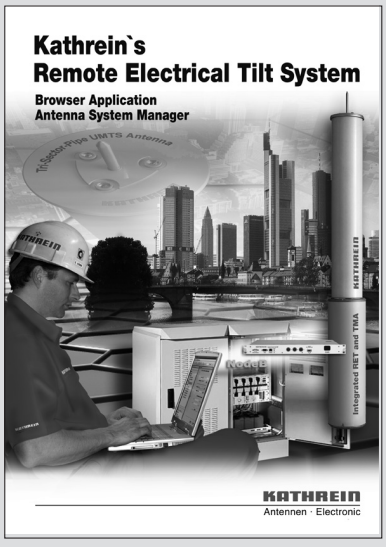
DTMA (Double Tower Mounted Amplifier)

Lightning Protection Device

Smart Plex®

Earthing Clamp

For details of RET system please see Kathrein RET system brochure



Remote Control Unit (RCU)

KATHREIN
Antennen · Electronic

Remote Control Unit (RCU) for Kathrein base station antennas with adjustable electrical downtilt and appropriate mechanical interface.

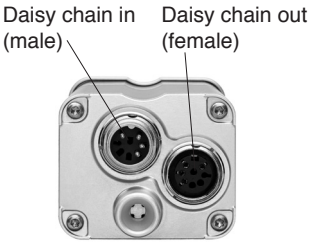
- Compliant to AISG 1.1 and 3GPP/AISG 2.0
- Compact size
- Daisy Chain feasibility
- Suitable for operation under outdoor condition

Type No.	86010147	86010148
Protocols	compliant to AISG 1.1 and 3GPP/AISG 2.0	
Logical interface ex factory [1]	AISG 1.1	3GPP/AISG 2.0
Input voltage range	10 ... 30 V (pin 1, pin 6)	
Power consumption	< 1 W (stand by); < 10 W (motor activated)	
Connectors [2]	2 x 8 pin connector according to IEC 60130-9; according to AISG Daisy chain in: male; Daisy chain out: female	
Hardware interfaces	RS 485A/B (pin 5, pin 3); power supply (pin 1, pin 6); DC return (pin 7); according to AISG / 3GPP	
Adjustment time (full range)	40 sec (typically, depending on antenna type)	
Adjustment cycles	> 50,000	
Temperature range	–40 °C … +60 °C	
Protection class	IP 24	
Lightning protection	AISG interface (each pin) 2.5 kA (10/350 μs) 8 kA (8/20 μs)	
Housing material	Profile: Aluminum anodized; cover: Aluminum die cast coated	
Weight	455 g (0.99 lbs)	
Packing size	245 x 93 x 102 mm, (9.6 x 3.6 x 4 inches)	
Dimensions (H x W x D)	177.5 x 59.5 x 49.5 mm, (7.0 x 2.3 x 1.9 inches)	

[1] The protocol of the logical interface can be switched from AISG 1.1 to 3GPP/AISG 2.0 and vice versa with a vendor specific command. Start-up operation of the RCU 86010147 is only possible in a RET system supporting AISG 1.1 and start-up operation of the RCU 86010148 is only possible in a RET system supporting 3GPP/AISG 2.0!
The protocol can also be changed as follows: *AISG 1.1 to 3 GPP:* Enter "3GPP" into the additional data filed "Installer's ID" and perform a layer 7 reset or a power reset. *3GPP to AISG 1.1:* Enter "AISG1" into the additional data field "Installer's ID" and perform a layer 2 reset or a power reset. After switching the protocol any other information can be entered into the "Installer's ID" field.

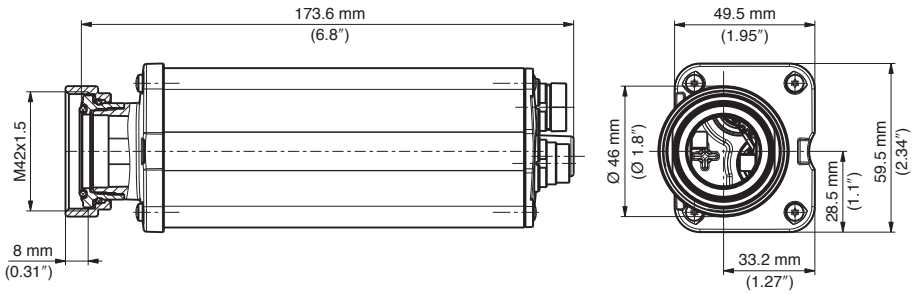
Please note:
If the Primary of the RET system doesn't support the standard of the 'logical interface ex factory', the RCU must be switched to the appropriate standard of the Primary before installation.
Please contact Kathrein for further information.

[2] The tightning torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened').
The connector should be tightened by hand only!



Bottom view of RCU

Standards:	EN 60950-1 (Safety) EN 60950-22 (Safety – Equipment installed outdoor) EN 55022 (Emission) EN 55024 (Immunity) ETS 300019-1-4 (Environmental) UL 60950-1; 1st edition
Certification:	CE, FCC
Scope of supply:	Remote Control Unit Assembly paste



RET

Central Control Unit (CCU)
For Remote Electrical Tilt (RET) and Tower Mounted Amplifier (TMA) Control

KATHREIN
Antennen · Electronic

For indoor use

AISG™
Antenna Interface Standards Group

Central Control Unit

Type No.	86010006	86010026
Connectors[1)] to RCU	3 x 8 pin connector acc. to IEC 60130-9, female, acc. to AISG	
Power supply from BTS	DC: –48 V / max. 1.7 A AC: 100 … 240 V / 50 ... 60 Hz / max. 1.6 A	DC: –48 V / max. 1.7 A
Power supply to RCU	3 x +29 V DC / max. 1.7 A (in total) 3 x +13 V DC / max. 3.8 A (in total)	
Total output power	Max. 50 W	
Interface to RCU and TMA	RS 485 / power supply	
Protocol to RCU and TMA	HDLC hex-coded command set, acc. to AISG	
Interface to BTS	Ethernet (10 Base-T) and RS 232	
Protocols to BTS	TCP/IP, PPP, HTTP/HTML, UDP, DHCP, FTP, SNMP, ICMP/PING	
Alarm interface to BTS	8 x open collector output, user programmable	
Max. number of RCU's and/or TMA's	Up to 27 RCU's in daisy chain and up to 6 DTMA's; depending on cable configuration and max. power	
Max. length of control cable	200 m (9 RCU's in daisy chain configuration)	
Temperature range	–25 °C ... +55 °C ambient temperature	
Packing size	597 mm x 367 mm x 148 mm	
Dimensions (h / w / d)	19″ 1 HU* (43.6 mm / 483 mm / 250 mm)	

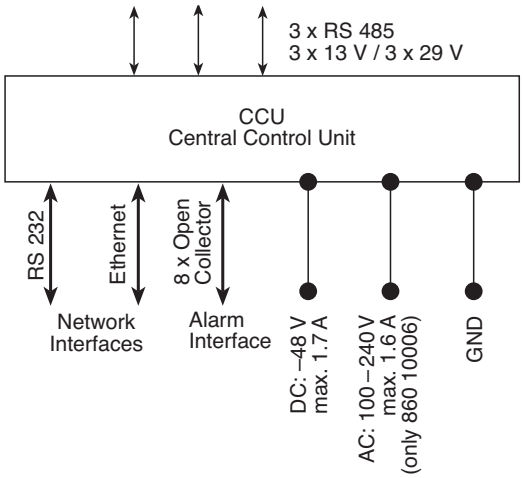
* HU = Height Unit
[1)] The tightning torque for fixing the connector must be 0.5 – 1.0 Nm ('hand tightened').
The connector should be tightened by hand only.

Standards: EN 60950-1
EN 55022
EN 55024
UL 60950-1, 1st edition

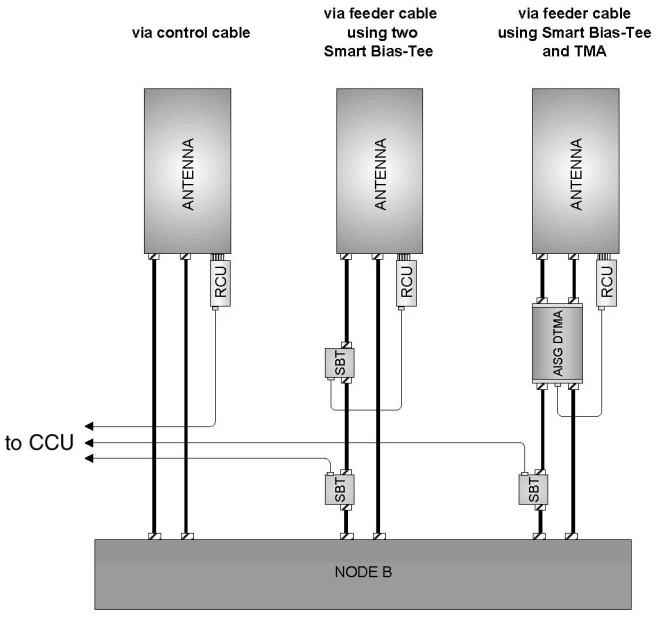
Certifications: CE, FCC part 15 class B; UL

Scope of supply: CCU
RET Manual
DC Cable
AC Power Cords for USA, UK and Germany
Ethernet cable, crossed

CCU Interfaces



Examples of CCU – RCU connections



RET

Portable Control Adapter (PCA)
For Remote Control Unit (RCU)
For Tower Mounted Amplifier (TMA)

KATHREIN
Antennen · Electronic

Portable Control Adapter

Type No.	86010046
Connector * to RCU/TMA	1 x 8-pin connector according to IEC 60130-9, female, conforming to AISG RF-connector (SMB male)
Input voltage of PCA	24 V DC
Output voltage to RCU's/ TMA's	AISG female pin 6 (24 V DC): 24 V DC ±10% AISG female pin 1 (12 V DC): 14 V DC ±7% RF male (at 24 V DC): 24 V DC ±10% *** RF male (at 12 V DC): 14 V DC ±7% ***
Output power (power supply to RCU's/ TMA's)	AISG female pin 6 (24 V DC) without load on pin 1 (12 V DC) and on RF-plug: ≤ 60 W AISG female Pin 1 (12 V DC) with max. 30 W load on pin 6 (24 V DC) and/or on RF plug: ≤ 30 W
Current monitoring measurement level	Per branch (12 V, 24 V, RF): 10 – 2500 mA
Over-current protection	Per branch (12 V, 24 V, RF): < 2500 mA
Interface to RCU/TMA	RS 485 / power supply / RF connector (SMB male)
Protocol to RCU/TMA	HDLC hex-coded command set, conforming to AISG 1.1 and 3GPP / AISG 2.0
Interface to PC	USB 1.1/2.0
Max. number of RCU's/TMA's	27/3 pcs., depending on system configuration and length of control cable
Max. length of control cable	200 m / 9 RCU's (in daisy chain configuration) 150 m / 6 RCU's (in splitter configuration)
Weight	535 g (incl. external power adapter)
Temperature range	0 ... +55 °C ambient temperature
Height x width x depth	40 mm x 95 mm x 160 mm
External power supply **	Input: 90 – 264 V AC, 47 – 63 Hz 24 V DC / 3.0 A

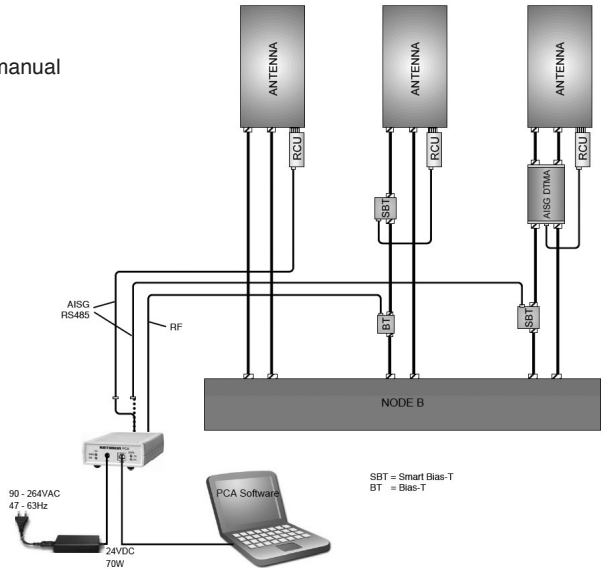
* Tightening torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened').
The connector should be tightened by hand only!
** If powered via AISG-interface, no external power supply is required.
*** Switchable with software

Certificate: CE
FCC part 15 class B
UL (for external power adapter)

Standards: EN 60950-1
EN 55022
EN 55024

System requirements for PCA Software: Windows 2000; Windows XP, Vista, Win7 (32 bit version)

Scope of supply: PCA
External power supply (24 V DC / 70 W)
USB cable
AC power cable
CD-ROM with PCA software, drivers and manual
Installation guide



RET

Connecting Cable
For Remote Electrical Tilt (RET) System

KATHREIN
Antennen · Electronic

For indoor and outdoor use

AISG™ Antenna Interface Standards Group

RET Cable for power supply and control

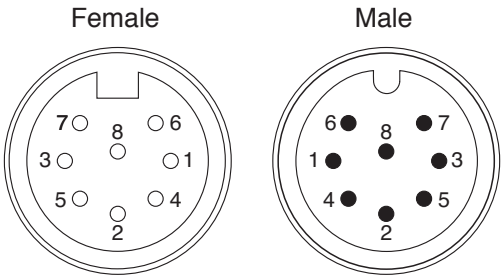
Type No.	86010007 ...
Connectors	2 x 8 pin connector according IEC 60130-9, female/male
Tightening torque for fixing the connectors	**0.5 – 1 Nm** **(The connector should be tightened by hand only)**
Construction	Screen 1x twisted pair 100 Ω/1 MHz 2x power supply, 1x ground AWM style 20317 I/II A/B + 20549 + 20233
Rated current	4 A (power supply) (at 50 °C air temperature)
Temperature range	–40 °C to +80 °C, (fixed position)
Protection class	IP 67 (connected)
Cable diameter	8 mm
Flammability	VL 1581 VW-1 CSA FT 1
Colour	Black, similar to RAL 9005

Minimum bending radius: One time 60 mm,
several times 120 mm.

The male and female connectors of all Kathrein RET products are compatible components which are designed to operate under the environmental conditions as described in ETS 300 019-1-4 class 4.1 E.

Control Cable

Length	Type No.
0.5 m	86010054
1 m	86010007
2 m	86010008
3 m	86010029
5 m	86010009
10 m	86010010
20 m	86010032
25 m	86010011
40 m	86010012
50 m	86010033
60 m	86010013
80 m	86010014
100 m	86010015



PIN assignment according AISG:
1 +13 V DC (+12 V DC nominal)
2 not connected
3 RS485 B
4 not connected
5 RS485 A
6 +29 V DC (+24 V DC nominal)
7 DC Return
8 not connected

DC-Power and Signal Splitter
For Remote Electrical Tilt (RET)
Indoor and Outdoor Use

KATHREIN
Antennen · Electronic

AISG compliant device for splitting of DC-power and control signals from one input to three outputs.

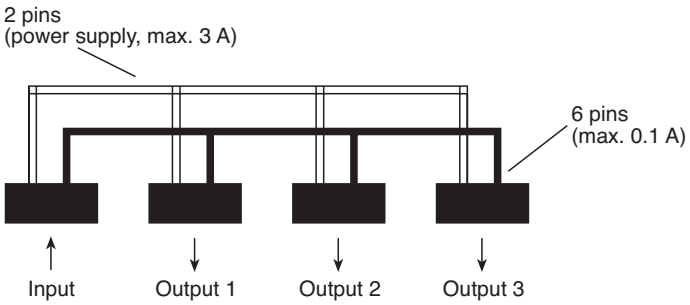
AISG
Antenna Interface Standards Group

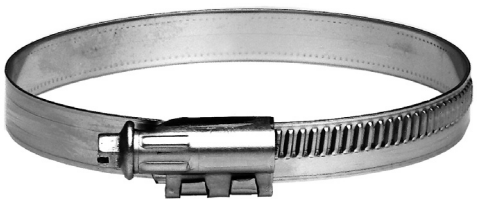
3-way Splitter for RET

Type No.	86010002
Connectors[1)]	4 x 8 pin connector according IEC 60130-9, 1 x male, 3 x female
Rated current (power supply)	3 A (at 50 °C)
Max. voltage	60 V
Protection class	IP 65
Weight	250 g
Packing size	114 mm x 117 mm x 117 mm
Height/width/depth	91 mm / 103 mm / 72 mm

[1)] The tightning torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened'). The connector should be thightened by hand only!

Material:	Connector plate: Aluminum. Cap: Plastic.
Mounting:	Mast mounting (50 – 145 mm diameter) by clamp. Wall mounting by screws (not supplied).
Note:	**Connectors must be situated at the bottom.** **No inverted mounting possible.**
Scope of supply:	3-way Splitter Clamp (Art.-No. 1311847)





Clamp, Art. No. 1311847

RET

Lightning Protection Device (LPD) For Remote Electrical Tilt (RET) Indoor and Outdoor Use

KATHREIN
Antennen · Electronic

The device is designed for lightning protection of control cables carrying partial lightning currents up to 25 kA (shield) and 2.5 kA (inner conductor), according IEC 61643-1, IEC 61312-3. Each pin is protected individually.

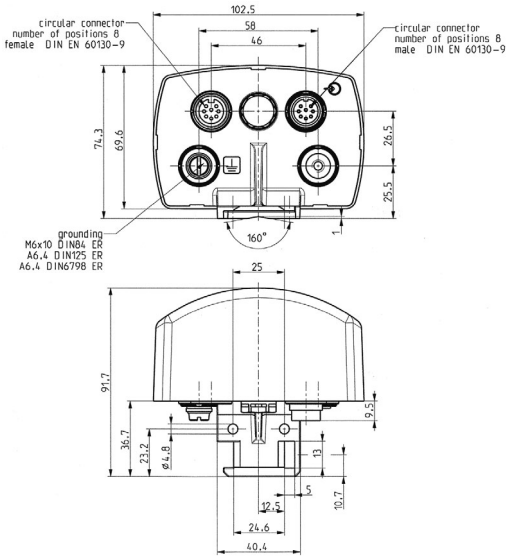
AISG™ Antenna Interface Standards Group

Lightning Protection Device for RET

Type No.	86010030
Connectors[1)]	2 x 8 pin connector according IEC 60130-9, input: male, output: female
SPD-Type	8 x bipolar gas tube
Max. impuls current	25 kA (housing, shield) (10/350 μs) inner conductors: 2.5 kA/pin (10/350 μs)
Max. dynamic overvoltage at spark gap (1 kV/μs)	< 700 V
Static overvoltage (100 V/s)	< 100 V
Grounding	Via mounting plate / clamps at metallic surfaces or via separate cable, min. cross-section 5 mm2 Cu (screw M6)
Max. operation current	4 A at 50 °C
Max. operation voltage	60 V
Weight	250 g
Packing size	114 mm x 117 mm x 117 mm
Height/width/depth	91 mm / 103 mm / 72 mm

[1)] The tightning torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened'). The connector should be thightened by hand only!

Material:	Connector plate: Aluminum. Cap: Plastic.
Mounting:	Mast mounting (50 – 145 mm diameter) by clamp. Wall mounting by screws (not supplied).
Note:	**No decoupling elements are integrated. The coordination with additional LPD's (device input) should be checked according to IEC 61312.** **Grounding of the device via the mounting plate at metallic surfaces or via additional grounding cable (not included in the delivery extend).** **Connectors must be situated at the bottom. No inverted mounting possible.** **Important: A control cable with a minimum length of 2 meters is required between Lightning Protection Device and Central Control Unit at the BTS to achieve the required decoupling.**
Scope of supply:	Lightning Protection Device Clamp (50 ... 145 mm)

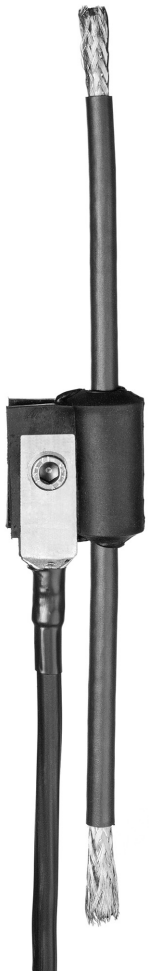


RET

Earthing Clamp
For Power Supply and Control Cable
For Remote Control Unit (RCU)

KATHREIN
Antennen · Electronic

The clamp is designed for lightning protection of control cables according to EN 50164-1



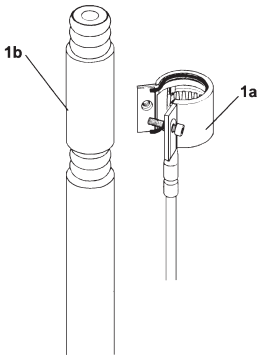
Earthing clamp for RCU power supply and signal cable

Type No.	86010031
Max. lightning current	20 kA (pulse 10/350 μsec)
Contact resistance	< 3 mΩ
Protection class	IP 68
Grounding	Via stranded grounding wire, 16 mm², length 0.5 m, one end terminated with cable eye (10 mm lug)
Packing size	Plastic bag: 210 mm x 210 mm
Weight	160 g

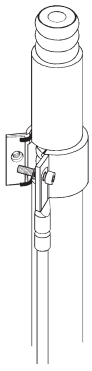
Material:	Body: Stainless steel with vulcanized Ethylene-Propylene-Caoutchouc Screw: Stainless steel Skin: Copper alloy Grounding wire: Copper
Note:	The earthing clamp is suitable only for the Kathrein Power Supply and Signal Cables, Type No. 860 10007 to 860 10015, 860 10029, 860 10032, 860 10033, 860 10054 to 860 10060 or shielded cables with – shield diameter 6.1 mm – jacket diameter 7.8 mm ±0.3 mm
The kit contains:	1 x Grounding kit body incl. Butyl sealing rope covered with paper 1 x Screw M6 DIN 912 1 x Grounding wire

Mounting instructions:

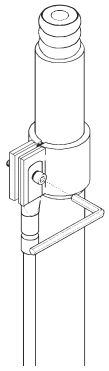
This instruction is written for qualified and experienced personnel. Please read it carefully before starting work. Any liability or responsibility for the result of improper or unsafe installation is disclaimed!



Attention!
Install grounding kit only where the cable runs straight.
Fig. 1a Preassembled grounding kit.
Fig. 1b Clean the plastic jacket at the desired grounding point and cut out a strip of 15 mm with aid of a suitable stripping tool.



Remove covering paper from Butyl sealing. Wrap the grounding kit body around the cable and align it.



Tighten the screw (> 6 Nm)

RET

Summary – Electrical Accessories
380 ... 3800

KATHREIN
Antennen · Electronic

Splitters

Type	Type No.	Frequency range	Remark	Max. power	Connector female	Page
2-way Splitter 380–3800	86010130	380 – 3800 MHz	Indoor/Outdoor	200 W	N	190
2-way Splitter 380–3800	86010131	380 – 3800 MHz	Indoor/Outdoor	700 W	7-16	190
2-way Splitter 694–2700	86010017	694 – 2700 MHz	Indoor	100 W	N	191
3-way Splitter 694–2700	86010018	694 – 2700 MHz	Indoor	100 W	N	191
4-way Splitter 694–2700	86010019	694 – 2700 MHz	Indoor	100 W	N	191
2-way Splitter 694–3800	86010100	694 – 3800 MHz	Indoor/Outdoor	200 W	N	192
2-way Splitter 694–3800	86010101	694 – 3800 MHz	Indoor/Outdoor	700 W	7-16	192
3-way Splitter 694–3800	86010102	694 – 3800 MHz	Indoor/Outdoor	200 W	N	192
3-way Splitter 694–3800	86010103	694 – 3800 MHz	Indoor/Outdoor	700 W	7-16	192
4-way Splitter 694–3800	86010104	694 – 3800 MHz	Indoor/Outdoor	200 W	N	192
4-way Splitter 694–3800	86010105	694 – 3800 MHz	Indoor/Outdoor	700 W	7-16	192

Tappers

2-way Tapper 694–2700 7.0/1.0 dB	86010136	694 – 2700 MHz	Indoor	100 W	N	193
2-way Tapper 694–2700 10.4/0.4 dB	86010137	694 – 2700 MHz	Indoor	100 W	N	193
2-way Tapper 694–2700 15.1/0.1 dB	86010138	694 – 2700 MHz	Indoor	100 W	N	193
2-way Tapper 694–2700 7.0/1.0 dB	86010150	694 – 2700 MHz	Indoor/Outdoor	500 W	7-16	194
2-way Tapper 694–2700 10.4/0.4 dB	86010151	694 – 2700 MHz	Indoor/Outdoor	500 W	7-16	194
2-way Tapper 694–2700 15.1/0.1 dB	86010152	694 – 2700 MHz	Indoor/Outdoor	500 W	7-16	194

Continuously adjustable ratio

2-way Tapper 790–960/1710–2170 5.0–15.0dB	K63236001	790 – 960 MHz 1710 – 2170 MHz	Indoor	100 W	N	195
2-way Tapper 870–960/1710–2500 5.0–15.0dB	86010023	870 – 960 MHz 1710 – 2500 MHz	Indoor	100 W	N	195

Antenna Measurement Tools (from Schomandl)

Power Meter

Low-loss Power Splitters Multi-band

380–3800

KATHREIN
Antennen · Electronic

For indoor and outdoor use.

2-way Splitter 380–3800

Type No.	86010130	86010131
Connector (female)	N	7-16
Max. power (at 50 °C ambient temperature)	200 W	700 W
For connecting ... antennas	2	
Frequency range	380 – 3800 MHz	
VSWR	< 1.5	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Impedance	50 Ω	
Insertion loss	< 0.05 dB	
Weight	750 g	870 g
Packing size	300 x 75 x 75 mm	

86010130

86010131

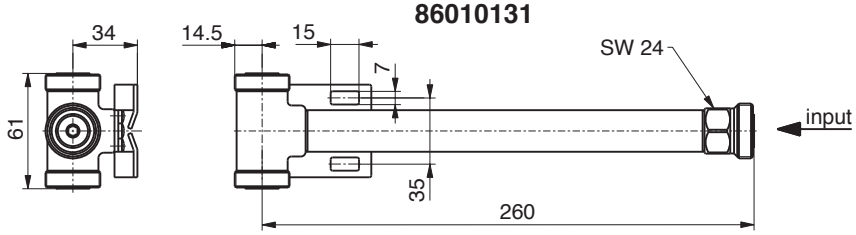
Material: Brass. Surface treatment: CuSnZn3

Mounting: Bracket for wall mounting included in the scope of supply.
For pipe mast mounting use clamps listed below (order separately).

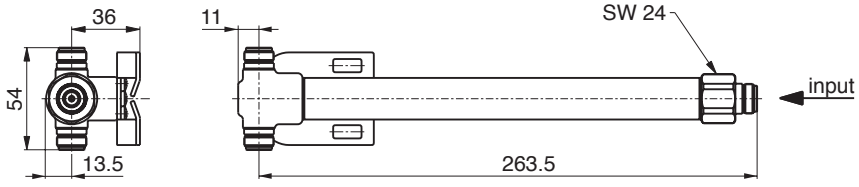
DC capability: DC transmission between all terminations (suitable for remote power supply systems).

Environmental conditions: ETS 300 019-1-4 class 4.1 E
– Low temperature: –55 °C
– High temperature (dry): +60 °C
IP 65

86010131



86010130



Clamps (order separately)

Type	Description	Remarks
736801	1 clamp	Mast: 34 – 60 mm diameter
736802	1 clamp	Mast: 60 – 80 mm diameter
736803	1 clamp	Mast: 80 – 100 mm diameter
736804	1 clamp	Mast: 100 – 120 mm diameter
736805	1 clamp	Mast: 120 – 140 mm diameter

736805

Low-loss Power Splitters Multi-band

694–2700

KATHREIN
Antennen · Electronic

For indoor use.

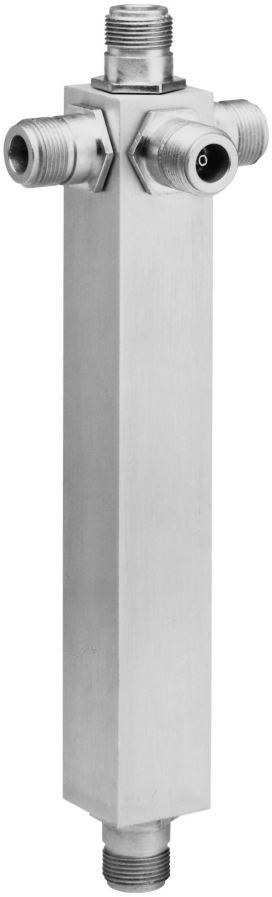
2-way Splitter 694–2700
3-way Splitter 694–2700
4-way Splitter 694–2700

Type No.	86010017	86010018	86010019
Frequency range	694 – 2700 MHz		
For connecting ... antennas	2	3	4
Insertion loss	< 0.05 dB		
Impedance	50 Ω		
VSWR 694 – 894 MHz:	< 1.52	< 1.52	< 1.5
790 – 2500 MHz:	< 1.25	< 1.25	< 1.3
2500 – 2700 MHz:	< 2.02	< 2.02	< 2.0
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power	100 W (at 50 °C ambient temperature)		
Connector	N female		
Weight	approx. 0.6 kg		
Profile cross-section	25 x 25 mm		
Packing size	242 x 110 x 95 mm		
Max. size	204 / 63 / 41 mm		

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission between all terminations
(suitbale for remote power supply systems).

Environmental conditions: IP 52



Input
86010019

Low-loss Power Splitters Multi-band

694–3800

KATHREIN
Antennen · Electronic

For indoor and outdoor use.

2-way Splitter 694–3800
3-way Splitter 694–3800
4-way Splitter 694–3800

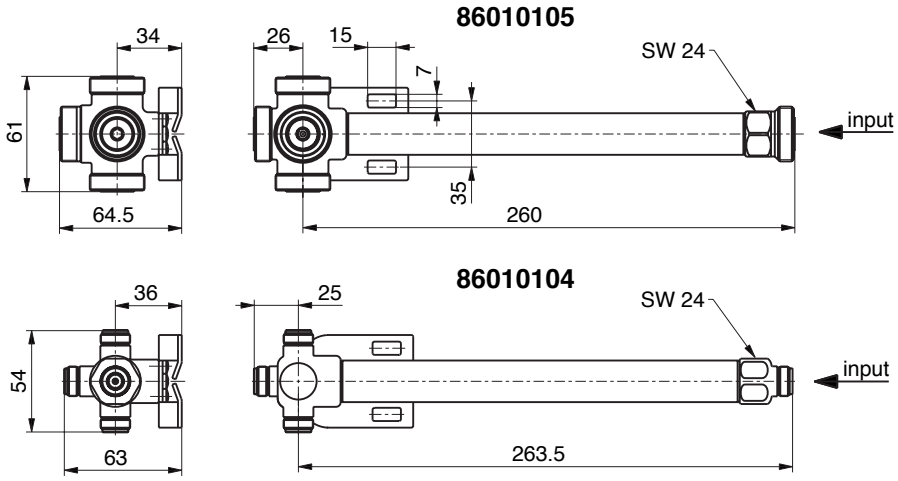
Type No.	86010100	86010101	86010102	86010103	86010104	86010105
Connector (female)	N	7-16	N	7-16	N	7-16
Max. power (at 50 °C ambient temperature)	200 W	700 W	200 W	700 W	200 W	700 W
For connecting ... antennas	2		3		4	
Frequency range	694 – 3800 MHz					
VSWR	694 – 894 MHz: < 1.32 790 – 3800 MHz: < 1.15					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)					
Impedance	50 Ω					
Insertion loss	< 0.05 dB					
Weight	750 g	870 g	760 g	900 g	775 g	960 g
Packing size	300 x 75 x 75 mm					

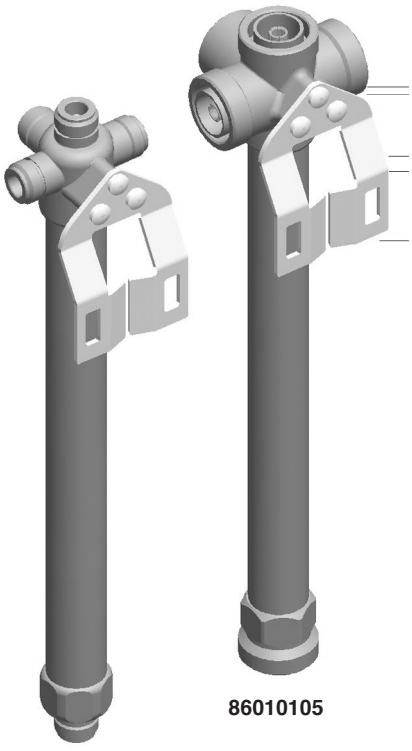
Material: Brass. Surface treatment: CuSnZn3

Mounting: Bracket for wall mounting included in the scope of supply.
For pipe mast mounting use clamps listed below (order separately).

DC capability: DC transmission between all terminations (suitable for remote power supply systems).

Environmental conditions: ETS 300 019-1-4 class 4.1 E
– Low temperature: –55 °C
– High temperature (dry): +60 °C
IP 65





Clamps (order separately)

Type	Description	Remarks
736801	1 clamp	Mast: 34 – 60 mm diameter
736802	1 clamp	Mast: 60 – 80 mm diameter
736803	1 clamp	Mast: 80 – 100 mm diameter
736804	1 clamp	Mast: 100 – 120 mm diameter
736805	1 clamp	Mast: 120 – 140 mm diameter

736805

Low-loss Power Tappers Multi-band

694–2700

KATHREIN
Antennen · Electronic

For indoor use.

2-way Tapper 694–2700 7.0 /1.0dB
2-way Tapper 694–2700 10.4/0.4dB
2-way Tapper 694–2700 15.1/0.1dB

Type No.	86010136	86010137	86010138
Frequency range	694 – 2700 MHz		
Tap Loss Input ↔ P_1 Input ↔ P_2	– 1.0 dB – 7.0 dB	– 0.4 dB – 10.4 dB	– 0.1 dB – 15.1 dB
For connecting ... antennas	2		
Insertion loss	< 0.05 dB		
Impedance	50 Ω		
VSWR	694 – 790 MHz: < 2.0 790 – 2500 MHz: < 1.5 2500 – 2700 MHz: < 2.0		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power	100 W (at 50 °C ambient temperature)		
Connector	N female		
Weight	500 g		
Profile cross-section	25 x 25 mm		
Packing size	267 x 95 x 111 mm		
Max. size	244 / 64 / 25 mm		

Material:	Housing: Aluminum. Inner conductor: Brass.
DC capability:	DC transmission only between input and port P_1. P_2 is coupled capacitively.
Environmental conditions:	IP 52

Low-loss Power Tappers Multi-band

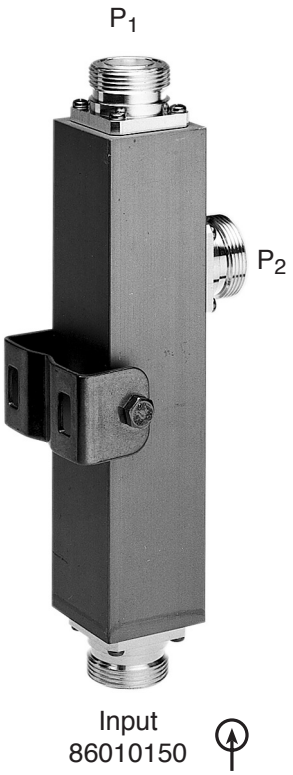
694–2700

KATHREIN
Antennen · Electronic

For indoor and outdoor use.

2-way Tapper 694–2700 7.0 /1.0dB
2-way Tapper 694–2700 10.5/0.5dB
2-way Tapper 694–2700 15.3/0.3dB

Type No.	86010150	86010151	86010152
Frequency range	694 – 2700 MHz		
Tap Loss Input ↔ P_1 Input ↔ P_2	 –1.0 dB –7.0 dB	 –0.5 dB –10.5 dB	 –0.3 dB –15.3 dB
For connecting ... antennas	2		
Insertion loss	< 0.05 dB		
Impedance	50 Ω		
VSWR	694 – 2700 MHz: < 1.5		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Connector	7-16 female		
Weight	Approx. 1.3 kg		
Packing size	310 x 93 x 112 mm		
Max. size	244 / 90 / 55 mm		



Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission only between input and port P_1.
P_2 is coupled capacitively.

Mounting: Bracked for wall mounting included in the scope of supply.
For pipe mast mounting use clamps listed below (order separately).

Environmental conditions: IP 65

Clamps (order separately)

Type No.	Description	Remarks
734360	1 tension band	Mast: 34 – 60 mm diameter
734361	1 tension band	Mast: 60 – 80 mm diameter
734362	1 tension band	Mast: 80 – 100 mm diameter
734363	1 tension band	Mast: 100 – 120 mm diameter
734364	1 tension band	Mast: 120 – 140 mm diameter
734365	1 tension band	Mast: 45 – 125 mm diameter

734364

Low-loss Power Tappers
Multi-band
Continuously Adjustable

790–960 / 1710–2170

870–960 / 1710–2500

5.0 – 15.0 dB

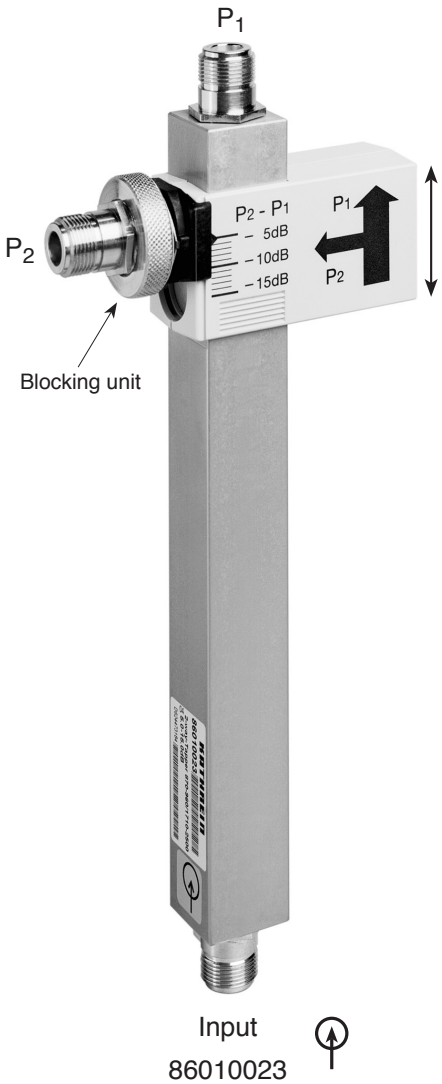
KATHREIN
Antennen · Electronic

For indoor use.

K63236001: 2-way Tapper 790–960/1710–2170 5.0–15.0dB
86010023: 2-way Tapper 870–960/1710–2500 5.0–15.0dB

Type No.	K63236001	86010023
Frequency range	790 – 960 MHz and 1710 – 2170 MHz	870 – 960 MHz and 1710 – 2500 MHz
Power ratio between outputs ($P_2 \leftrightarrow P_1$)	–5.0 dB to –15.0 dB continuously adjustable	
For connecting ... antennas	2	
Insertion loss	< 0.1 dB	
Impedance	50 Ω	
VSWR	790 – 824 MHz: < 2.1 824 – 960 MHz: < 1.7 1710 – 2170 MHz: < 1.7	< 1.7
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power	100 W (at 50 °C ambient temperature)	
Connector	N female	
Weight	0.5 kg	
Profile cross-section	25 x 25 mm	
Packing size	249 x 111 x 40 mm	277 x 111 x 40 mm
Max. size	235 / 100 / 25 mm	263 / 100 / 25 mm

Material:	Housing: Aluminum. Inner conductor: Brass. Adjustment mechanism: ASA.
DC capability:	DC transmission only between input and port P_1. P_2 is coupled capacitively.
Environmental conditions:	IP 52



Splitting table

P_2 / P_1 [dB]	Splitting ratio P_1 / P_2	Splitting attenuation P_{Input} / P_1 [dB]	Splitting attenuation P_{Input} / P_2 [dB]
–5	3.2	–1.2	–6.2
–6	4	–1.0	–7.0
–7	5	–0.8	–7.8
–8	6.3	–0.6	–8.6
–9	8	–0.5	–9.5
–10	10	–0.4	–10.4
–11	12.6	–0.3	–11.3
–12	15.8	–0.3	–12.3
–13	20	–0.2	–13.2
–14	25.1	–0.2	–14.2
–15	31.6	–0.1	–15.1

SWR Instrument FAT 2710

SCHOMANDL
RF-Instruments by a Kathrein-Group Company

KATHREIN
Antennen · Electronic

- LCD Display works in direct sunlight and with backlight in dark areas.
- Built-in synthesized RF sweeping source.
- Measured results can stored for further analysing and documentation on internal and external storage media
- Time stamp and operator ID is possible
- All in one analysing for antenna tuning and control
- FAT 2710 measures antenna, frequency, SWR and bandwidth by sweeping band of interest
- A cost-effective SWR Analyzer covering all major Cellular and mobile radio communication bands
- FAT 2710 gives you quick and reliable trouble-shooting

Specifications

Model	FAT 2710 (BN: 86817.001)
Application	Measurement of SWR in 50 ø transmission lines
Frequency range	30->2700 MHz entered as centre and span
Center Frequency	30 to 2700 MHz.
Span	0 to 2670 MHz.
Frequency stability	±50ppm
Measurement range	1.0<SWR<9.9, 0<dB<-30dB
Impedance	Nom. 50 ø
Generator output	Approx. -4dBm
Max. input on test terminal	100 mW
Tolerance on SWR reading	30-650MHz)± 5%; 650-1450MHz ± 10%; and 1450-2700MHz ±15%
Operating temperature range	0° C-> + 50° C
Storage temperature range	-30°C -> + 50° C
Connectors	"N"-female RF test connector. USB A type for memory key. USB B type for serial PC communication. Mini DIN for RS232 communication up to 38400 Baud
Power supply	4 NiMH type AA rechargeable batteries (Batteries, NiMH rechargeable and 230VAC/7.5VDC charger supplied)
Auto Power off NOT OK	For battery economy, FAT 2710 automatically turns off 3 min. after last entry
Normal operating use	Fully charged: More than 10 hours.
Colour	Silver/blue
Width	82 mm
Depth	31 mm
Height	165 mm
Weight	500 gram (incl. Batteries)
EMC	Complies with directive 89/336EEC as amended by 92/31EEC and 93/68/EEC
Standards	Emissions: EN 61000-6-4: 2001 Immunity: EN 61000-6-2: 2005
Accessory	Soft carrying bag with RF-adapter set, car charching cable and two 7/16 connectors
Order Number for Accessory:	BN: 86817.101

Please contact for technical information and orders:
SCHOMANDL-Vertriebs-GmbH
Bahnhofstraße 108 · D-83224 Grassau/Germany
Telephone: 08641-403-140 · Telefax: 08641-403-264
e-mail: info@schomandl.de · Internet: http://www.schomandl.de

WLAN Power Meter

SCHOMANDL
RF-Instruments by a Kathrein-Group Company

KATHREIN
Antennen · Electronic

Display forward, reflected power and VSWR

2 GHz to 6 GHz

Diagnose 802.11a,b and g WLAN

Accessory:
Soft carrying bag with SMA 50 Ohm load 6 GHz, RPSMA male BN 86817.104 to SMA female Adaptor, SMA male to RPSMA, SMA male to SMA male Adaptor and special 2,4 GHz SMA Antenna

Specifications

Model No.:		86817.004
Frequency range:		2 – 6 GHz
Insertion loss:		<0.4dB
Absolute accuracy :		±1dB
Power range indicated:		1μW – 999mW
VSWR indicated:		1.01 – 9.99 : 1
Directivity:		>30dB
Peak Detect of:		<1mS pulse
Auto Power off		1 minute
Power Supply:		3Volt (2 X AAA Alkaline)
Max power consumption:		50 mA
Operating time (no backlight)		20 Hours
Optional Accessories:		SMA to RPSMA adaptors
Belt clip		Option
EMI/RFI		EN55022 /B
Dimensions:	– Width: – Depth: – Height:	58 mm 23 mm 105 mm
Weight incl. Batteries:		approx. 130g
Temperature:	– Operating – Storage	0 to 40°C –20 to 80°C
Colour:	– Standard	White/Grey

Please contact for technical information and orders:
SCHOMANDL-Vertriebs-GmbH
Bahnhofstraße 108 · D-83224 Grassau/Germany
Telephone: 08641-403-140 · Telefax: 08641-403-264
e-mail: info@schomandl.de · Internet: http://www.schomandl.de

Broadcast RF Power Monitor
Digital RF Power Meter

SCHOMANDL
RF-Instruments by a Kathrein-Group Company

KATHREIN
Antennen · Electronic

Also avalible as 19″ Rack mount Version:

1U Rack mount Power Monitor

including all options BN 86818.000

additional power, reflected power, VSWR calculation

Accessory:
UHF Probe 1 or 2 required BN 86818.101
VHF Probe 1 or 2 required BN 86818.102

Specifications for Broadcast Power Monitor with external coupler

Model No.:	86818.002
Frequency range: (Coupler dependent)	50 – 860 MHz
Coupling Flatness ,	±0,2dB
from 6dB/octave Probes 3015,3016	
Absolute accuracy after offset adjustment:	±0,2dB (±4%)
True RMS Power range:	–34 dBm to +10 dBm
Peak Power range:	+24 dBm
Dynamic range:	> 50 dB
Power readout: Auto range 1KW – 999KW	1024 steps
Coupler attenuation VHF @ 100MHz:	43 dB to 73 dB
Coupler attenuation UHF @ 500MHz:	50 dB to 80 dB
VSWR readout:	1,00:1-9,99:1
Remote Temperature Sensing	0 – 99°C
Remote Voltage Sensing	0–100VDC
Remote Current Sensing	0–3V DC (1024 bits)
Relay Out/Digital Out:	Open Collector 50V/0,5A
Controller out for SNMP or dialup	RS232 1200- 9600 Bps
Power Supply: – AC power:	90-264V @ 50-60Hz
Max power consumption: – AC	10V/A
EMI/RFI	EN55022 /B
Connectors: – RF sensors – Power AC in rear Options: – Analogue/digital – RS232	DB9 Female IEC DB9 Female DB9 Male
Dimensions: – Width: 19″ unit – Depth: 1HU	482.5 mm 180 mm 44 mm
Dimensions: – Width: Stand alone unit – Depth: – Height:	216 mm 180 mm 53 mm
Weight:	approx. 1.8 kg
Temperature: – Operating -Storage	5 to 50°C 20 to 80°C
Colour: – standard	Silver Anodised
Order Number for Accessory:	BN: 86817.101

Please contact for technical information and orders:
SCHOMANDL-Vertriebs-GmbH
Bahnhofstraße 108 · D-83224 Grassau/Germany
Telephone: 08641-403-140 · Telefax: 08641-403-264
e-mail: info@schomandl.de · Internet: http://www.schomandl.de

Safe One
Personal RF Safety Monitor

SCHOMANDL
RF-Instruments by a Kathrein-Group Company

KATHREIN
Antennen · Electronic

Monitors RF fields

Indicates RF pollution

Alarm and Silent modes

Broadband coverage

General Safety According to WHO ICNIRP

Alarm 2W/m^2 or 10W/m^2

Specifications for Broadcast Power Monitor with external coupler

Model No.:		86817.003
Frequency range:		10 – 10000 MHz
Frequency response		ICNIRP
Absolute accuracy 400–2500MHz:		±6dB
Power range indicated:		0. 1 – 100 W/m2
Field strenght indicated:		19 – 137 V/m
Dynamic range:		>30dB
Audio Alarm		80dBa
LED Alarm always enabled		15mcd
Normal Mode Audio and LED Alarm: (–)		2W/m2 – 28V/m or 10W/m2 – 137V/m
Timed Mode Silent in: (– –)		5 minutes
Audible Alarm Off Mode: (– – –)		Never
Power Supply:		3Volt (2 X AAA Alkaline)
Max power consumption no alarm:		110μA
Operating time (no Audio Alarm)		+500 Days
Belt clip included		
EMI/RFI		EN55022 /B
Dimensions:	– Width: – Depth: – Height:	58 mm 23 mm 105 mm
Weight incl. Batteries:		approx. 88g
Temperature:	– Operating – Storage	–10 to 40°C –20 to 80°C
Colour:	– Standard	Black/Grey

Please contact for technical information and orders:
SCHOMANDL-Vertriebs-GmbH
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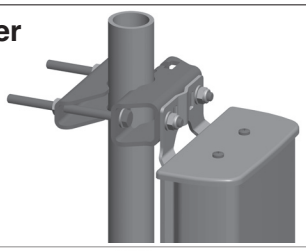
Telephone: 08641-403-140 · Telefax: 08641-403-264
e-mail: info@schomandl.de · Internet: http://www.schomandl.de

Summary – Mechanical Accessories
Clamps, Downtilt Kits ...

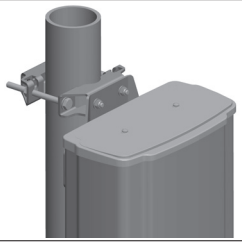
KATHREIN
Antennen · Electronic

The hereinafter referred to “wind load category L - M - H” correspond to the defined “category of mounting hardware” given in the respective data sheets.

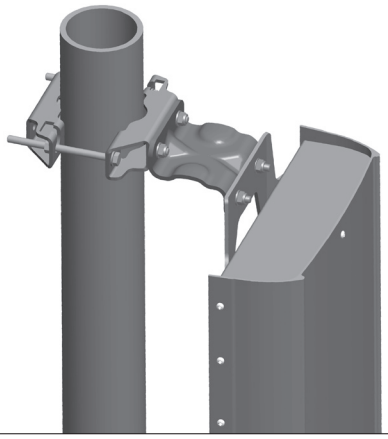
Small Pipe Diameter



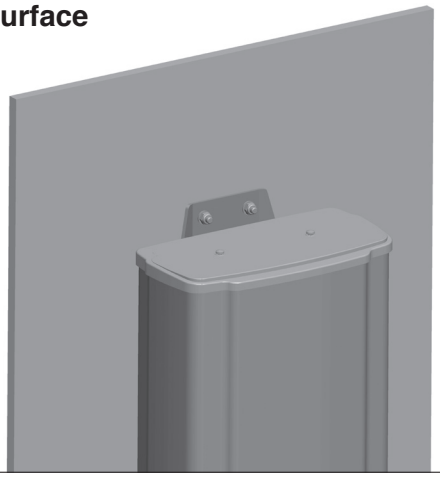
Large Pipe Diameter



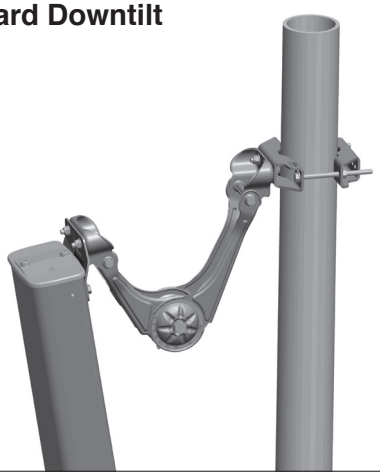
Off-set



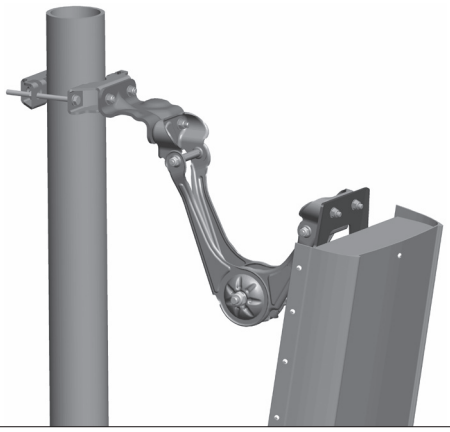
Flat Surface



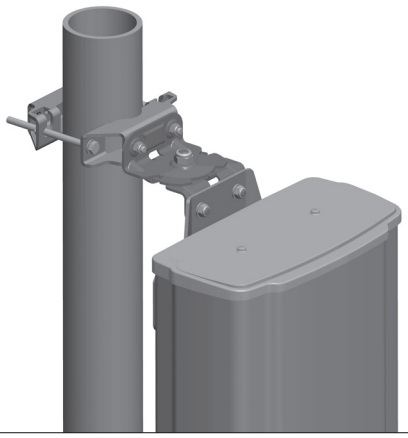
Standard Downtilt



Off-set Downtilt



Azimuth

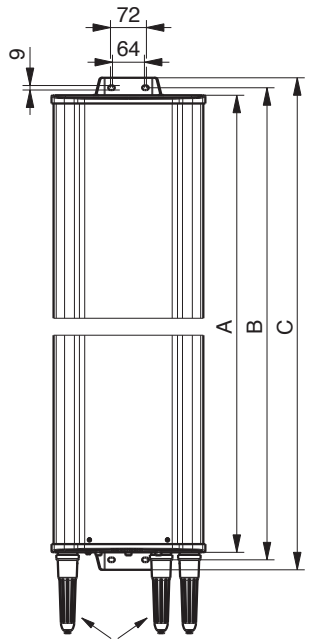


Antenna dimensions and detailed connector position can be found on our current data sheets. Please refer to the information on page 2 of out latest data sheets which are available on our homepage:

www.kathrein.de
– Base station system products
– Product search

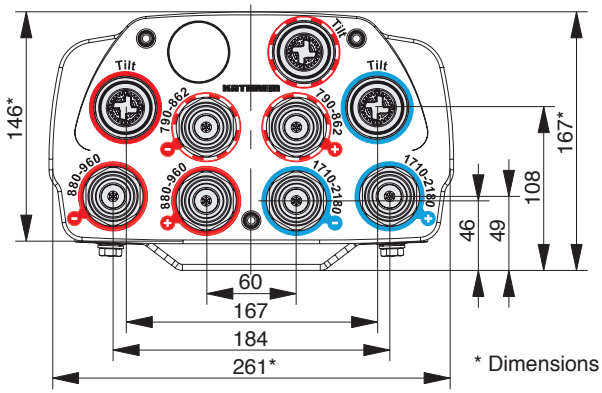
An example is shown below of how the antenna dimensions are displayed on our data sheets:

Front view



Adjustment mechanism
with integrated scale

Bottom view



* Dimensions refer to radome

Colour Coding for Connectors on outdoor Base Station Antennas

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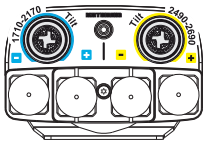
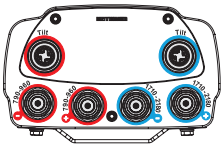
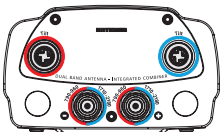
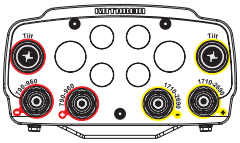
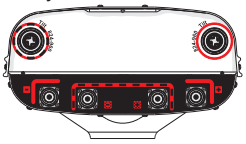
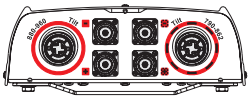
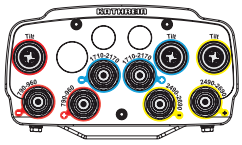
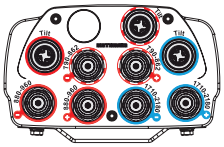
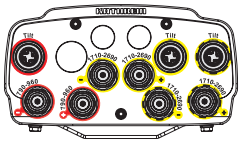
	First coding	Second coding	Third coding
Frequency range (MHz)	Frequency range us not devided	Frequency range is split into 2 bandwidths or 2 separate systems within same frequency range	Frequency range is split into 3 bandwidths or 3 separate systems within same frequency range
Low band 694 ... 960	**Base colour Red** Continuous line	Broken line	Dotted line
High-band 1710 ... 2200	**Base colour Blue** Continuous line	Broken line	Dotted line
incl. LTE 2.6 1710 ... 2690	**Base colour Yellow** Continuous line	Broken line	Dotted line
Dual-band antenna	Dual-band filterantenna // 2.6 GHz  Standard Dual-band 800 MHz // 2.6 GHz  Standard Dual-band 800 MHz // 2.6 GHz Combiner Version  Dual-band 800 MHz // 2.6 GHz 	Side-by-side 900 // 900 MHz  Side-by-side 800 // 900 MHz 	not available
Triple-band antenna	Filterantenna Triple-band 900 MHz // 2 // 2.6 GHz 	Filterantenna Triple-band 800 // 900 MHz // 2 GHz  Stacked Triple-band 900 MHz // 2.6 // 2.6 GHz 	Triple-band 2.6 // 2.6 // 2.6 GHz 
Quad-band antenna	not available	Filterantenna Quad-band 800 // 1800 MHz // 2 // 2.6 GHz  Quad-band 800 // 1800 MHz // 2 // 2.6 GHz	no example available yet

Modified Product Line of Mounting Parts

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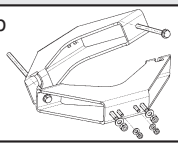
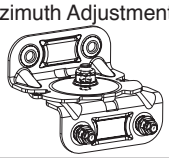
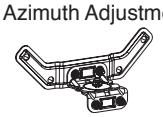
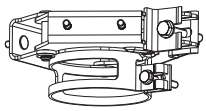
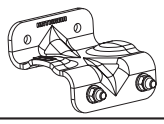
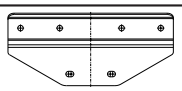
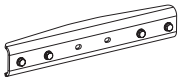
Type	Windload Classification	Pole Diameter in mm	Type No.	Remark
Clamp 	light / medium	∅ 28 – 64	731651	Modified product
	light / medium / heavy	∅ 42 – 115	738546	
	light / medium / heavy	∅ 110 – 220	85010002	
		∅ 210 – 380	85010003	
Downtilt kit 	light		732317	Modified product
			732318	
			732321	
			732322	
			732327	
Downtilt kit 	light / medium		737971	Modified product
			737972	
			737973	
			737974	
			737975	
			737976	
			737977	
			737978	
Downtilt kit 	heavy	New product	85010008	Replacement for 85010007
Azimuth Adjustment Kit 	light / medium		85010014	Pole mounting adjustment angle ±30° (additional clamp needed)
	heavy		85010015	
Azimuth Adjustment Kit 	light / medium		85010016	Wall mounting adjustment angle ±30°
	heavy		85010017	
3 Sector Clamp 	light / medium	∅ 88.9	742263	
		∅ 88.9	742317	New product
		∅ 114.3	742033	
		∅ 139.7	742034	
	heavy	∅ 114.3	85010058	New product
		∅ 139.7	85010059	New product
Offset 	light / medium	New product	85010060	Clearance between pole and antenna (additional clamp needed)
	heavy	New product	85010061	
2x Panel Mounting Kit	light / medium		742113	Additional clamp needed
	heavy		85010006	
Tension Band 	light	∅ 34 – 60	734360	Please note: Only usable without downtilt kit
		∅ 60 – 80	734361	
		∅ 80 – 100	734362	
		∅ 100 – 120	734363	
		∅ 120 – 140	734364	
		∅ 45 – 125	734365	

Mounting Hardware
Amount of needed clamps

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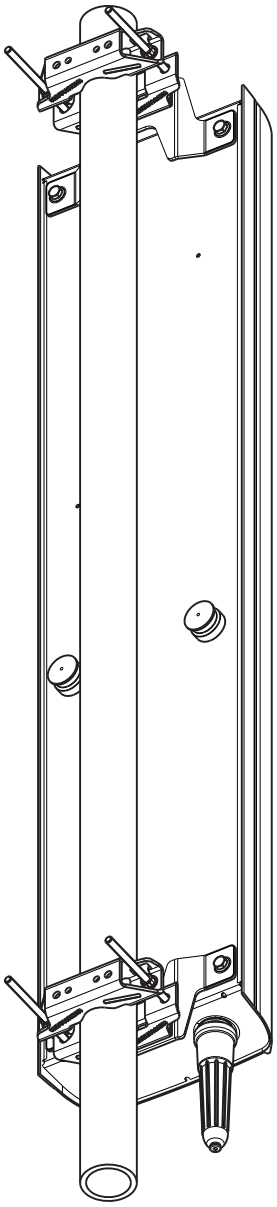
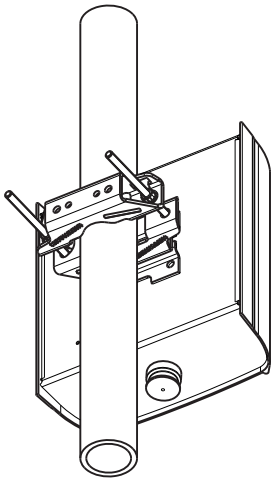
VPol 800/900
All other Panels

2 pcs



VPol 800/900
Antenna height: 264 mm

1 pc



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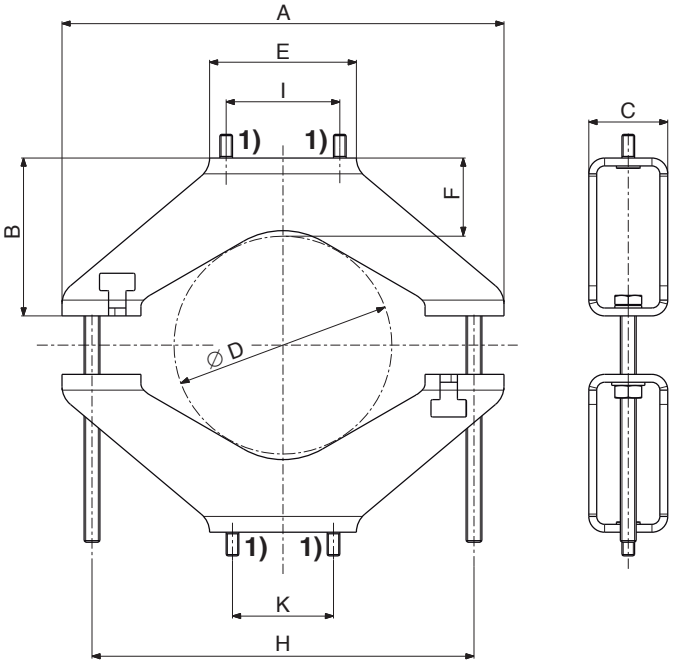
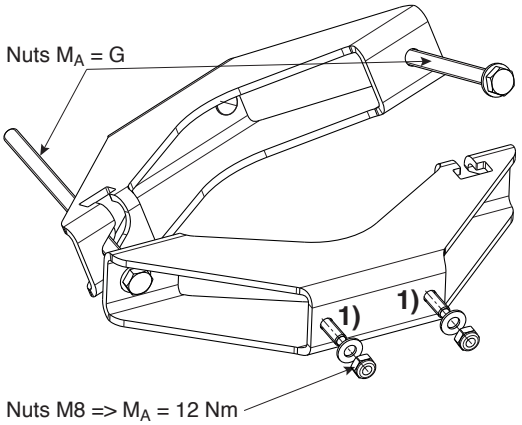
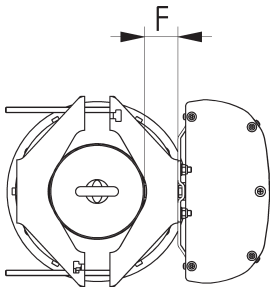
Clamps

Type No.	731651	738546	85010002	85010003
Suitable for mast diameter	28 – 60 mm	42 – 115 mm	110 – 220 mm	210 – 380 mm
Antenna – mast distance F	25 – 28 mm	20 – 26 mm	47 – 55 mm	48 – 68 mm
Number of pieces	1 clamp	1 clamp	1 clamp	1 clamp
Material – Clamp – Screws – Nuts	Hot-dip galvanized steel Hot-dip galvanized steel/ Stainless steel Stainless steel	Hot-dip galvanized steel Hot-dip galvanized steel/ Stainless steel Stainless steel	Hot-dip galvanized steel Hot-dip galvanized steel/ Stainless steel Stainless steel	Hot-dip galvanized steel Stainless steel/ Stainless steel Stainless steel
Weight	0.8 kg	1.1 kg	2.7 kg	4.8 kg





1) Modified version with studs will be supplied from middle of 2012 onwards. Until then the clamps will be delivered as previously specified (with mounting holes).



Type No.	A	B	C	D	E	F	G	H	I	K
731651	116 mm	40 mm	40 mm	28 – 60 mm	93 mm	25 – 28 mm	20 Nm	84 mm	–	64 mm
738546	152 mm	40 mm	40 mm	42 – 115 mm	93 mm	20 – 26 mm	25 Nm	125 mm	72 mm	64 mm
85010002	280 mm	100 mm	50 mm	110 – 220 mm	93 mm	47 – 55 mm	35 Nm	240 mm	72 mm	64 mm
85010003	442 mm	150 mm	50 mm	210 – 380 mm	150 mm	48 – 68 mm	35 Nm	392 mm	72 mm	64 mm

Please note: Kathrein does not recommend to use counter nuts.
The additional nuts supplied are only meant as spares.

Standard Downtilt kit for Panel Antennas (Wind load Category “L”)

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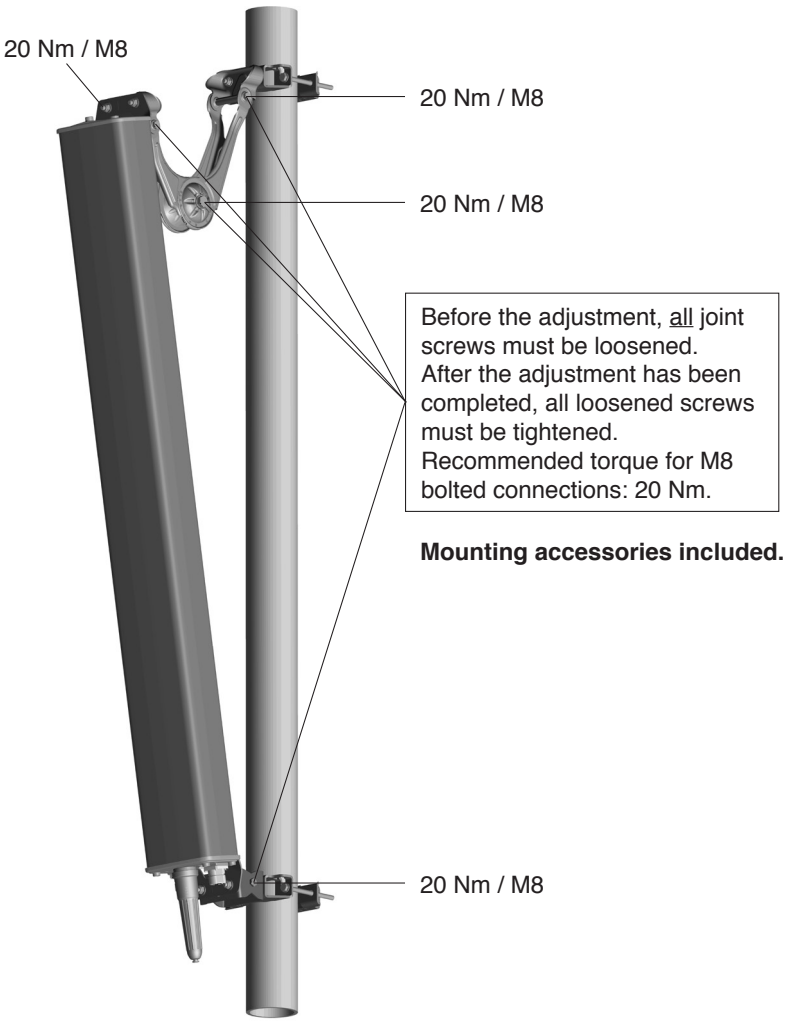
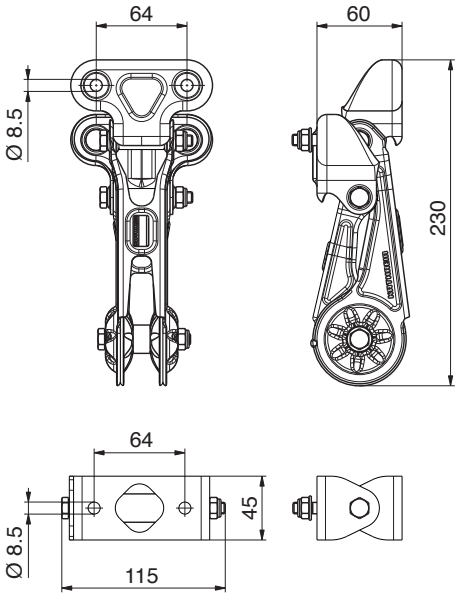
Antenna height: 502 mm
662 mm
982 mm
1302 mm



Before the adjustment, all joint screws must be loosened. After the adjustment has been completed, all loosened screws must be tightened. Recommended torque for M8 bolted connections: 20 Nm.

Mounting accessories included.



For heights not mentioned in this table please use downtilt kit 732327.

Downtilt angle

		Downtilt kit with scale	Downtilt kit without scale*		
Antenna height	**Downtilt angle**	**Type No.**	**Type No.**	**Weight**	**Material**
502 mm	0° – 25°	732322	732327	Approx. 1.3 kg	All parts: Hot-dip galvanized steel Nuts / washers: Stainless steel
662 mm	0° – 19°	732321			
982 mm	0° – 13°	732318			
1302 mm	0° – 10°	732317			

* Instructions to adjust the required downtilt angle are given in the datasheet or on the rearside of the antenna.

Mounting a downtilt kit enlarges the spacing between mast and antenna by 42 mm.

Standard Downtilt kit for Panel Antennas (Wind load Category “L” and “M”)

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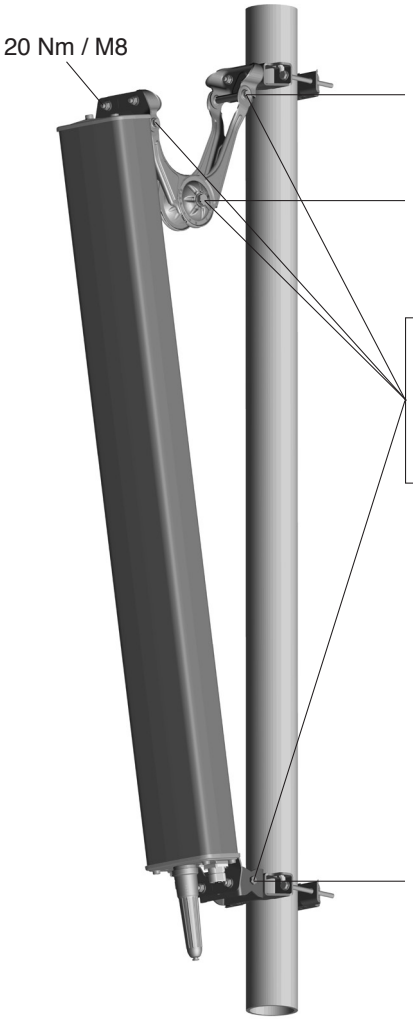
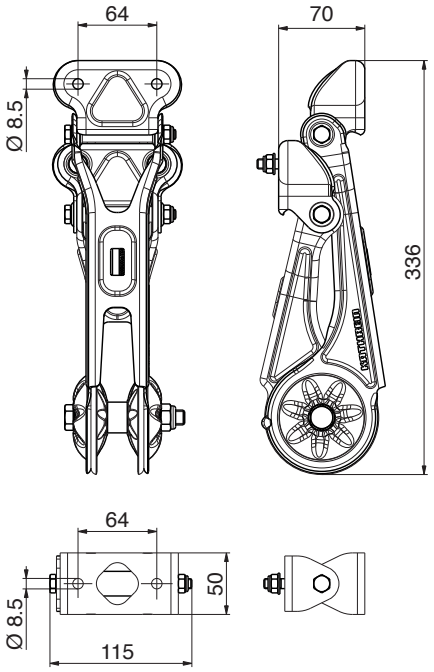
Antenna height: 654 – 735 mm
974 – 1032 mm
1294 – 1306 mm
1934 – 1946 mm
2254 / 2256 mm
2574 – 2582 mm



Before the adjustment, all joint screws must be loosened. After the adjustment has been completed, all loosened screws must be tightened.

Mounting accessories included.



For heights not mentioned in this table please use downtilt kit 737978.

Downtilt angle

		Downtilt kit with scale	Downtilt kit without scale*		
Antenna height	**Downtilt angle**	**Type No.**	**Type No.**	**Weight**	**Material**
654 – 735 mm	0° – 30°	737972	737978	Approx. 2.3 kg	All parts: Hot-dip galvanized steel Nuts / washers: Stainless steel
974 – 1032 mm	0° – 21°	737973			
1294 – 1306 mm	0° – 16°	737974			
1934 – 1946 mm	0° – 11°	737975			
2254 / 2256 mm	0° – 9°	737977			
2574 – 2582 mm	0° – 8°	737971			

* Instructions to adjust the required downtilt angle are given in the datasheet or on the rearside of the antenna.

Mounting a downtilt kit enlarges the spacing between mast and antenna by 84 mm.

Use the downtilt kit together with the clamps Type No. 731651, 738546, 85010002, 85010003, 85010014 for pole mounting and 85010016 for wall mounting.

Standard Downtilt kit for Panel Antennas (Wind load Category “H”)

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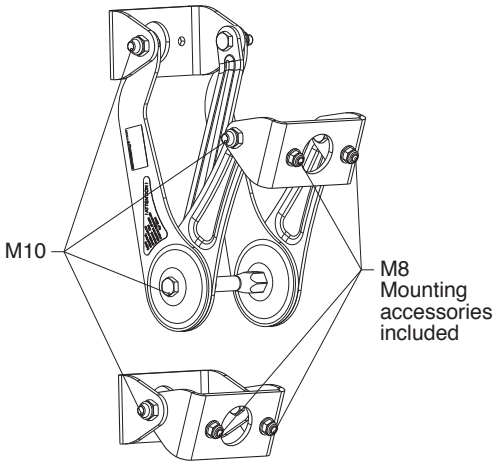
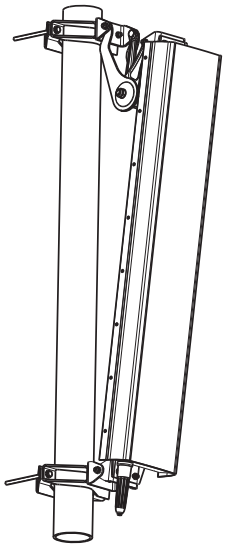
Special downtilt kit for Panel antennas with a higher wind load.



Downtilt kit

Type No.	85010008
Preferred range of use	– Panel antennas with a higher wind load – Panel antennas with attached mounting plates – **Downtilt kit without scale for universal use**
Weight	6.5 kg
Material	Hot-dip galvanized steel
Screws	Hot-dip galvanized steel / stainless steel
Nuts	Stainless steel



Recommended mast clamps:

Type No.	Description	Mast diameter	Weight approx.	Units per antenna
738546	1 clamp	42 – 115 mm	1.1 kg	2
85010002	1 clamp	110 – 220 mm	2.9 kg	2
85010003	1 clamp	210 – 380 mm	4.8 kg	2

Recommended torque for all bolted connections:

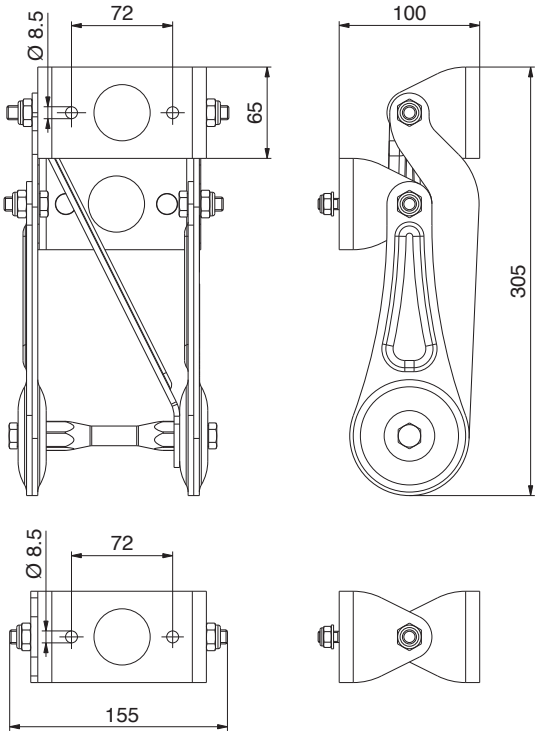
Screw size	Torque
M8	20 Nm
M10	50 Nm

Maximum acceptable load:

Frontal wind load	< 5000 N
Lateral wind load	< 1300 N

Downtilt angle

Antenna height	Downtilt angle
1498 mm	0° – 13°
2058 mm	0° – 10°
2516 mm	0° – 8°
2628 mm	0° – 8°



All Panels
Mounting Hardware
Azimuth Adjustment Kits

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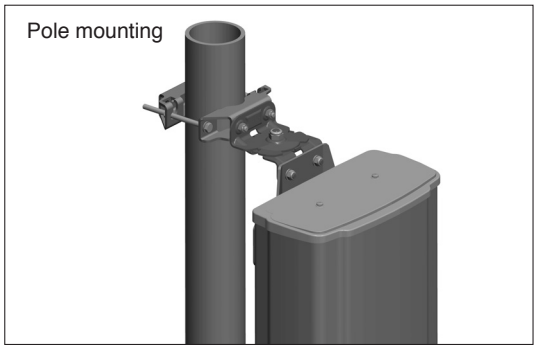
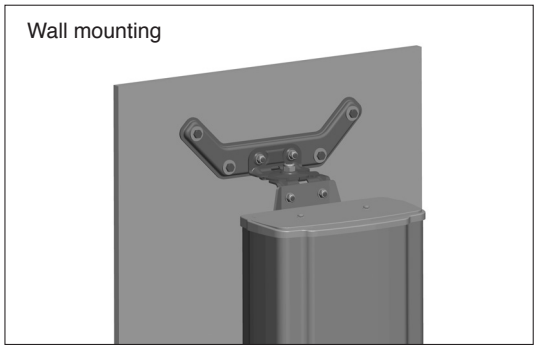
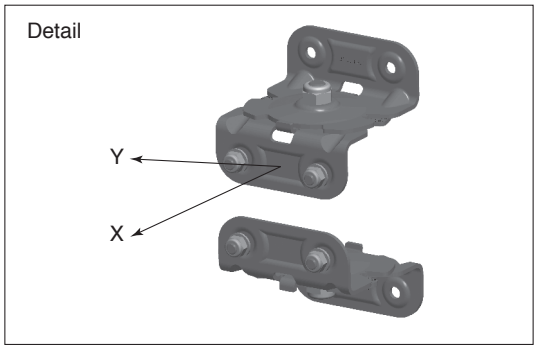
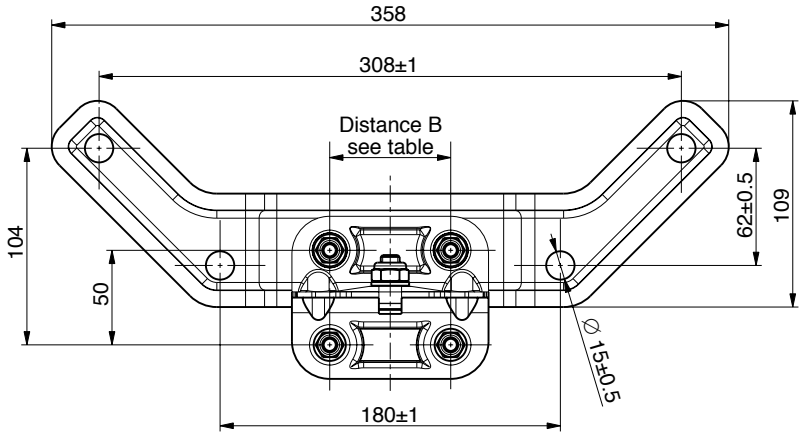
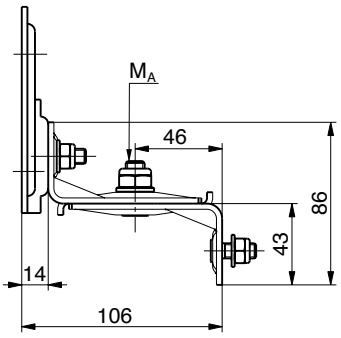










The azimuth adjustment kit for pole mounting can be mounted with all suitable clamps, 3-Sector clamps and 2x A-/C-/F-Panel mounting kits (with the latter only as an interface between mounting kit and antenna).

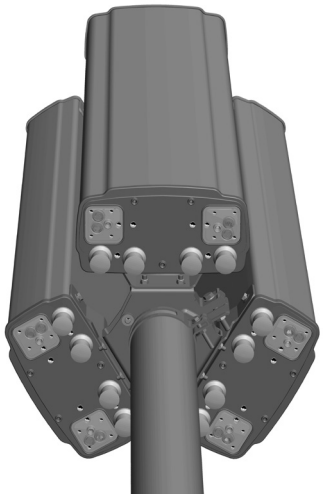
Type No.	85010014	85010015	85010016	85010017
Suitable for	pole mounting		wall mounting	
Number of pieces	2 brackets	2 brackets	2 brackets	2 brackets
Distance between screws [B]	64 mm	72 mm	64 mm	72 mm
Angular range	± 30°		± 30°	
Weight / kit	approx. 1260 g	approx. 1260 g	approx. 2500 g	approx. 2500 g
Supplied mounting accessories	all screws		Screws and dowels for wall fastening are not supplied, they must be chosen by installer according to on-site requirements.	
	Adapter for downtilt kit 7323xx series		Adapter for downtilt kit 7323xx series	
Materials	Parts are hot-dip galvanized steel; Captive nuts are stainless steel			
Max. permissible static load / kit – X direction – Y direction	 2150 N 760 N	 5100 N 1350 N	 2150 N 760 N	 5100 N 1350 N

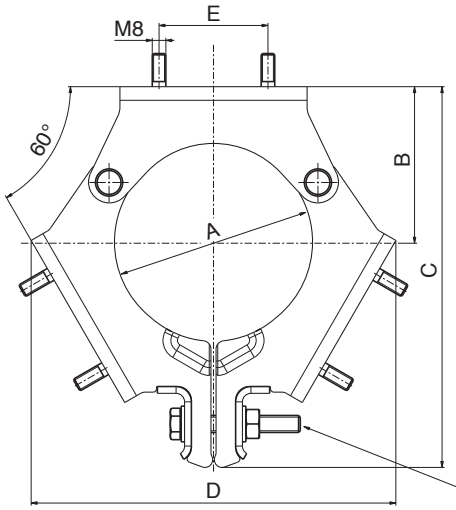
Recommended torque: Screws M6: 8 Nm; Screws M8: 20 Nm; MoS_2 greased.
Minimum torque MA: 30 Nm; MoS_2 greased

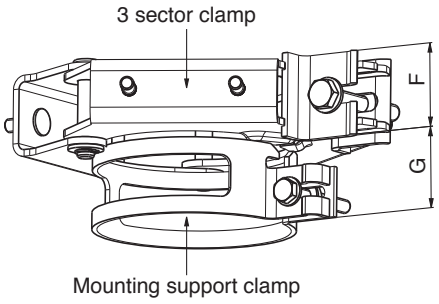
3 Sector Panel Arrangement
3 Sector Clamp Kit
Mounting Hardware

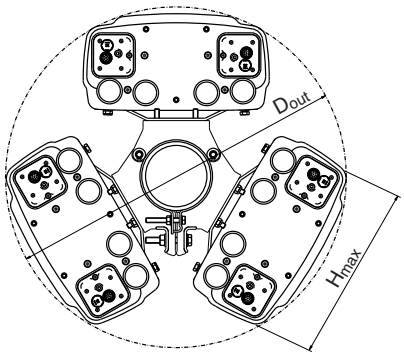
KATHREIN
Antennen · Electronic

- Slim and unobstrusive design.
- Nearly cylindrical optical appearance with small outer diameter.
- Suitable for all Panels with an antenna housing width less than 400 mm (H_{max}).
  Please note:
  Panels with connector position “Rearside” fit only with downtilt kit azimuth adjustment kit or offset mounted in-between.









Bottom view without downtilt kit

Type No.	A	B	C	D	E	F	G	H_{max}	Weight
742263	88.9	65	180	168	64	50	45	280	4 kg
742317	88.9	88	213	199	64	50	45	361	4 kg
742033	114.3	92	217	207	64	50	45	375	4 kg
742034	139.7	100	236	228	64	50	45	400	4 kg
85010058	114.3	92	217	207	72	50	45	375	4 kg
85010059	139.7	100	236	228	72	50	45	400	4 kg

All dimensions in mm.
D_{out} is determined by mounted components.

3 Sector Clamp Kit (Antenna Wind load Category “L” and “M”)

Type No.	742263	742317	742033	742034
Angle between antennas	120°	120°	120°	120°
Suitable for mast diameter	88.9 mm	88.9 mm	114.3 mm	139.7 mm
Number of pieces	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp
Material – 3 sector clamp – Mounting support clamp – Screws – Nuts	 Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel	 Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel	 Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel	 Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel

3 Sector Clamp Kit (Antenna Wind load Category “H”)

Type No.	85010058	85010059
Angle between antennas	120°	120°
Suitable for mast diameter	114.3 mm	139.7 mm
Number of pieces	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp
Material – 3 sector clamp – Mounting support clamp – Screws – Nuts	 Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel	 Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel

Mounting Hardware
Offset for Panel Antennas

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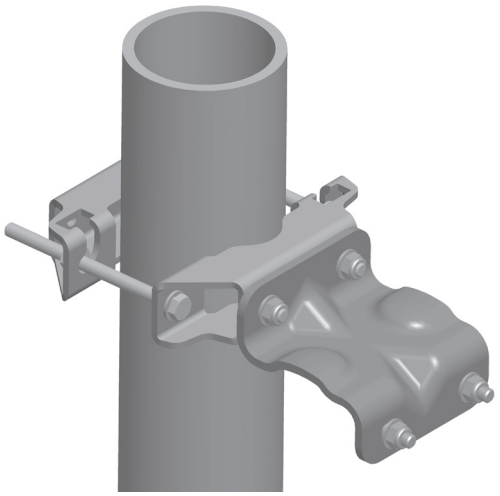
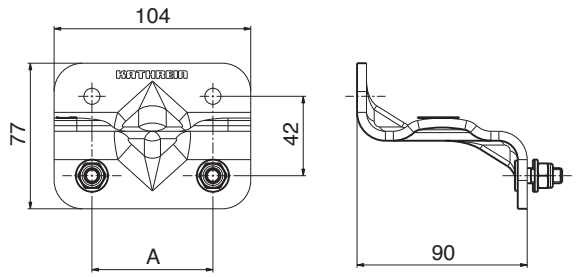


Type No.	85010060	85010061
Wind load category	"L" and "M"	"H"
Quantity needed per antenna	2 x spacer	
Material: – spacer – nuts	Hot-dip galvanized steel Stainless steel	
Dimension "A"	64 mm	72 mm
Weight	0.65 kg	
Scope of supply	1 x spacer, Fitting accessories	

Recommended torque for M8 bolted connections: 20 Nm

Please use the offset in combination with clamps corresponding to the pole diameter.



Mounting accessories (order separately)
Possible clamps in combination with:

85010060

Type No.	Description	Mast diameter	Weight approx.	Units per antenna
731651	1 clamp	28 – 64 mm	0.8 kg	2
738546	1 clamp	42 – 115 mm	1.1 kg	2
85010002	1 clamp	110 – 220 mm	2.9 kg	2
85010003	1 clamp	210 – 380 mm	4.8 kg	2
742263	2 x 3 sector clamp	88.9 mm	4.0 kg	1
742317	2 x 3 sector clamp	88.9 mm	4.0 kg	1
742033	2 x 3 sector clamp	114.3 mm	4.0 kg	1
742034	2 x 3 sector clamp	139.7 mm	4.0 kg	1

85010061

Type No.	Description	Mast diameter	Weight approx.	Units per antenna
738546	1 clamp	42 – 115 mm	1.1 kg	2
85010002	1 clamp	110 – 220 mm	2.9 kg	2
85010003	1 clamp	210 – 380 mm	4.8 kg	2
85010058	2 x 3 sector clamp	114.3 mm	4.0 kg	1
85010059	2 x 3 sector clamp	139.7 mm	4.0 kg	1

If a downtilt kit is used, please choose the fitting one from the antenna data sheet.

Panel Accessories
2 x Panel Mounting Kit
for Panels width 112 mm and 155 mm

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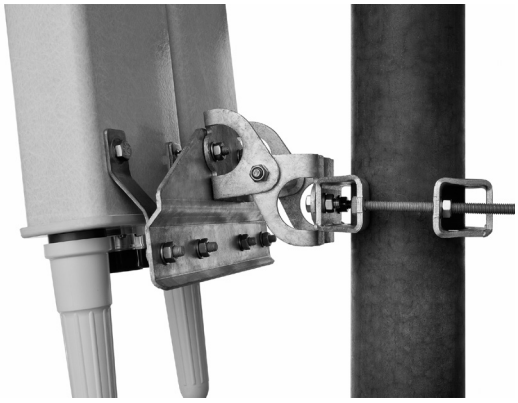
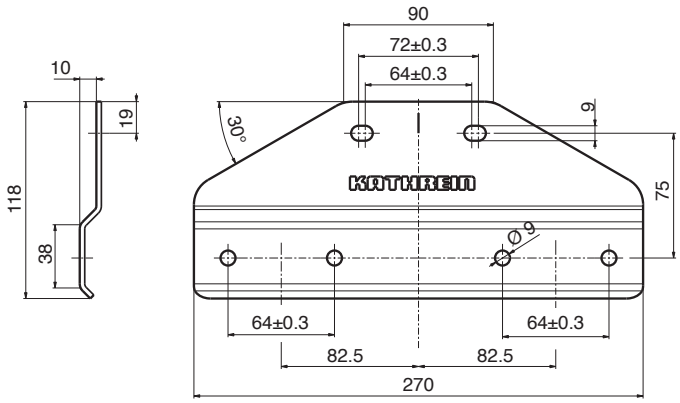
Use this mounting kit only for Panels with a maximum width of 160 mm.
Wind load category: L (Light) or M (Medium)

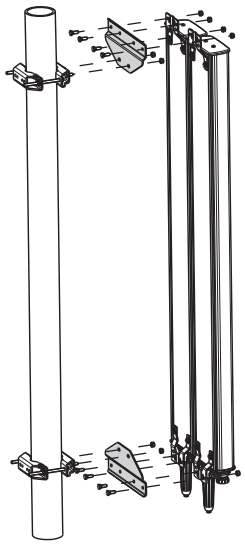
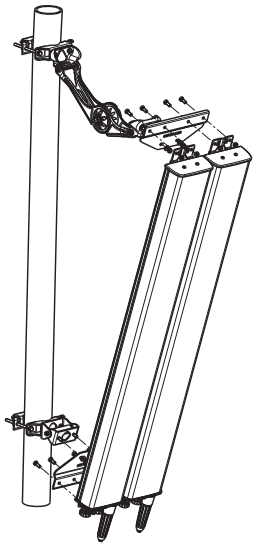


2 x Panel Mounting Kit

Type No.	742113
Contens	2 x brackets and mounting accessories
Material: – Clamp and screws – Nuts and washers	Hot-dip galvanized steel Stainless steel
Weight	Approx. 1.6 kg

Recommended torque for M8 bolted connections: 20 Nm



Configuration without mechanical downtilt	Configuration with mechanical downtilt
	

Use the 2 x Panel Mounting Kit together with the following mounting accessories

Type No.	Description	Remarks	Weight approx.	Units per antenna
731651	1 clamp	Mast: 28 – 60 mm diameter	0.8 kg	2
738546	1 clamp	Mast: 42 – 115 mm diameter	1.1 kg	2
85010002	1 clamp	Mast: 110 – 220 mm diameter	2.7 kg	2
85010003	1 clamp	Mast: 210 – 380 mm diameter	4.8 kg	2
85010060	1 offset	in combination with the clamps	1.3 kg	2
737978	1 downtilt kit	Downtilt angle: depending on antenna height	2.3 kg	1

If a downtilt kit is used, please choose the fitting one from the antenna datasheet.

For a three sector panel arrangement, use the mounting kit type no. 742113 together with the three sector clamp 742213, 742033 or 742034.
Three sector clamp 742263 does not match.

Panels VPol / XPol 800/900
Panels XXPol 800/900 / 1800/2000
2 x Panel Mounting Kit

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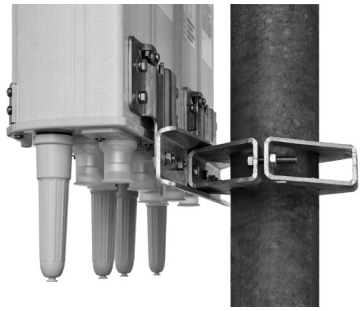
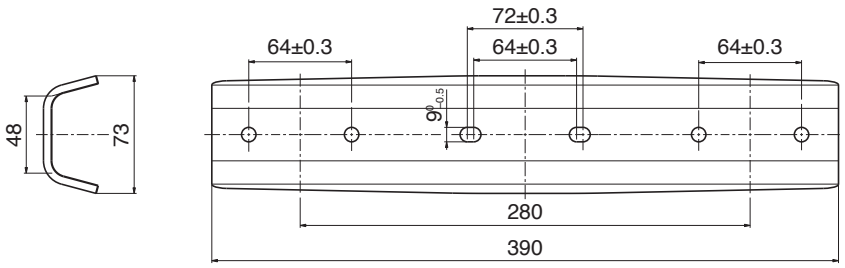
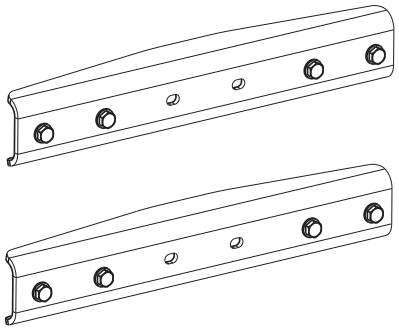
Use this mounting kit only for Panels with a maximum width of 262 mm.
Wind load category: H (Heavy)

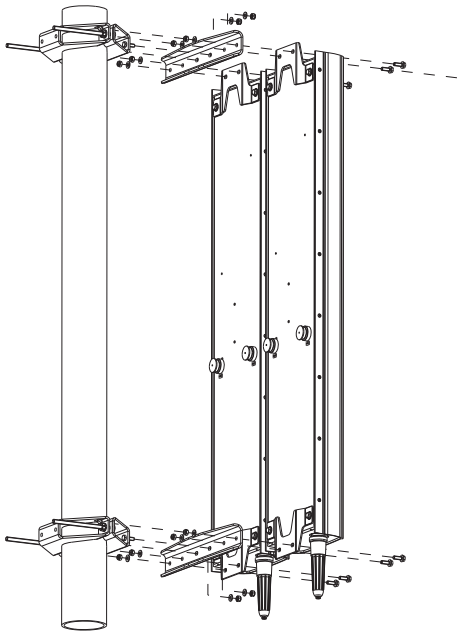
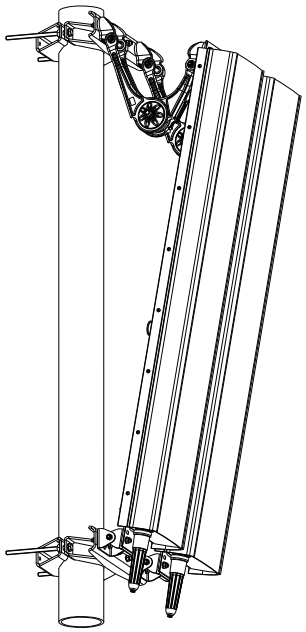


Type No.	85010006
Contens	2 x brackets and mounting accessories
Material: – Clamp and screws – Nuts and washers	Hot-dip galvanized steel Stainless steel
Weight	Approx. 3.3 kg

Recommended torque for M8 bolted connections: 20 Nm





Configuration <u>without</u> mechanical downtilt	Configuration <u>with</u> mechanical downtilt
	

Mounting Accessories (order separately)

Clamps (only the listed clamps are allowed!)

Type No.	Description	Remarks	Weight approx.	Units per antenna
85010002	1 clamp	Mast: 110 – 220 mm diameter	2.7 kg	2
85010003	1 clamp	Mast: 210 – 380 mm diameter	4.8 kg	2
85010061	1 offset	in combination with the clamps	1.3 kg	2

If a downtilt kit is used, please choose the fitting one from the antenna datasheet.

Mounting Hardware
Tension Band for Panel Antennas
(Wind load Category “L”)

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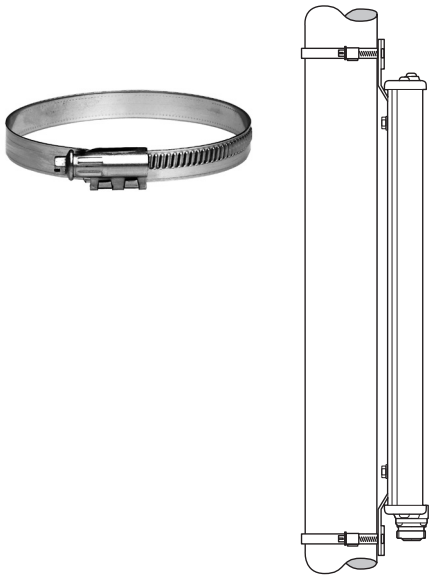
Type No.	734360	734361	734362	734363	734364	734365
Suitable for mast diameter	34 – 60 mm	60 – 80 mm	80 – 100 mm	100 – 120 mm	120 – 140 mm	45 – 125 mm
Material	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Weight (approx.)	0.06 kg	0.07 kg	0.08 kg	0.09 kg	0.11 kg	0.08 kg



Please note:
Only usable without downtilt kit!

Side-mounting Clamp
Omnidirectional Antennas
Large Pipe

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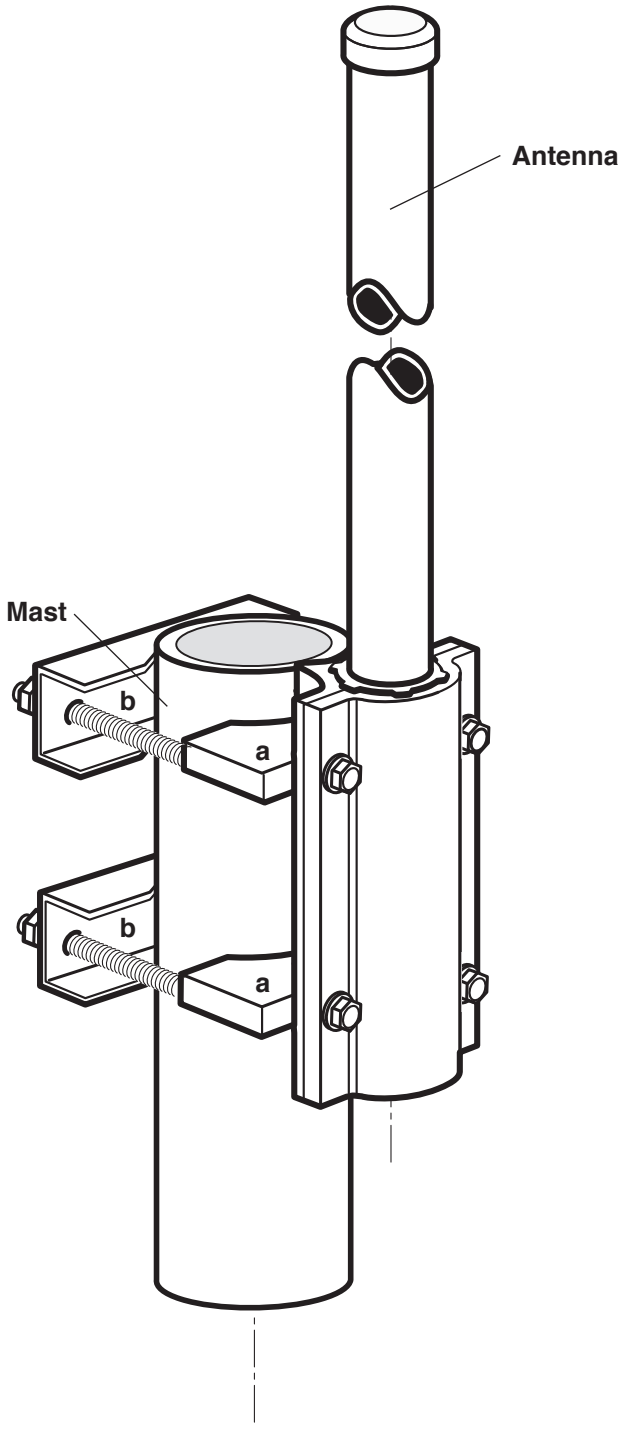
Antennen · Electronic

Type No. 738908

For masts of 94 – 125 mm diameter

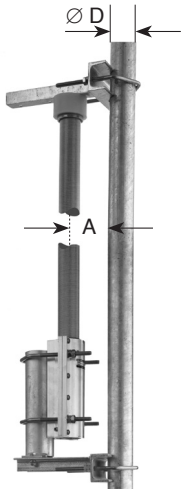


Side-mounting Bracket
Omnidirectional Antennas

KATHREIN
Antennen · Electronic

Type No. 737398
Side-mounted bracket
(for mast diameters of 40 – 105 mm)

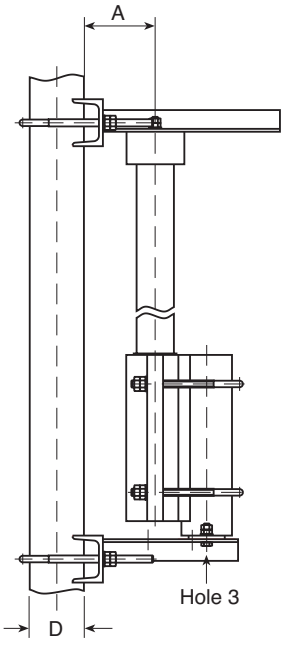
Type No.	737398			
Bracket	At the bottom only			
Fits for antenna type no.	**800/900 MHz** 736347 736348 736349 736350 736351 738664 738192	**1800 MHz** 739785 738187 739404 737190	**UMTS** 741790	**Dual-band** 80010274



Side-mounting is possible for four fixed distances between the tubular mast and the antenna:

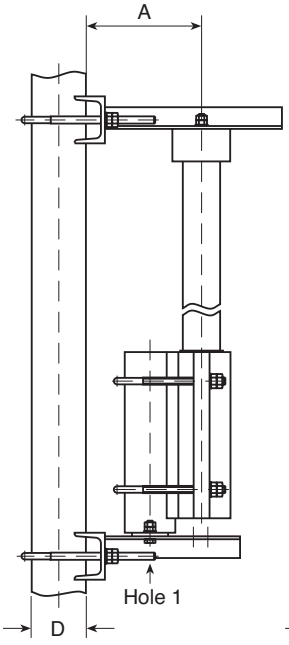
800/900 MHz (holes 1 and 3)

A = 100 mm = 0.3 λ



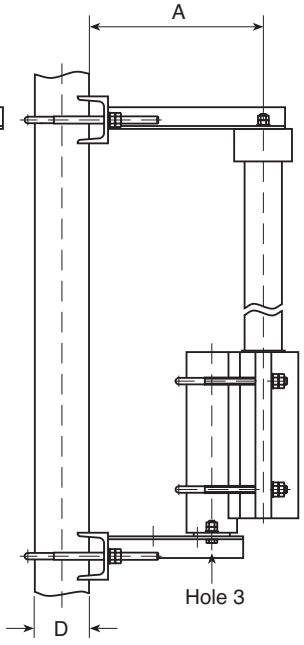
Pipe D	Horizonal Radiation Pattern	Spacing A / Curve
40 mm	direction from mast to antenna →	100 mm 160 mm 240 mm

A = 160 mm = 0.5 λ



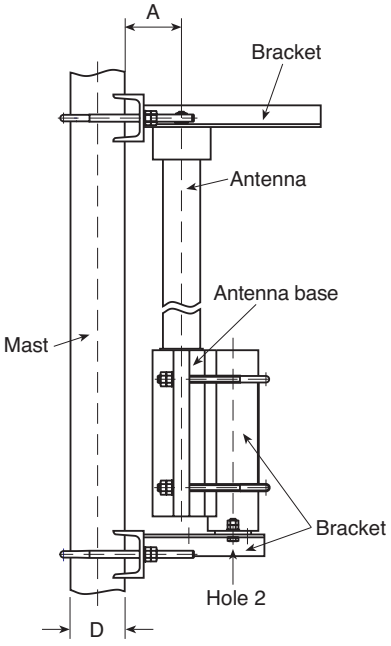
Pipe D	Horizonal Radiation Pattern	Spacing A / Curve
40 mm	direction from mast to antenna →	100 mm 160 mm 240 mm

A = 240 mm = 0.75 λ



1800/2000 MHz (hole 2)

A = 80 mm = 0.5 λ



Pipe D / Curve	Horizonal Radiation Pattern	Spacing A
40 mm 100 mm	direction from mast to antenna →	80 mm

Side-mounting Brackets
Omnidirectional Antennas
900

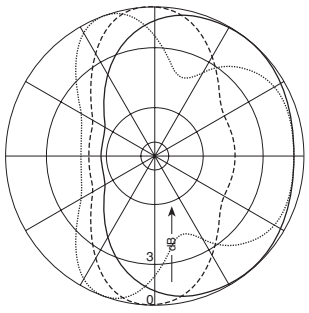
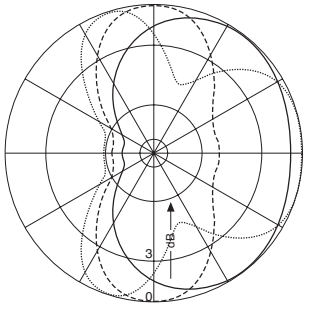
KATHREIN
Antennen · Electronic

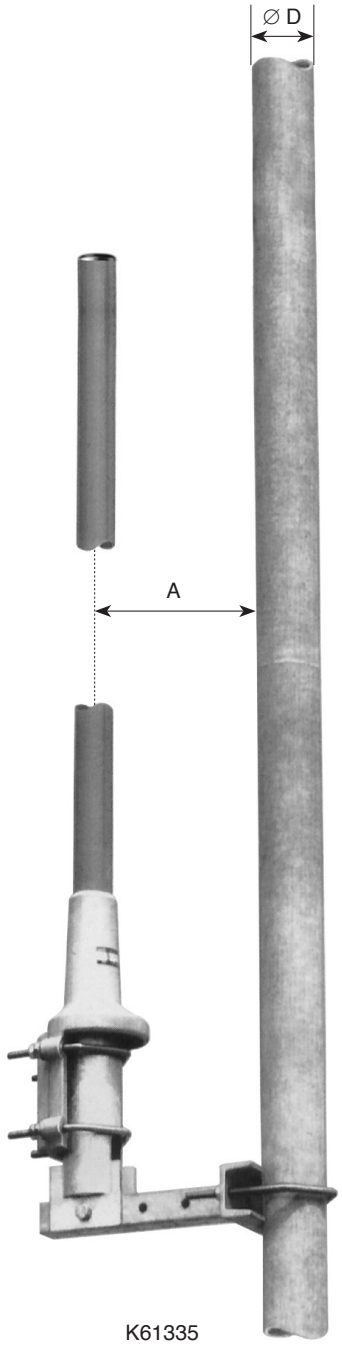
For mast diameters of 40 – 105 mm

Type No.	K61335
Bracket	At the bottom only
Fits for antenna type no.	K75116.. K75156..

Side mounting is possible for three fixed distances between the tubular mast and the antenna:

100 mm = 0.3 λ
160 mm = 0.5 λ
240 mm = 0.75 λ

Pipe D	Horizontal Radiation Pattern	Spacing A / Curve	Additional gain to the nominal value of the antenna gain
40 mm	 direction from mast to antenna	100 mm	2 dB
		160 mm	3 dB
		240 mm	2 dB
100 mm	 direction from mast to antenna	100 mm	2.5 dB
		160 mm	3.5 dB
		240 mm	2.5 dB



K61335

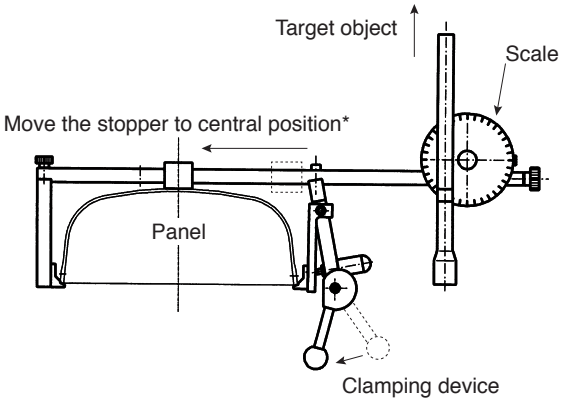
All Panels
Accessories
Azimuth Adjustment Tool

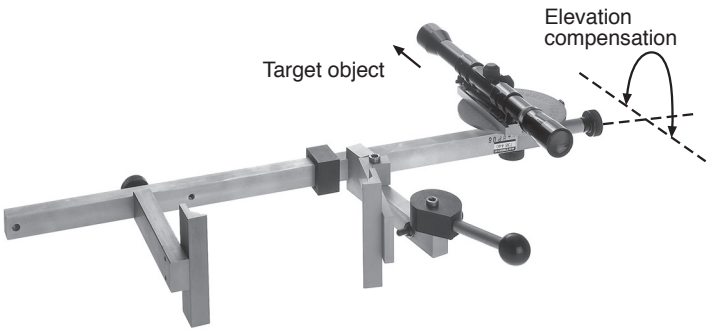
KATHREIN
Antennen · Electronic

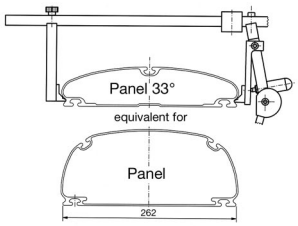
Type No. 738440

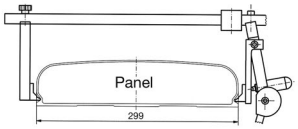
Precise azimuth adjustment for mast mounted antennas can easily be achieved by using the azimuth adjustment tool.

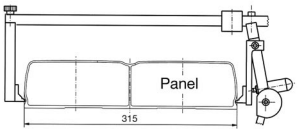
This tool is suitable to all types of Panels and Tri-Sector Pipe Antennas with a maximum width of 315 mm.

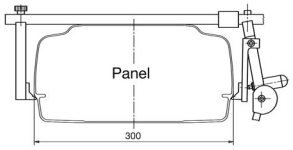


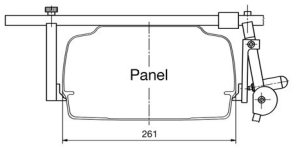


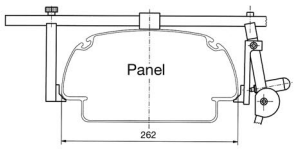


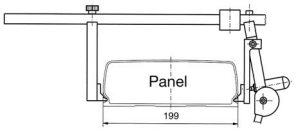


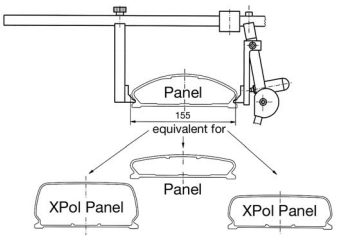


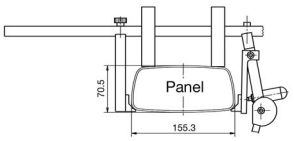


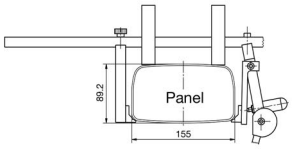












Instruction:

– Use a map to work out the angle between the designed antenna azimuth and target (church, building, mountain peak).
– Set this angle on the scale of the adjustment tool.
– Place the adjustment tool onto the antenna and tighten the clamping device.
– Use the telescope to aim at the target object, if necessary, use elevation compensation.
– Then rotate the antenna until the target object appears in the telescope.

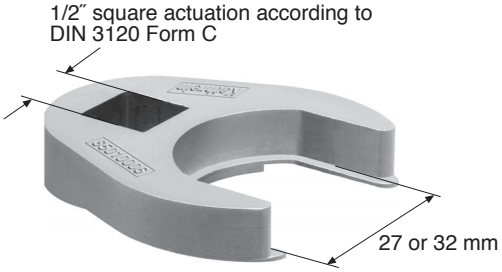
* Observe the position of the stopper when fitting the azimuth adjustment tool.

Kathrein Installation Tool for Triple-band Antennas Type No. 85010005

KATHREIN
Antennen · Electronic

Please note: To avoid any damage to the interfaces, please ensure that only suitable tools are used. To tighten the feederline connector interfaces, we strongly recommend using a special Kathrein installation tool (as shown below) in combination with a standard torque-wrench.

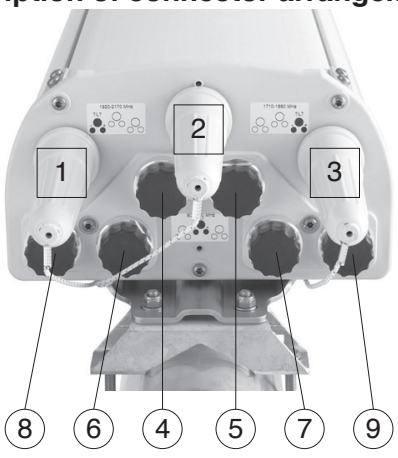
Kathrein installation set: Type No. 85010005
Set has to be ordered separately!
Set consists of two spanners of 27 and 32 mm width.



These tools are suitable for 7-16 connectors with a wrench size of 27 or 32 mm.

Tighten nut within a torque range of 25 – 33 Nm depending on connector manufacturers' specifications.

Description of connector arrangement:



Adjustment mechanisms (1 – 3)

Feederline connectors (4 – 9)

There are six feederline connectors and three adjustment mechanisms located at the bottom of the antenna.

For detailed information
about feederline installation for Triple-band Antennas
please see Kathrein RET system brochure.

Part 2:

Filters, Combiners and Amplifiers for Mobile Communications

Filters / Duplexers

Multiband Combiners

Dual-Band Combiners
Triple-Band Combiners
Quad-Band Combiners

Same-Band Combiners
Hybrid Combiners

Same-Band Combiner
Duplex Hybrid Combiner
Active Duplex Hybrid Combiner
Hybrid Combiner
3-dB Couplers
Hybrid Ring Junctions

System Components

Bias Tees
Measuring Directional Couplers
DC-Stops
Attenuators
50-Ω Loads
Power Distribution Unit

DTMAs

Summary of Filter, Combiner and Amplifier Types

The articles are listed by type number in numerical order.

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New Products

Filters / Duplexers

Summary of Filter and Duplexer Types

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Antennen · Electronic

Filters:

Description	Type No.	Frequency range	Max. input power	Page
Band-pass Filter	78211149	801 – 862 MHz	100 W	227
Band-pass Filter	78210390	890 – 960 MHz	400 W	228
Band-pass Filter	78210391	890 – 960 MHz	400 W	228
Band-pass Filter	78210392	824 – 888 MHz	400 W	229

Duplexers:

Description	Type No.	Frequency range	Max. input power	Page
Duplexer	78210168	Low band: 824 – 835 MHz High band: 869 – 880 MHz	400 W	230, 231
Duplexer	78210169	Low band: 824 – 835 MHz High band: 869 – 880 MHz	400 W	230, 231
Duplexer	78210170	Low band: 824 – 835 MHz High band: 869 – 880 MHz	400 W	230, 231
Duplexer	78210171	Low band: 835 – 851 MHz High band: 880 – 896 MHz	400 W	230, 231
Duplexer	78210172	Low band: 835 – 851 MHz High band: 880 – 896 MHz	400 W	230, 231
Duplexer	78210215	Low band: 824 – 851 MHz High band: 869 – 896 MHz	400 W	232, 233
Duplexer	78210216	Low band: 824 – 851 MHz High band: 869 – 896 MHz	400 W	232, 233
Duplexer	78210257	Low band: 824 – 846.5 MHz High band: 869 – 891.5 MHz	400 W	232, 233
Duplexer	78210265	Low band: 824 – 846.5 MHz High band: 869 – 891.5 MHz	800 W	232, 233
Duplexer	78210164	Low band: 890 – 915 MHz High band: 935 – 960 MHz	500 W	234
Duplexer	78210165	Low band: 890 – 915 MHz High band: 935 – 960 MHz	500 W	234
Duplexer	78210161	Low band: 890 – 915 MHz High band: 935 – 960 MHz	500 W	234
Duplexer	78210162	Low band: 890 – 915 MHz High band: 935 – 960 MHz	500 W	234
Duplexer	78210167	Low band: 880 – 915 MHz High band: 925 – 960 MHz	250 W	235
Duplexer	792542	Low band: 1710 – 1785 MHz High band: 1805 – 1880 MHz	250 W	236
Duplexer	78210415	Low band: 1710 – 1785 MHz High band: 1805 – 1880 MHz	250 W	236
Duplexer	792544	Low band: 1850 – 1910 MHz High band: 1930 – 1990 MHz	300 W	237
Duplexer	78210192	Low band: 1920 – 1980 MHz High band: 2110 – 2170 MHz	250 W	238
Duplexer	78210193	Low band: 1920 – 1980 MHz High band: 2110 – 2170 MHz	250 W	238

New Products

Band-pass Filter
801 – 862 MHz

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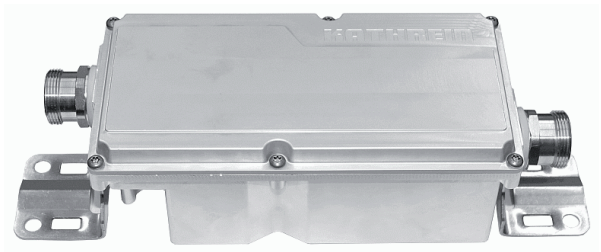
• Band-pass Filter for LTE800 with DVB-T suppression



Typical Attenuation Curves

Diagram I

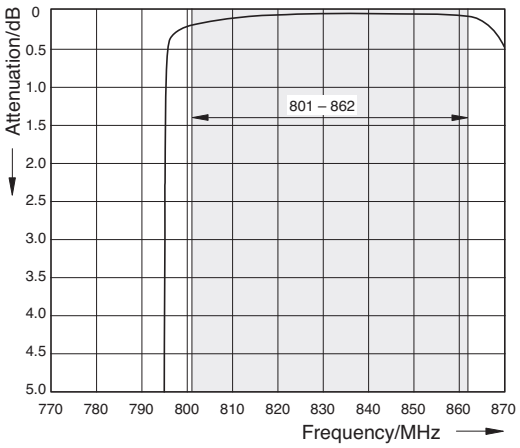
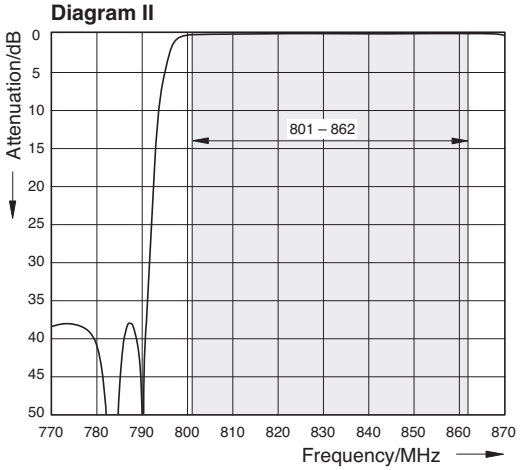


Diagram II



Technical Data

Type No.	78211149
Pass band	801 – 862 MHz
Insertion loss	< 0.3 dB (typ. 0.2 dB)
Stop band attenuation	> 35 dB (470 – 790 MHz)
VSWR	< 1.2
Impedance	50 Ω
Input power	< 100 W
Intermodulation products	< –160 dBc (with 2 x 20 W)
Temperature range	–40 ... +65 °C
DC/AISG	By-pass
Connectors	7–16-female
Application	Outdoor (IP 66)
Weight	Approx. 1.1 kg
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Dimensions (w x h x d)	Approx. 105 x 180 x 60 mm (incl. connectors and mounting feet)

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Band-pass Filter
890 – 960 MHz (GSM 900)

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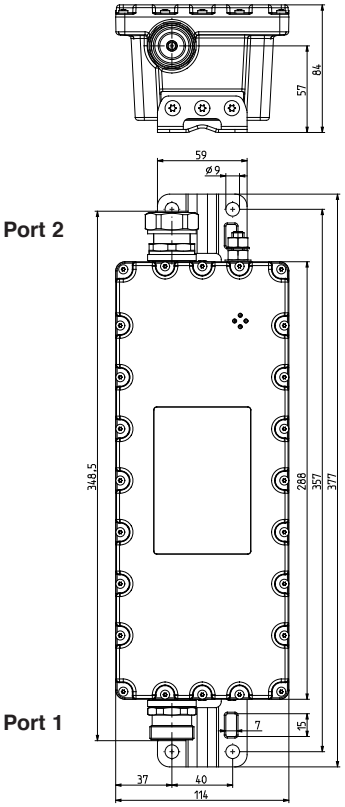
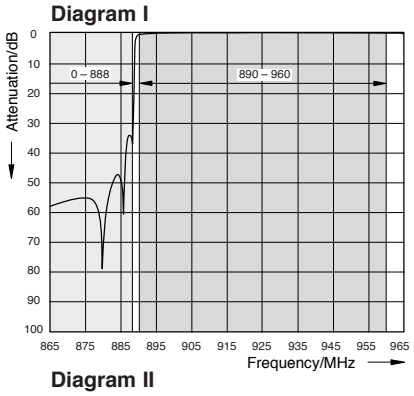
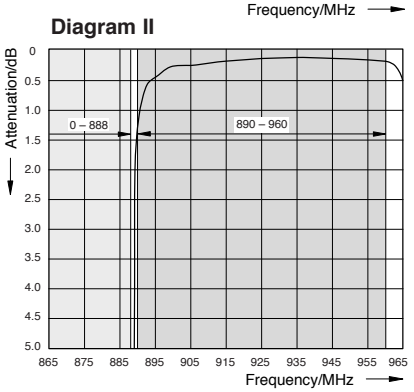
- GSM 900 Tx/Rx preselector filter
- Suppression of interfering Tx signals of an adjacent AMPS or CDMA frequency band
- Suitable for indoor applications
- Built-in DC stop

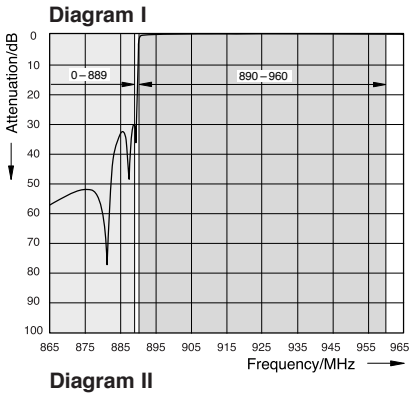


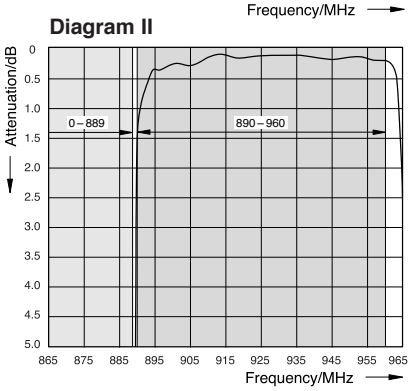
78210390
Typical Attenuation Curves





78210391
Typical Attenuation Curves





Technical Data

Type No. Stop band Frequency spacing	78210390 0 – 888 MHz 2 MHz	78210391 0 – 889 MHz 1 MHz
Pass band	890 – 960 MHz	890 – 960 MHz
Insertion loss	< 1.5 dB (890 – 892 MHz) < 0.8 dB (892 – 893 MHz) < 0.6 dB (893 – 905 MHz) < 0.3 dB (905 – 960 MHz)	< 4.0 dB (890 – 891 MHz) < 2.5 dB (891 – 892 MHz) < 1.0 dB (892 – 893 MHz) < 0.6 dB (893 – 905 MHz) < 0.3 dB (905 – 960 MHz)
Stop band attenuation	> 50 dB (0 – 880 MHz) > 40 dB (880 – 885 MHz) > 30 dB (885 – 888 MHz)	> 50 dB (0 – 869 MHz) > 30 dB (869 – 889 MHz)
VSWR	< 1.25 (890 – 960 MHz)	< 1.3 (891 – 960 MHz)
Impedance	50 Ω	
Input power	< 400 W (935 – 960 MHz)	
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–40 ... +60 °C	–5 ... +45 °C
Connectors	Port 1: 7-16 female, long neck / Port 2: 7-16 male	
Application	Indoor or outdoor (IP66)	
DC/AISG transparency Port 1 ↔ Port 2	Stop	
Mounting	With 4 screws (max. 4 mm diameter)	
Weight	2 kg	
Packing size	387 x 137 x 130 mm	
Dimensions (w x h x d)	114 x 84 x 377 mm (including connectors and mounting feet)	

Band-pass Filter
824 – 888 MHz (AMPS/CDMA850)

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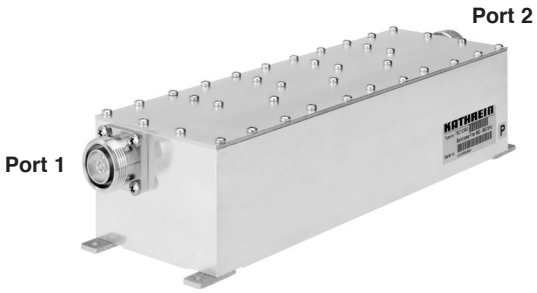
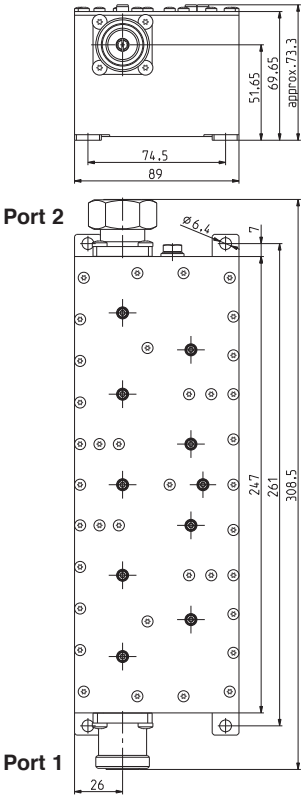
- AMPS/CDMA850 Tx/Rx filter
- Suppression of spurious emissions at adjacent GSM900 Rx frequencys
- Suitable for indoor applications
- Built-in DC stop





Typical Attenuation Curves

Diagram I

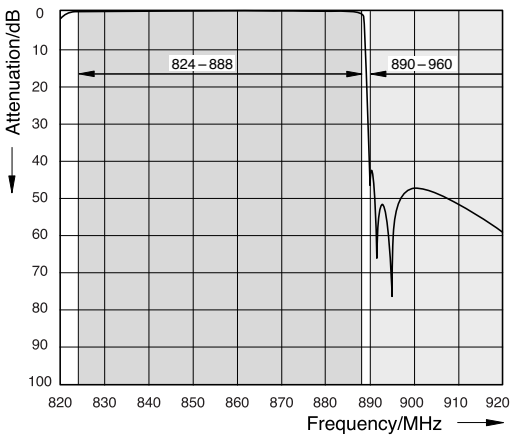
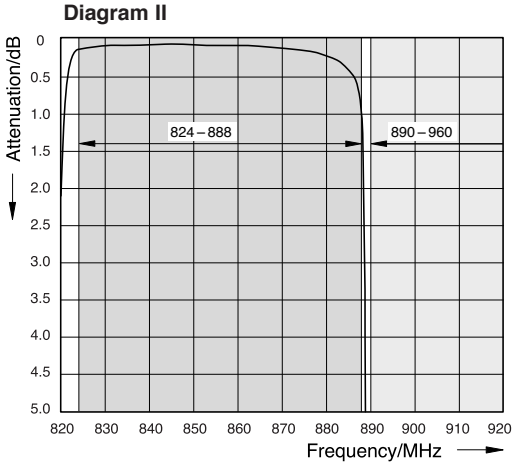


Diagram II



Technical Data

Type No.	78210392
Pass band	824 – 888 MHz
Insertion loss	< 0.5 dB (824 – 885 MHz) < 0.8 dB (885 – 886 MHz) < 1.5 dB (886 – 888 MHz)
Stop band attenuation	> 40 dB (890 – 960 MHz)
VSWR	< 1.25
Impedance	50 Ω
Input power	< 400 W (824 – 888 MHz)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–20 … +55 °C
Connectors	Port 1: 7-16 female (long neck) / Port 2: 7-16 male
Application	Indoor
DC/AISG transparency Port 1 ↔ Port 2	Stop
Mounting	With 4 screws (max. 4 mm diameter)
Weight	2 kg
Packing size	387 x 137 x 130 mm
Dimensions (w x h x d)	89 x 73.3 x 308.5 mm (including connectors and mounting feet)

Duplexer
824 – 835 / 869 – 880 MHz (AMPS A-Band)
835 – 851 / 880 – 896 MHz (AMPS B-Band)

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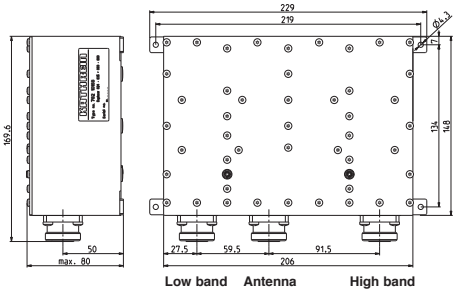
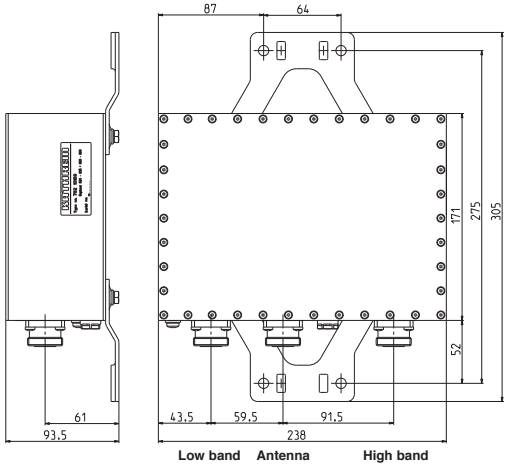
The Duplexer is designed to combine/split GSM Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

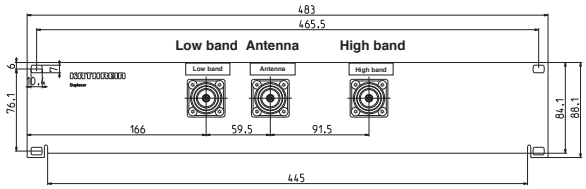
- **78210168:** AMPS A-Band, indoor version
- **78210169:** AMPS A-Band, outdoor version
- **78210170:** AMPS A-Band, indoor version mounted onto a 19˝ drawer
- **78210171:** AMPS B-Band, indoor version
- **78210172:** AMPS B-Band, outdoor version

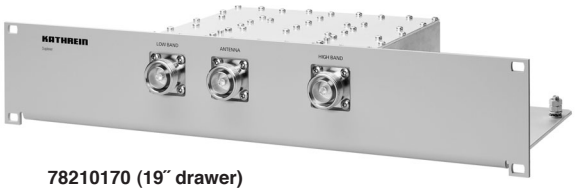


78210168
78210171
(indoor)



78210169
78210172
(outdoor)





78210170 (19˝ drawer)

Technical Data

Type No.	78210168	78210169	78210170	78210171	78210172
	AMPS A-Band			AMPS B-Band	
Pass band Low band High band	824 – 835 MHz 869 – 880 MHz			835 – 851 MHz 880 – 896 MHz	
Insertion loss Antenna → Low band High band → Antenna	< 0.5 dB (824 – 835 MHz) < 0.5 dB (869 – 880 MHz)			< 0.5 dB (835 – 851 MHz) < 0.5 dB (880 – 896 MHz)	
Isolation Low band ↔ High band	> 85 dB (824 – 835 / 869 – 880 MHz)			> 85 dB (835 – 851 / 880 – 896 MHz)	
VSWR	< 1.25 (824 – 835 / 869 – 880 MHz)			< 1.25 (835 – 851 / 880 – 896 MHz)	
Impedance	50 Ω			50 Ω	
Input power	< 400 W (high band; with max. 8 carriers)			< 400 W (high band; with max. 12 carriers)	
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)			< –160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–20 ... +55 °C	–40 ... +60 °C	–20 ... +55 °C	–20 ... +55 °C	–40 ... +60 °C
Connectors	7-16 female			7-16 female	
Application	**Indoor**	**Outdoor (IP 66)**	**Indoor, 19˝ drawer**	**Indoor**	**Outdoor (IP 66)**
Special features	Built-in DC stop between all ports			Built-in DC stop between all ports	
Mounting	With 4 screws (max. 4 mm diameter)	Wall mounting with 4 screws (max. 8 mm diameter) Mast mounting with additional clamp set	With 4 screws (max. 6 mm diameter)	With 4 screws (max. 4 mm diameter)	Wall mounting with 4 screws (max. 8 mm diameter) Mast mounting with additional clamp set
Weight	2.8 kg	5.5 kg	3.7 kg	2.8 kg	5.5 kg
Packing size	309 x 162 x 252 mm	347 x 297 x 174 mm	612 x 312 x 224 mm	309 x 162 x 252 mm	347 x 297 x 174 mm
Dimensions (w x h x d)	229 x 80 x 169.6 mm (including connectors and mounting feet)	238 x 305 x 93.5 mm (including mounting feet)	19˝ drawer, 2 height units, plug-in depth 170 mm	229 x 80 x 169.6 mm (including connectors and mounting feet)	238 x 305 x 93.5 mm (including mounting feet)

Duplexer
824 – 835 / 869 – 880 MHz (AMPS A-Band)
835 – 851 / 880 – 896 MHz (AMPS B-Band)

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Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

Clamp Set

Typical Attenuation Curves (78210168, 78210169, 78210170)

Diagram I

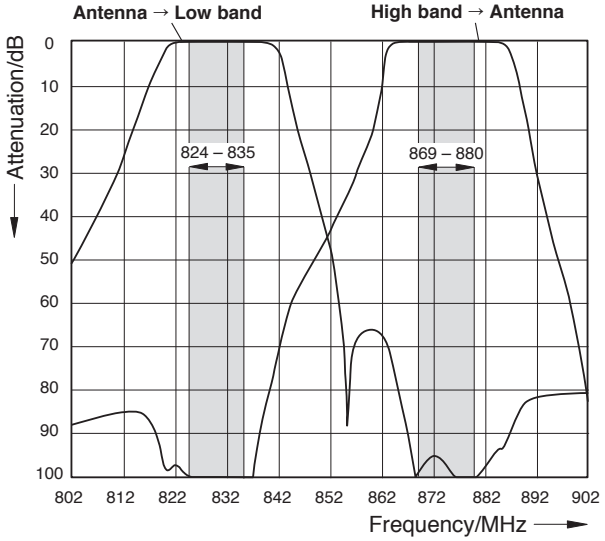
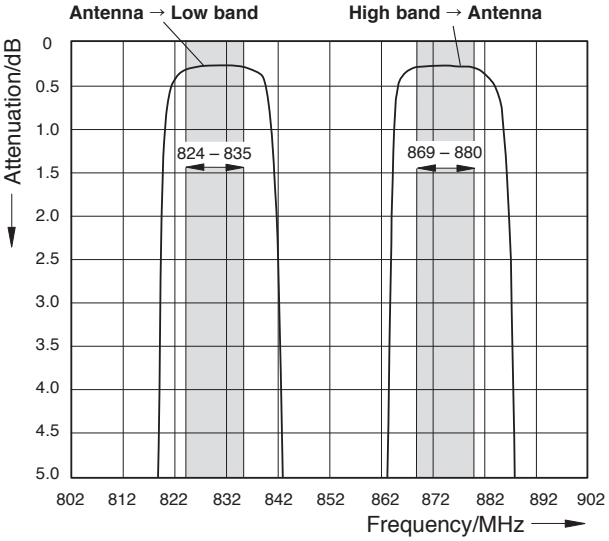


Diagram II



Typical Attenuation Curves (78210171, 78210172)

Diagram I

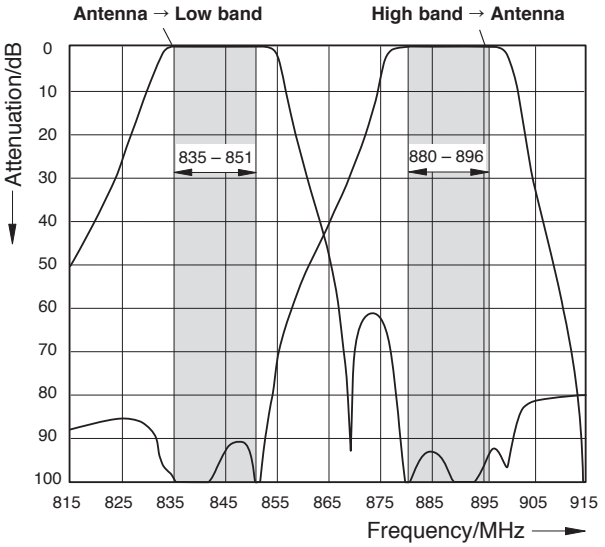
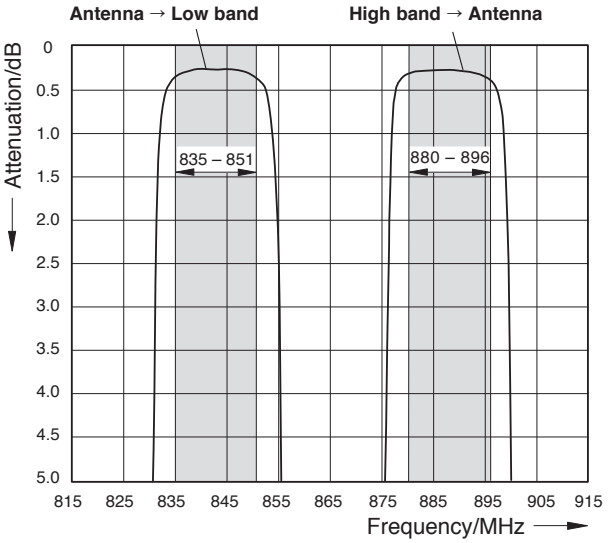


Diagram II



Duplexer
824 – 851 / 869 – 896 MHz (AMPS A/B-Band)
824 – 846.5 / 869 – 891.5 MHz (AMPS A/B-Band)

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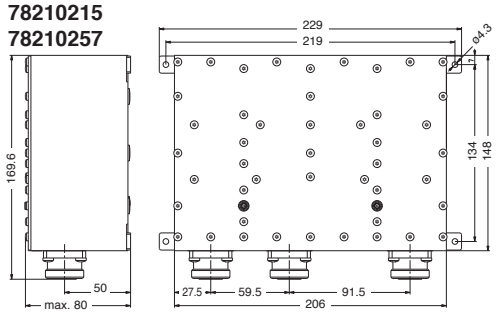
The Duplexer is designed to combine/split AMPS Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- Suitable for indoor application
- Built-in DC stop

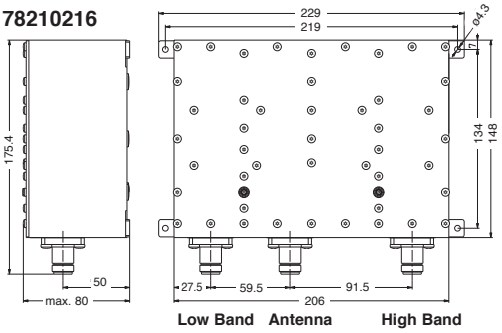
78210215, 78210257

78210216

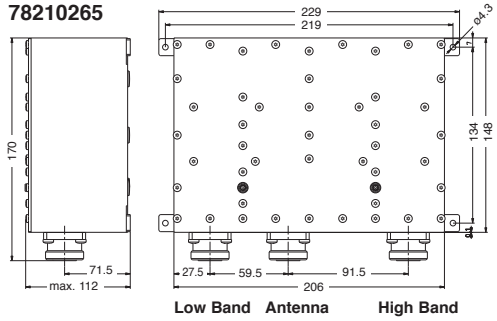
78210215
78210257



78210216



78210265



Technical Data

Type No.	78210215 / 78210216 AMPS A/B-Band		78210257 / 78210265 AMPS A/B-Band (reduced bandwidth)	
Pass band Low band High band	824 – 851 MHz 869 – 896 MHz		824 – 846.5 MHz 869 – 891.5 MHz	
Insertion loss Antenna → Low band High band → Antenna	< 0.5 dB (824 – 851 MHz) < 0.5 dB (869 – 896 MHz)		< 0.5 dB (824 – 846.5 MHz) < 0.5 dB (869 – 891.5 MHz)	
Isolation Low band ↔ High band	> 65 dB (824 – 851 / 869 – 896 MHz)		> 70 dB (824 – 846.5 / 869 – 891.5 MHz)	
VSWR	< 1.25 (824 – 851 / 869 – 896 MHz)		< 1.25 (824 – 846.5 / 869 – 891.5 MHz)	
Impedance	50 Ω		50 Ω	
Input power	< 400 W (high band; with max. 16 carriers)		< 400 W (high band; with max. 16 carriers)	**< 800 W** (high band; with max. 32 carriers)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)		< –160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–20 ... +55 °C		–20 ... +55 °C	
Connectors	7-16 female	N female	7-16 female	
Application	Indoor		Indoor	
Special features	Built-in DC stop between all ports		Built-in DC stop between all ports	
Mounting	With 4 screws (max. 4 mm diameter)		With 4 screws (max. 4 mm diameter)	
Weight	2.6 kg		2.6 kg	Approx. 3 kg
Packing size	309 x 252 x 162 mm		309 x 252 x 162 mm	309 x 252 x 162 mm
Dimensions (w x h x d)	229 x 80 x 169.6 mm (including connectors and mounting feet)	229 x 80 x 175.4 mm (including connectors and mounting feet)	229 x 80 x 169.6 mm (including connectors and mounting feet)	229 x 112 x 170 mm (including connectors and mounting feet)

Duplexer
824 – 851 / 869 – 896 MHz (AMPS A/B-Band)
824 – 846.5 / 869 – 891.5 MHz (AMPS A/B-Band)

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Typical Attenuation Curves (78210215, 78210216)

Diagram I

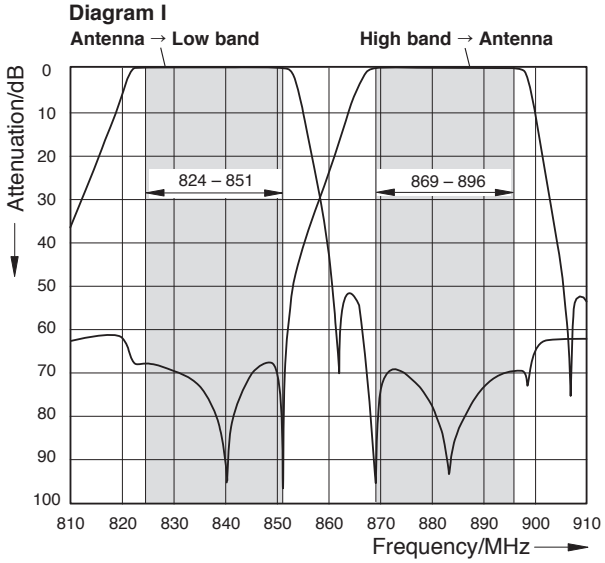
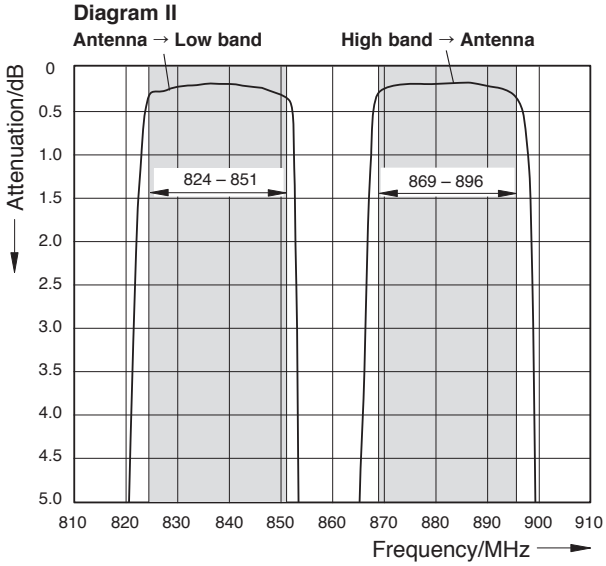


Diagram II



Typical Attenuation Curves (78210257)

Diagram I

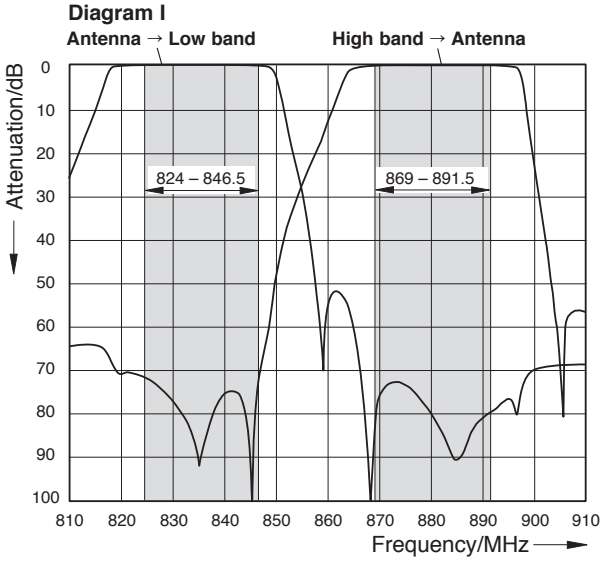
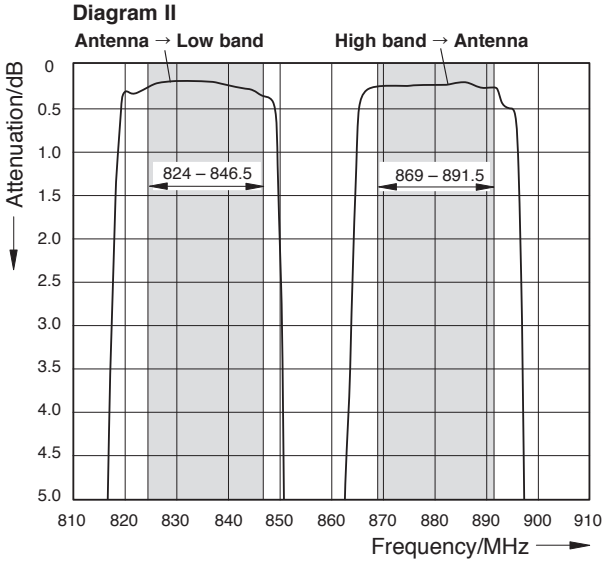


Diagram II



Typical Attenuation Curves (78210265)

Diagram I

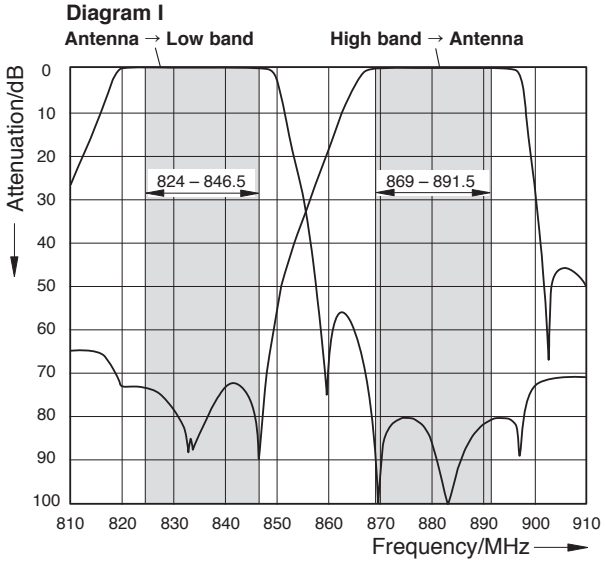
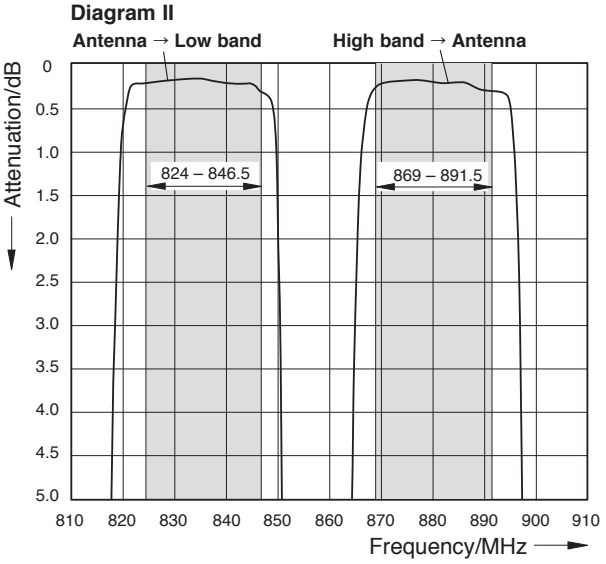


Diagram II



Duplexer
890 – 915 / 935 – 960 MHz (GSM)

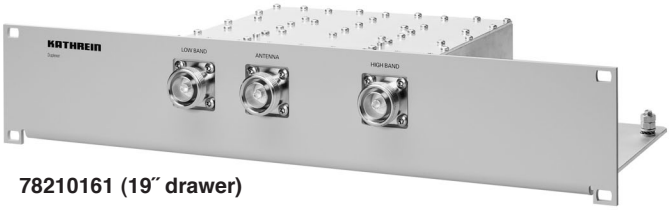
KATHREIN
Antennen · Electronic

The Duplexer is designed to combine/split GSM Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- **78210164:** Indoor version with 7-16 female connectors
- **78210165:** Indoor version with 7-16/N female connectors
- **78210161:** Indoor version with 7-16 female connectors mounted onto a 19″ drawer
- **78210162:** Outdoor version with 7-16 female connectors

78210164 (indoor)

78210162 (outdoor)



78210161 (19″ drawer)

78210165 (indoor)

Typical Attenuation Curves

Diagram I

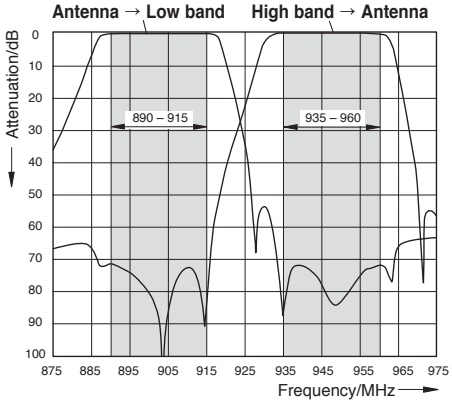
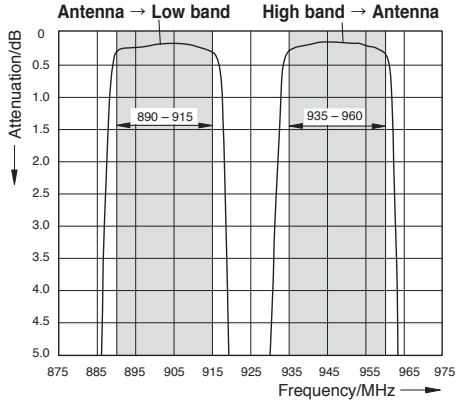


Diagram II



Technical Data

Type No.	78210164	78210165	78210161	78210162
Pass band Low band High band	890 – 915 MHz 935 – 960 MHz			
Insertion loss Antenna → Low band High band → Antenna	< 0.5 dB (890 – 915 MHz) < 0.5 dB (935 – 960 MHz)			
Isolation Low band ↔ High band	> 70 dB (890 – 915 / 935 – 960 MHz)			
VSWR	< 1.25 (890 – 915 / 935 – 960 MHz)			
Impedance	50 Ω			
Input power	< 500 W (high band; with max. 16 carriers)			
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)			
Temperature range	–20 ... +55 °C			–40 ... +60 °C
Connectors Low band High band Antenna	7-16 female 7-16 female 7-16 female	N female 7-16 female 7-16 female	7-16 female 7-16 female 7-16 female	7-16 female 7-16 female 7-16 female
Application	**Indoor**	**Indoor**	**Indoor, 19″ drawer**	**Outdoor (IP 66)**
Special features	Built-in DC stop between all ports			
Mounting	With 4 screws (max. 4 mm diameter)		With 4 screws (max. 6 mm diameter)	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additio-nal clamp set
Weight	2.6 kg		3.5 kg	5.5 kg
Packing size	309 x 162 x 252 mm		612 x 312 x 224 mm	347 x 294 x 174 mm
Dimensions (w x h x d)	229 x 80 x 175.2 mm (including connectors and mounting feet)		19″ drawer, 2 height units, plug-in depth 172 mm	238 x 93.5 x 305 mm (including connectors and mounting brackets)

Duplexer
880 – 915 / 925 – 960 MHz (EGSM)

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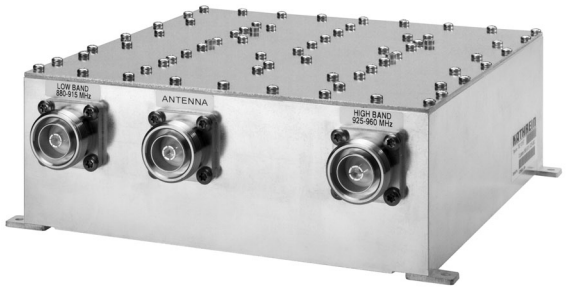
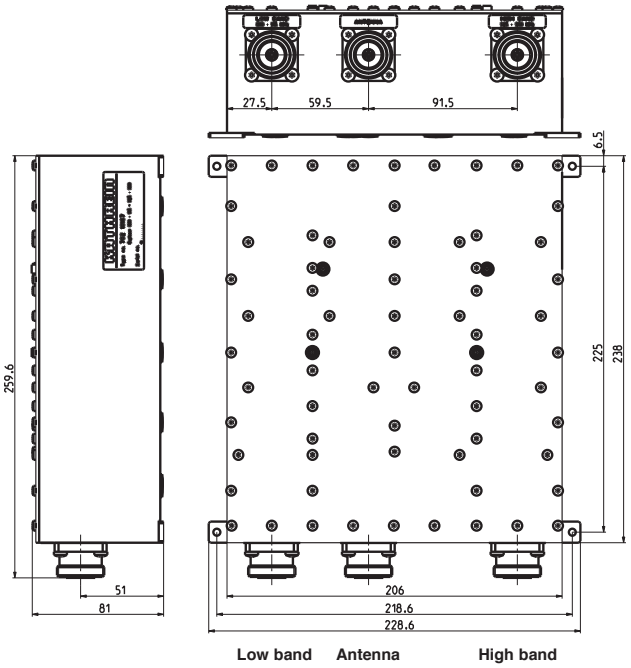
The Duplexer is designed to combine/split EGSM Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- Suitable for indoor applications
- Built-in DC Stop





Typical Attenuation Curves

Diagram I

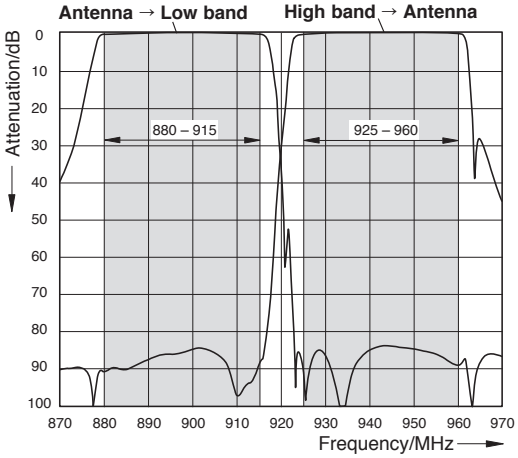
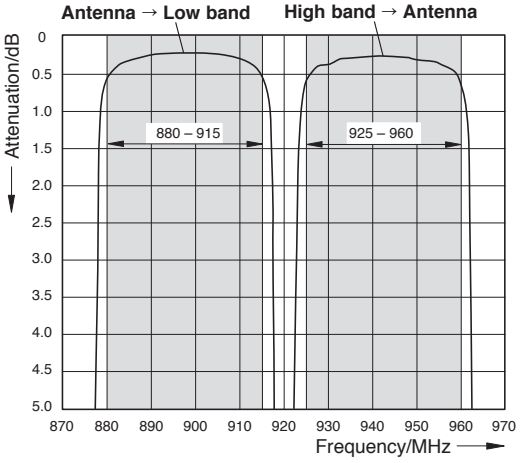


Diagram II



Technical Data

Type No.	78210167
Pass band Low band High band	 880 – 915 MHz 925 – 960 MHz
Insertion loss Antenna → Low band High band → Antenna	 < 0.9 dB (880 – 915 MHz) < 0.9 dB (925 – 960 MHz)
Isolation Low band ↔ High band	 > 75 dB (880 – 915 / 925 – 960 MHz)
VSWR	< 1.25 (880 – 915 / 925 – 960 MHz)
Impedance	50 Ω
Input power	< 250 W (low band *or* high band)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–20 … +55 °C
Connectors	7-16 female
Application	Indoor
Special features	Built-in DC stop between all ports
Mounting	With 4 screws (max. 4 mm diameter)
Weight	4.6 kg
Packing size	347 x 297 x 174 mm
Dimensions (w x h x d)	228.6 x 81 x 259.6 mm (including connectors and mounting feet)

Duplexer
1710 – 1785 / 1805 – 1880 MHz (GSM 1800)

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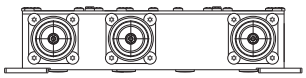
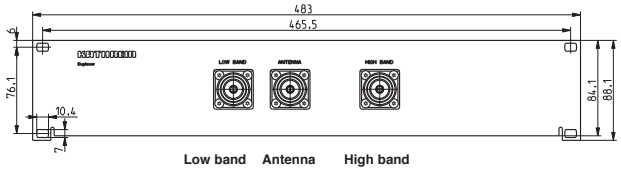
The Duplexer is designed to combine/split GSM 1800 Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

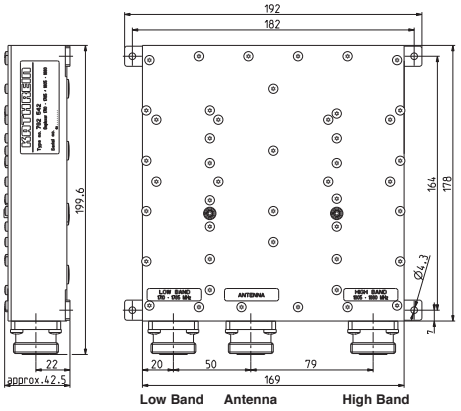
- Suitable for indoor applications
- Built-in DC stop between all ports

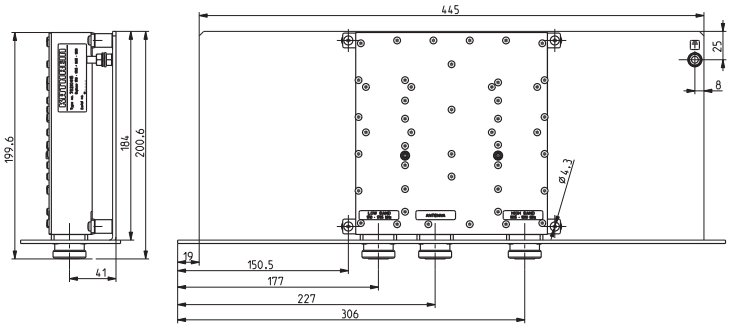
792542



78210415







Typical Attenuation Curves

Diagram I

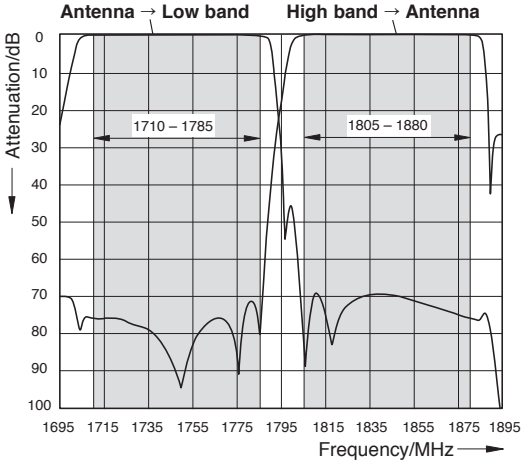
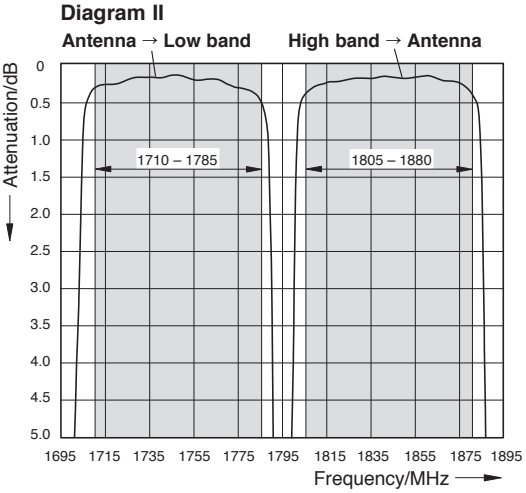


Diagram II



Technical Data

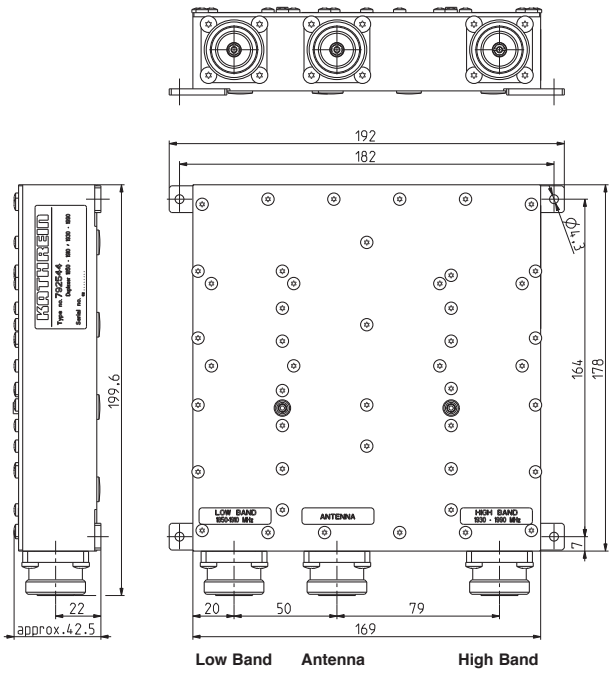
Type No.	792542	78210415
Pass band Low band High band	1710 – 1785 MHz 1805 – 1880 MHz	
Insertion loss Antenna → Low band High band → Antenna	< 0.7 dB (1710 – 1785 MHz) < 0.7 dB (1805 – 1880 MHz)	
Isolation Low band ↔ High band	> 65 dB (1710 – 1785 / 1805 – 1880 MHz)	
VSWR	< 1.25 (1710 – 1785 / 1805 – 1880 MHz)	
Impedance	50 Ω	
Input power	< 250 W (low band *or* high band, with max. 8 carriers)	
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–20 ... +55 °C	
Connectors	7-16 female	
Application	**Indoor**	**Indoor, 19˝ drawer**
DC/AISG transparency	Built-in DC stop between all ports	
Mounting	With 4 screws (max. 4 mm diameter)	With 4 screws (max. 6 mm diameter)
Weight	1.6 kg	2.6 kg
Packing size	282 x 252 x 114 mm	612 x 312 x 224 mm
Dimensions (w x h x d)	192 x 42.5 x 199.6 mm (including connectors and mounting feet)	19˝ drawer, 2 height units plug-in depth 184 mm

Duplexer
1850 – 1910 / 1930 – 1990 MHz (GSM 1900)

KATHREIN
Antennen · Electronic

The Duplexer is designed to combine/split GSM 1900 Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- Suitable for indoor applications
- Built-in DC stop



Typical Attenuation Curves

Diagram I

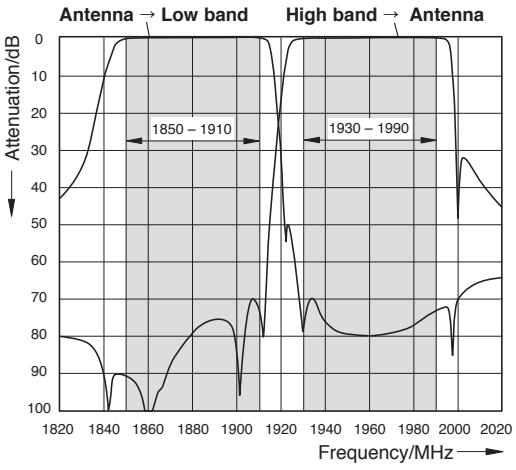
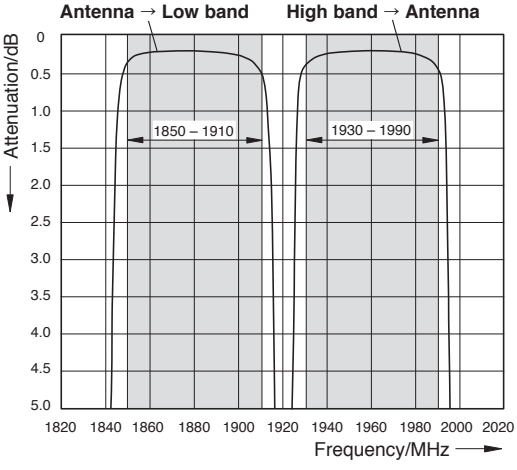


Diagram II



Technical Data

Type No.	792544
Pass band Low band High band	 1850 – 1910 MHz 1930 – 1990 MHz
Insertion loss Antenna → Low band High band → Antenna	 < 0.7 dB (1850 – 1910 MHz) < 0.7 dB (1930 – 1990 MHz)
Isolation Low band ↔ High band	 > 65 dB (1850 – 1910 / 1930 – 1990 MHz)
VSWR	< 1.25 (1850 – 1910 / 1930 – 1990 MHz)
Impedance	50 Ω
Input power	< 300 W (low band *or* high band)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–20 ... +55 °C
Connectors	7-16 female
Application	Indoor
Special features	Built-in DC stop between all ports
Mounting	With 4 screws (max. 4 mm diameter)
Weight	1.7 kg
Packing size	282 x 252 x 114 mm
Dimensions (w x h x d)	192 x 42.5 x 199.6 mm (including connectors and mounting feet)

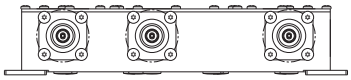
Duplexer
1920 – 1980 / 2110 – 2170 MHz (UMTS)

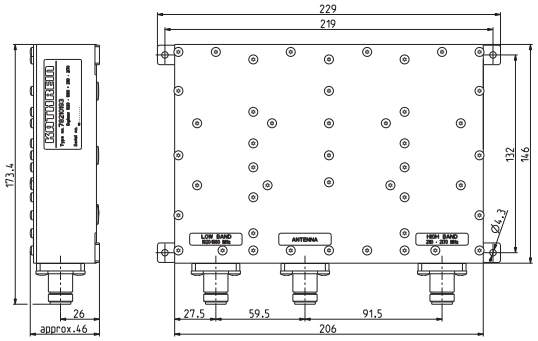
KATHREIN
Antennen · Electronic

The Duplexer is designed to combine/split UMTS Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

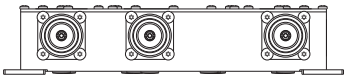
- Suitable for indoor applications
- Built-in DC stop

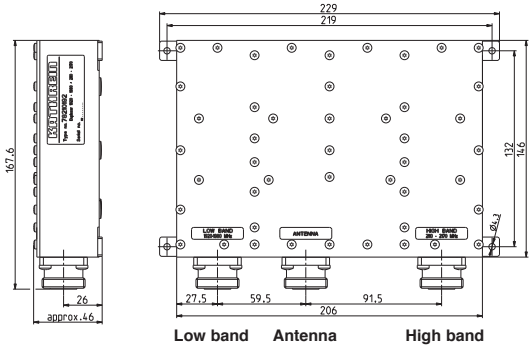
78210193





78210192





Typical Attenuation Curves

Diagram I

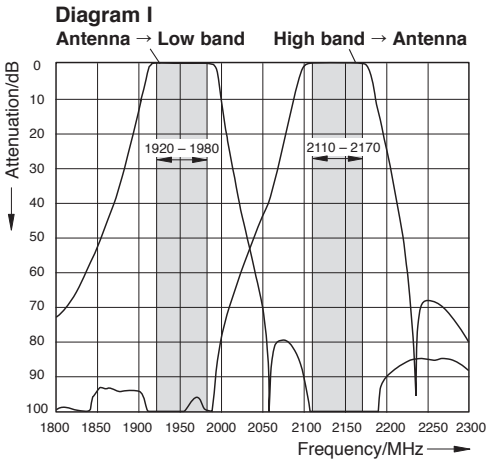
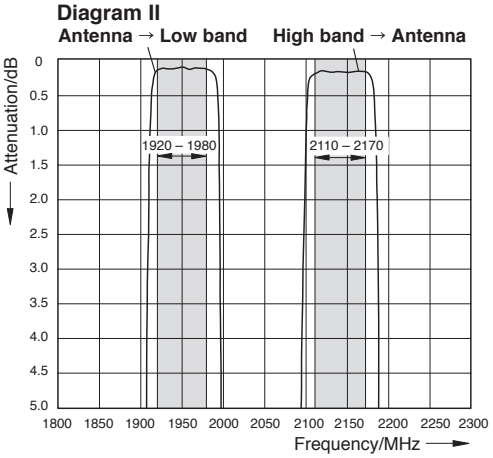


Diagram II



Technical Data

Type No.	78210192	78210193
Pass band Low band High band	1920 – 1980 MHz 2110 – 2170 MHz	
Insertion loss Antenna → Low band High band → Antenna	< 0.3 dB (1920 – 1980 MHz) < 0.3 dB (2110 – 2170 MHz)	
Isolation Low band ↔ High band	> 90 dB (1920 – 1980 / 2110 – 2170 MHz)	
VSWR	< 1.25 (1920 – 1980 / 2110 – 2170 MHz)	
Impedance	50 Ω	
Input power	< 250 W (low band *or* high band)	
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–20 … +55 °C	
Connectors	**7-16 female**	**N female**
Application	Indoor	
Special features	Built-in DC stop between all ports	
Mounting	With 4 screws (max. 4 mm diameter)	
Weight	1.67 kg	
Packing size	272 x 237 x 119 mm	
Dimensions (w x h x d)	229 x 46 x 167.6 mm (including connectors and mounting feet)	229 x 46 x 173.4 mm

Multiband Combiners

Dual-Band Combiners
Triple-Band Combiners
Quad-Band Combiners

Summary of Multiband Combiner Types

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Multiband Combiners:

Description	Type No.	Frequency range	Max. input power	Page
Dual-Band Combiner	728954	Band 1: 68 – 470 MHz Band 2: 870 – 970 MHz	50 W 50 W	243
Dual-Band Combiner	78210460	Band 1: 50 – 470 MHz Band 2: 806 – 2500 MHz	500 W 500 W	244, 245
Dual-Band Combiner	78210457	Band 1: 87.5 – 470 MHz Band 2: 806 – 2500 MHz	500 W 500 W	244, 245
Dual-Band Combiner	78210458	Band 1: 87.5 – 470 MHz Band 2: 806 – 2500 MHz	500 W 500 W	244, 245
Dual-Band Combiner	791145	Band 1: 50 – 1000 MHz Band 2: 1600 – 2000 MHz	100 W 50 W	246
Dual-Band Combiner	78210341	Band 1: 824 – 880 MHz Band 2: 890 – 960 MHz	400 W 400 W	247
Dual-Band Combiner	78210970	Band 1: 790 – 862 MHz Band 2: 880 – 960 MHz	200 W 200 W	248, 249
Dual-Band Combiner	78210971	Band 1: 790 – 862 MHz Band 2: 880 – 960 MHz	200 W 200 W	248, 249
Dual-Band Combiner	78210972	Band 1: 790 – 862 MHz Band 2: 880 – 960 MHz	200 W 200 W	248, 249
Dual-Band Combiner	78210973	Band 1: 790 – 862 MHz Band 2: 880 – 960 MHz	200 W 200 W	248, 249
Dual-Band Combiner	78210660	Band 1: 470 – 960 MHz Band 2: 1710 – 2700 MHz	650 W 350 W	250, 251
Dual-Band Combiner	78210661	Band 1: 470 – 960 MHz Band 2: 1710 – 2700 MHz	650 W 350 W	250, 251
Dual-Band Combiner	78210662	Band 1: 470 – 960 MHz Band 2: 1710 – 2700 MHz	650 W 350 W	250, 251
Dual-Band Combiner	78210663	Band 1: 470 – 960 MHz Band 2: 1710 – 2700 MHz	650 W 350 W	250, 251
Dual-Band Combiner	78210664	Band 1: 470 – 960 MHz Band 2: 1710 – 2700 MHz	650 W 350 W	250, 251
Dual-Band Combiner	78210665	Band 1: 470 – 960 MHz Band 2: 1710 – 2700 MHz	650 W 350 W	250, 251
Dual-Band Combiner	78210669	Band 1: 470 – 960 MHz Band 2: 1710 – 2700 MHz	650 W 350 W	252, 253
Dual-Band Combiner	78210680	Band 1: 380 – 960 MHz Band 2: 1710 – 2700 MHz	700 W 650 W	254, 255
Dual-Band Combiner	78210681	Band 1: 380 – 960 MHz Band 2: 1710 – 2700 MHz	700 W 650 W	254, 255
Dual-Band Combiner	78210682	Band 1: 380 – 960 MHz Band 2: 1710 – 2700 MHz	700 W 650 W	254, 255
Dual-Band Combiner	78210683	Band 1: 380 – 960 MHz Band 2: 1710 – 2700 MHz	700 W 650 W	254, 255
Dual-Band Combiner	78210278	Band 1: 790 – 1880 MHz Band 2: 1920 – 2170 MHz	500 W 500 W	256, 257
Dual-Band Combiner	78210279	Band 1: 790 – 1880 MHz Band 2: 1920 – 2170 MHz	500 W 500 W	256, 257
Dual-Band Combiner	78210305	Band 1: 790 – 1880 MHz Band 2: 1920 – 2170 MHz	500 W 500 W	256, 257
Dual-Band Combiner	78210306	Band 1: 790 – 1880 MHz Band 2: 1920 – 2170 MHz	500 W 500 W	256, 257
Dual-Band Combiner	78210620	Band 1: 1710 – 1880 MHz Band 2: 1920 – 2170 MHz	300 W 300 W	258, 259
Dual-Band Combiner	78210621	Band 1: 1710 – 1880 MHz Band 2: 1920 – 2170 MHz	300 W 300 W	258, 259
Dual-Band Combiner	78210622	Band 1: 1710 – 1880 MHz Band 2: 1920 – 2170 MHz	300 W 300 W	258, 259
Dual-Band Combiner	78210623	Band 1: 1710 – 1880 MHz Band 2: 1920 – 2170 MHz	300 W 300 W	258, 259
Dual-Band Combiner	78210624	Band 1: 1710 – 1880 MHz Band 2: 1920 – 2170 MHz	300 W 300 W	258, 259
Dual-Band Combiner	78210625	Band 1: 1710 – 1880 MHz Band 2: 1920 – 2170 MHz	300 W 300 W	258, 259
Dual-Band Combiner	78210626	Band 1: 1710 – 1880 MHz Band 2: 1920 – 2170 MHz	300 W 300 W	260, 261
Dual-Band Combiner	78210469	Band 1: 1850 – 1990 MHz Band 2: 1710 – 2155 MHz	250 W 250 W	262
Dual-Band Combiner	78210808	Band 1: 1850 – 1990 MHz Band 2: 1710 – 2155 MHz	250 W 250 W	262
Dual-Band Combiner	78210809	Band 1: 1850 – 1990 MHz Band 2: 1710 – 2155 MHz	250 W 250 W	263
Dual-Band Combiner	78210810	Band 1: 1850 – 1990 MHz Band 2: 1710 – 2155 MHz	250 W 250 W	263
Dual-Band Combiner	78210800	Band 1: 1710 – 2180 MHz Band 2: 2400 – 2700 MHz	300 W 300 W	264, 265
Dual-Band Combiner	78211091	Band 1: 1710 – 2180 MHz Band 2: 2400 – 2700 MHz	300 W 300 W	264, 265

Summary of Multiband Combiner Types

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Multiband Combiners:

Description	Type No.	Frequency range	Max. input power	Page
Dual-Band Combiner	78211092	Band 1: 1710 – 2180 MHz Band 2: 2400 – 2700 MHz	300 W 300 W	264, 265
Dual-Band Combiner	78211093	Band 1: 1710 – 2180 MHz Band 2: 2400 – 2700 MHz	300 W 300 W	264, 265
Dual-Band Combiner	78211094	Band 1: 1710 – 2180 MHz Band 2: 2400 – 2700 MHz	300 W 300 W	264, 265
Dual-Band Combiner	78211095	Band 1: 1710 – 2180 MHz Band 2: 2400 – 2700 MHz	300 W 300 W	264, 265
Dual-Band Combiner	78210264	Band 1: 50 – 2200 MHz Band 2: 2400 – 2500 MHz	200 W 200 W	274
SmartPlex Dual-Band Combiner	78210900	Band 1: 380 – 960 MHz Band 2: 1710 – 2690 MHz	500 W 300 W	272, 273
SmartPlex Dual-Band Combiner	78210901	Band 1: 380 – 960 MHz Band 2: 1710 – 2690 MHz	500 W 300 W	272, 273
Triple-Band Combiner	78210630	Band 1: 380 – 960 MHz Band 2: 1710 – 1880 MHz Band 3: 1920 – 2170 MHz	700 W 300 W 300 W	266, 267
Triple-Band Combiner	78210631	Band 1: 380 – 960 MHz Band 2: 1710 – 1880 MHz Band 3: 1920 – 2170 MHz	700 W 300 W 300 W	266, 267
Triple-Band Combiner	78210632	Band 1: 380 – 960 MHz Band 2: 1710 – 1880 MHz Band 3: 1920 – 2170 MHz	700 W 300 W 300 W	266, 267
Triple-Band Combiner	78210633	Band 1: 380 – 960 MHz Band 2: 1710 – 1880 MHz Band 3: 1920 – 2170 MHz	700 W 300 W 300 W	266, 267
Triple-Band Combiner	78210634	Band 1: 380 – 960 MHz Band 2: 1710 – 1880 MHz Band 3: 1920 – 2170 MHz	700 W 300 W 300 W	266, 267
Triple-Band Combiner	78210635	Band 1: 380 – 960 MHz Band 2: 1710 – 1880 MHz Band 3: 1920 – 2170 MHz	700 W 300 W 300 W	266, 267
Triple-Band Combiner	**78211130**	Band 1: 710 – 960 MHz Band 2: 1710 – 2180 MHz Band 3: 2490 – 2690 MHz	300 W 300 W 300 W	268, 269
Triple-Band Combiner	**78211131**	Band 1: 710 – 960 MHz Band 2: 1710 – 2180 MHz Band 3: 2490 – 2690 MHz	300 W 300 W 300 W	268, 269
Triple-Band Combiner	**78211132**	Band 1: 710 – 960 MHz Band 2: 1710 – 2180 MHz Band 3: 2490 – 2690 MHz	300 W 300 W 300 W	268, 269
Triple-Band Combiner	**78211133**	Band 1: 710 – 960 MHz Band 2: 1710 – 2180 MHz Band 3: 2490 – 2690 MHz	300 W 300 W 300 W	268, 269
Quad-Band Combiner	78210640	Band 1: 380 – 960 MHz Band 2: 1710 – 1880 MHz Band 3: 1920 – 2200 MHz Band 4: 2500 – 2690 MHz	700 W 300 W 300 W 200 W	270, 271
Quad-Band Combiner	78210641	Band 1: 380 – 960 MHz Band 2: 1710 – 1880 MHz Band 3: 1920 – 2200 MHz Band 4: 2500 – 2690 MHz	700 W 300 W 300 W 200 W	270, 271
Quad-Band Combiner	78210642	Band 1: 380 – 960 MHz Band 2: 1710 – 1880 MHz Band 3: 1920 – 2200 MHz Band 4: 2500 – 2690 MHz	700 W 300 W 300 W 200 W	270, 271
Quad-Band Combiner	78210643	Band 1: 380 – 960 MHz Band 2: 1710 – 1880 MHz Band 3: 1920 – 2200 MHz Band 4: 2500 – 2690 MHz	700 W 300 W 300 W 200 W	270, 271

New Products

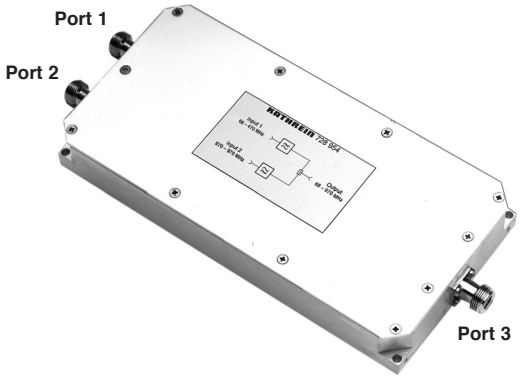
Type No.	Frequency / MHz
	PMR · LTE800 · GSM/UMTS900 · GSM1800 · UMTS2100 · WLAN · LTE2600/WiMax 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000
Dual-band Combiners	
728954	68 - 470 · 870 - 970
791145	50 - 1000 · 1600 - 2000
78210457, ..458 ..460	50 - 470 · 806 - 2500
78210341	824 - 880 · 890 - 960
78210970, ..971 ..972 ..973	790 - 862 · 880 - 960
78210660, ..1 ..2 ..3 ..4 ..5 ..9	470 - 960 · 1710 - 2700
78210680, ..681 ..682 ..683	380 - 960 · 1710 - 2700
78210900, 78210901	380 - 960 · 1710 - 2690
78210278, ..279 ..305 ..306	790 - 1880 · 1920 - 2170
78210620, ..1 ..2 ..3 ..4 ..5 ..6	1710 - 1880 · 1920 - 2170
78210264	50 - 2200 · 2400 - 2500
78210800, 78211091, ..2 ..3 ..4 ..5	1710 - 2180 · 2400 - 2700
78210469, ..808 ..809 ..810	1710-1755 · 1850 - 1910 · 2110-2155
Triple-band Combiners	
78210630, ..1 ..2 ..3 ..4 ..5	380 - 960 · 1710 - 1880 · 1920 - 2170
78211130, ..131 ..132 ..133	790 - 960 · 1710 - 2180 · 2490 - 2690
Quad-band Combiners	
78210640, ..641 ..642 ..643	380 - 960 · 1710 - 1880 · 1920 - 2200 · 2500 - 2690

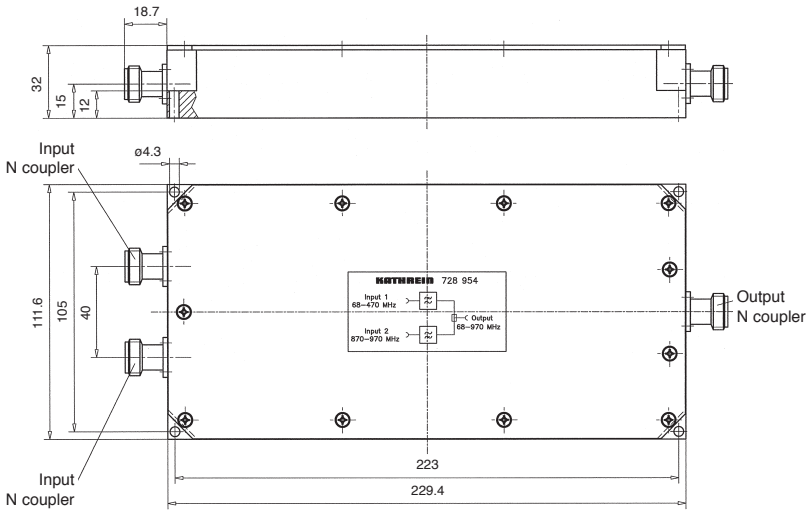
Dual-Band Combiner

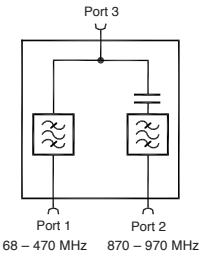
KATHREIN
Antennen · Electronic

68 – 470 MHz	870 – 970 MHz
80 / 160 / 400 MHz	GSM 900

- Designed for inhouse multiband distribution network
- Enables feeder sharing
- DC by-pass between port 1 and port 3
- Built-in DC stop between port 2 and port 3







Technical Data

Type No.	728954
Pass band Band 1 Band 2	 68 – 470 MHz 870 – 970 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	 < 0.5 dB (68 – 470 MHz) < 0.5 dB (870 – 970 MHz)
Isolation Port 1 ↔ Port 2	 > 45 dB
VSWR	< 1.2
Impedance	50 Ω
Input power Band 1 Band 2	 < 50 W < 50 W
Intermodulation products	< –160 dBc ($2^{nd}/3^{rd}$ order; with 2 x 20 W)
Temperature range	–20 ... +70 °C
Connectors	N female
Application	Indoor
DC transparency Port 1 ↔ Port 3 Port 2 → Port 3 Port 3 → Port 2	 By-pass (max. 2500mA) short circuited stop
Weight	0.8 kg
Packing size	285 x 55 x 125 mm
Dimensions (w x h x d)	229.4 x 32 x 111.6 mm (without connectors)

Typical Attenuation Curves

Diagram I

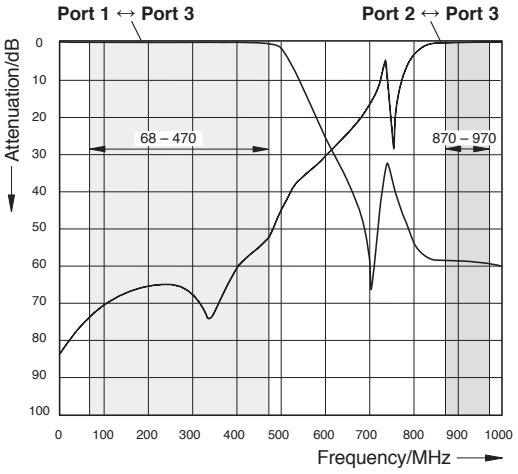
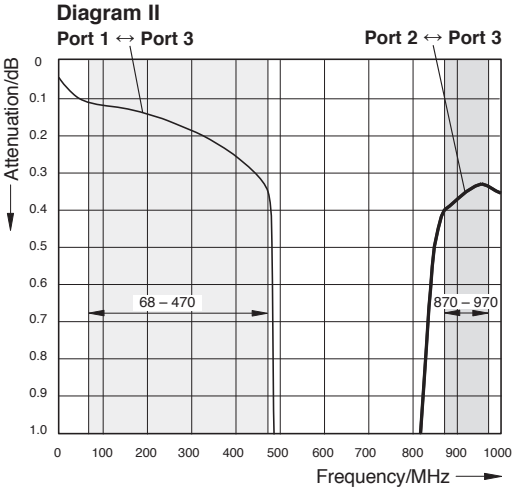


Diagram II

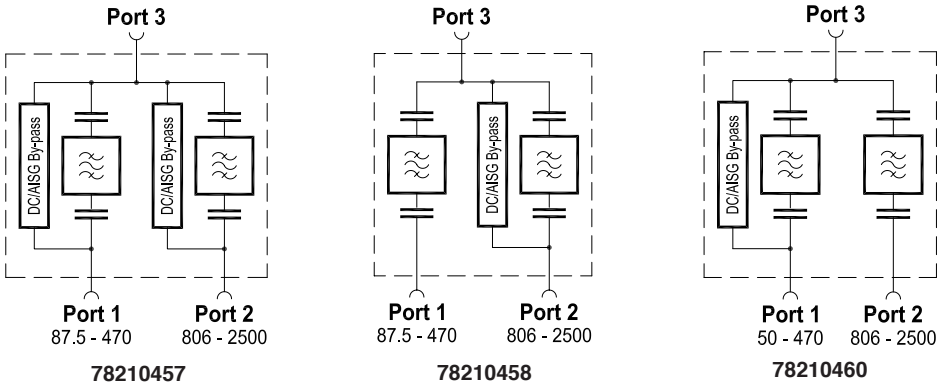


Dual-Band Combiner

KATHREIN
Antennen · Electronic

50 – 470 MHz	806 – 2500 MHz
PMR / TETRA / TETRAPOL	CDMA 850 / GSM 900 / GSM 1800 / UMTS 2100 / WLAN

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- External DC stop available as an accessory
- **Very low insertion loss**
- **High input power**



Technical Data

Type No.	78210457	78210458	78210460
Pass band Band 1 Band 2	87.5 – 470 MHz 806 – 2500 MHz		50 – 470 MHz 806 – 2500 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.15 dB (87.5 – 470 MHz) < 0.15 dB (806 – 2500 MHz)		< 0.15 dB (50 – 470 MHz) < 0.15 dB (806 – 2500 MHz)
Isolation Port 1 ↔ Port 2	> 50 dB (250 – 470 / 806 – 2500 MHz) > 40 dB (87.5 – 250 MHz)		> 50 dB (50 – 470 / 806 – 2500 MHz)
VSWR	< 1.25 (87.5 – 470 / 806 – 960 / 1710 – 2500 MHz)		< 1.25 (50 – 470 / 806 – 960 / 1710 – 2500 MHz)
Impedance	50 Ω		
Input power Band 1 Band 2	< 500 W < 500 W		
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)		
Temperature range	–55 ... +60 °C		
Connectors	7-16 female, long neck		
Application	Indoor or outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	**By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA)	**Stop** **By-pass** (max. 2500 mA)	**By-pass** (max. 2500 mA) **Stop**
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set		
Weight	4 kg		
Dimensions (w x h x d)	122 x 284.7 x 52 mm (without connectors, without mounting brackets)		

50 – 470 MHz	806 – 2500 MHz
PMR / TETRA / TETRAPOL	CDMA 850 / GSM 900 / GSM 1800 / UMTS 2100 / WLAN

Typical Attenuation Curves

78210457

Diagram I

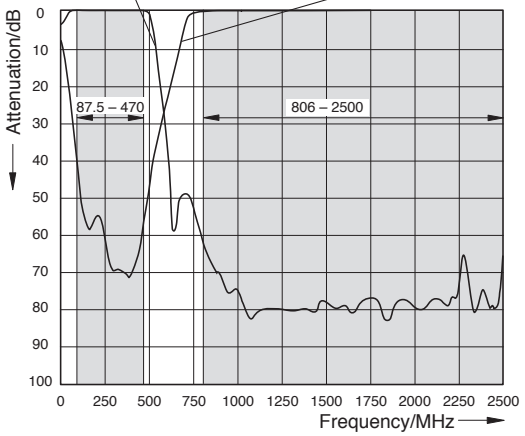
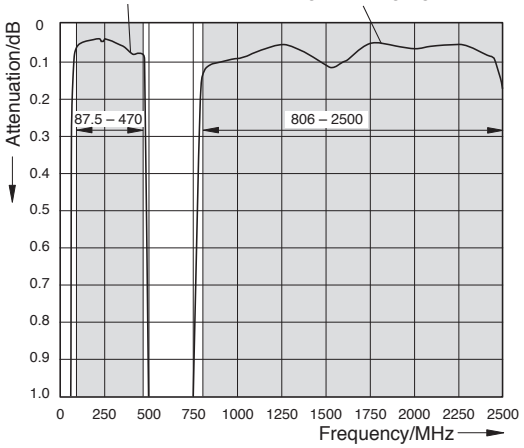


Diagram II



78210458

Diagram I

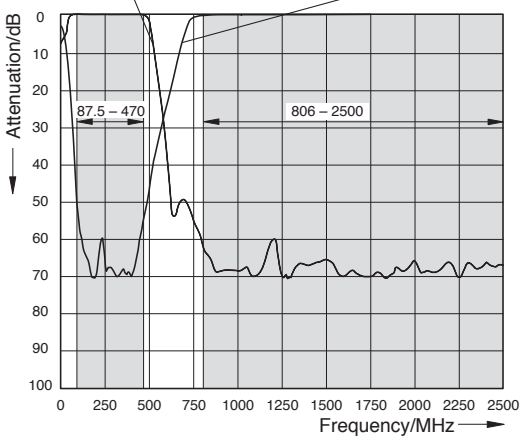
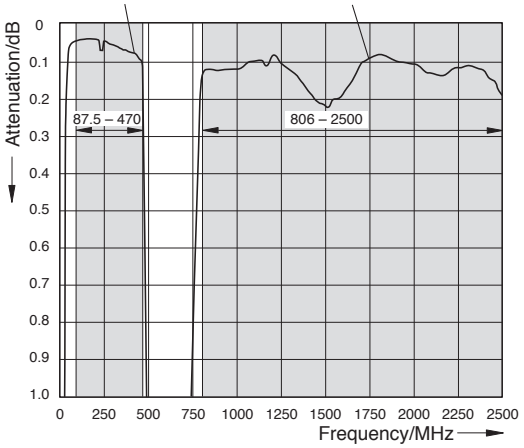


Diagram II



78210460

Diagram I

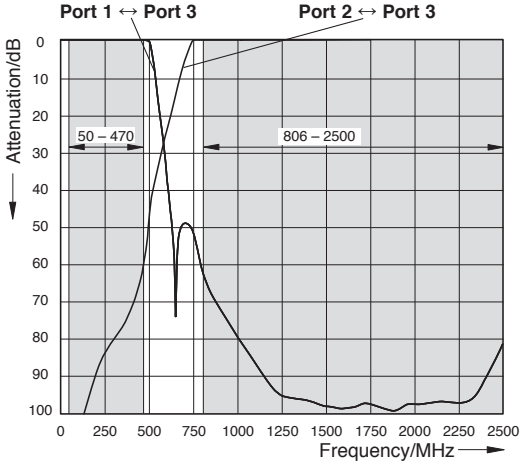
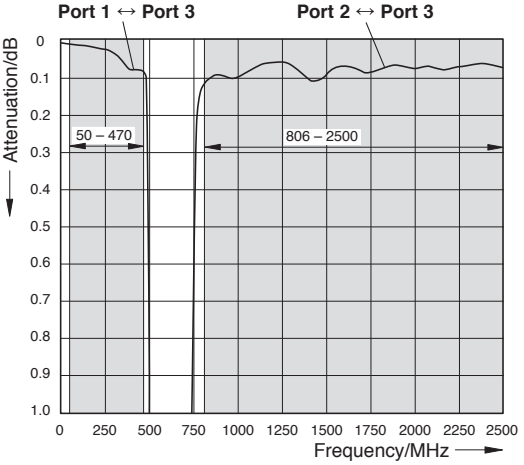


Diagram II

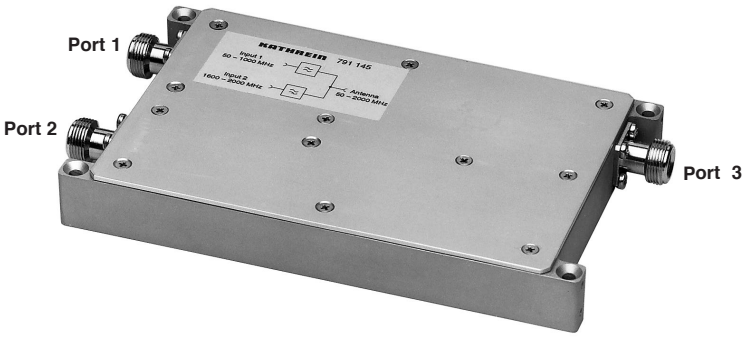


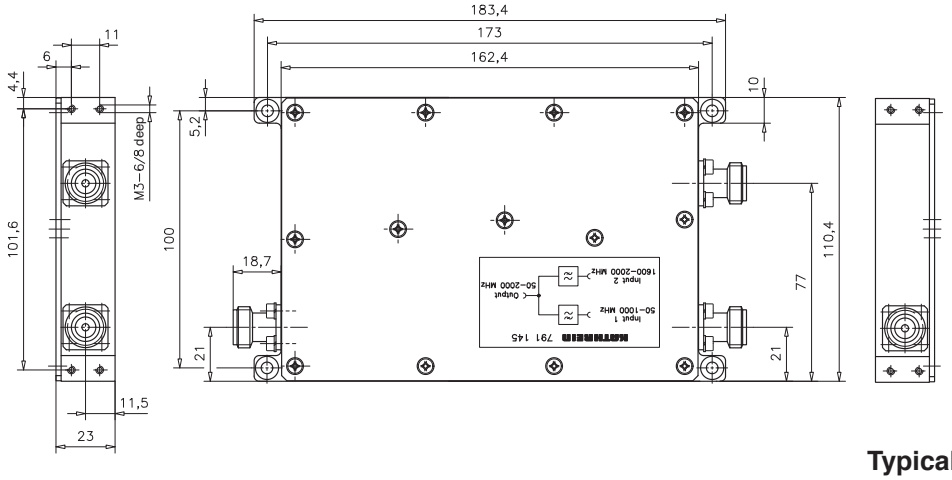
Dual-Band Combiner

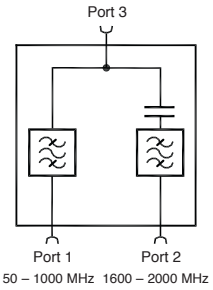
KATHREIN
Antennen · Electronic

50 – 1000 MHz	**1600 – 2000 MHz**
80 / 160 / 400 / GSM 900	GSM 1800

- Designed for inhouse multiband distribution network
- Enables feeder sharing
- DC by-pass between port 1 and port 3
- Built-in DC stop between port 2 and port 3







Typical Attenuation Curves

Diagram I

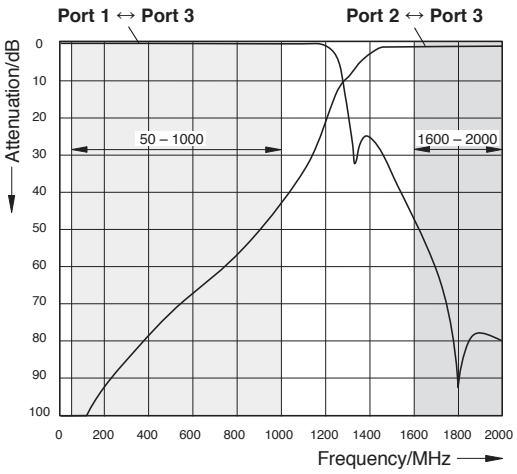
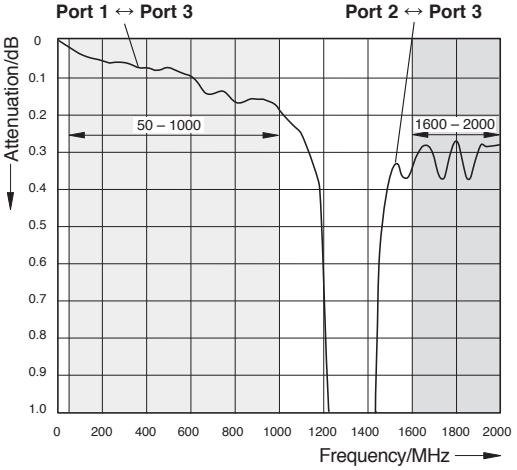


Diagram II



Technical Data

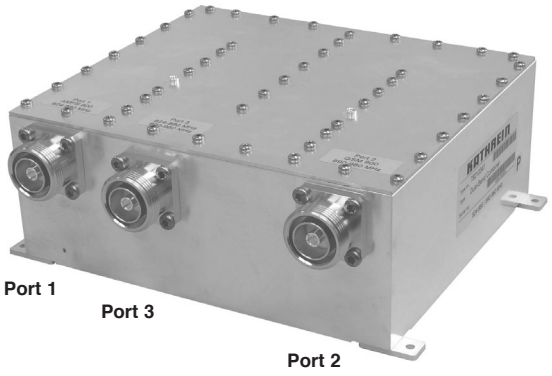
Type No.	**791145**
Pass band Band 1 Band 2	 50 – 1000 MHz 1600 – 2000 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	 < 0.3 dB (50 – 1000 MHz) < 0.5 dB (1600 – 2000 MHz)
Isolation Port 1 ↔ Port 2	 > 40 dB (50 – 1000 / 1600 – 2000 MHz)
VSWR (all ports)	< 1.2 (50 – 1000 / 1600 – 2000 MHz)
Impedance	50 Ω
Input power Band 1 Band 2	 < 100 W < 50 W
Temperature range	–30 … +60 °C
Connectors	N female
Application	Indoor
DC transparency Port 1 ↔ Port 3 Port 2 → Port 3 Port 3 → Port 2	 By-pass (max. 2500mA) Short circuited Stop
Mounting	With 4 screws (max.4 mm diameter)
Weight	0.7 kg
Packing size	220 x 40 x 140 mm
Dimensions (w x h x d)	199.5 x 23 x 110.4 mm (incl. connectors)

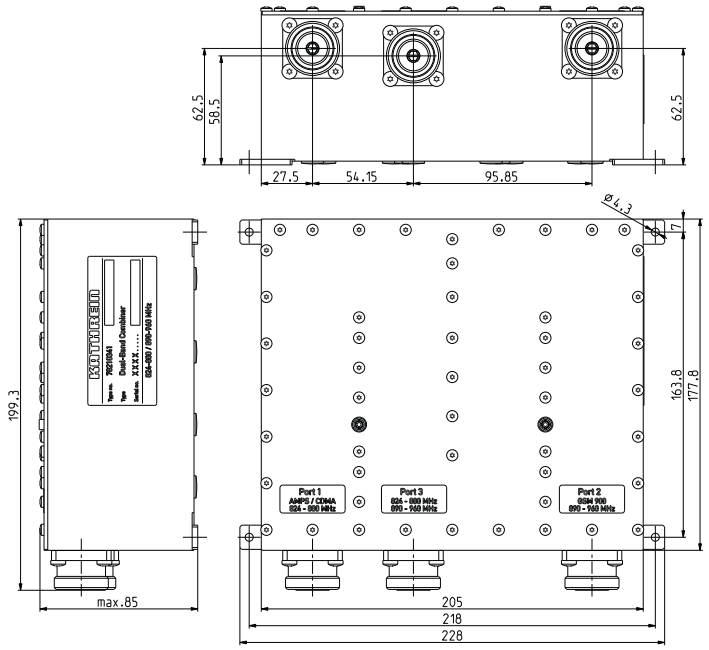
Dual-Band Combiner

KATHREIN
Antennen · Electronic

824 – 880 MHz	890 – 960 MHz
AMPS / CDMA 850	GSM 900

- Designed for co-siting purposes
- Enables feeder sharing
- Suitable for indoor applications
- Built-in DC stop between all ports





Technical Data

Type No.	78210341
Pass band Band 1 (AMPS / CDMA 800) Band 2 (GSM 900)	 824 – 880 MHz 890 – 960 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	 < 0.6 dB (824 – 880 MHz) < 0.6 dB (890 – 960 MHz)
Isolation Port 1 ↔ Port 2	 > 55 dB (824 – 880 / 890 – 960 MHz)
VSWR	< 1.2 (824 – 880 / 890 – 960 MHz)
Impedance	50 Ω
Input power Band 1 Band 2	 < 400 W (with max. 8 carriers) < 400 W (with max. 8 carriers)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–20 ... +55 °C
Connectors	7-16 female
Application	Indoor
Special features	Built-in DC stop between all ports
Mounting	With 4 screws (max. 4 mm diameter)
Weight	3.2 kg
Dimensions (w x h x d)	228 x 85 x 199.3 mm (including connectors and mounting feet)

Typical Attenuation Curves

Diagram I

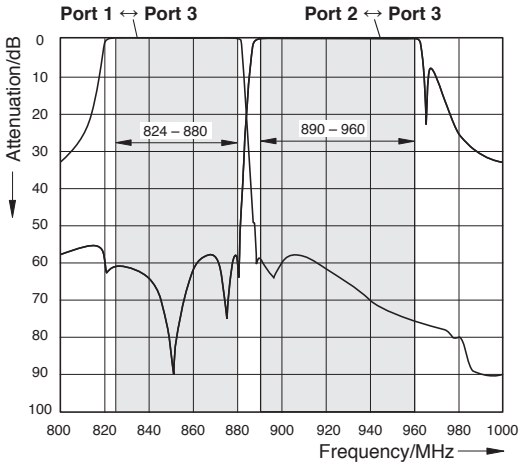
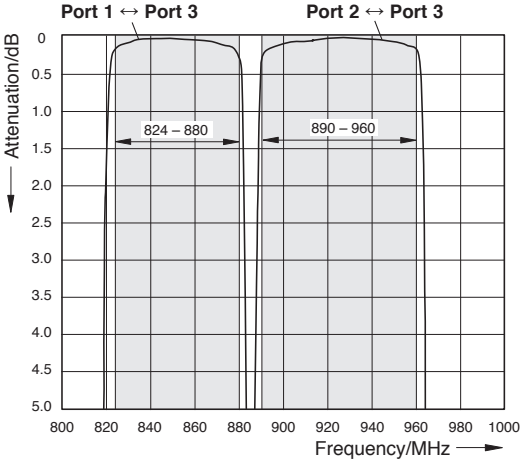


Diagram II

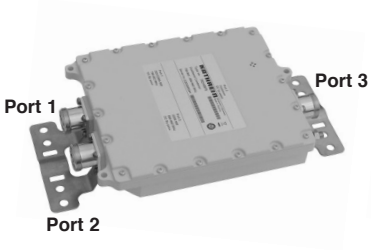


Dual-Band Combiner

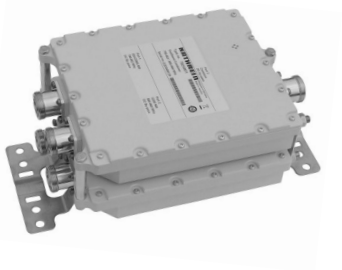
KATHREIN
Antennen · Electronic

790 – 862 MHz	**880 – 960 MHz**
LTE 800	GSM 900

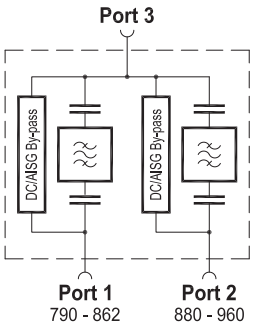
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory

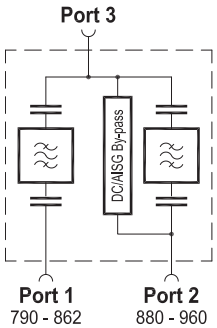


78210970, 78210972
Single Unit



78210971, 78210973
Double Unit





Technical Data

Type No.	**78210970** Single Unit	**78210972** Single Unit
	78210971 Double Unit	**78210973** Double Unit
Pass band Band 1 Band 2	790 – 862 MHz 880 – 960 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.4 dB, typically 0.2 dB (790 – 862 MHz) < 0.4 dB, typically 0.2 dB (880 – 960 MHz)	
Isolation Port 1 ↔ Port 2	> 50 dB (790 – 862 MHz / 880 – 960 MHz)	
VSWR	< 1.25 (790 – 862 / 880 – 960 MHz)	
Impedance	50 Ω	
Input power Band 1 / Band 2	< 200 W / < 200 W	
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–40 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor *or* outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	**By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA)	**Stop** **By-pass** (max. 2500 mA)
Lightning protection	3 kA, 10/350 µs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	Single Unit: 2.9 kg / Double Unit: 5.8 kg	
Dimensions (w x h x d)	Single Unit: 177.4 x 209.4 x 52.4 mm / Double Unit: 177.4 x 209.4 x 108.4 mm (without connectors, without mounting brackets)	

Dual-Band Combiner

KATHREIN
Antennen · Electronic

790 – 862 MHz	880 – 960 MHz
LTE 800	GSM 900

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Type No.	Description
793301	**DC stop**
78410367	**50-Ohm load**

Clamp Set

DC stop

50-Ohm load

Typical Attenuation Curves

Diagram I

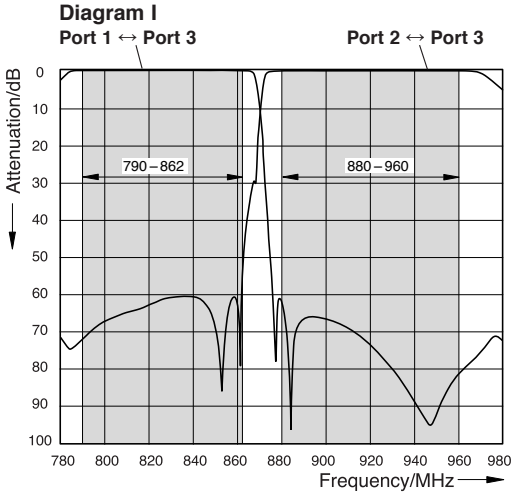
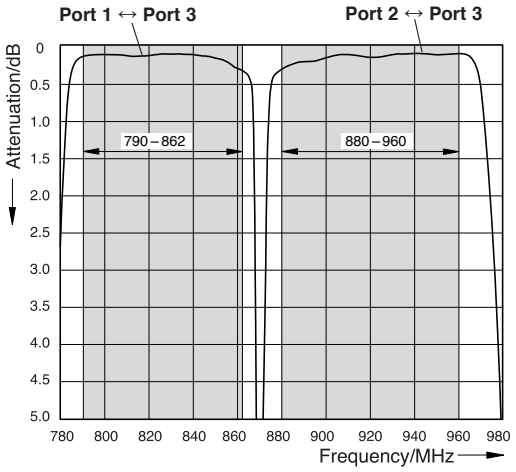
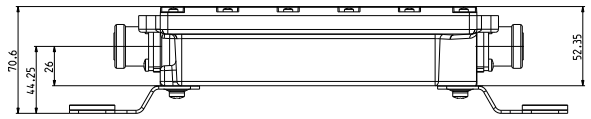
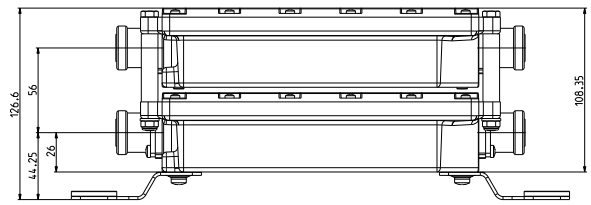


Diagram II

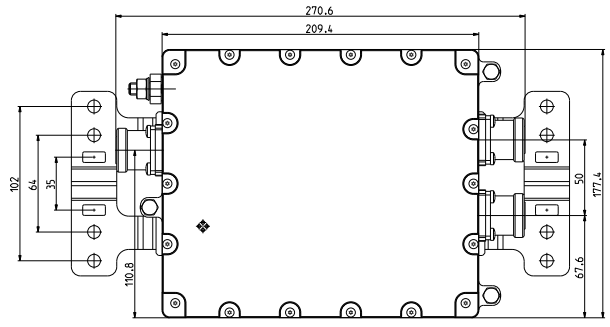




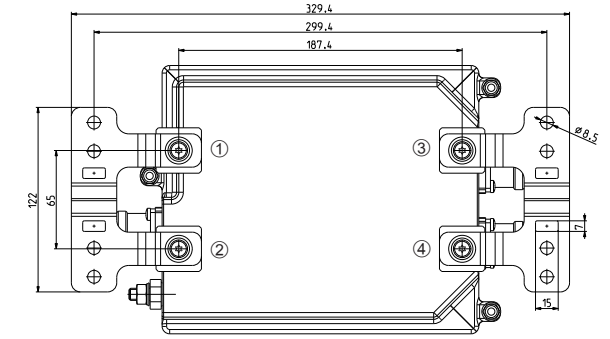
Side view Single Unit



Side view Double Unit



Top view Single Unit, Double Unit



Bottom view Single Unit, Double Unit

Please note:

The mounting plates can be removed by loosening the screws ① to ④ (M5 x 12) and replaced with other means of mounting, always provided that the max. drilled depth of 7.5 mm is respected with the choice of replacement screws.

Dual-Band Combiner

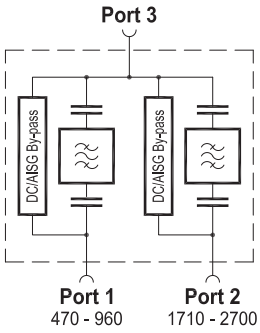
KATHREIN
Antennen · Electronic

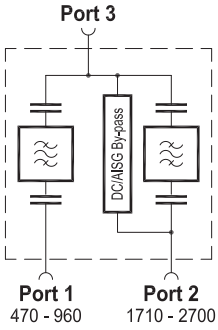
470 – 960 MHz	1710 – 2700 MHz
LTE 800 / CDMA 850 / GSM 900	GSM 1800 / UMTS 2100 / WiMAX / LTE 2600

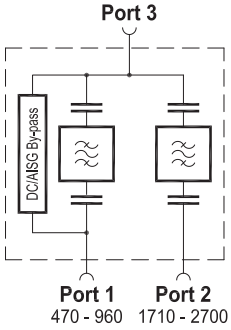
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**

78210660, 78210662, 78210664
Single Unit

78210661, 78210663, 78210665
Double Unit







Technical Data

Type No.	**78210660** Single Unit / **78210661** Double Unit	**78210662** Single Unit / **78210663** Double Unit	**78210664** Single Unit / **78210665** Double Unit
Pass band Band 1 Band 2	470 – 960 MHz 1710 – 2700 MHz		
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.15 dB (470 – 960 MHz), typically 0.1 dB (470 – 960 MHz) < 0.2 dB (1710 – 2700 MHz), typically 0.1 dB (1710 – 2700 MHz)		
Isolation Port 1 ↔ Port 2	> 55 dB (470 – 960 MHz) / > 65 dB (1710 – 2700 MHz)		
VSWR	< 1.2 (470 – 960 / 1710 – 2700 MHz)		
Impedance	50 Ohm		
Input power Band 1 / Band 2	< 650 W / < 350 W		
Intermodulation products	< –160 dBc (3rd order with 2 x 20 W)		
Temperature range	–55 ... +60 °C		
Connectors	7-16 female (long neck)		
Application	Indoor *or* outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	**By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA)	**Stop** **By-pass** (max. 2500 mA)	**By-pass** (max. 2500 mA) **Stop**
Lightning protection	3 kA, 10/350 µs pulse		
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	Single Unit: 1.2 kg / Double Unit: 2.4 kg		
Packing size	Single Unit: 285 x 157 x 93 mm / Double Unit: 285 x 157 x 148 mm		
Dimensions (w x h x d)	Single Unit: 126 x 145 x 38 mm / Double Unit: 126 x 145 x 93 mm (without connectors, without mounting brackets)		

Dual-Band Combiner

KATHREIN
Antennen · Electronic

470 – 960 MHz	1710 – 2700 MHz
LTE 800 / CDMA 850 / GSM 900	GSM 1800 / UMTS 2100 / WiMAX / LTE 2600

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Clamp Set

Type No.	Description
78210850	**DC stop**
78410367	**50-Ohm load**

DC stop

50-Ohm load

Typical Attenuation Curves

Diagram I

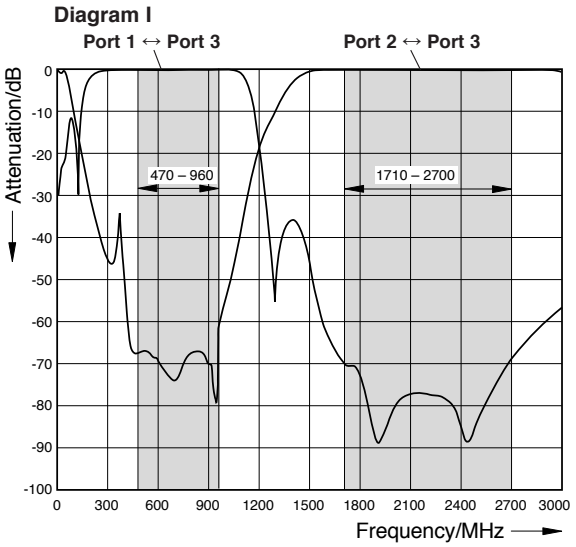
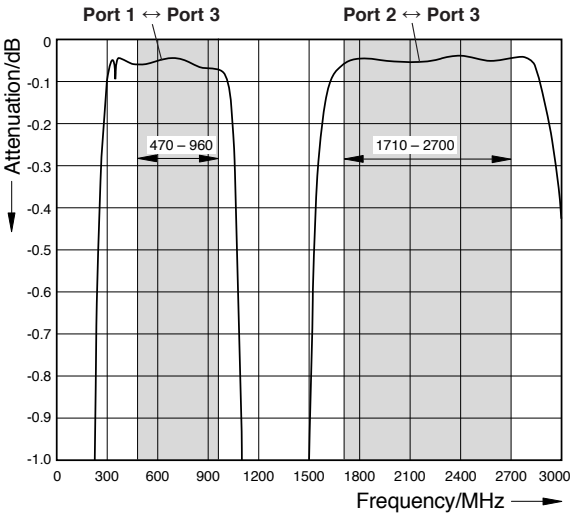
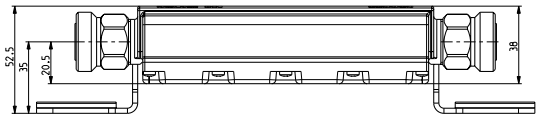
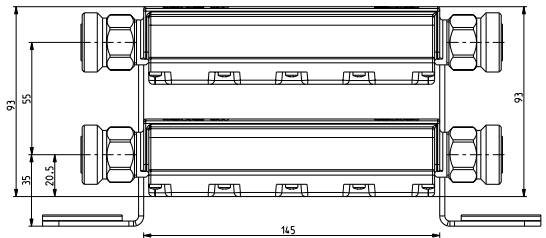


Diagram II

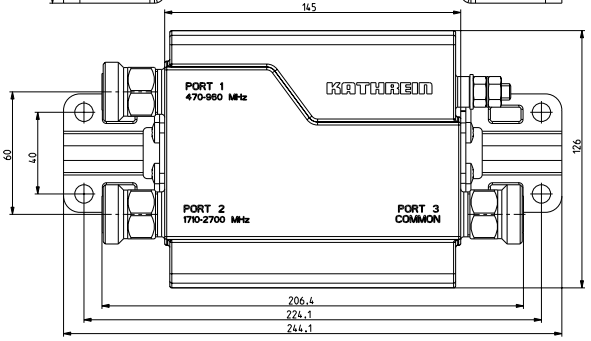




Side view Single Unit



Side view Double Unit



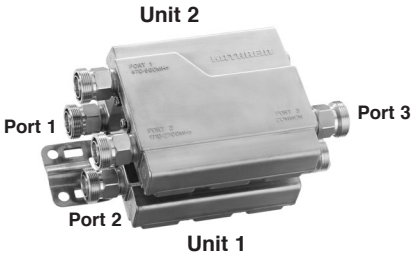
Top view Single Unit, Double Unit

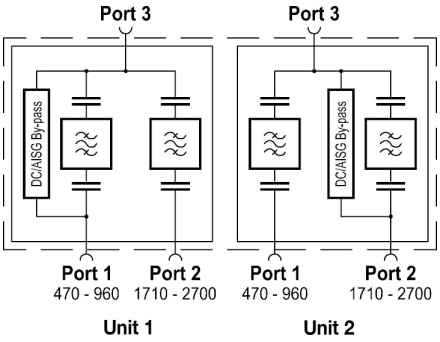
Dual-Band Combiner

KATHREIN
Antennen · Electronic

470 – 960 MHz	1710 – 2700 MHz
DVB-H / CDMA 850 / GSM 900	GSM 1800 / UMTS 2100 / WiMAX / LTE 2600

- Designed to support separate DC/AISG supply for a low-band and high-band DTMA via 2 feeder cables (see application)
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit for XPol antennas
- Built-in lightning protection
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**

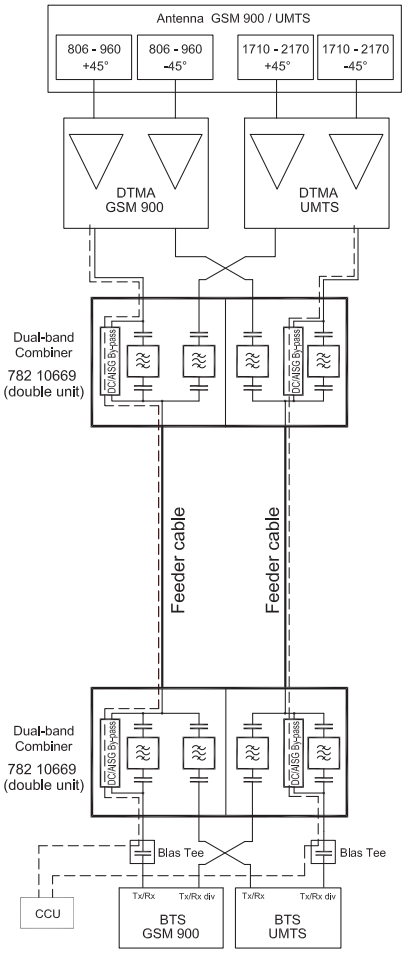




Technical Data

Type No.	78210669 Double Unit	
Pass band Band 1 Band 2	470 – 960 MHz 1710 – 2700 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.1 dB (470 – 960 MHz) < 0.1 dB (1710 – 2700 MHz)	
Isolation Port 1 ↔ Port 2	> 55 dB (470 – 960 MHz) / > 65 dB (1710 – 2700 MHz)	
VSWR	< 1.2 (470 – 960 / 1710 – 2700 MHz)	
Impedance	50 Ohm	
Input power Band 1 / Band 2	< 650 W / < 350 W	
Intermodulation products	< –160 dBc (3rd order with 2 x 20 W)	
Temperature range	–55 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor *or* outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	**Unit 1** **By-pass** (max. 2500 mA) **Stop**	**Unit 2** **Stop** **By-pass** (max. 2500 mA)
Lightning protection	3 kA, 10/350 µs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	2.4 kg	
Packing size	285 x 157 x 148 mm	
Dimensions (w x h x d)	126 x 145 x 93 mm (without connectors, without mounting brackets)	

Application Example



Dual-Band Combiner

KATHREIN
Antennen · Electronic

470 – 960 MHz	1710 – 2700 MHz
DVB-H / CDMA 850 / GSM 900	GSM 1800 / UMTS 2100 / WiMAX / LTE 2600

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Type No.	Description
78210850	**DC stop**
78410367	**50-Ohm load**

Clamp Set

DC stop

50-Ohm load

Typical Attenuation Curves

Diagram I

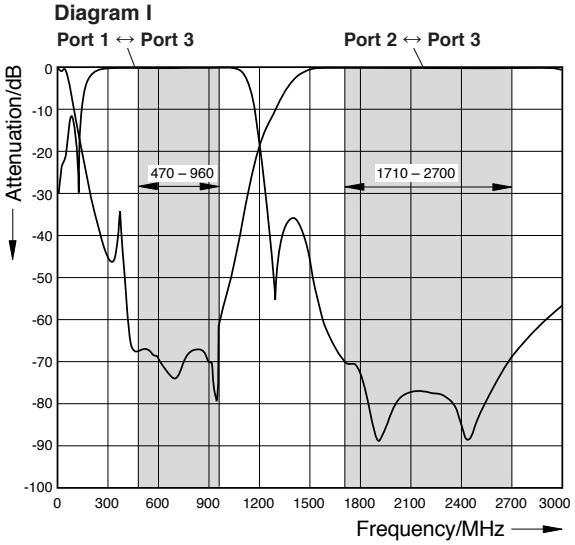
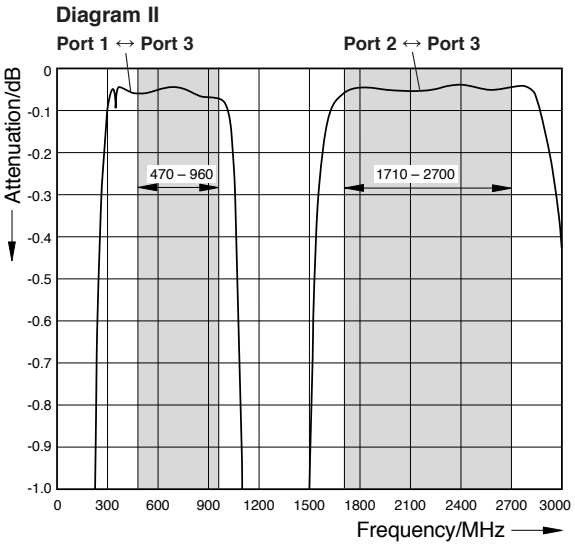
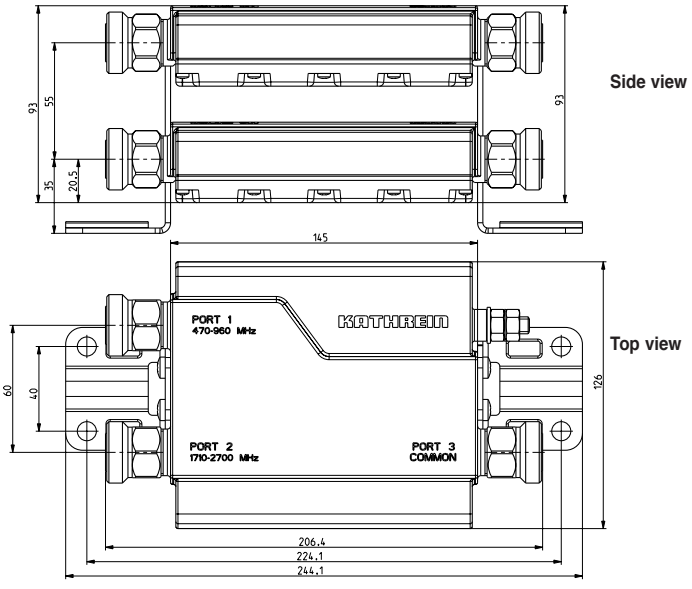


Diagram II



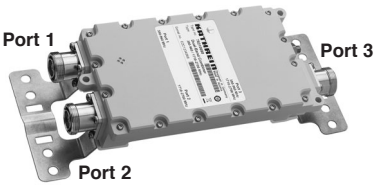


Dual-Band Combiner

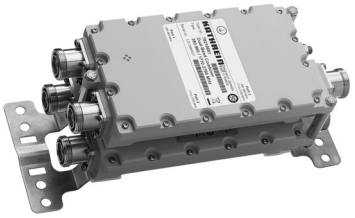
KATHREIN
Antennen · Electronic

380 – 960 MHz	1710 – 2700 MHz
TETRA / LTE800 / CDMA850 / GSM900	GSM1800 / UMTS2100 / WiMAX / LTE2600

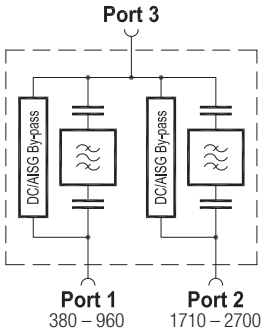
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Extremely low insertion loss**
- **High input power**

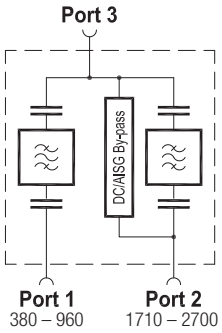


78210680, 78210682
Single Unit



78210681, 78210683
Double Unit





Technical Data

Type No.	**78210680** Single Unit	**78210682** Single Unit
	78210681 Double Unit	**78210683** Double Unit
Pass band Band 1 Band 2	380 – 960 MHz 1710 – 2700 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.1 dB (380 – 960 MHz) < 0.1 dB (1710 – 2700 MHz)	
Isolation Port 1 ↔ Port 2	> 55 dB (380 – 550 MHz) / > 65 dB (550 – 960 MHz) / > 65 dB (1710 – 2700 MHz)	
VSWR	< 1.2 (380 – 960 / 1710 – 2700 MHz)	
Impedance	50 Ω	
Input power Band 1 / Band 2	< 700 W / < 700 W	
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–55 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor *or* outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	**By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA)	**Stop** **By-pass** (max. 2500 mA)
Lightning protection	3 kA, 10/350 µs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	Single Unit: 2.2 kg / Double Unit: 4.3 kg	
Packing size	Single Unit: 365 x 207 x 150 mm / Double Unit: 365 x 207 x 214 mm	
Dimensions (w x h x d)	Single Unit: 117 x 209.5 x 48.8 mm / Double Unit: 117 x 209.5 x 99.5 mm (without connectors, without mounting brackets)	

Dual-Band Combiner

KATHREIN
Antennen · Electronic

380 – 960 MHz	1710 – 2700 MHz
TETRA / LTE800 / CDMA850 / GSM900	GSM1800 / UMTS2100 / WiMAX / LTE2600

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Type No.	Description
78210850	**DC stop**
78410367	**50-Ohm load**

Clamp Set

DC stop

50-Ohm load

Typical Attenuation Curves

Diagram I

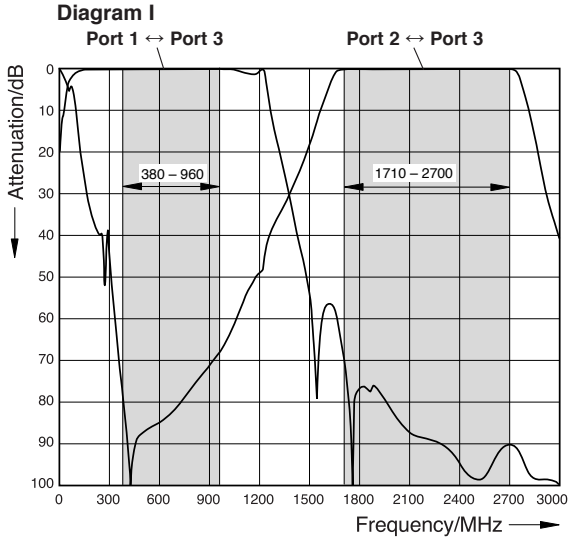
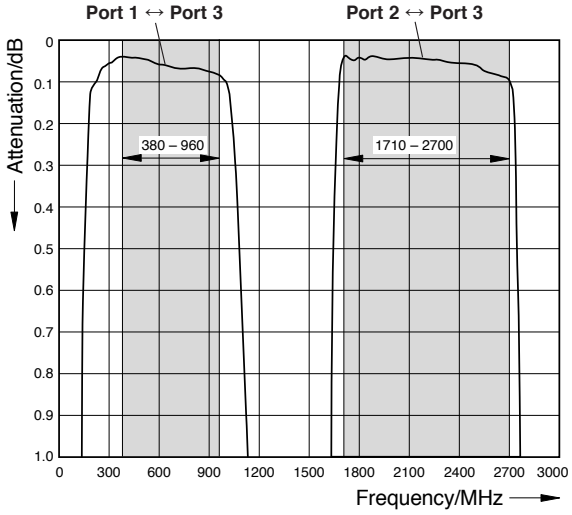
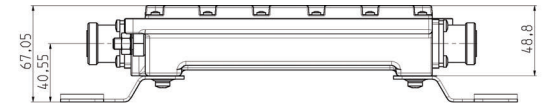
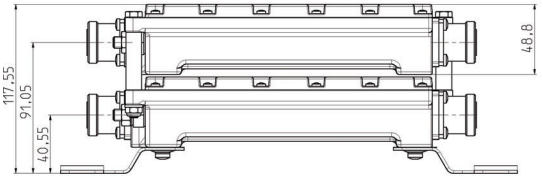


Diagram II

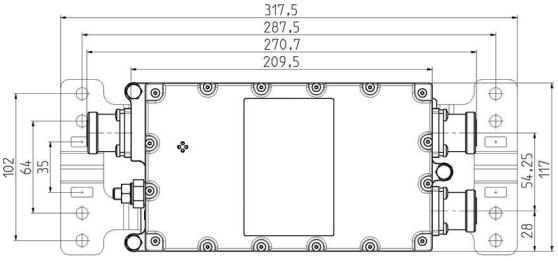




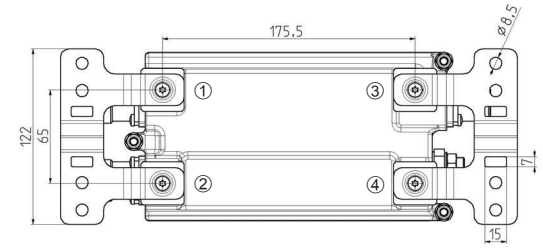
Side view Single Unit



Side view Double Unit



Top view Single Unit, Double Unit



Bottom view Single Unit, Double Unit

Please note:
The mounting plates can be removed by loosening the screws ① to ④ (M5 x 12) and replaced with other means of mounting, always provided that the max. drilled depth of 7.5 mm is respected with the choice of replacement screws.

Dual-Band Combiner

KATHREIN
Antennen · Electronic

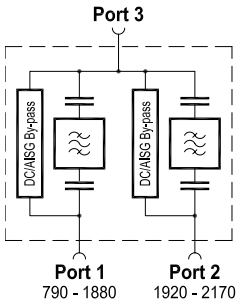
790 – 1880 MHz
LTE 800 / CDMA 850 / GSM 900 / GSM 1800

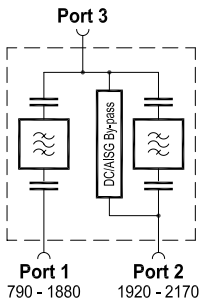
1920 – 2170 MHz
UMTS 2100

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory

78210278, 78210305
Single Unit

78210279, 78210306
Double Unit





Technical Data

Type No.	**78210278** Single Unit / **78210279** Double Unit	**78210305** Single Unit / **78210306** Double Unit
Pass band Band 1 Band 2	790 – 1880 MHz 1920 – 2170 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.1 dB, typically 0.05 dB (790 – 960 MHz) / < 0.4 dB, typically 0.2 dB (1710 – 1880 MHz) < 0.4 dB, typically 0.2 dB (1920 – 2170 MHz)	
Isolation Port 1 ↔ Port 2	> 55 dB (790 – 960 MHz) / > 50 dB (1710 – 1880 MHz) / > 50 dB (1920 – 2170 MHz)	
VSWR	< 1.2 (790 – 960 MHz) / < 1.25 (1710 – 1880 MHz) / < 1.2 (1920 – 2170 MHz)	
Impedance	50 Ω	
Input power Band 1 / Band 2	< 500 W / < 500 W	
Intermodulation products	< –160 dBc (2^{nd}/3^{rd} order; with 2 x 20 W)	
Temperature range	–55 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor *or* outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	**By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA)	**Stop** **By-pass** (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	Single Unit: 3.4 kg / Double Unit: 6.6 kg	
Packing size	Single Unit: 207 x 437 x 154 mm / Double Unit: 207 x 437 x 214 mm	
Dimensions (w x h x d)	Single Unit: 122 x 269.9 x 43 mm / Double Unit:122 x 269.9 x 98.5 mm (without connectors, without mounting brackets)	

Dual-Band Combiner

KATHREIN
Antennen · Electronic

790 – 1880 MHz	1920 – 2170 MHz
LTE 800 / CDMA 850 / GSM 900 / GSM 1800	UMTS

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Type No.	Description
78210850	**DC stop**
78410367	**50-Ohm load**

Clamp Set

DC stop

50-Ohm load

Typical Attenuation Curves

Diagram I

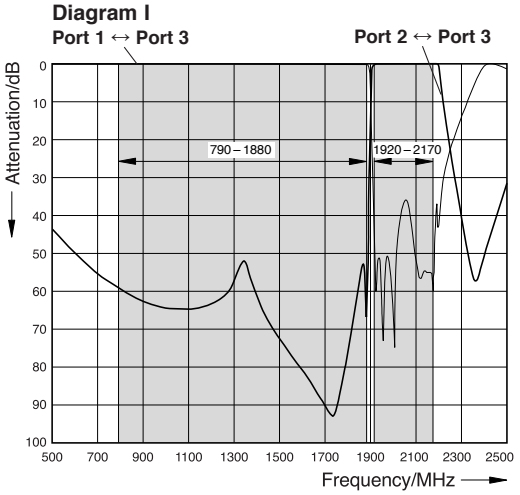
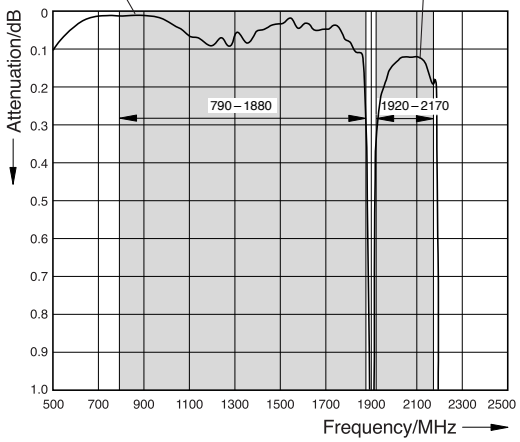
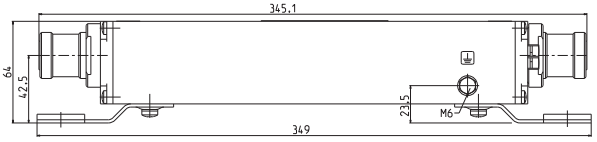
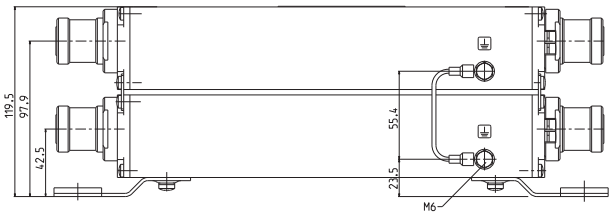


Diagram II

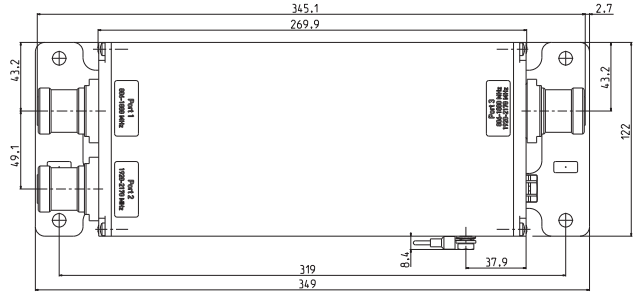




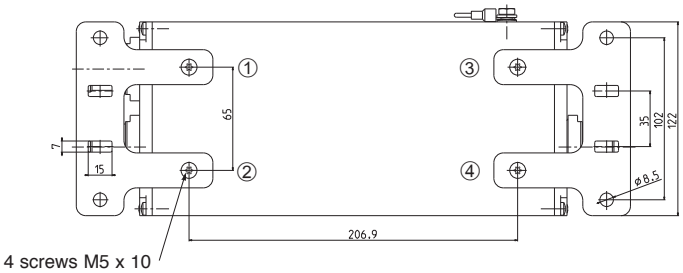
Side view, Single Unit



Side view, Double Unit



**Top view, Single Unit,
Double Unit**



4 screws M5 x 10
4 spring washers
5.5 DIN 6095

**Bottom view, Single Unit,
Double Unit**

Please note:
The mounting plates can be removed by loosening the screws ① to ④ (M5 x 10) and replaced with other means of mounting, always provided that the max. drilled depth of 8.5 mm is respected with the choice of replacement screws.

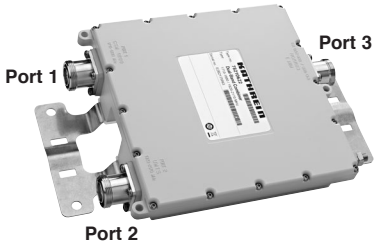
Dual-Band Combiner

KATHREIN
Antennen · Electronic

1710 – 1880 MHz
GSM 1800

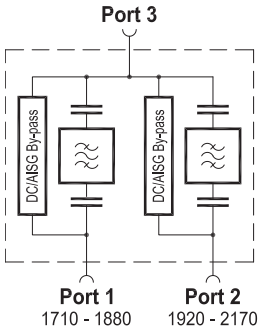
1920 – 2170 MHz
UMTS 2100

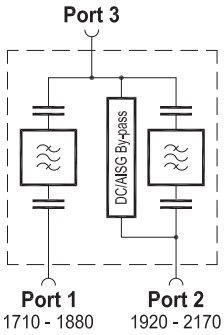
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory

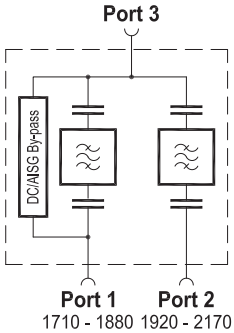


78210620, 78210622, 78210624
Single Unit

78210621, 78210623, 78210625
Double Unit







Technical Data

Type No.	**78210620** Single Unit / **78210621** Double Unit	**78210622** Single Unit / **78210623** Double Unit	**78210624** Single Unit / **78210625** Double Unit
Pass band Band 1 (GSM 1800) Band 2 (UMTS)	1710 – 1880 MHz 1920 – 2170 MHz		
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.3 dB (1710 – 1880 MHz) < 0.3 dB (1920 – 2170 MHz)		
Isolation Port 1 ↔ Port 2	> 50 dB (1710 – 1880 / 1920 – 2170 MHz)		
VSWR	< 1.25 (1710 – 1880 / 1920 – 2170 MHz)		
Impedance	50 Ω		
Input power Band 1 / Band 2	< 300 W / < 300 W		
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)		
Temperature range	–40 ... +60 °C		
Connectors	7-16 female (long neck)		
Application	Indoor *or* outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	**By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA)	**Stop** **By-pass** (max. 2500 mA)	**By-pass** (max. 2500 mA) **Stop**
Lightning protection	3 kA, 10/350 µs pulse		
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	Single Unit: 2.9 kg / Double Unit: 5.7 kg		
Packing size	Single Unit: 392 x 272 x 139 mm / Double Unit: 392 x 272 x 189 mm		
Dimensions (w x h x d)	Single Unit: 199 x 199 x 48 mm / Double Unit: 199 x 199 x 104 mm (without connectors, without mounting brackets)		

Dual-Band Combiner

KATHREIN
Antennen · Electronic

1710 – 1880 MHz	1920 – 2170 MHz
GSM 1800	UMTS 2100

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Type No.	Description
793301	**DC stop**
78410367	**50-Ohm load**

Clamp Set

DC stop

50-Ohm load

Typical Attenuation Curves

Diagram I

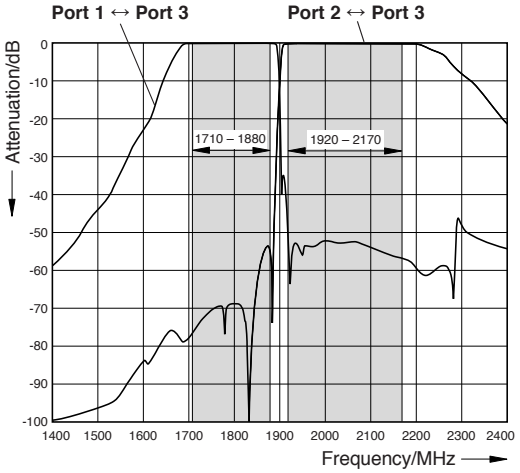
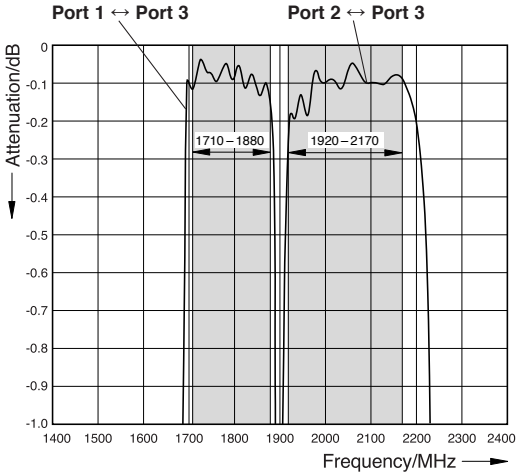
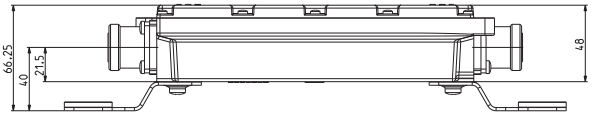
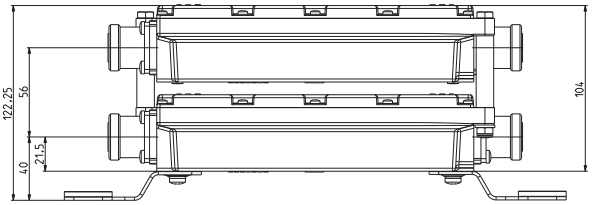


Diagram II

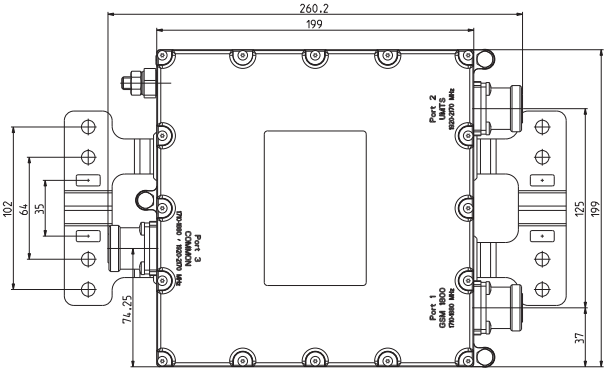




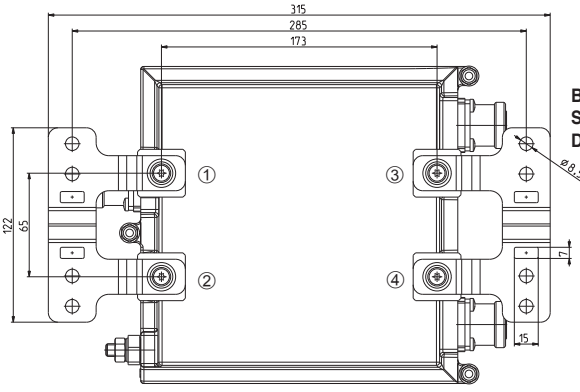
Side view Single Unit



Side view Double Unit



Top view Single Unit, Double Unit



Bottom view Single Unit, Double Unit

Please note:

The mounting plates can be removed by loosening the screws ① to ④ (M5 x 12) and replaced with other means of mounting, always provided that the max. drilled depth of 7.5 mm is respected with the choice of replacement screws.

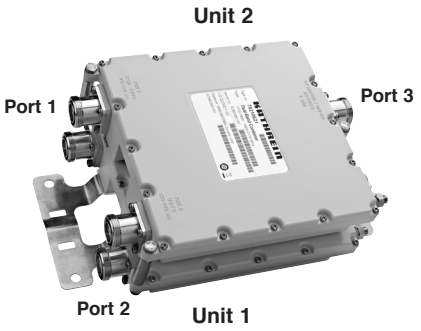
Dual-Band Combiner

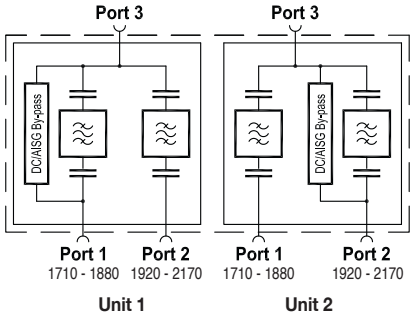
KATHREIN
Antennen · Electronic

1710 – 1880 MHz
GSM 1800

1920 – 2170 MHz
UMTS 2100

- Designed to support separate DC/AISG supply for a low-band and high-band DTMA via 2 feeder cables (see application)
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit for XPol antennas
- Built-in lightning protection

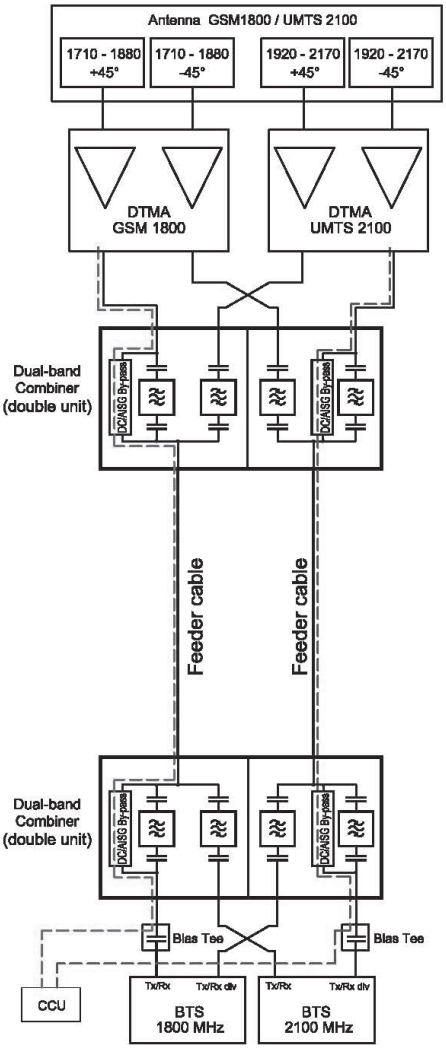




Technical Data

Type No.	**78210626** Double Unit	
Pass band Band 1 (GSM 1800) Band 2 (UMTS)	1710 – 1880 MHz 1920 – 2170 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.3 dB (1710 – 1880 MHz) < 0.3 dB (1920 – 2170 MHz)	
Isolation Port 1 ↔ Port 2	> 50 dB (1710 – 1880 / 1920 – 2170 MHz)	
VSWR	< 1.25 (1710 – 1880 / 1920 – 2170 MHz)	
Impedance	50 Ohm	
Input power Band 1 / Band 2	< 300 W / < 300 W	
Intermodulation products	< –160 dBc (3rd order with 2 x 20 W)	
Temperature range	–40 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor *or* outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	**Unit 1** **By-pass** (max. 2500 mA) **Stop**	**Unit 2** **Stop** **By-pass** (max. 2500 mA)
Lightning protection	3 kA, 10/350 µs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	5.7 kg	
Packing size	392 x 272 x 189 mm	
Dimensions (w x h x d)	199 x 199 x 104 mm (without connectors, without mounting brackets)	

Application Example



Dual-Band Combiner

KATHREIN
Antennen · Electronic

1710 – 1880 MHz
GSM 1800

1920 – 2170 MHz
UMTS 2100

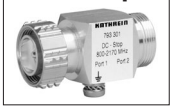
Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Type No.	Description
793301	**DC stop**
78410367	**50-Ohm load**

Clamp Set

DC stop



50-Ohm load

Typical Attenuation Curves

Diagram I

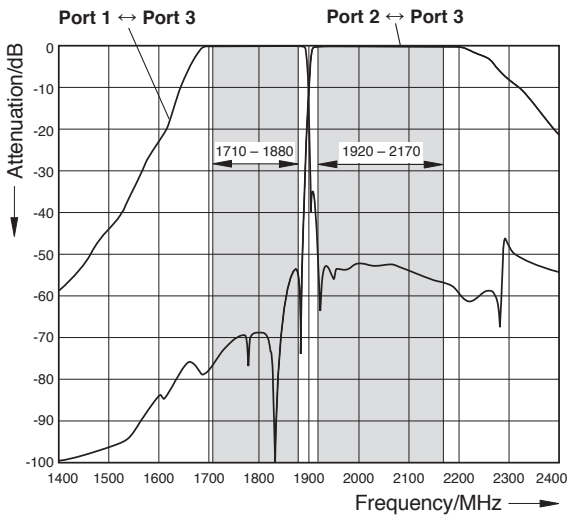
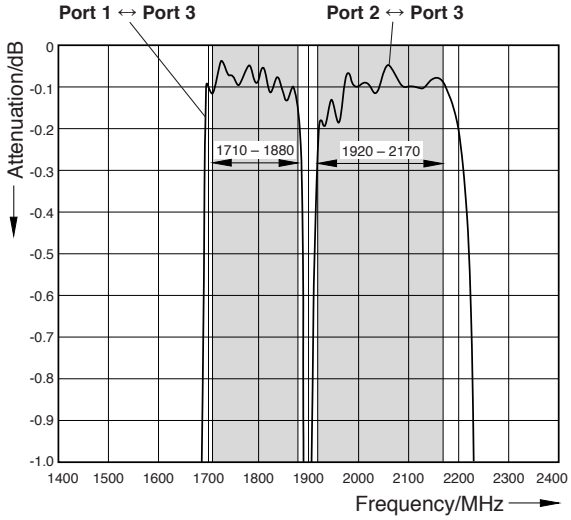
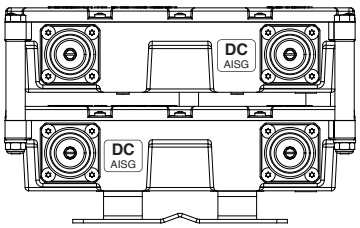


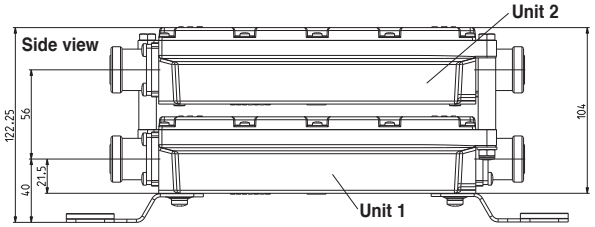
Diagram II



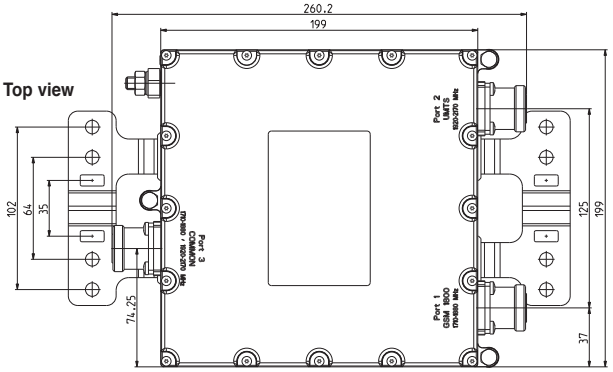
Front view



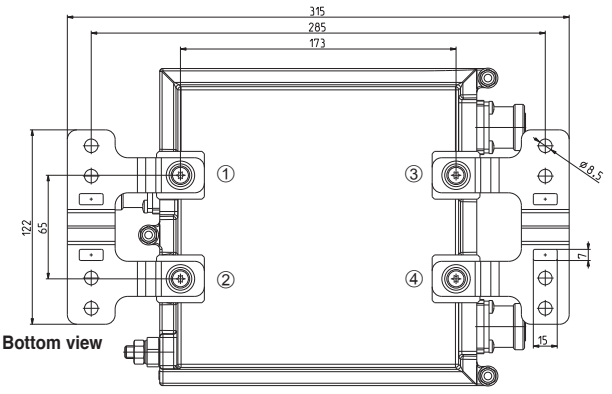
Side view



Top view



Bottom view



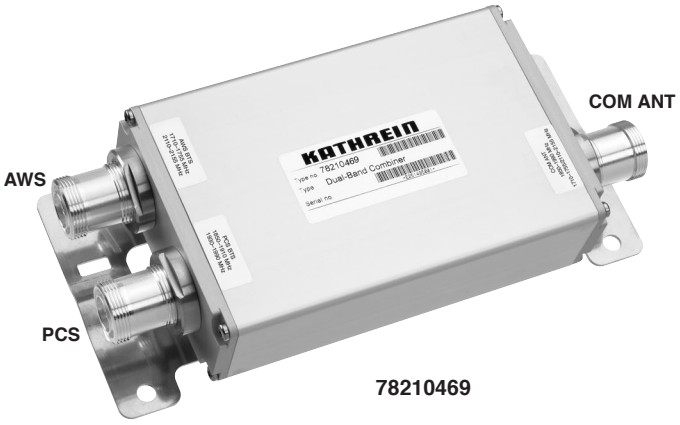
Dual-Band Combiner

KATHREIN
Antennen · Electronic

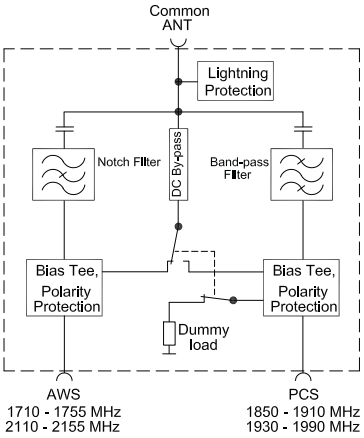
1850 – 1910 / 1930 – 1990 MHz
PCS

1710 – 1755 / 2110 – 2155 MHz
AWS

- Designed for co-siting purposes
- Enables feeder sharing
- Suitable for indoor or outdoor applications
- With fault detection and integrated switch for multiple DC power supply



78210469



Technical Data

Type No.	78210469 Single unit	78210808 Double unit
Pass band Band 1 (PCS) Band 2 (AWS)	1850 – 1910 (Rx) / 1930 – 1990 (Tx) MHz 1710 – 1755 (Rx) / 2110 – 2155 (Tx) MHz	
Insertion loss Port PCS ↔ Port ANT Port AWS ↔ Port ANT	< 0.3 dB (1850 – 1910 / 1930 – 1990 MHz) < 0.2 dB (1710 – 1755 / 2110 – 2155 MHz)	
Isolation Port PCS ↔ Port AWS	> 50 dB (1850 – 1910 / 1930 – 1990 MHz) > 50 dB (1710 – 1755 / 2110 – 2155 MHz)	
VSWR	< 1.25 (1850 – 1910 / 1930 – 1990 MHz) < 1.25 (1710 – 1755 / 2110 – 2155 MHz)	
Impedance	50 Ω	
Input power Port PCS Port AWS	< 250 W (1850 – 1910 / 1930 – 1990 MHz) < 250 W (1710 – 1755 / 2110 – 2155 MHz)	
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)	
Power supply voltage operational survival	 +10 … +15 V DC (Port PCS) +10 … +30 V DC (Port AWS) +10 … +35 V DC	
Polarity protection	–48 V DC (Port PCS, Port AWS)	
Max. Current	1.5 A (Port ANT)	
Power supply current at PCS port operating with dummy load	100 mA ±20 mA (+10 ... +15 V DC)	
Lightning protection	8/20 µs, 20 kA; 10/350 µs, 3 kA (Port ANT)	
Temperature range	–40 ... +65 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
Weight	2.5 kg	5 kg
Dimensions (w x h x d)	122 x 216.3 x 47 mm (without connectors, without mounting brackets)	122 x 216.3 x 102.6 mm (without connectors, without mounting brackets)

Typical Attenuation Curves

Diagram I

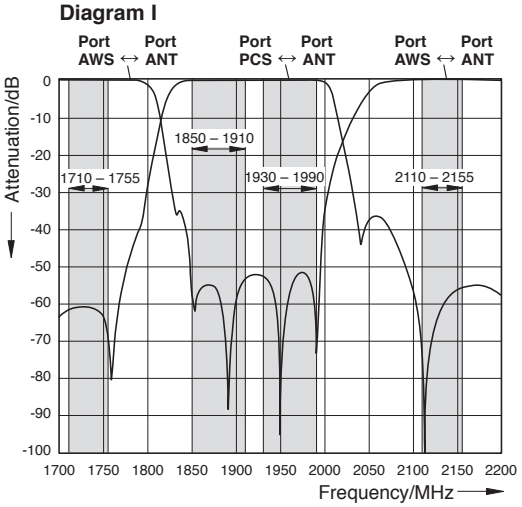
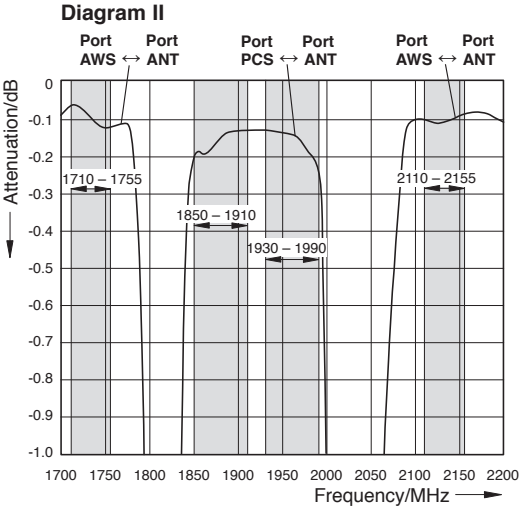


Diagram II



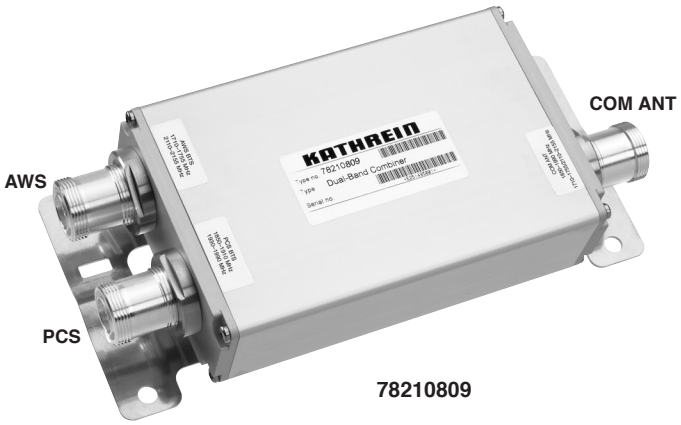
Dual-Band Combiner

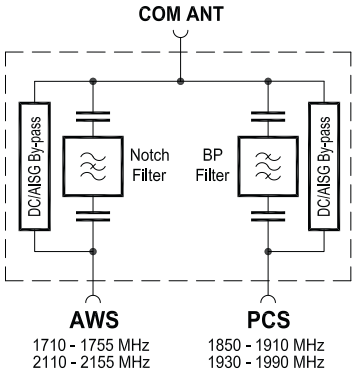
KATHREIN
Antennen · Electronic

1850 – 1910 / 1930 – 1990 MHz
PCS

1710 – 1755 / 2110 – 2155 MHz
AWS

- Designed for co-siting purposes
- Enables feeder sharing
- Suitable for indoor or outdoor applications
- DC by-pass between all ports
- External DC stop available as an accessory





Typical Attenuation Curves

Diagram I

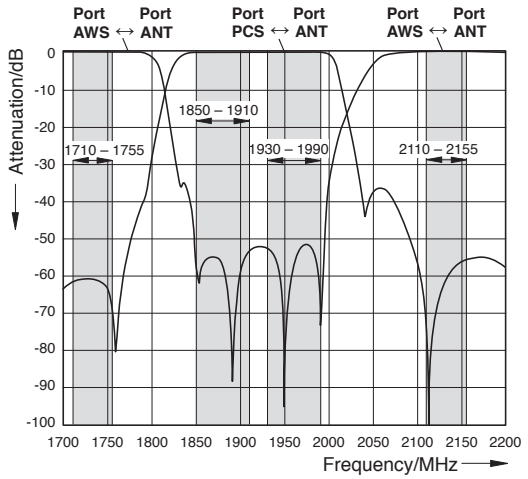
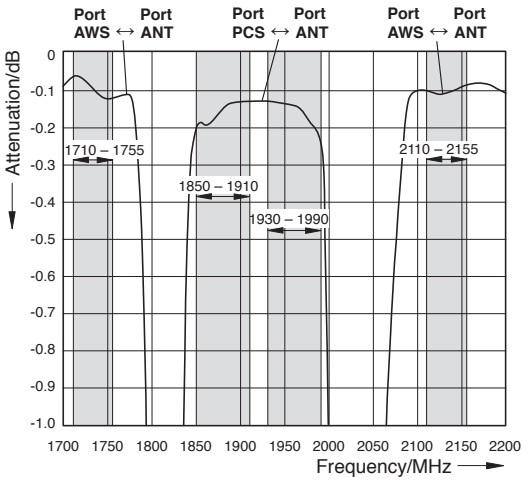


Diagram II



Technical Data

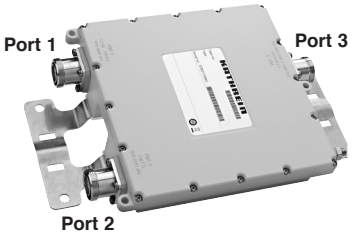
Type No.	78210809 Single unit	78210810 Double unit
Pass band Band 1 (PCS) Band 2 (AWS)	1850 – 1910 (Rx) / 1930 – 1990 (Tx) MHz 1710 – 1755 (Rx) / 2110 – 2155 (Tx) MHz	
Insertion loss Port PCS ↔ Port ANT Port AWS ↔ Port ANT	< 0.3 dB (1850 – 1910 / 1930 – 1990 MHz) < 0.2 dB (1710 – 1755 / 2110 – 2155 MHz)	
Isolation Port PCS ↔ Port AWS	> 50 dB (1850 – 1910 / 1930 – 1990 MHz) > 50 dB (1710 – 1755 / 2110 – 2155 MHz)	
VSWR	< 1.25 (1850 – 1910 / 1930 – 1990 MHz) < 1.25 (1710 – 1755 / 2110 – 2155 MHz)	
Impedance	50 Ω	
Input power Port PCS Port AWS	< 250 W (1850 – 1910 / 1930 – 1990 MHz) < 250 W (1710 – 1755 / 2110 – 2155 MHz)	
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)	
Lightning protection	3 kA, 10/350 µs pulse	
Temperature range	–40 ... +65 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency	By-pass between all ports (max. 2500 mA)	
Weight	2.5 kg	5 kg
Dimensions (w x h x d)	122 x 216.3 x 47 mm (without connectors, without mounting brackets)	122 x 216.3 x 102.6 mm (without connectors, without mounting brackets)

Dual-Band Combiner

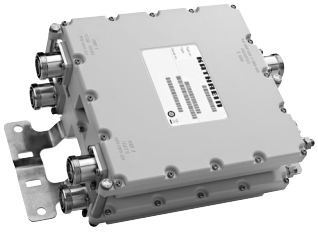
KATHREIN
Antennen · Electronic

1710 – 2180 MHz	2400 – 2700 MHz
GSM1800 / PCS1900 / AWS / UMTS2100	WLAN / WiMAX / BRS/ LTE2600

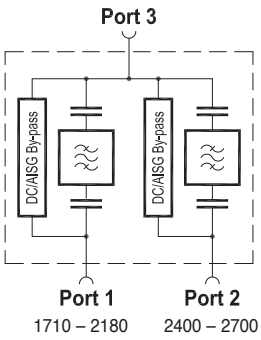
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Very low insertion loss**

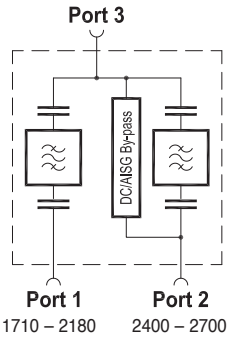


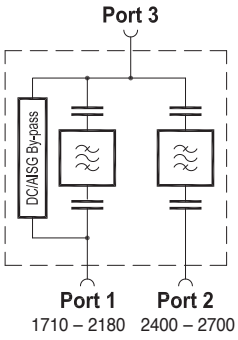
78210800, 78211092, 78211094
Single Unit



78211091, 78211093, 78211095
Double Unit







Technical Data

Type No.	**78210800** Single Unit	**78211092** Single Unit	**78211094** Single Unit
	78211091 Double Unit	**78211093** Double Unit	**78211095** Double Unit
Pass band Band 1 Band 2	1710 – 2180 MHz 2400 – 2700 MHz		
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.15 dB < 0.15 dB		
Isolation Port 1 ↔ Port 2	> 60 dB		
VSWR	< 1.25 (1710 – 2180 / 2400 – 2700 MHz)		
Impedance	50 Ω		
Input power Band 1 / Band 2	< 300 W / < 300 W		
Intermodulation products	< –160 dBc (3rd order with 2 x 20 W)		
Temperature range	–40 ... +60 °C		
Connectors	7-16 female (long neck)		
Application	Indoor *or* outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	**By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA)	**Stop** **By-pass** (max. 2500 mA)	**By-pass** (max. 2500 mA) **Stop**
Lightning protection	3 kA, 10/350 µs pulse		
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	Single Unit: 2.9 kg / Double Unit: 5.7 kg		
Packing size	Single Unit: 392 x 272 x 139 mm / Double Unit: 392 x 272 x 189 mm		
Dimensions (w x h x d)	Single Unit: 199 x 199 x 44 mm / Double Unit: 199 x 199 x 95 mm (without connectors, without mounting brackets)		

Dual-Band Combiner

KATHREIN
Antennen · Electronic

1710 – 2180 MHz	2400 – 2700 MHz
GSM1800 / PCS1900 / AWS / UMTS2100	WLAN / WiMAX / BRS/ LTE2600

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Type No.	Description
78210850	**DC stop**
78410367	**50-Ohm load**

Clamp Set

DC stop

50-Ohm load

Typical Attenuation Curves

Diagram I

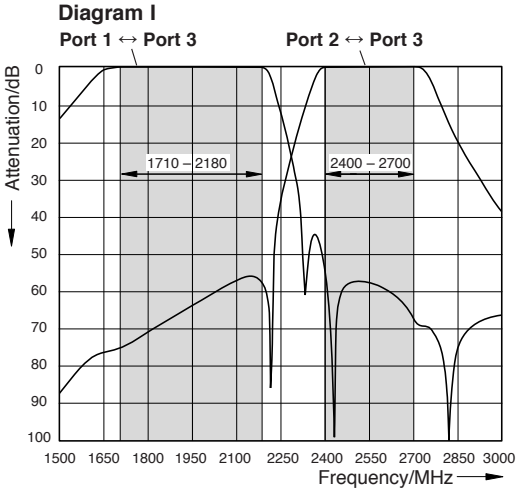
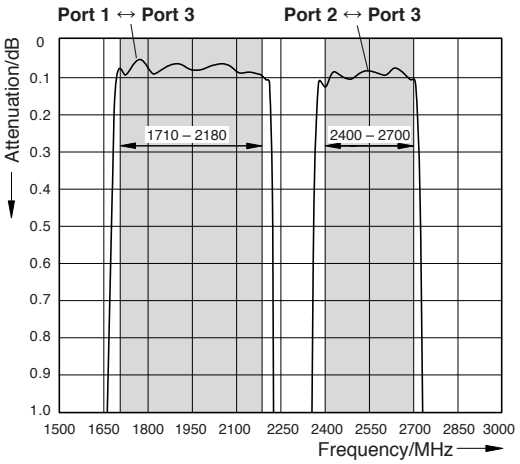
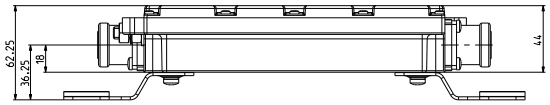
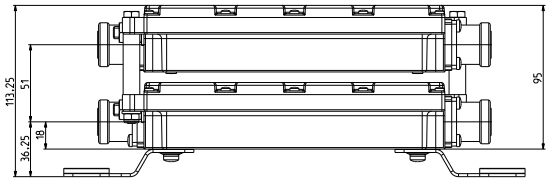


Diagram II

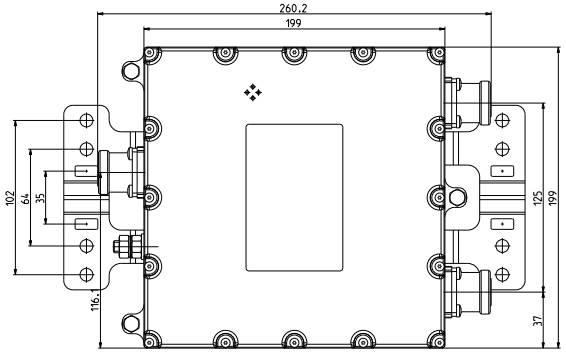




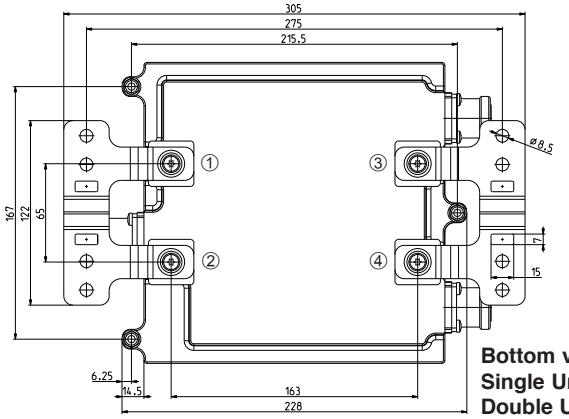
Single Unit
Side view



Double Unit
Side view



Top view
Single Unit
Double Unit



Bottom view
Single Unit
Double Unit

Please note:

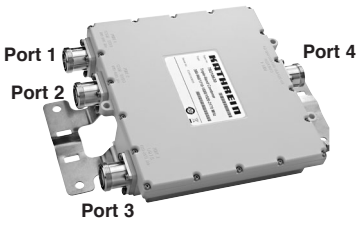
The mounting plates can be removed by loosening the screws ① to ④ (M5 x 12) and replaced with other means of mounting, always provided that the max. drilled depth of 7.5 mm is respected with the choice of replacement screws.

Triple-Band Combiner

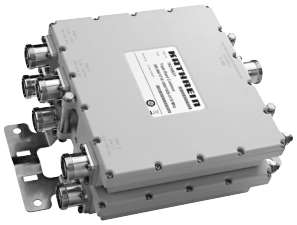
KATHREIN
Antennen · Electronic

380 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz
TETRA, LTE 800, CDMA 850, GSM 900	GSM 1800	UMTS 2100

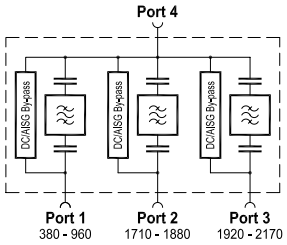
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory

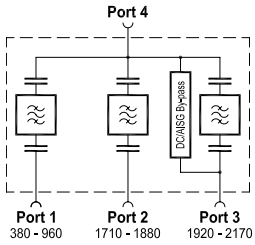


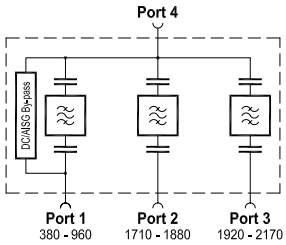
78210630, 78210632, 78210634
Single Unit



78210631, 78210633, 78210635
Double Unit







Technical Data

Type No.	**78210630** Single Unit **78210631** Double Unit	**78210632** Single Unit **78210633** Double Unit	**78210634** Single Unit **78210635** Double Unit
Pass band Band 1 (TETRA ... GSM 900) Band 2 (GSM 1800) Band 3 (UMTS)	380 – 960 MHz 1710 – 1880 MHz 1920 – 2170 MHz		
Insertion loss Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4	< 0.2 dB (380 – 960 MHz) < 0.3 dB (1710 – 1880 MHz) < 0.3 dB (1920 – 2170 MHz)		
Isolation Port 1 ↔ Port 2 Port 1 ↔ Port 3 Port 2 ↔ Port 3	> 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 1710 – 1880 MHz) > 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 1920 – 2170 MHz) > 50 dB (1710 – 1880 / 1920 – 2170 MHz)		
VSWR	< 1.25 (380 – 960 / 1710 – 1880 / 1920 – 2170 MHz)		
Impedance	50 Ω		
Input power Band 1 / Band 2 / Band 3	< 700 W / < 300 W / < 300 W		
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)		
Temperature range	–40 ... +60 °C		
Connectors	7-16 female (long neck)		
Application	Indoor *or* outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4	**By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA)	**Stop** **Stop** **By-pass** (max. 2500 mA)	**By-pass** (max. 2500 mA) **Stop** **Stop**
Lightning protection	3 kA, 10/350 µs pulse		
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	Single Unit: 3.2 kg / Double Unit: 6.3 kg		
Packing size	Single Unit: 392 x 292 x 139 mm / Double Unit: 392 x 292 x 189 mm		
Dimensions (w x h x d)	Single Unit: 219 x 199 x 48 mm / Double Unit: 219 x 199 x 104 mm (without connectors, without mounting brackets)		

Triple-Band Combiner

KATHREIN
Antennen · Electronic

380 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz
TETRA, LTE 800, CDMA 850, GSM 900	GSM 1800	UMTS 2100

Accessories (order separately)

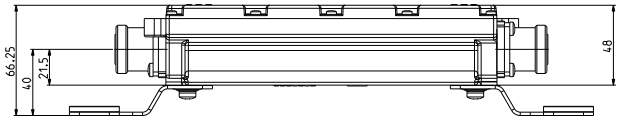
Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Clamp Set

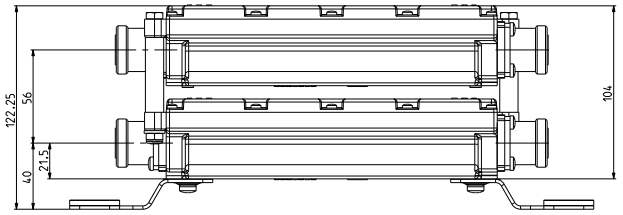
DC stop

50-Ohm load

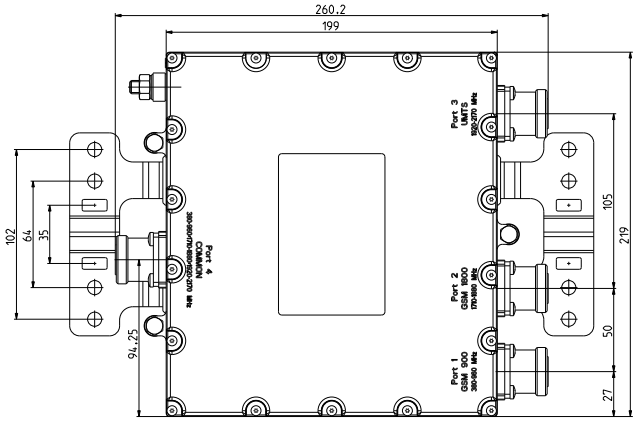
Type No.	Description
78210850	**DC stop**
78410367	**50-Ohm load**



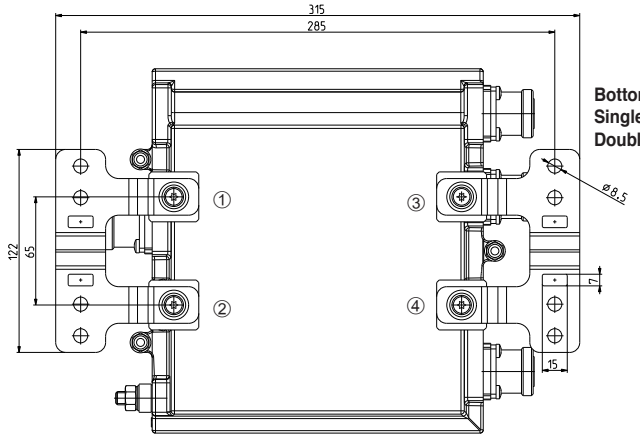
Side view Single Unit



Side view Double Unit



Top view Single Unit, Double Unit



Bottom view Single Unit, Double Unit

Typical Attenuation Curves

Diagram I

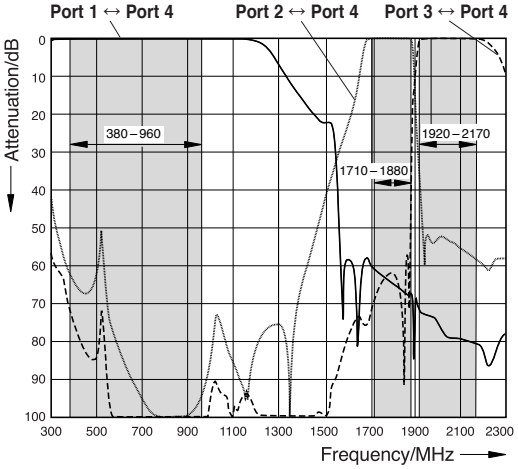
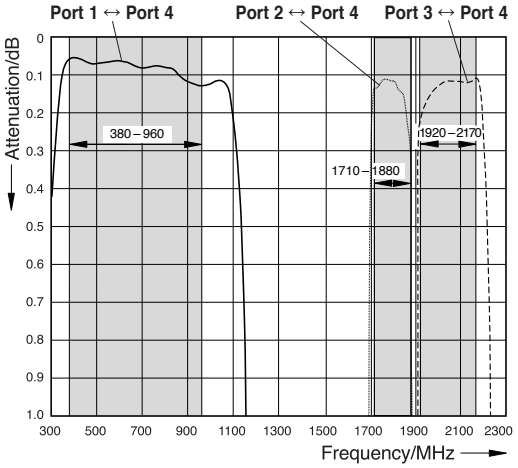


Diagram II



Please note:

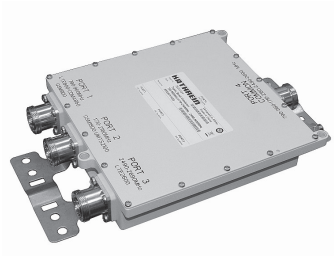
The mounting plates can be removed by loosening the screws ① to ④ (M5 x 12) and replaced with other means of mounting, always provided that the max. drilled depth of 7.5 mm is respected with the choice of replacement screws.

Triple-Band Combiner

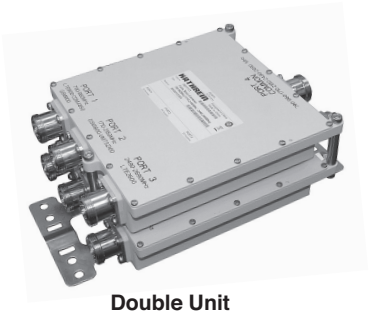
KATHREIN
Antennen · Electronic

790 – 960 MHz	1710 – 2180 MHz	2490 – 2690 MHz
LTE800 / CDMA850 / GSM900	GSM1800 / UMTS2100	LTE2600

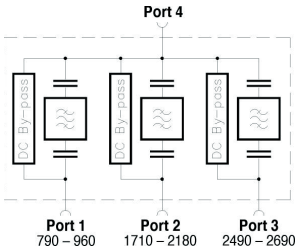
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection

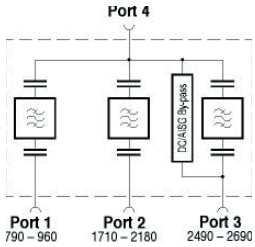


Single Unit



Double Unit





Technical Data

Type No.	78211130 Single Unit	78211132 Single Unit
	78211131 Double Unit	78211133 Double Unit
Pass band		
Band 1 (LTE800, GSM900)	790 – 960 MHz	
Band 2 (GSM1800, UMTS2100)	1710 – 2180 MHz	
Band 3 (LTE2600)	2490 – 2690 MHz	
Insertion loss		
Port 1 ↔ Port 4	< 0.2 dB (790 – 960 MHz)	
Port 2 ↔ Port 4	< 0.2 dB (1710 – 2180 MHz)	
Port 3 ↔ Port 4	< 0.2 dB (2490 – 2690 MHz)	
Isolation		
Port 1 ↔ Port 2	> 50 dB (790 – 960 MHz)	
Port 1 ↔ Port 3	> 50 dB (1710 – 2180 MHz)	
Port 2 ↔ Port 3	> 50 dB (2400 – 2690 MHz)	
VSWR	< 1.25 (790 – 960 / 1710 – 2180 / 2490 – 2690 MHz	
Impedance	50 Ω	
Input power		
Band 1 / Band 2 / Band 3	< 300 W / < 300 W / < 300 W	
Intermodulation products	< – 160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–40 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor *or* outdoor (IP 66)	
DC/AISG transparency		
Port 1 ↔ Port 4	**By-pass** (max. 2500 mA)	**Stop**
Port 2 ↔ Port 4	**By-pass** (max. 2500 mA)	**Stop**
Port 3 ↔ Port 4	**By-pass** (max. 2500 mA)	**By-pass** (max. 2500 mA)
Lightining protection	3 kA, 10/350 µs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	Single Unit: 3 kg / Double Unit: 5.4 kg	
Dimensions (w x h x d)	Single Unit: 199 x 199 x 48 mm / Double Unit: 199 x 199 x 104 mm (without connectors, without mounting brackets)	

Triple-Band Combiner

KATHREIN
Antennen · Electronic

790 – 960 MHz	1710 – 2180 MHz	2490 – 2690 MHz
LTE800 / CDMA850 / GSM900	GSM1800 / UMTS2100	LTE2600

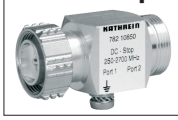
Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

Type No.	Description
78210850	DC stop
78410367	50-Ohm load

Clamp Set

DC Stop



50-Ohm load

Typical Attenuation Curves

Diagram I

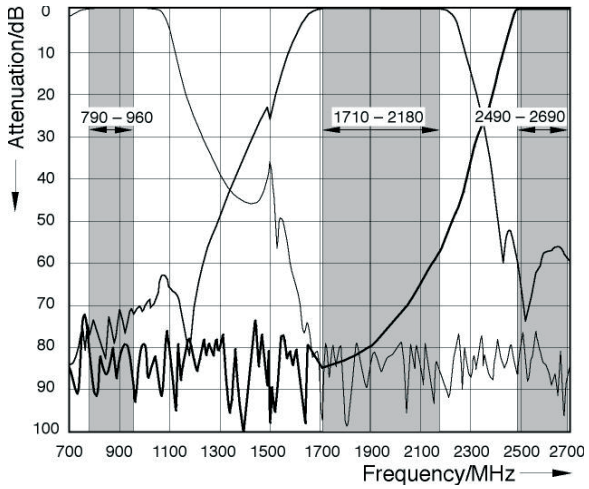
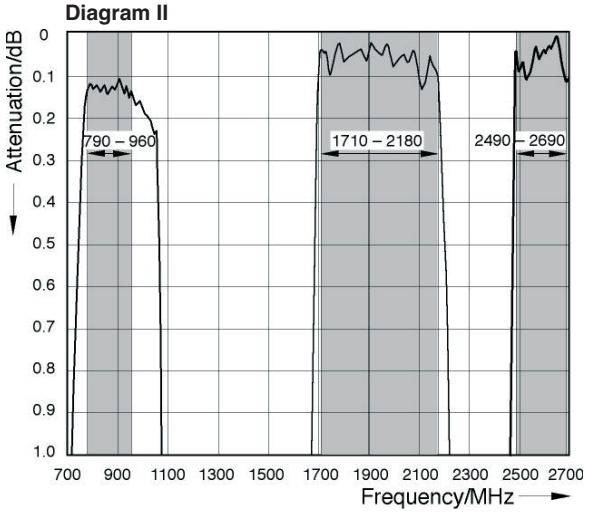
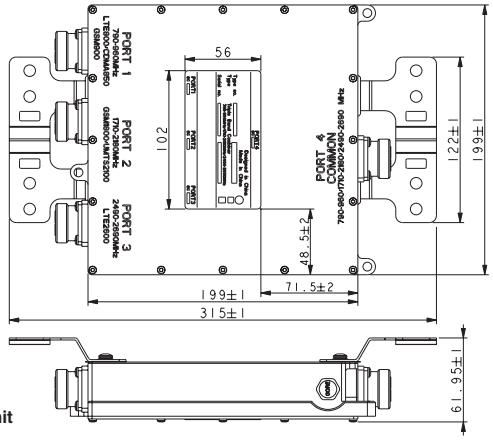
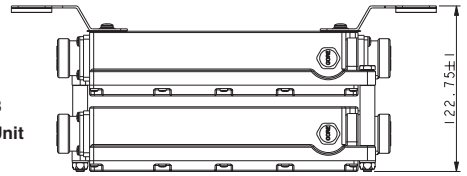


Diagram II

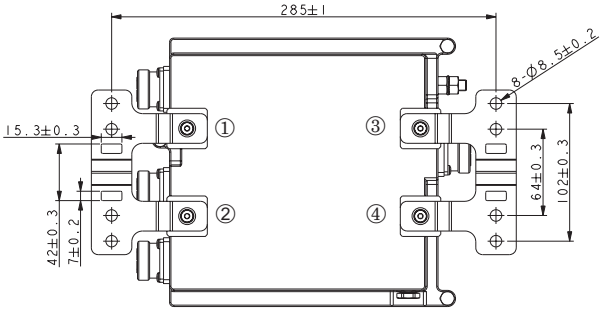




78211130
78211132
Single Unit



78211131
78211133
Duoble Unit



Please Note:

The mounting plates can be removed by loosening the screws ① to ④ (M5 x 12) and replaced with other means of mounting, always provided that the max. drilled depth of 7.5 mm is respected with the choice of replacement screws.

Quad-Band Combiner

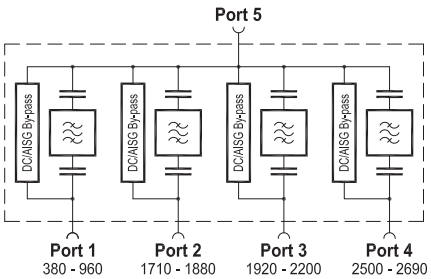
KATHREIN
Antennen · Electronic

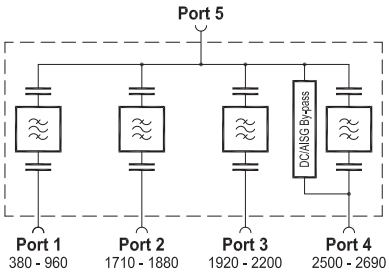
380 – 960 MHz	1710 – 1880 MHz	1920 – 2200 MHz	2500 – 2690 MHz
TETRA / LTE 800 / CDMA 850 / GSM 900	GSM 1800	UMTS 2100	LTE 2600

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory

78210640, 78210642
Single Unit

78210641, 78210643
Double Unit





Technical Data

Type No.	**78210640** Single Unit / **78210641** Double Unit	**78210642** Single Unit / **78210643** Double Unit
Pass band Band 1 (TETRA ... GSM 900) Band 2 (GSM 1800) Band 3 (UMTS) Band 4 (LTE 2600)	380 – 960 MHz 1710 – 1880 MHz 1920 – 2200 MHz 2500 – 2690 MHz	
Insertion loss Port 1 ↔ Port 5 Port 2 ↔ Port 5 Port 3 ↔ Port 5 Port 4 ↔ Port 5	< 0.2 dB (380 – 960 MHz) < 0.3 dB (1710 – 1880 MHz) < 0.3 dB (1920 – 2200 MHz) < 0.2 dB (2500 – 2690 MHz)	
Isolation Port 1 ↔ Port 2 Port 1 ↔ Port 3 Port 1 ↔ Port 4 Port 2 ↔ Port 3 Port 2 ↔ Port 4 Port 3 ↔ Port 4	> 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 1710 – 1880 MHz) > 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 1920 – 2200 MHz) > 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 2500 – 2690 MHz) > 50 dB (1710 – 1880 / 1920 – 2200 MHz) > 50 dB (1710 – 1880 / 2500 – 2690 MHz) > 50 dB (1920 – 2200 / 2500 – 2690 MHz)	
VSWR	< 1.25 (380 – 960 / 1710 – 1880 / 1920 – 2200 / 2500 – 2690 MHz)	
Impedance	50 Ω	
Input power Band 1 / Band 2 / Band 3 / Band 4	< 700 W / < 300 W / < 300 W / < 200 W	
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–40 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor *or* outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 5 Port 2 ↔ Port 5 Port 3 ↔ Port 5 Port 4 ↔ Port 5	 **By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA) **By-pass** (max. 2500 mA)	 **Stop** **Stop** **Stop** **By-pass** (max. 2500 mA)
Lightning protection	3 kA, 10/350 µs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	Single Unit: 3.8 kg / Double Unit: 7.5 kg	
Packing size	Single Unit: 392 x 292 x 139 mm / Double Unit: 392 x 292 x 189 mm	
Dimensions (w x h x d)	Single Unit: 215 x 227.5 x 50.3 mm / Double Unit: 215 x 227.5 x 106.3 mm (without connectors, without mounting brackets)	

Quad-Band Combiner

KATHREIN
Antennen · Electronic

380 – 960 MHz	1710 – 1880 MHz	1920 – 2200 MHz	2500 – 2690 MHz
TETRA / LTE 800 / CDMA 850 / GSM 900	GSM 1800	UMTS 2100	LTE 2600

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Type No.	Description
78210850	**DC stop**
78410367	**50-Ohm load**

Clamp Set

DC stop

50-Ohm load

Typical Attenuation Curves

Diagram I

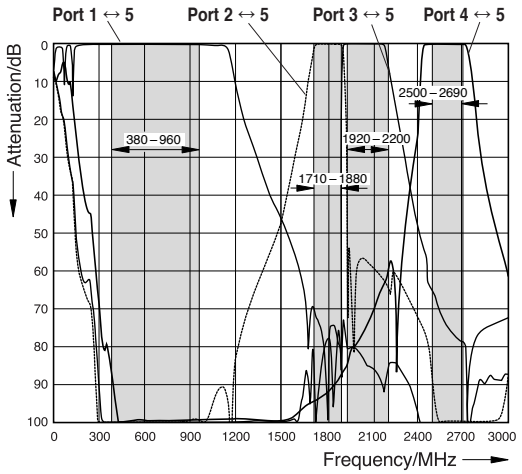
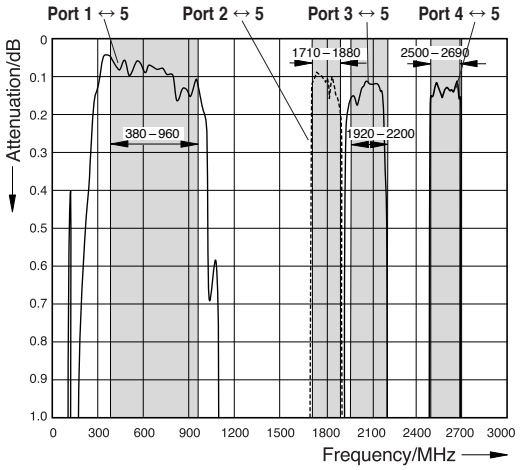
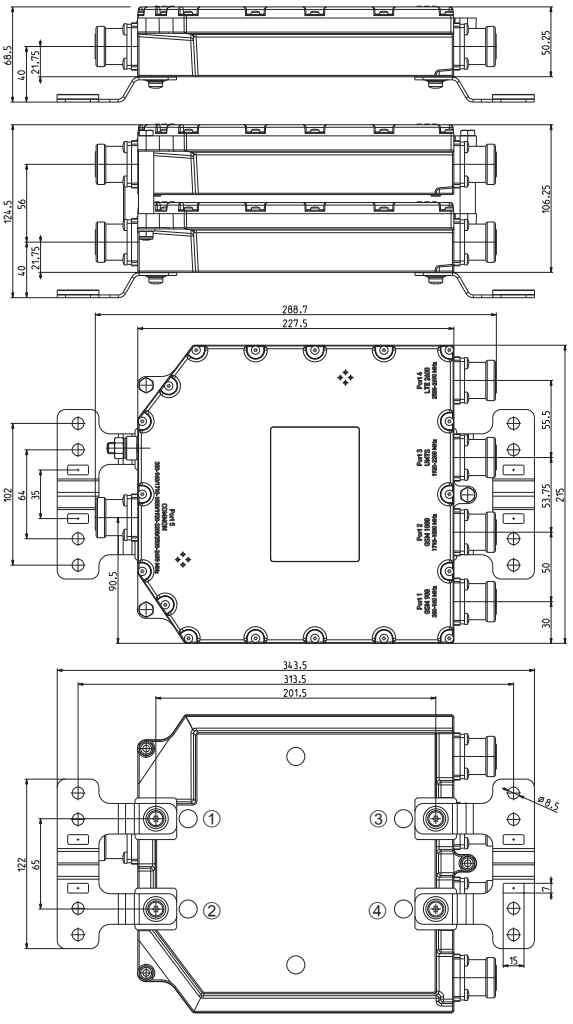


Diagram II





Side view
Single Unit

Side view
Double Unit

Top view
Single Unit,
Double Unit

Bottom view
Single Unit,
Double Unit

Please note:

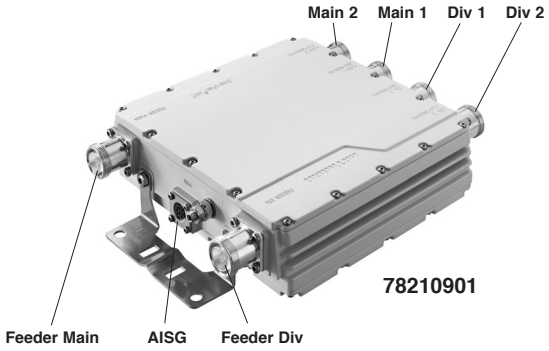
The mounting plates can be removed by loosening the screws ① to ④ (M5 x 12) and replaced with other means of mounting, always provided that the max. drilled depth of 7.5 mm is respected with the choice of replacement screws.

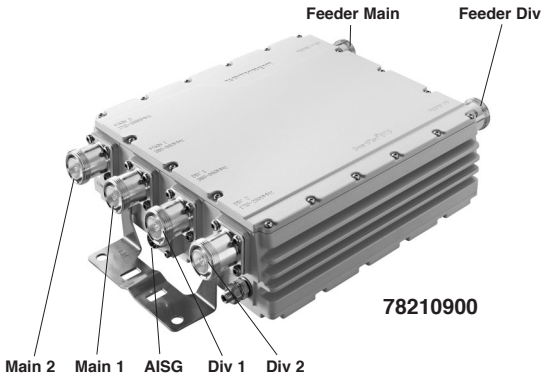
SmartPlex® Dual-Band Combiner

KATHREIN
Antennen · Electronic

380 – 960 MHz	1710 – 2690 MHz
TETRA / LTE 800 / DD / CDMA / GSM 900	GSM / PCS / AWS / UMTS 2100 / LTE

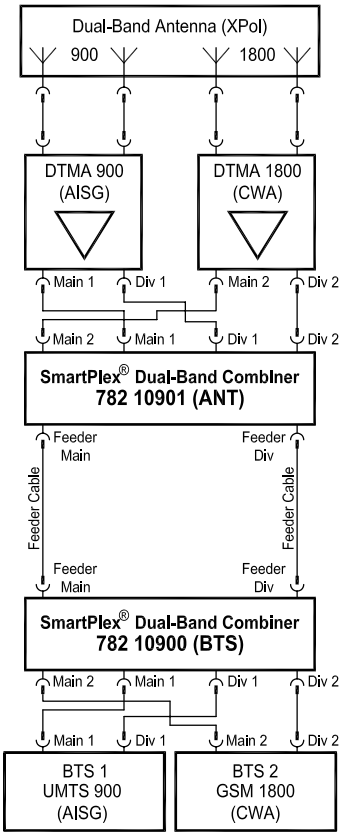
- Universal multi-protocol dual-band combiner
  - AISG 1.1
  - AISG 2.0
  - 3GPP
  - Current window alarming (CWA)
  - Vendor specific protocols
- Designed for co-siting purposes
- Enables feeder sharing
- **78210900:** For use near the base station **(BTS)**, thereby converting different base station DC voltages into one common feeder DC voltage **(multi-BTS power supply handling)**
  78210901: For use near the antenna **(ANT)**, thereby reproducing the base station DC voltages for the antenna line devices
- **Simultaneous** support of antenna line devices (TMAs, RET units)
- **Dynamic DC/AISG by-pass:** Automatic setting on each RF path according to the BTS and antenna line device requirements
- DC power supply either from BTS via RF path, or from an external source via AISG port (782 10900)
- Provides full **Smart Bias Tee functionality**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit in one housing for XPol antennas
- Built-in lightning protection
- Very low insertion loss
- High input power





Technical Data

Type No.	78210901 (ANT) 78210900 (BTS)
Pass band Band 1 / Band 2	380 – 960 / 1710 – 2690 MHz
Insertion loss	< 0.2 dB, typically 0.15 dB (380 – 960 / 1710 – 2690 MHz)
Isolation Main 1 ↔ Main 2 / Div 1 ↔ Div 2	> 60 dB (380 – 960 / 1710 – 2690 MHz)
VSWR	< 1.22 (380 – 960 / 1710 – 2690 MHz)
Impedance	50 Ohm
Input power Band 1 / Band 2	< 500 W / < 300 W
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +60 °C
Connectors RF AISG	7-16 female (long neck) 8-pin, IEC 60130-9 (782 10900/901: Male/female) Pin 2: -48V DC (782 10900 only), Pin 3: RS485B, Pin 5: RS485A, Pin 6: Nominal 24 V DC, Pin 7: DC return (78210900/901: Not grounded/grounded), Other pins: Not connected
Power consumption	2 W (idle mode)
DC supply	782 10900: 7 – 30 V DC (via RF connectors)
Application	Indoor *or* outdoor (IP 67)
DC/AISG transparency	For AISG 1.1, AISG 2.0, 3GPP, vendor specific protocols and for current window alarm (CWA) controlled TMAs
Lightning protection	3 kA (10/350 µs pulse), 10 kA (8/20 µs pulse)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	782 10900: 6.5 kg, 782 10901: 4.9 kg
Dimensions (w x h x d)	782 10900: 233 x 258 x 79 mm 782 10901: 233 x 223 x 62 mm (without connectors, without mounting brackets)



Application Example

SmartPlex® Dual-Band Combiner

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380 – 960 MHz	1710 – 2690 MHz
TETRA / LTE 800 / DD / CDMA / GSM 900	GSM / PCS / AWS / UMTS 2100 / LTE

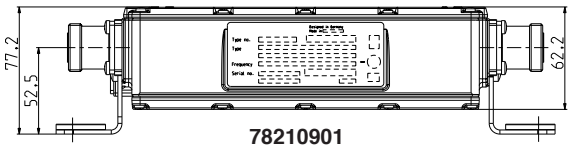
Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

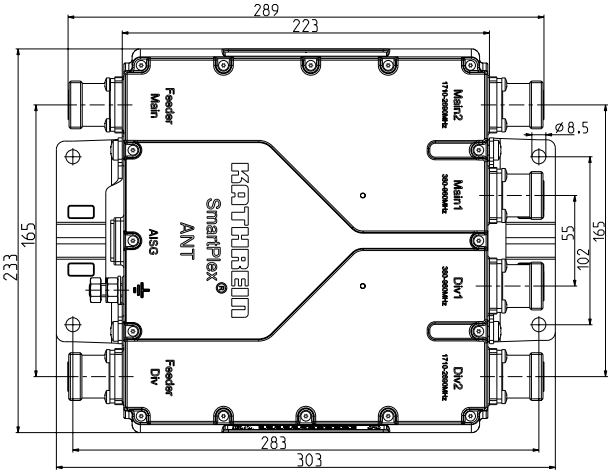
Clamp Set

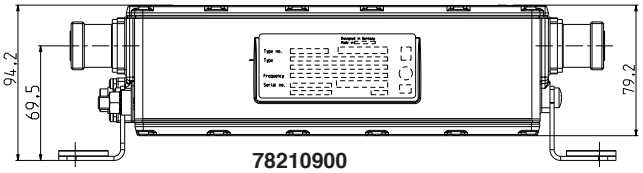
50-Ohm load

Type No.	Description
78410367	**50-Ohm load** 1.5 W / indoor or outdoor
78211100	DC cable kit –48 VDC
78211101	DC cable kit +24 VDC

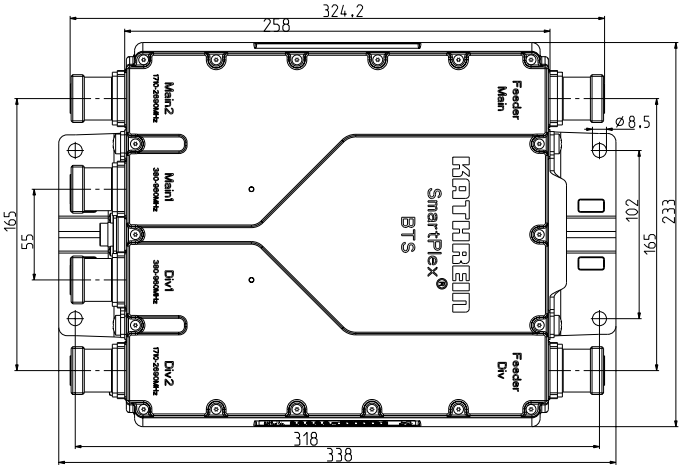


78210901





78210900



Typical Attenuation Curves

Diagram I

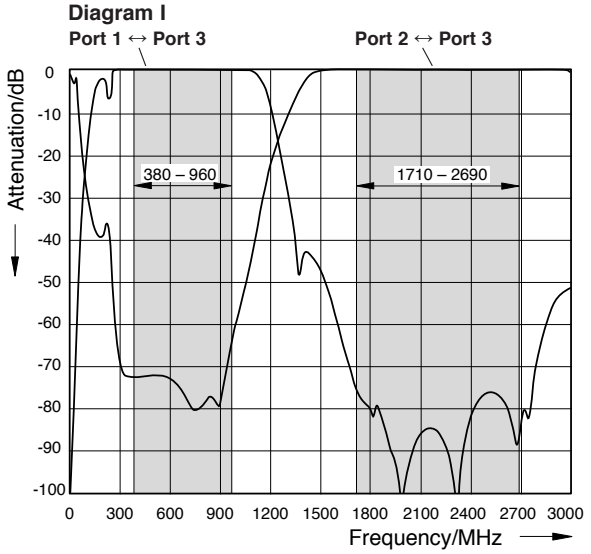
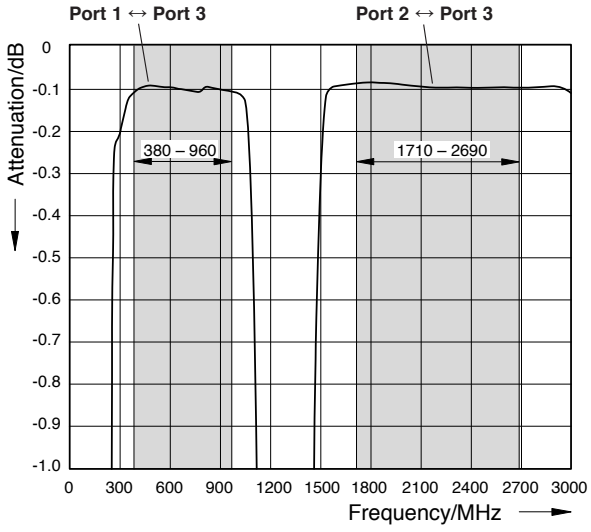


Diagram II



Dual-Band Combiner

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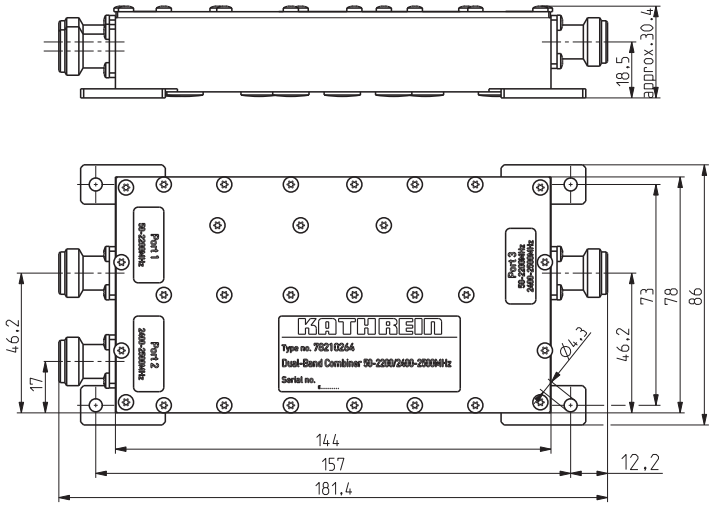
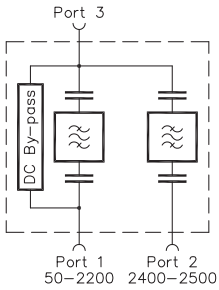
50 – 2200 MHz 80 / 160 / 400 / 900 / 1800 / UMTS	**2400 – 2500 MHz** WLAN

- Designed for inhouse multiband distribution networks
- Enables feeder sharing
- DC by-pass between ports 1 and 3
- Built-in DC stop between ports 2 and 3





Technical Data

Type No.	**78210264**
Pass band Band 1 Band 2	 50 – 2200 MHz 2400 – 2500 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	 < 0.1 dB (50 – 2200 MHz) < 0.2 dB (2400 – 2500 MHz)
Isolation Port 1 ↔ Port 2	 > 50 dB (50 – 2200 / 2400 – 2500 MHz)
VSWR	< 1.25 (50 – 2200 / 2400 – 2500 MHz)
Impedance	50 Ω
Input power Band 1 Band 2	 < 200 W < 200 W
Intermodulation products	< –150 dBc (3rd order; with 2 x 20 W)
Temperature range	–20 ... +55 °C
Connectors	N female
Application	Indoor
Special features	Built-in DC stop between ports 2 and 3 DC by-pass between ports 1 and 3 (max. 2500 mA)
Mounting	With 4 screws (max. 4 mm diameter)
Weight	0.47 kg
Packing size	225 x 140 x 75 mm
Dimensions (w x h x d)	86 x 30.4 x 181.4 mm (including connectors and mounting feet)

Typical Attenuation Curves

Diagram I

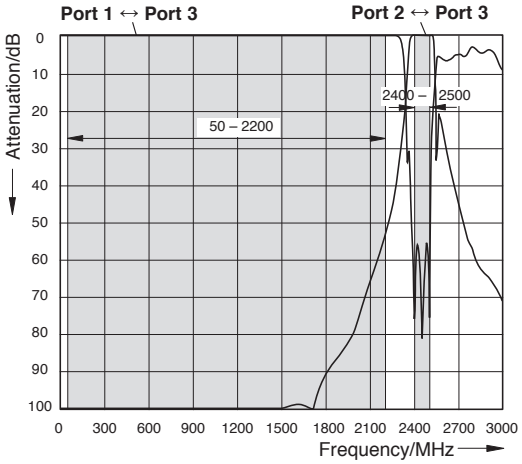
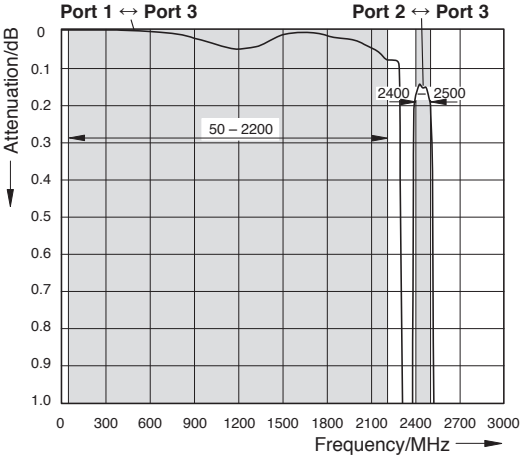


Diagram II



Same-Band Combiners
Hybrid Combiners

Same-Band Combiner
Duplex Hybrid Combiner
Active Duplex Hybrid Combiner
Hybrid Combiner
3-dB Couplers
Hybrid Ring Junctions

Summary of Same-Band Combiner and Hybrid Combiner Types

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Hybrid Combiners and Couplers:

Description	Type No.	Frequency range	Max. input power	Connector	Page
Hybrid Combiner 2:1	792699	806 – 960 MHz	150 W per Tx/Rx port	7-16	278
Hybrid Combiner 2:1	792702	1700 – 2200 MHz	150 W per Tx/Rx port	7-16	279
Hybrid Combiner 2:1	793555	800 – 2200 MHz	150 W per Tx/Rx port	7-16	280
Hybrid Combiner 2:1	78210500	806 – 960 MHz	60 W at each port	7-16	281
Hybrid Combiner 2:1	78210502	1710 – 2170 MHz	60 W at each port	7-16	282
Hybrid Combiner 2:1	78210504	698 – 2690 MHz	60 W at each port	7-16	283
Hybrid Combiner 4:4	78210532	1710 – 2170 MHz	60 W at each port	7-16	284
Hybrid Combiner 4:4	78210534	698 – 2600 MHz	150 W at each port	7-16	285
Hybrid Combiner 8:4	78211141	790 – 960 MHz 1710 – 2690 MHz	75 W	7-16	286 –289
Hybrid Combiner 8:4	78211142	1710 – 1880 MHz 1920 – 2170 MHz	75 W	7-16	286 –289
Hybrid Combiner 12:4	78211143	790 – 960 MHz 1710 – 1880 MHz 1920 – 2170 MHz	50 W	7-16	286 –289
Hybrid Combiner 16:4	78211144	790 – 960 MHz 1710 – 1880 MHz 1920 – 2200 MHz 2500 – 2690 MHz	50 W	7-16	286 –289
Active Duplex Hybrid Combiner	78211110	Rx: 880 – 915 MHz Tx: 925 – 960 MHz	250 W	7-16	292 – 293
Duplex Hybrid Combiner	78210805	Rx: 880 – 915 MHz Tx: 925 – 960 MHz	250 W	7-16	290, 291
Same-Band Combiner	78210925	1920 – 2170 MHz	100 W at each port	7-16	294, 295
Same-Band Combiner	78210926	1920 – 2170 MHz	100 W at each port	7-16	296, 297
Same-Band Combiner	78210930	880 – 960 MHz	100 W at each port	7-16	298, 299
Same-Band Combiner	78210936	880 – 960 MHz	100 W at each port	7-16	300, 301
Hybrid Ring Junction	K6373621	806 – 960 MHz	100 W at each port	N	302, 303
Hybrid Ring Junction	790881	890 – 960 MHz	100 W at each port	N	302, 303
Hybrid Ring Junction	791498	1710 – 1880 MHz	50 W at each port	N	302, 303
3-dB Coupler	78210524	698 – 2690 MHz	150 W at each port	7-16	304, 305
3-dB Coupler	793506	806 – 960 MHz	500 W	7-16	306
3-dB Coupler	793006	1700 – 2200 MHz	300 W	7-16	307
3-dB Coupler	793554	800 – 2200 MHz	300 W	7-16	308

New Products

Hybrid Combiner 2:1
806 – 960 MHz
2 x 150 W

KATHREIN
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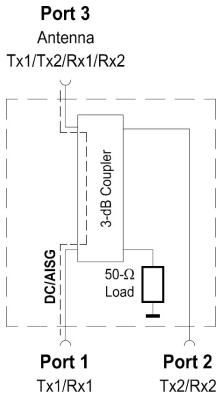
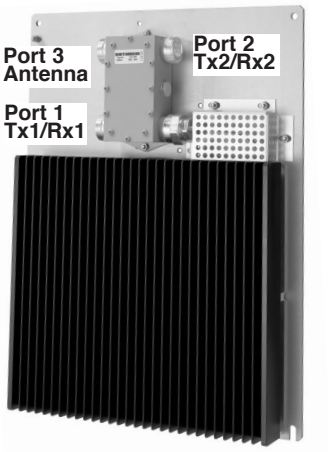
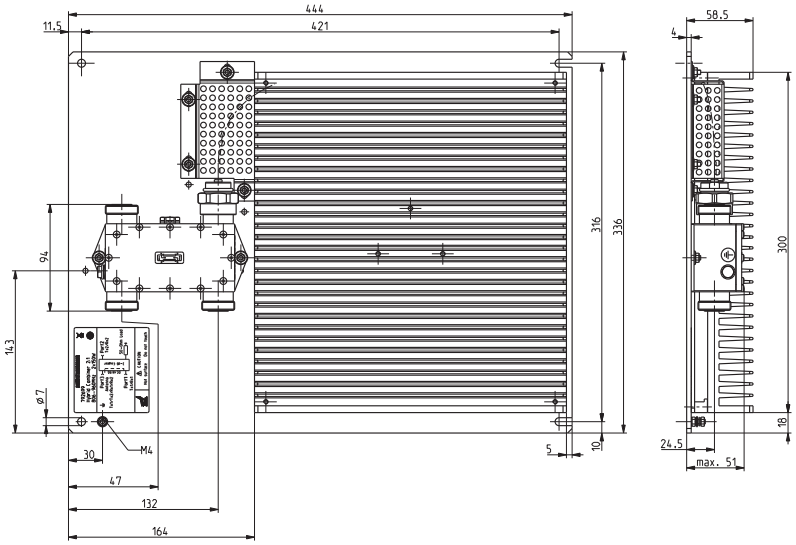
- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor applications
- Wall or 19´´ rack mounting
- DC bypass between port 1 and port 3
- External DC stop available as an accessory





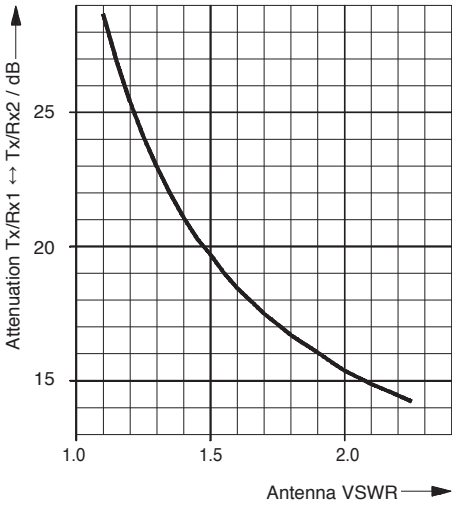


Technical Data

Type No.	792699
Frequency range	806 – 960 MHz
Attenuation Port 1 ↔ Port 3 Port 2 ↔ Port 3 Port 1 ↔ Port 2	 3.1 ±0.4 dB 3.1 ±0.4 dB > 27 dB *
VSWR (all ports)	< 1.11
Impedance	50 Ω
Input power Port 1 Port 2	 < 150 W (with max. 16 signals) < 150 W (with max. 16 signals)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–20 … +50 °C
Connectors	7-16 female
Application	Indoor
DC/AISG transparency Port 1 ↔ Port 3 Port 2	 Bypass (max. 2500 mA) Short circuit (External DC stop available as an accessory)
Mounting	Wall mounting: With 4 screws (max. 7 mm diameter) 19´´ rack mounting: To be inserted on pre-installed 19´´ sliding bars (2 height units required)
Weight	10.3 kg
Packing size	510 x 410 x 100 mm
Dimensions (w x h x d)	336 x 444 x 64 mm

* Valid if all ports are terminated with 50-Ω loads (see diagram).

Typical attenuation Tx/Rx1 ↔ Tx/Rx2 vs. Antenna VSWR



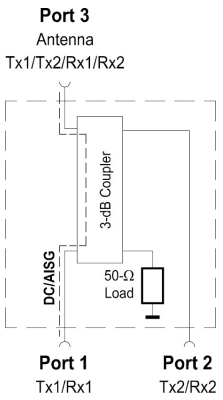
Note:
The input power rating of 150 W per port is specified at an ambient temperature of +55 °C with the combiner mounted vertically (see photo), without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

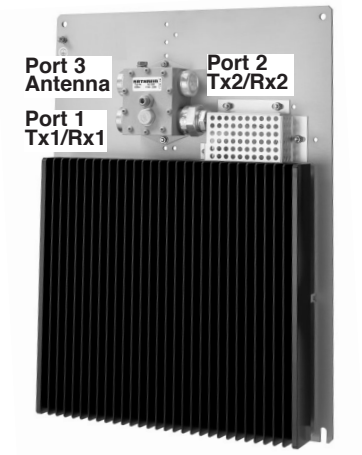
When installed in a 19´´ rack, it must be ensured that the max. power of 150 W is sufficiently dissipated, so that the ambient temperature does not rise above +50 °C. This can be achieved for example by the additional installation of a correspondingly dimensioned ventilator in the 19´´ rack or by reducing the maximum input power.

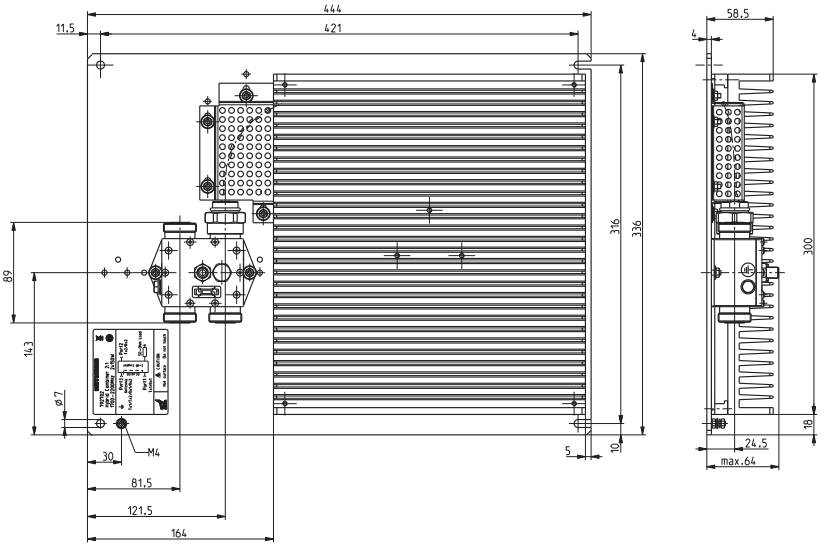
Hybrid Combiner 2:1
1700 – 2200 MHz
2 x 150 W

KATHREIN
Antennen · Electronic

- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor applications
- Wall or 19´´ rack mounting
- DC bypass between port 1 and port 3
- External DC stop available as an accessory





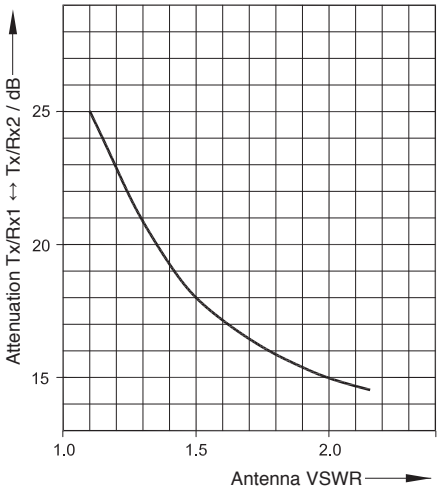


Technical Data

Type No.	792702
Frequency range	1700 – 2200 MHz
Attenuation Port 1 ↔ Port 3 Port 2 ↔ Port 3 Port 1 ↔ Port 2	 3.1 ±0.4 dB 3.1 ±0.4 dB > 24 dB*
VSWR (all ports)	< 1.15
Impedance	50 Ω
Input power Port 1 Port 2	 < 150 W (with max. 16 signals) < 150 W (with max. 16 signals)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–20 … +50 °C
Connectors	7-16 female
Application	Indoor
DC/AISG transparency Port 1 ↔ Port 3 Port 2	 Bypass (max. 2500 mA) Short circuit (External DC stop available as an accessory)
Mounting	Wall mounting: With 4 screws (max. 7 mm diameter) 19´´ rack mounting: To be inserted on pre-installed 19´´ sliding bars (2 height units required)
Weight	9.8 kg
Packing size	510 x 410 x 100 mm
Dimensions (w x h x d)	336 x 444 x 64 mm

* Valid if all ports are terminated with 50-Ω loads (see diagram).

Typical attenuation Tx/Rx1 ↔ Tx/Rx2 vs. Antenna VSWR



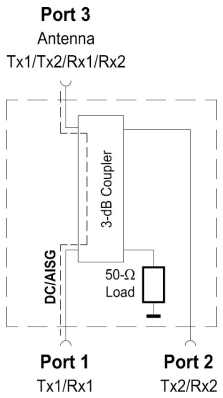
Note:
The input power rating of 150 W per port is specified at an ambient temperature of +55 °C with the combiner mounted vertically (see photo), without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

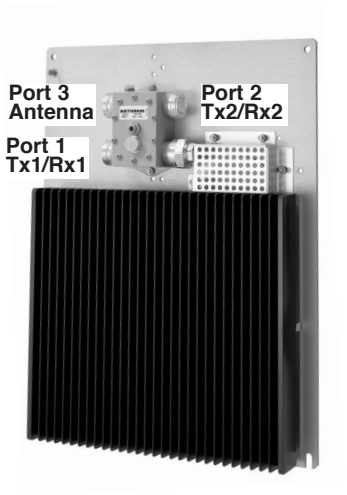
When installed in a 19´´ rack, it must be ensured that the max. power of 150 W is sufficiently dissipated, so that the ambient temperature does not rise above +50 °C. This can be achieved for example by the additional installation of a correspondingly dimensioned ventilator in the 19´´ rack or by reducing the maximum input power.

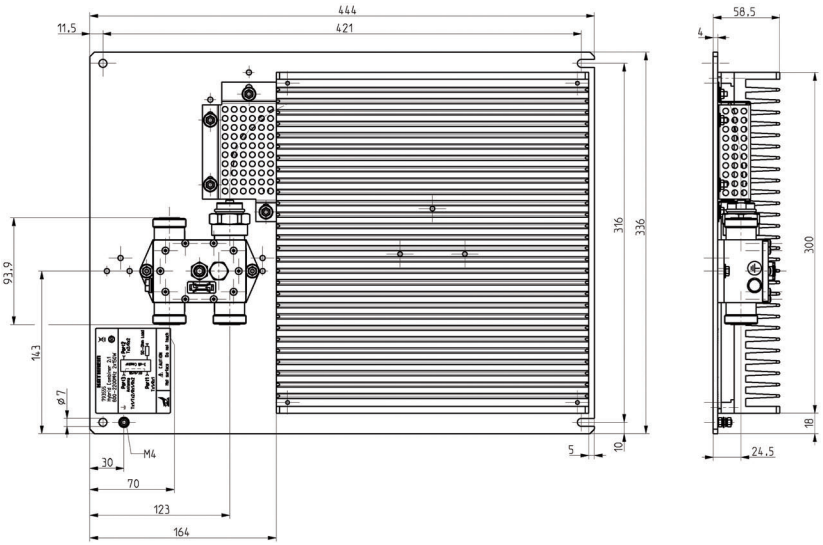
Hybrid Combiner 2:1
800 – 2200 MHz
2 x 150 W

KATHREIN
Antennen · Electronic

- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor applications
- Wall or 19´´ rack mounting
- DC bypass between port 1 and port 3
- External DC stop available as an accessory





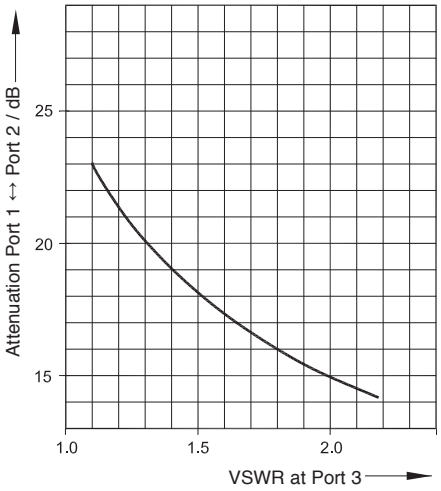


Technical Data

Type No.	793555
Frequency range	800 – 2200 MHz
Attenuation Port 1 ↔ Port 3 Port 2 ↔ Port 3 Port 1 ↔ Port 2	 3.1 ±1.2 dB 3.1 ±1.2 dB > 22 dB*
VSWR (all ports)	< 1.2
Impedance	50 Ω
Input power Port 1 Port 2	 < 150 W (with max. 16 signals) < 150 W (with max. 16 signals)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–20 … +50 °C
Connectors	7-16 female
Application	Indoor
DC/AISG transparency Port 1 ↔ Port 3 Port 2	 Bypass (max. 2500 mA) Short circuit (External DC stop available as an accessory)
Mounting	Wall mounting: With 4 screws (max. 7 mm diameter) 19´´ rack mounting: To be inserted on pre-installed 19´´ sliding bars (2 height units required)
Weight	10 kg
Packing size	510 x 410 x 100 mm
Dimensions (w x h x d)	336 x 444 x 58.5 mm

* Valid if all ports are terminated with 50-Ω loads (see diagram)

Typical attenuation Port 1 ↔ Port 2 vs. VSWR at Port 3



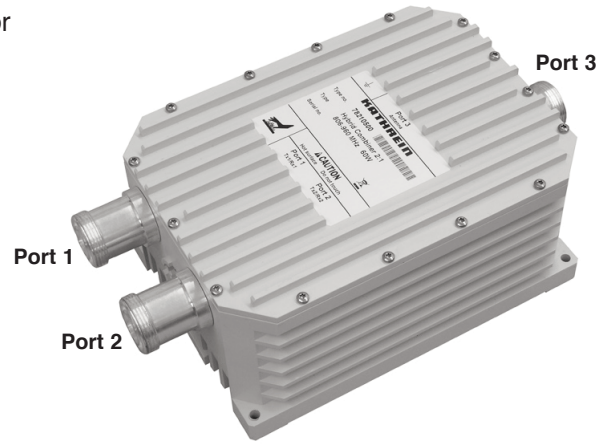
Note:
The input power rating of 150 W per port is specified at an ambient temperature of +55 °C with the combiner mounted vertically (see photo), without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

When installed in a 19´´ rack, it must be ensured that the max. power of 150 W is sufficiently dissipated, so that the ambient temperature does not rise above +50 °C. This can be achieved for example by the additional installation of a correspondingly dimensioned ventilator in the 19´´ rack or by reducing the maximum input power.

Hybrid Combiner 2:1
806 – 960 MHz
2 x 60 W

KATHREIN
Antennen · Electronic

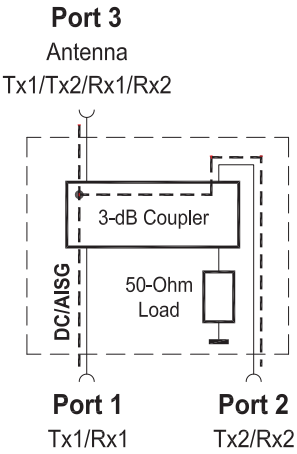
- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- DC bypass between all ports
- External DC stop available as an accessory



Technical Data

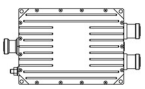
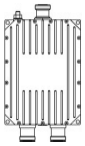
Type No.	78210500
Frequency range	806 – 960 MHz
Attenuation Port 1 ↔ Port 3 Port 2 ↔ Port 3 Port 1 ↔ Port 2	 3.1 ±0.5 dB 3.1 ±0.5 dB > 23 dB *
VSWR (all ports)	< 1.15
Impedance	50 Ω
Input power Port 1 Port 2	 < 60 W < 60 W
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +55 °C
Connectors	7-16 female (long neck)
Application	Indoor *or* outdoor (IP 66)
DC/AISG transparency	Bypass between all ports (max. 2500 mA) AISG: Attenuation 3 dB with / 6 dB without external DC stop at either Port 1 or Port 2
Mounting	Wall mounting: With 4 screws (max. 6.5 mm diameter) Mast mounting: With additional clamp set (see data sheet)
Weight	3.7 kg
Packing size	377 x 232 x 189 mm
Dimensions (w x h x d)	143.6 x 258 x 97.5 mm (including connectors)

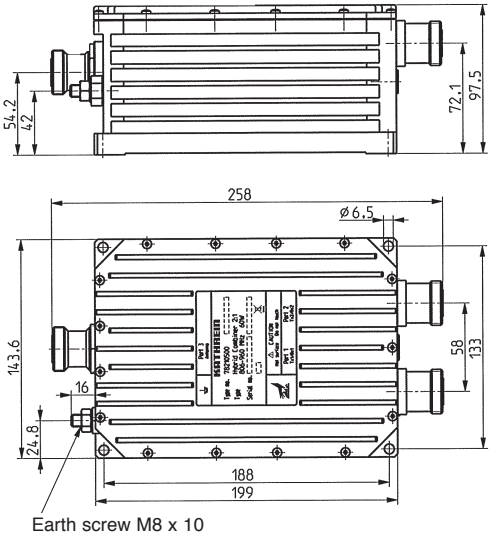
* Valid if all ports are terminated with 50-Ω loads.



Note:
The input power rating of 60 W per port is specified at an ambient temperature of +55 °C with the combiner mounted horizontally, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).
If mounted vertically and/or used at a lower ambient temperature, then a higher input power in accordance with the following table is possible:

Max. input power per port

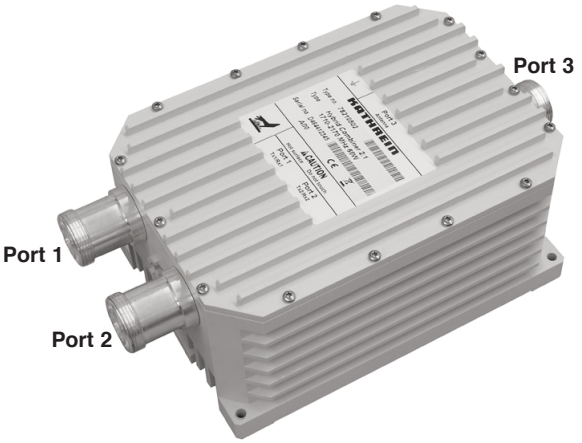
Max. ambient temperature	Mounted horizontally 	Mounted vertically 
+55 °C	**60 W**	70 W
+40 °C	70 W	80 W
+25 °C	75 W	85 W



Hybrid Combiner 2:1
1710 – 2170 MHz
2 x 60 W

KATHREIN
Antennen · Electronic

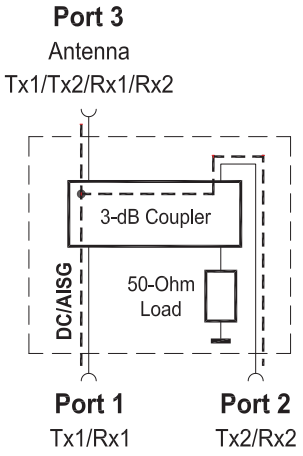
- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- DC bypass between all ports
- External DC stop available as an accessory



Technical Data

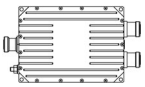
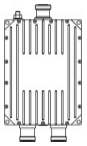
Type No.	78210502
Frequency range	1710 – 2170 MHz
Attenuation Port 1 ↔ Port 3 Port 2 ↔ Port 3 Port 1 ↔ Port 2	 3.1 ±0.5 dB 3.1 ±0.5 dB > 22 dB *
VSWR (all ports)	< 1.25
Impedance	50 Ω
Input power Port 1 Port 2	 < 60 W < 60 W
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +55 °C
Connectors	7-16 female (long neck)
Application	Indoor *or* outdoor (IP 66)
DC/AISG transparency	Bypass between all ports (max. 2500 mA) AISG: Attenuation 3 dB with / 6 dB without external DC stop at either Port 1 or Port 2
Mounting	Wall mounting: With 4 screws (max. 6.5 mm diameter) Mast mounting: With additional clamp set
Weight	3.7 kg
Packing size	377 x 232 x 189 mm
Dimensions (w x h x d)	143.6 x 256 x 97.5 mm (including connectors)

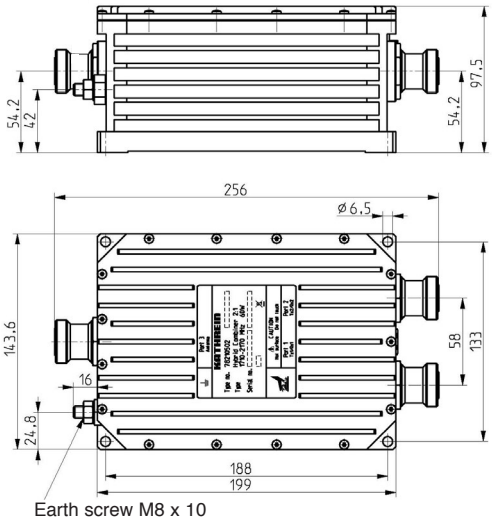
* Valid if all ports are terminated with 50-Ω loads.



Note:
The input power rating of 60 W per port is specified at an ambient temperature of +55 °C with the combiner mounted horizontally, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).
If mounted vertically and/or used at a lower ambient temperature, then a higher input power in accordance with the following table is possible:

Max. input power per port

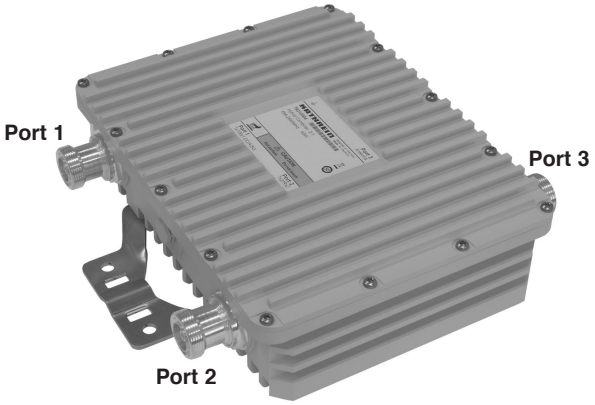
Max. ambient temperature	Mounted horizontally 	Mounted vertically 
+55 °C	**60 W**	70 W
+40 °C	70 W	80 W
+25 °C	75 W	85 W



Hybrid Combiner 2:1
698 – 2690 MHz
2 x 60 W

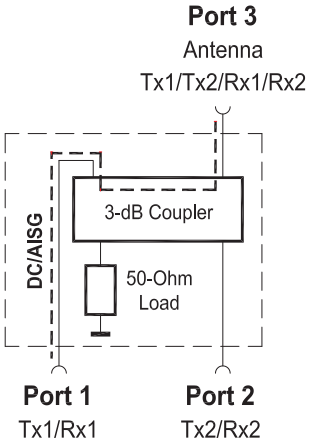
KATHREIN
Antennen · Electronic

- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- DC bypass between port 1 and port 3



Technical Data

Type No.	78210504
Frequency range	698 – 2690 MHz
Attenuation Port 1 ↔ Port 3 Port 2 ↔ Port 3 Port 1 ↔ Port 2	 3.1 ±0.5 dB 3.1 ±0.5 dB > 23 dB*
VSWR (all ports)	< 1.2 (698 – 2170 MHz) / < 1.25 (2170 – 2690 MHz)
Impedance	50 Ω
Input power Port 1 Port 2	 < 60 W < 60 W
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +55 °C
Connectors	7-16 female (long neck)
Application	Indoor *or* outdoor (IP 66)
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	 Bypass (max. 2500 mA) Stop
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	4.3 kg
Packing size	385 x 345 x 168 mm
Dimensions (w x h x d)	264 x 203 x 72.5 mm (without connectors, without mounting brackets)



* Valid if all ports are terminated with 50-Ohm loads.

Note:
The input power rating of 60 W per port is specified at an ambient temperature of +55 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).
If used at a lower ambient temperature, then a higher input power in accordance with the following table is possible:

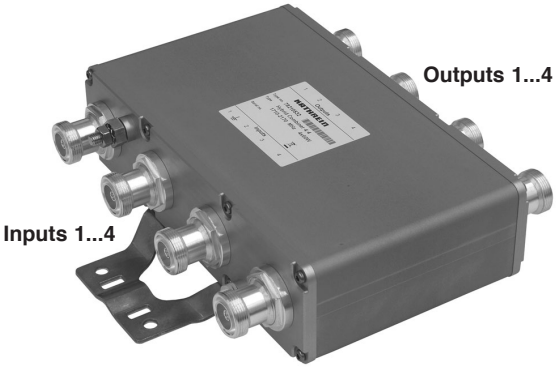
Max. input power per port

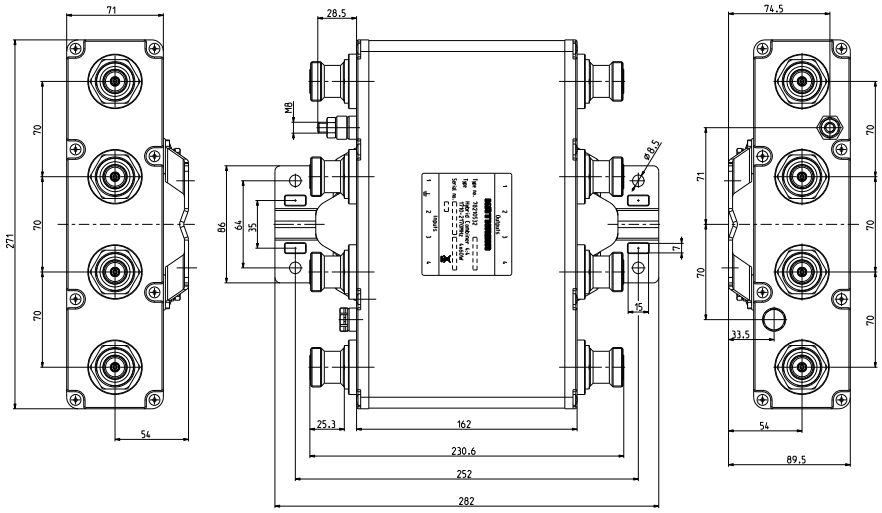
Max. ambient temperature	Mounted horizontally 	Mounted vertically 
+55 °C	55 W	**60 W**
+40 °C	70 W	75 W
+25 °C	80 W	85 W

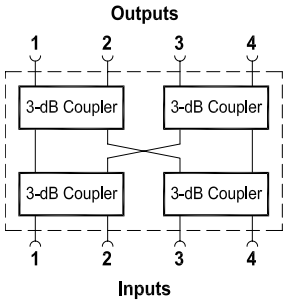
Hybrid Combiner 4:4
1710 – 2170 MHz
4 x 60 W

KATHREIN
Antennen · Electronic

- Designed for the decoupled combining of 4 transmitter or receiver signals and distributing these signals equally onto 4 antenna outputs
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- DC bypass between all ports
- External DC stop available as an accessory







Technical Data

Type No.	78210532
Frequency range	1710 – 2170 MHz
Insertion Loss Input 1...4 ↔ Output 1...4	0.5 dB ±0.2 dB
Power distribution loss (excluding insertion loss) Input 1...4 ↔ Output 1...4	6 ±0.75 dB
Isolation Input 1...4 ↔ Input 1...4 Output 1...4 ↔ Output 1...4	> 22 dB* > 22 dB*
VSWR (all ports)	< 1.25
Impedance	50 Ω
Input power	< 60 W at each port
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +60 °C
Connectors	7-16 female (long neck)
Application	Indoor *or* outdoor (IP 66)
DC/AISG transparency	Bypass between all ports (max. 2500 mA) External DC stop available as an accessory
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	4.4 kg
Packing size	357 x 312 x 189 mm
Dimensions (w x h x d)	271 x 282 x 89.5 mm (including connectors and mounting brackets)

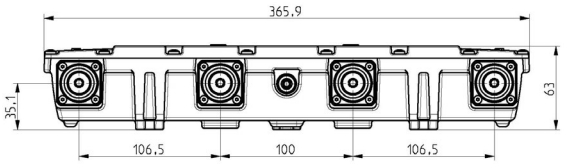
* Valid if all ports are terminated with 50-Ω loads

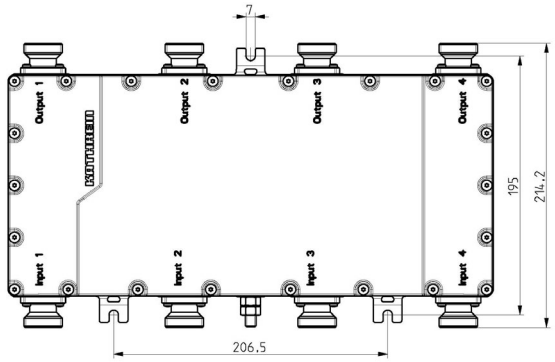
Note:
The use of fewer than 4 inputs or outputs is possible. Any unused input ports have to be terminated with low-power 50-Ohm loads (e.g. Kathrein type 784 10367), unused output ports have to be terminated with high-power 50-Ohm loads (e.g. Kathrein low-intermodulation type 782 10474).

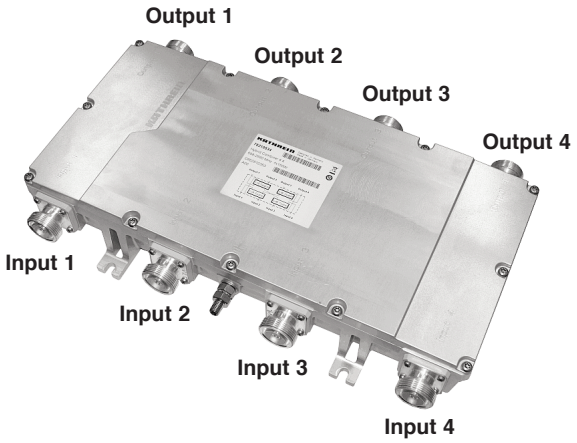
Hybrid Combiner 4:4
698 – 2690 MHz
4 x 150 W

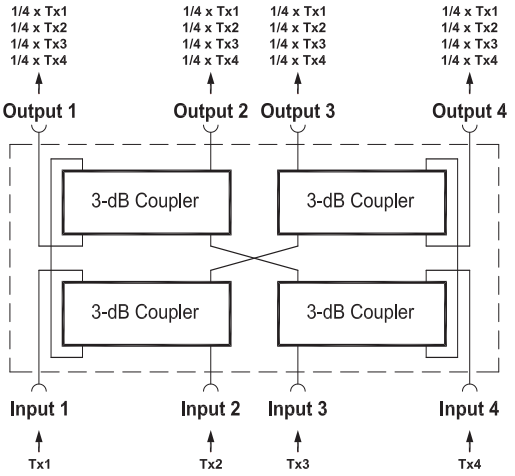
KATHREIN
Antennen · Electronic

- Designed for the decoupled combining of 4 transmitter or receiver signals and distributing these signals equally onto 4 antenna outputs
- Suitable for indoor or outdoor applications
- DC/AISG bypass
- External DC stop available as an accessory









Technical Data

Type No.	78210534
Frequency range	698 – 2690 MHz
Insertion loss Input 1...4 ↔ Output 1...4	0.35 ±0.15 dB
Power distribution loss (excluding insertion loss) Input 1...4 ↔ Output 1...4	6 ±0.75 dB (typically 6.3 dB)
Isolation Input 1...4 ↔ Input 1...4 Output 1...4 ↔ Output 1...4	> 20 dB* (698 – 2690 MHz) > 20 dB* (698 – 2690 MHz)
VSWR (all ports)	< 1.22 (698 – 2170 MHz) < 1.4 (2170 – 2690 MHz)
Impedance	50 Ω
Input power	< 150 W at each input port
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +60 °C
Connectors	7-16 female
Application	Indoor *or* outdoor (IP 66)
DC/AISG transparency	Bypass (max. 2500 mA) between Input 1 ↔ Output 4 / Input 2 ↔ Output 2 / Input 3 ↔ Output 3 / Input 4 ↔ Output 1 External DC stop available as an accessory
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional mounting kit
Weight	4.5 kg
Packing size	453 x 125 x 273 mm
Dimensions (w x h x d)	365.9 x 214.2 x 63 mm (with connectors and mounting feet)

* Valid if all ports are terminated with 50-Ohm loads

Note:
The use of fewer than 4 inputs or outputs is possible. Any unused input ports have to be terminated with low-power 50-Ohm loads (e.g. Kathrein type 78410367), unused output ports have to be terminated with high-power 50-Ohm loads (e.g. Kathrein low-intermodulation type 78210474).

Accessories (order separately)

Type No.	Description
78210850	DC stop
78210474	50-Ohm load (80 W)
78410367	50-Ohm load (1.5 W)
78210535	Mast mounting kit

DC stop

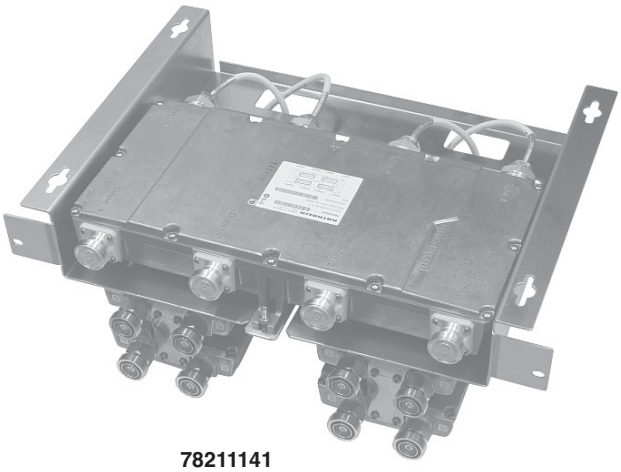
50-Ohm load

50-Ohm load

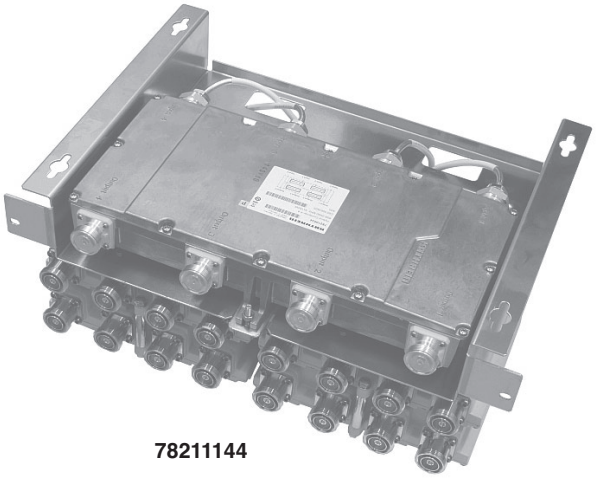
Hybrid Combiner
8:4 / 8:4 / 12:4 / 16:4

KATHREIN
Antennen · Electronic

- Designed for the decoupled combining of 8/12/16 transmitter or receiver signals and distributing these signals evenly onto 4 antenna outputs.



78211141

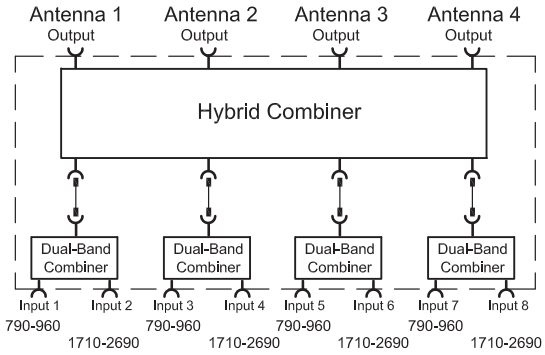


78211144

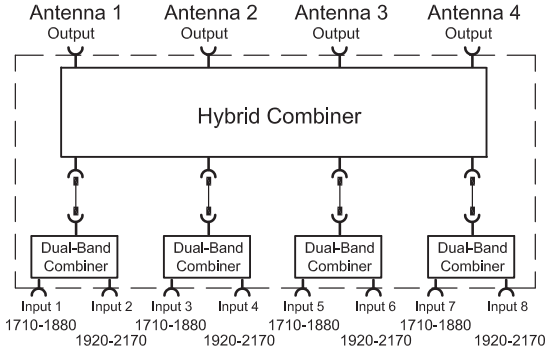
Technical Data

Type No.	78211141 8 : 4	78211142 8 : 4	78211143 12 : 4	78211144 16 : 4
Frequency range Band 1 Band 2 Band 3 Band 4	698 – 960 MHz 1710 – 2690 MHz	1710 – 1880 MHz 1920 – 2170 MHz	698 – 960 MHz 1710 – 1880 MHz 1920 – 2170 MHz	698 – 960 MHz 1710 – 1880 MHz 1920 – 2170 MHz 2500 – 2690 MHz
Power distribution loss (excluding insertion loss) Input 1 ... 8/12/16 ↔ Output 1 ... 4	6 ±0.75 dB } (typically 6.5 dB)			
Insertion loss Input 1 ... 8/12/16 ↔ Output 1 ... 4	< 0.8 dB } (typically 6.5 dB)			
Isolation between input ports Same bands Different bands	> 22 dB > 50 dB			
Impedance	50 Ω			
Input power at each input port	< 75 W	< 75 W	< 50 W	< 50 W
Intermodulation products	< – 160 dBc (3rd order; with 2 x 20 W)			
Temperature range	–40 ... +60 °C			
Connectors	7-16 female			
Application	Indoor			
Mounting	Wall mounting: With 4 screws (max. 6 mm diameter) / 19“-drawer			
Weight	Approx. 13 kg	Approx. 19 kg	Approx. 21 kg	Approx. 22 kg

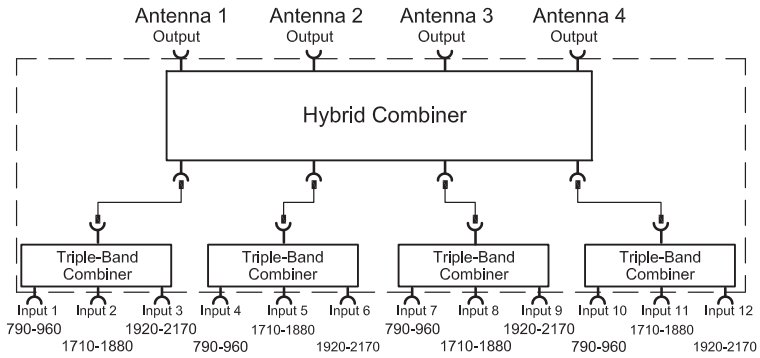
Note:
The use of fewer than 8/12/16 inputs or 4 outputs is possible. Any unused input ports have to be terminated with low-power 50-Ohm loads (e.g. Kathrein type 78410367), unused output ports have to be terminated with high-power 50-Ohm loads (e.g. Kathrein low-intermodulation type 78210474).



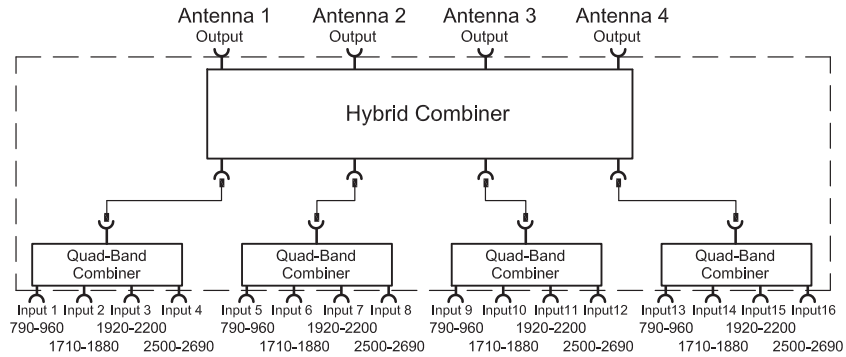
78211141



78211142



78211143



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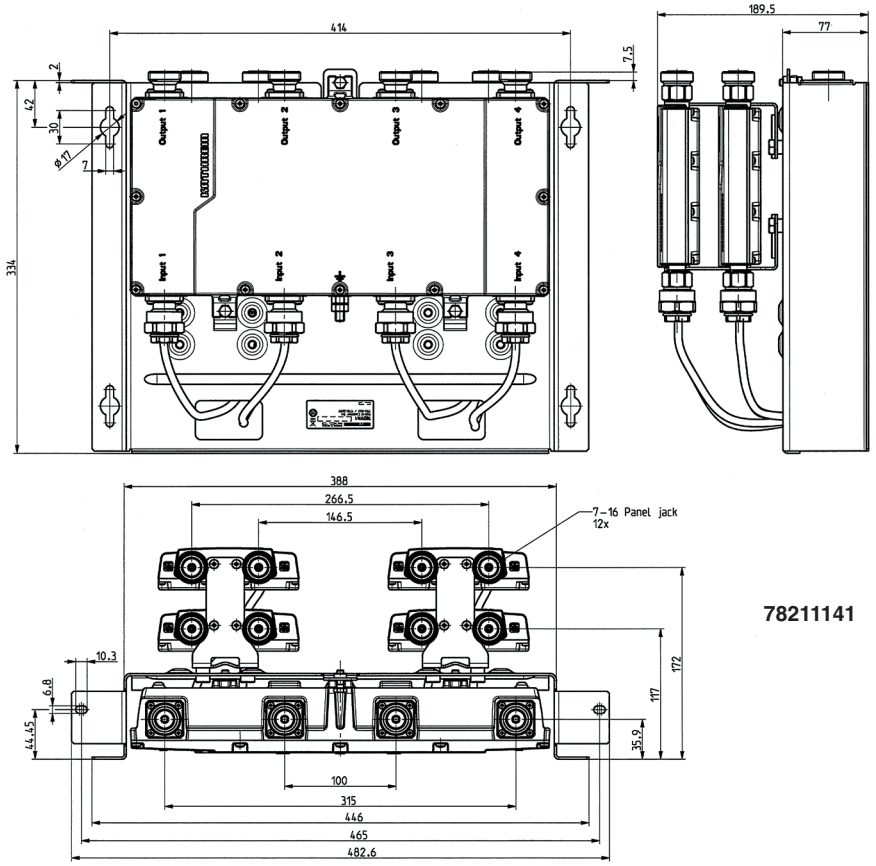

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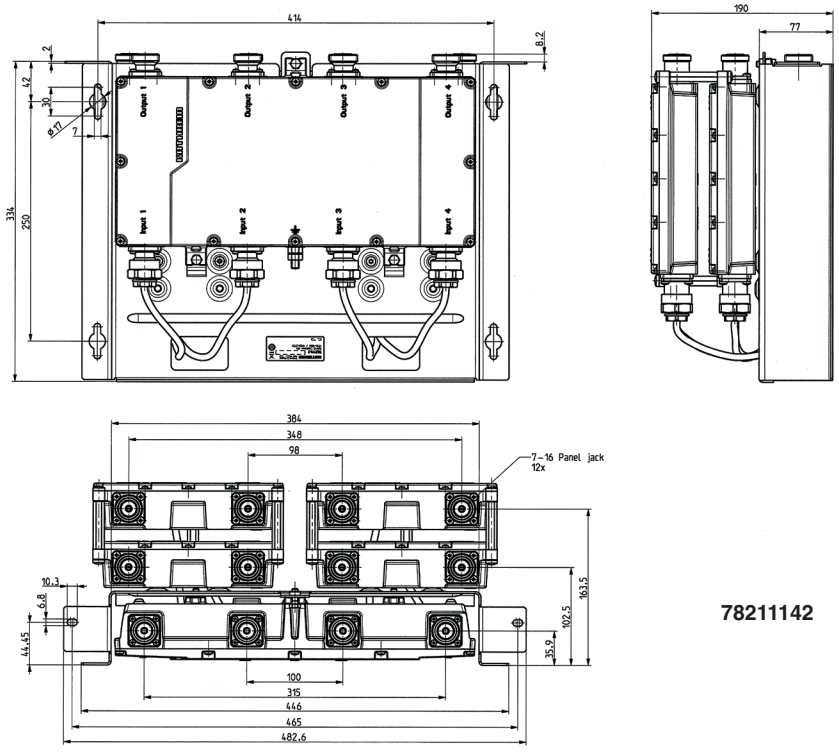

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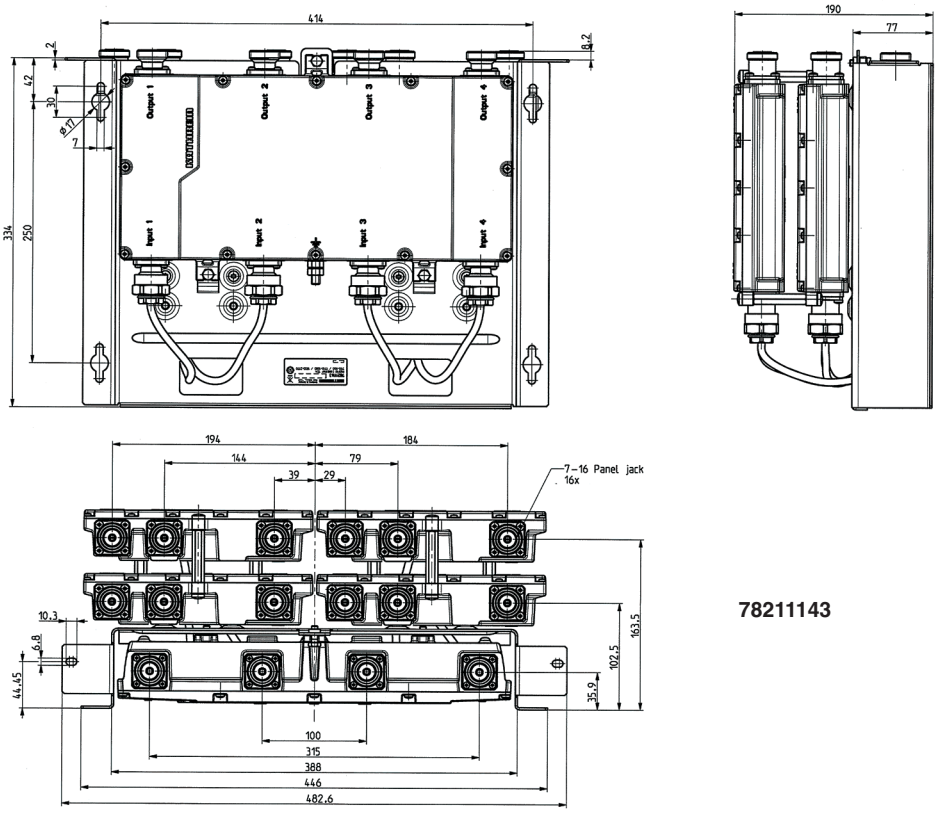
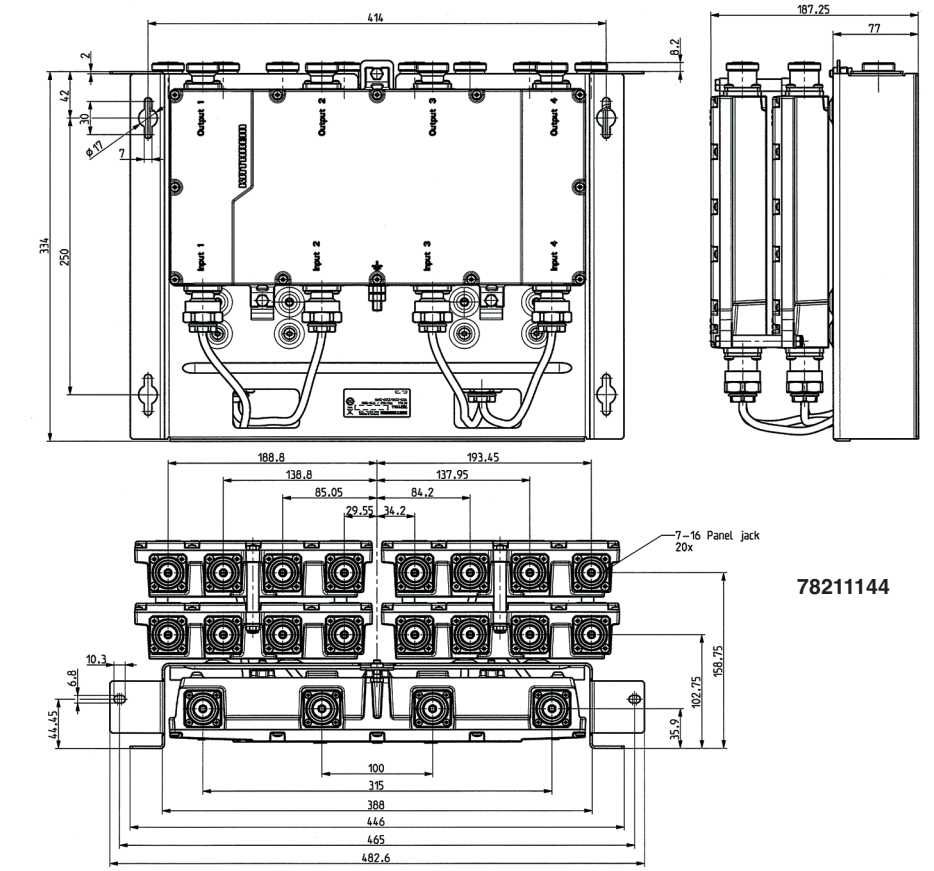


78211143



78211144

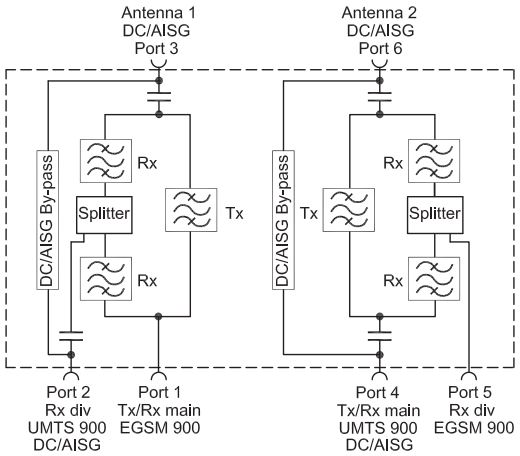
Duplex Hybrid Combiner (Same-Band Combiner)

KATHREIN
Antennen · Electronic

880 – 960 MHz
EGSM 900

880 – 960 MHz
UMTS 900

- Enables antenna and feeder sharing for two base stations in the 900 MHz frequency band
- Very low insertion loss over full EGSM/UMTS 900 Tx bandwith compared to standard hybrid combiners
- Double unit in one housing for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG bypass for DTMA supply (for UMTS paths only)
- Rx diversity ports protected against incorrectly connected Tx power



Typical Attenuation Curves

Diagram I — **Port 1 ↔ Port 3, Port 4 ↔ Port 6**

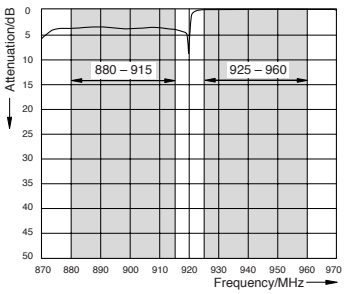


Diagram II — **Port 1 ↔ Port 3, Port 4 ↔ Port 6**

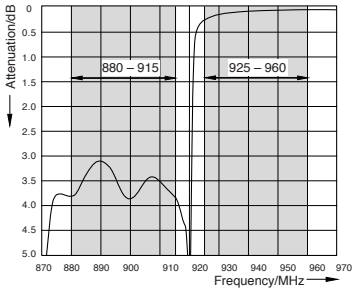


Diagram III — **Port 2 ↔ Port 3, Port 5 ↔ Port 6**

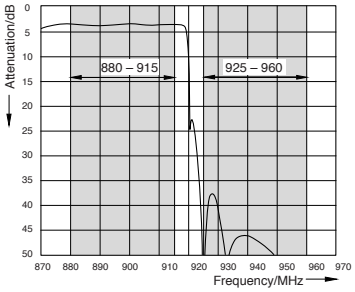
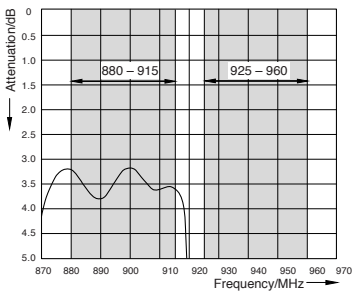


Diagram IV — **Port 2 ↔ Port 3, Port 5 ↔ Port 6**



Technical Data

Type No.	78210805	
Pass band Rx Tx	 880 – 915 MHz 925 – 960 MHz	
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	 < 0.4 dB, typically 0.2 dB (925 – 960 MHz) – see Diagram I and II < 4.3 dB, typically 3.6 dB (880 – 915 MHz) – see Diagram I and II < 4.0 dB, typically 3.5 dB (880 – 915 MHz) – see Diagram III and IV	
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	 > 25 dB (880 – 915 MHz) > 35 dB (925 – 960 MHz)	
VSWR	< 1.2 (880 – 915 / 925 – 960 MHz)	
Impedance	50 Ω	
Input power	Port 1: < 250 W Port 4: < 250 W	Port 2: < 50 W Port 5: < 50 W
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–40 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 / Port 5 ↔ Port 6 Port 2 ↔ Port 3 / Port 4 ↔ Port 6	 Stop Bypass (max. 2500 mA)	
Lightning protection	3 kA, 10/350 µs pulse	
Mounting	With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	6.5 kg	
Packing size	390 x 470 x 160 mm	
Dimensions (w x h x d)	287.1 x 278.6 x 71 mm (without connectors, without mounting brackets)	

Duplex Hybrid Combiner (Same-Band Combiner)

KATHREIN
Antennen · Electronic

880 – 960 MHz EGSM 900	880 – 960 MHz UMTS 900

Accessories (order separately)

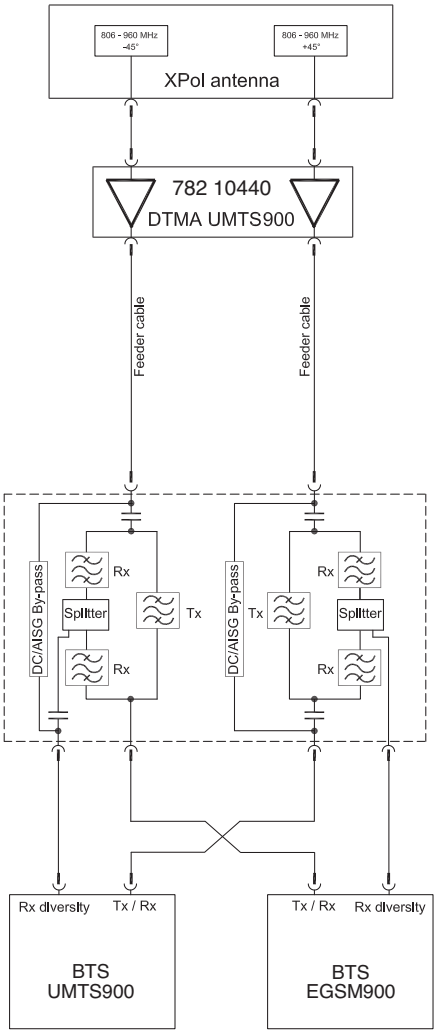
Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Type No.	Description
793301	DC stop
78410367	50-Ω load 1.5 W indoor or outdoor

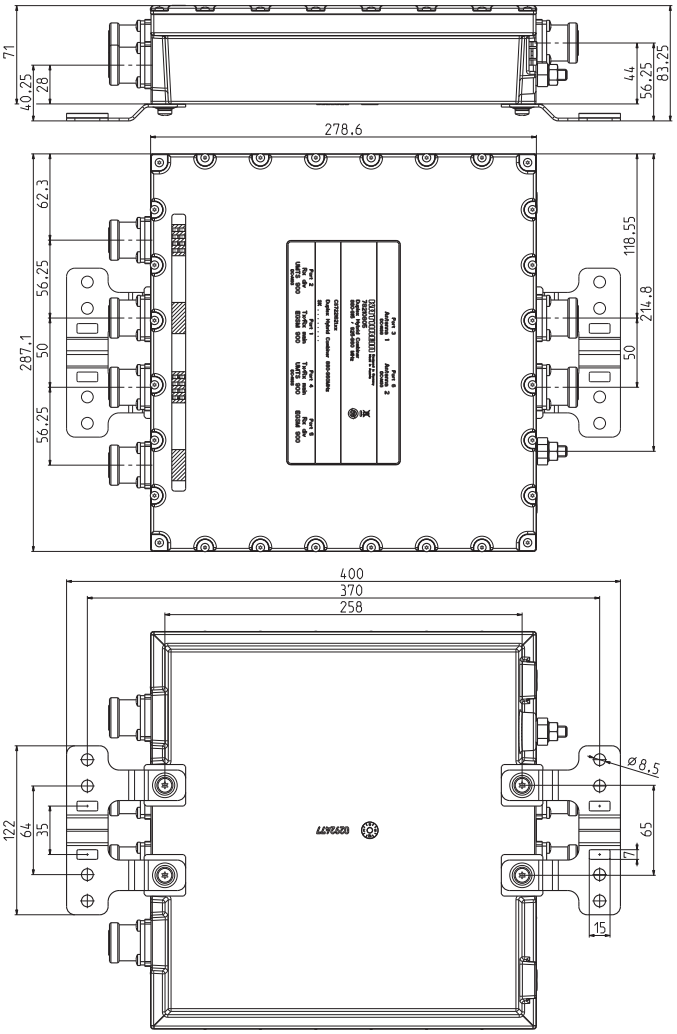
Clamp Set

DC stop

50-Ω load



Application example



Active Duplex Hybrid Combiner (Same-Band Combiner)

KATHREIN
Antennen · Electronic

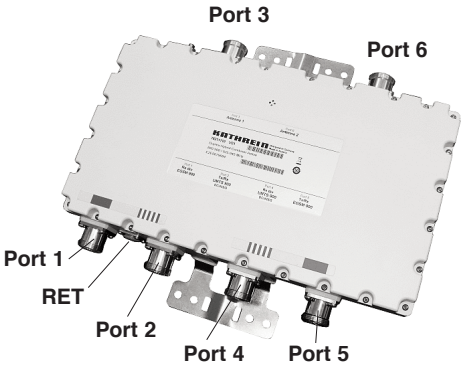
880 ... 960 MHz
EGSM 900

880 ... 960 MHz
UMTS 900

- Enables antenna and feeder sharing for two base stations in the 900 MHz frequency band
- 12 dB gain over 20 MHz Rx bandwidth (factory tunable)
- Very low insertion loss over 20 MHz Tx bandwidth (factory tunable) compared to standard hybrid combiners
- Double unit in one housing for XPol antennas
- Suitable for indoor or outdoor applications
- Supports AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode (LNA) to ensure cell operation in case of DC power down
- Built-in lightning protection

Frequency ordering information:
When ordering please specify the required Tx-and Rx-frequencies
Examples of tuning versions:
78211110V01: Rx 880 – 900 MHz, Tx 925 – 945 MHz
78211110V02: Rx 895 – 915 MHz, Tx 940 – 960 MHz
Other frequencies on request.

RET = **R**emote **E**lectrical **T**ilt
AISG = **A**ntenna **I**nterface **S**tandards **G**roup
CWA = **C**urrent **W**indow **A**larm



Technical Data

Type No.	78211110	
Pass band Rx Tx	 20 MHz within 880 ... 915 MHz (factory tunable) 20 MHz within 925 ... 960 MHz (factory tunable)	
Tx Insertion loss Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 0.2 dB (925 – 945 MHz)* – see Diagram I and II	
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	 > 25 dB (880 – 900 MHz)* > 65 dB (925 – 945 MHz)*	
Gain	12 dB nominal	
Gain ripple	±1 dB	
Loss in bypass mode	< 5.5 dB (DC OFF)	
Return loss	> 18 dB (DC ON) / > 12 dB (DC OFF)	
Noise figure	< 1.6 dB (+22 ... +28 °C)	
Output 1-dB compression point	> 11 dBm	
3rd order intercept point (OIP3)	> 25 dBm (typically 30 dBm)	
VSWR	< 1.25 (880 – 900 / 925 – 945 MHz)*	
Impedance	50 Ω	
Input power	Port 2 < 200 W Port 5 < 200 W	
Intermodulation products	< 160 dBc (5th order, with 2 x 20 W)	
Environmental Characteristics		
Operating temperature range	–40 … +65 °C	
IP rating	IP67 (see note on page 2)	
MTBF	> 1 000 000 hours (per TMA)	
EMC	According to ETS 300 342-3	
DC and Alarm Characteristics	**CWA Mode**	**AISG Mode**
DC supply	9 – 19 V	9 – 30 V
Operating current per TMA (without RET)	80 – 120 mA	Nom. 20 mA at 9 V Nom. 30 mA at 30 V
Alarm management	170 – 200 mA	AISG (see note on page 2)
Mechanical Characteristics		
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: not connected)	
Mounting	Wall mounting: with 4 screws (max. 8 mm diameter) Mast mounting: with additional clamp set	
Weight	6.8 kg	
Packing size	460 x 375 x 135 mm	
Dimensions (w x h x d)	369 x 209 x 68 mm (without connectors, without mounting brackets)	

* Tuning version 78211110V01: Rx 880 – 900 MHz, Tx 925 – 945 MHz

Active Duplex Hybrid Combiner (Same-Band Combiner)

KATHREIN
Antennen · Electronic

880 ... 960 MHz EGSM 900	**880 ... 960 MHz** UMTS 900

Accessories (order separately)

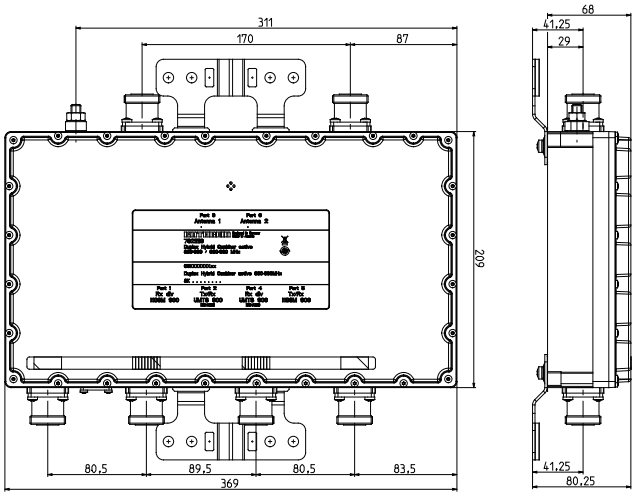
Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

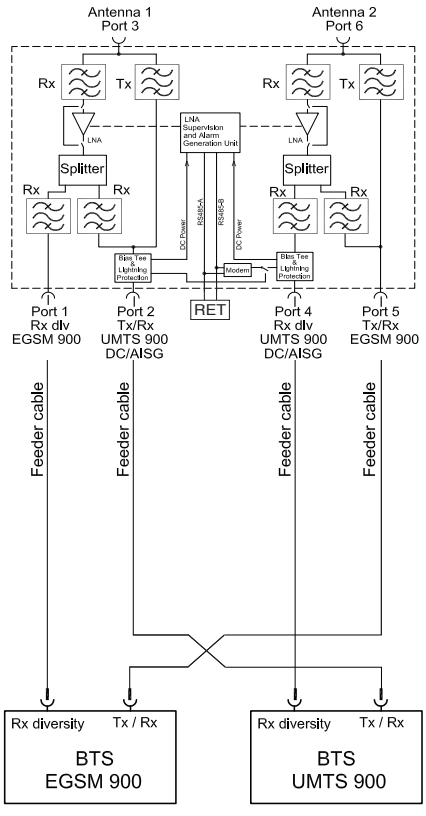
Type No.	Description
793301	**DC stop**
78410367	**50-Ω load** 1.5 W / indoor or outdoor

Clamp Set

DC stop

50-Ω load





Application example

Typical Attenuation Curves

Tuning example 78211110V01
Rx: 880 – 900 MHz, Tx: 925 – 945 MHz

Diagram I — **Port 2 ↔ Port 3, Port 5 ↔ Port 6**

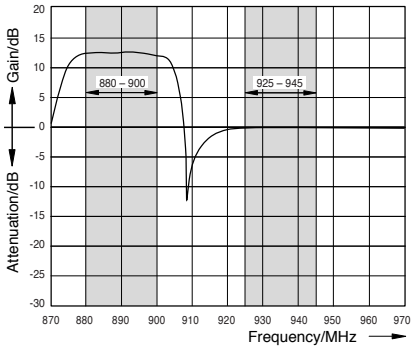


Diagram II — **Port 2 ↔ Port 3, Port 5 ↔ Port 6**

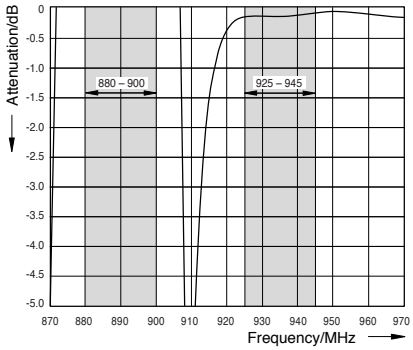


Diagram III — **Port 1 ↔ Port 3, Port 4 ↔ Port 6**

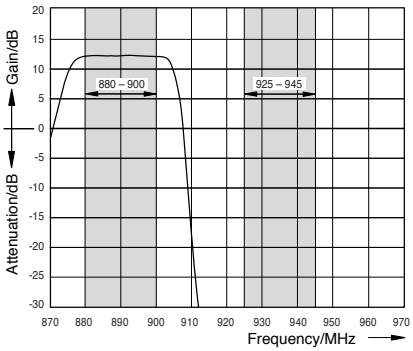
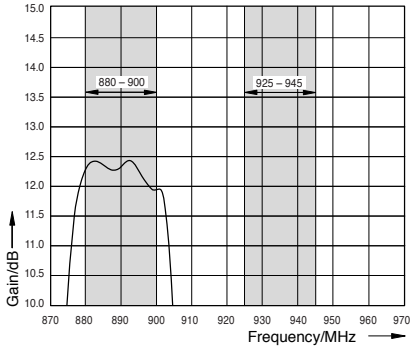


Diagram IV — **Port 1 ↔ Port 3, Port 4 ↔ Port 6**



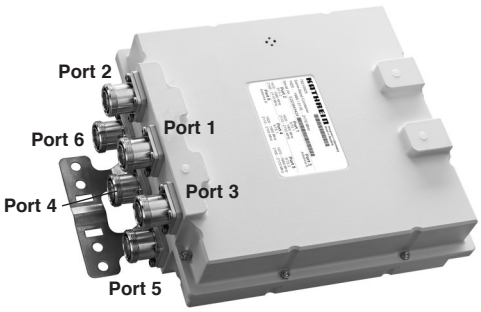
Same-Band Combiner

KATHREIN
Antennen · Electronic

1920 – 1980 / 2110 – 2170 MHz
UMTS 2100

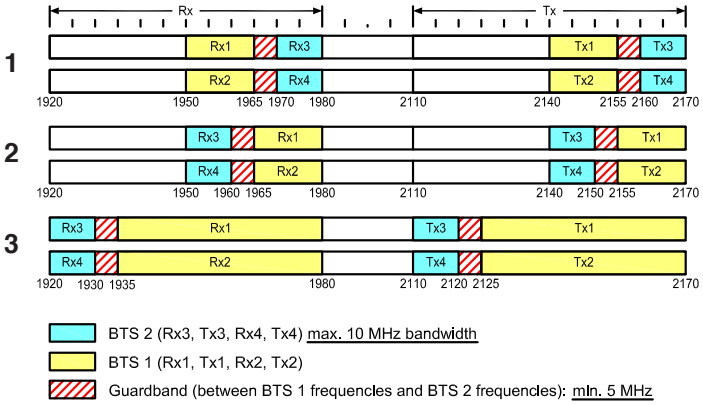
1920 ... 1980 / 2110 ... 2170 MHz
UMTS 2100 (10 MHz Bandwidth)

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Customized 10 MHz Tx/Rx bandpass filters (factory tunable) available for inserting a second UMTS 2100 base station
- Full pass-band (without the second UMTS 2100 10 MHz Tx/Rx frequency blocks) available for the first UMTS 2100 base station
- Low insertion loss over complete UMTS 2100 Tx/Rx bandwidth compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply

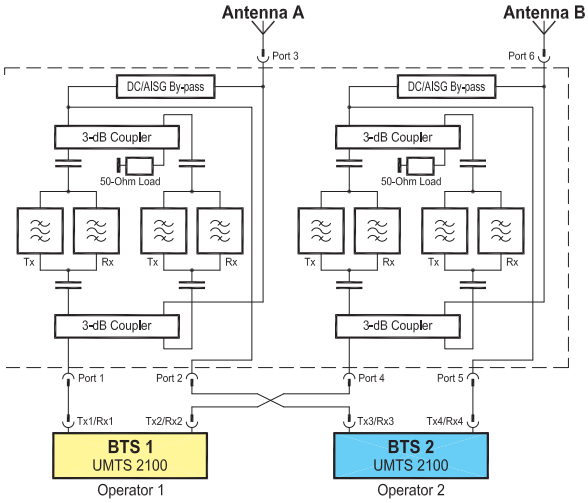


Frequency ordering information:
When ordering please specify the required Tx- and Rx-frequencies
e.g. (tuning example 1)
Rx1/Rx2 1950 – 1965 MHz, Rx3/Rx4 1970 – 1980 MHz
TX1/Tx2 2140 – 2155 MHz, TX3/Tx4 2160 – 2170 MHz

Tuning Examples



Block Diagram



Technical Data

Type No.	78210925
Pass band BTS 1 (UMTS 2100) BTS 2 (UMTS 2100)	Rx = 1920 – 1980 / Tx = 2110 – 2170 MHz (without assigned BTS 2 10 MHz Tx/Rx frequency blocks and ±5 MHz guard bands) Rx = 1920 ... 1980 / Tx = 2110 ... 2170 MHz (factory tunable 10 MHz frequency blocks)
Guard band	5 MHz (between Tx1/Rx1 and Tx3/Rx3, between Tx2/Rx2 and Tx4/Rx4 e.g. tuning example 1: Rx1 (Rx2) = 1950 – 1965 and Tx1 (Tx2) = 2140 – 2155 MHz Rx3 (Rx4) = 1970 – 1980 and Tx3 (Tx4) = 2160 – 2170 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 1.2 dB – see diagram I and II for tuning example 1 < 1.2 dB – see diagram III and IV for tuning example 1
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	> 30 dB (1920 – 1980 / 2110 – 2170 MHz)
VSWR	< 1.25 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	< 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +60 °C
Connectors	7-16 female (long neck)
Application	Indoor *or* outdoor (IP66)
DC/AISG transparency Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	 Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 µs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	7 kg
Packing size	425 x 315 x 180 mm
Dimensions (w x h x d)	243 x 240 x 100 mm (without connectors, without mounting brackets)

Same-Band Combiner

KATHREIN
Antennen · Electronic

1920 – 1980 / 2110 – 2170 MHz
UMTS 2100

1920 ... 1980 / 2110 ... 2170 MHz
UMTS 2100 (10 MHz Bandwidth)

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

Type No.	Description
78410367	**50-Ohm load**

Clamp Set

50-Ohm load

Typical Attenuation Curves (Tuning Example 1)

BTS 1 (UMTS 2100)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

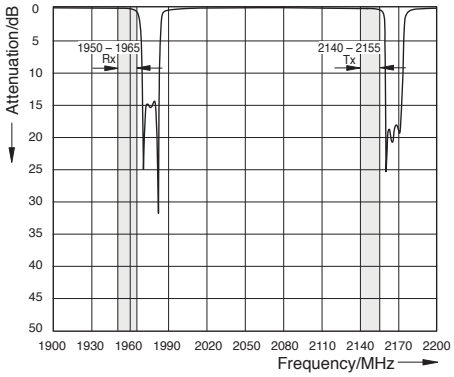
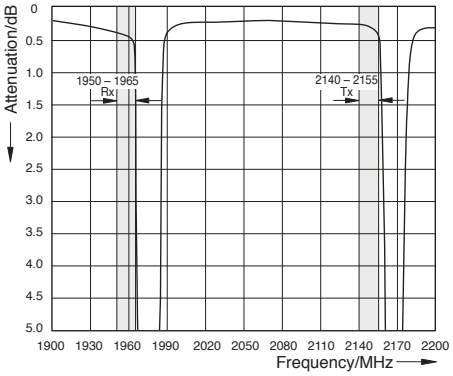


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (UMTS 2100)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ 6)

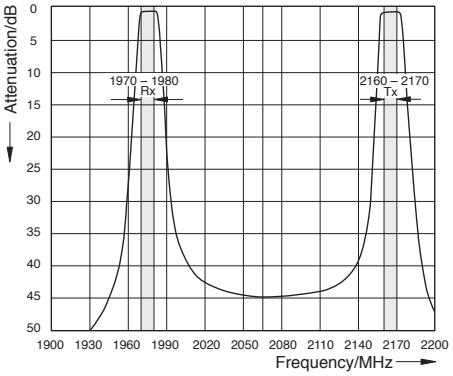
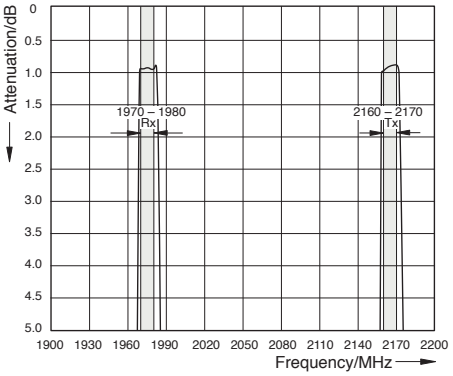
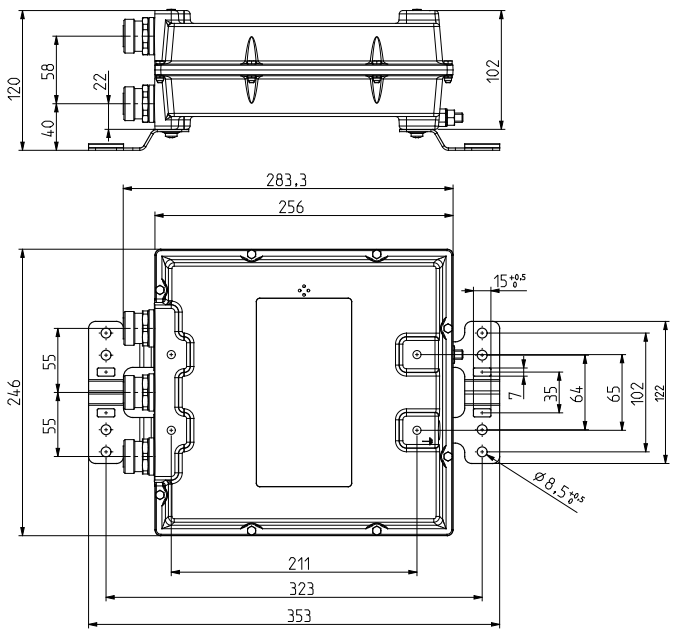


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)





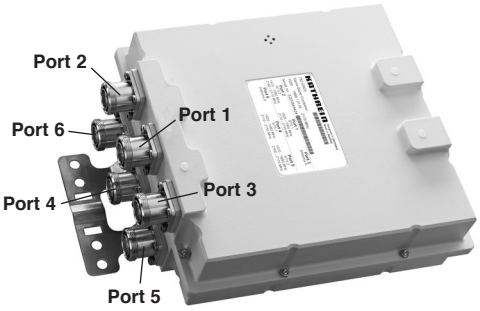
Same-Band Combiner

KATHREIN
Antennen · Electronic

1920 – 1980 / 2110 – 2170 MHz
UMTS 2100

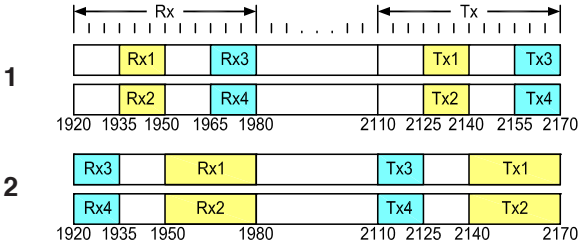
1920 ... 1980 / 2110 ... 2170 MHz
UMTS 2100 (15 MHz Bandwidth)

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Customized 15 MHz Tx/Rx bandpass filters (factory tunable) available for inserting a second UMTS 2100 base station
- Full pass-band (without the second UMTS 2100 15 MHz Tx/Rx frequency blocks) available for the first UMTS 2100 base station
- Low insertion loss over complete UMTS 2100 Tx/Rx band-width compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply

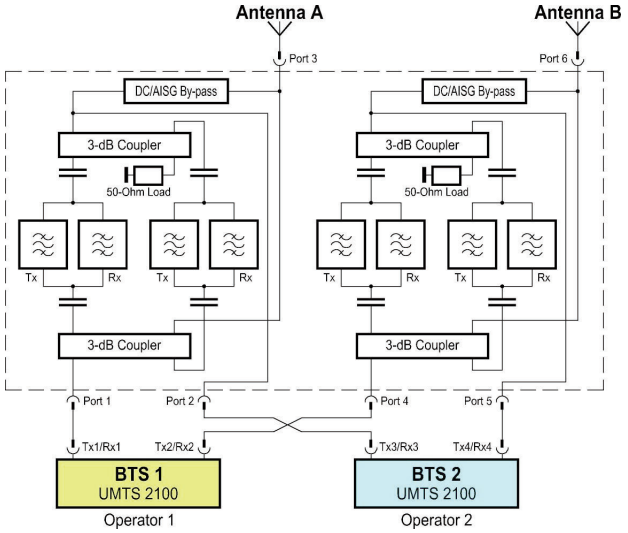


Frequency ordering information:
When ordering please specify the required Tx- and Rx-frequencies e.g. (tuning example 1)
Rx1/Rx2 1935 – 1950 MHz, Rx3/Rx4 1965 – 1980 MHz,
Tx1/Tx2 2125 – 2140 MHz, Tx3/Tx4 2155 – 2170 MHz

Tuning Examples



Block Diagram



Technical Data

Type No.	78210926
Pass band BTS 1 (UMTS 2100) BTS 2 (UMTS 2100)	 Rx = 1920 – 1980 / Tx = 2110 – 2170 MHz (without assigned BTS 2 15 MHz Tx/Rx frequency blocks and ±15 MHz guard bands) Rx = 1920 ... 1980 / Tx = 2110 ... 2170 MHz (factory tunable 15 MHz frequency blocks)
Guard band	15 MHz (between Tx1/Rx1 and Tx3/Rx3, between Tx2/Rx2 and Tx4/Rx4 e.g. tuning example 1: Rx1 (Rx2) = 1935 – 1950 and Tx1 (Tx2) = 2125 – 2140 MHz Rx3 (Rx4) = 1965 – 1980 and Tx3 (Tx4) = 2155 – 2170 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	 < 1.2 dB < 1.2 dB
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	 > 28 dB (1920 – 1980 / 2110 – 2170 MHz)
VSWR	< 1.25 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	 < 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +60 °C
Connectors	7-16 female (long neck)
Application	Indoor *or* outdoor (IP66)
DC/AISG transparency Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	 Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 µs pulse
Packing size	425 x 315 x 180 mm
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	7 kg
Dimensions (w x h x d)	246 x 256 x 102 mm (without connectors, without mounting brackets)

Same-Band Combiner

KATHREIN
Antennen · Electronic

1920 – 1980 / 2110 – 2170 MHz	1920 ... 1980 / 2110 ... 2170 MHz
UMTS 2100	UMTS 2100 (15 MHz Bandwidth)

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

Type No.	Description
78410367	**50-Ohm load**

Clamp Set

50-Ohm load

Typical Attenuation Curves (Tuning Example 1)

BTS 1 (UMTS 2100)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

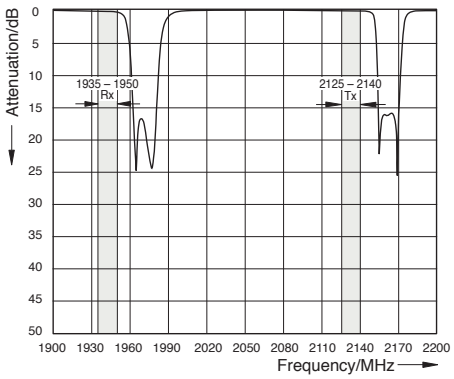
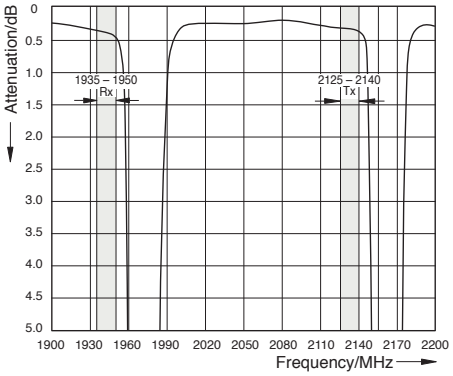


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (UMTS 2100)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ 6)

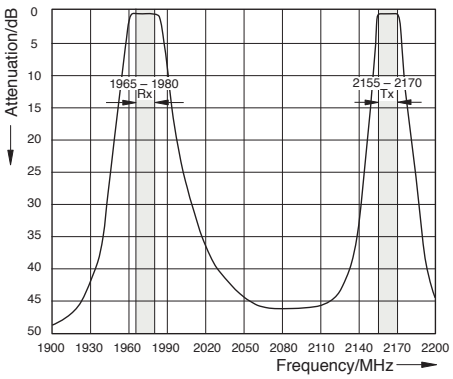
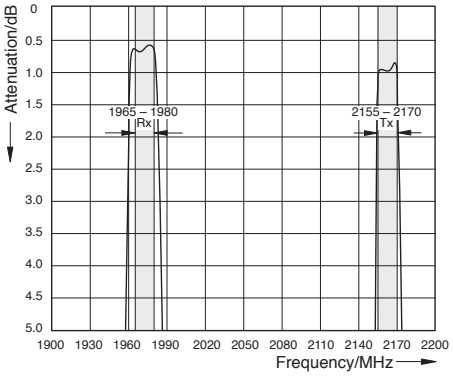
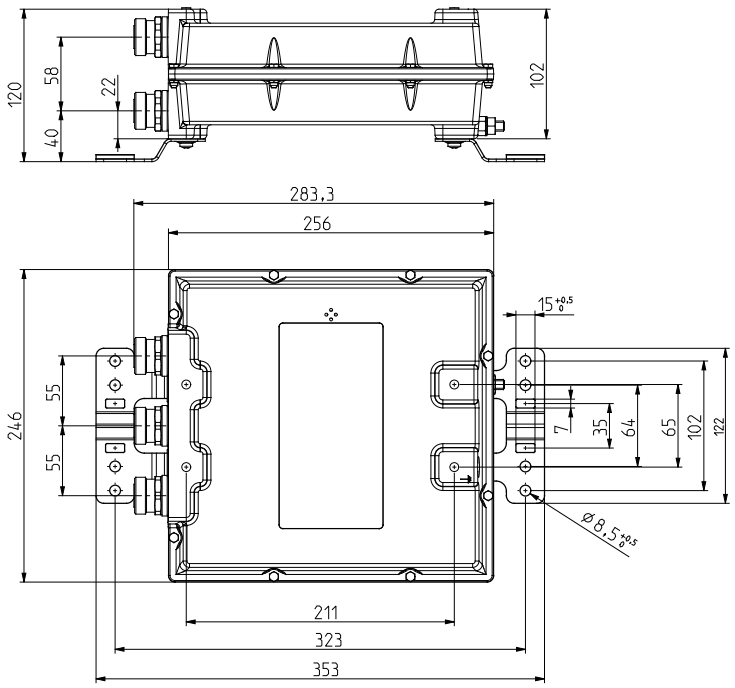


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)





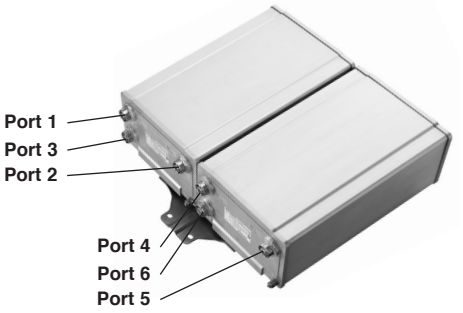
Same-Band Combiner

KATHREIN
Antennen · Electronic

880 – 915 / 925 – 960 MHz
GSM 900

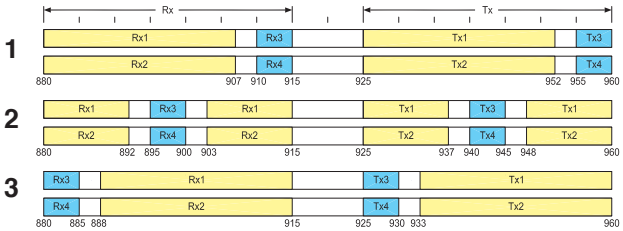
880 ... 915 / 925 ... 960 MHz
LTE / UMTS 900 (5 MHz Bandwidth)

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Suitable for two operators with frequency allocations within the same frequency band
- Customized 5 MHz Tx/Rx pass-band filters (factory tunable) available for inserting LTE/UMTS 900 base station
- Full pass-band (without LTE/UMTS 900 5 MHz Tx/Rx frequency blocks) available for GSM 900 base station
- Very low insertion loss over complete EGSM Tx/Rx bandwidth compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply

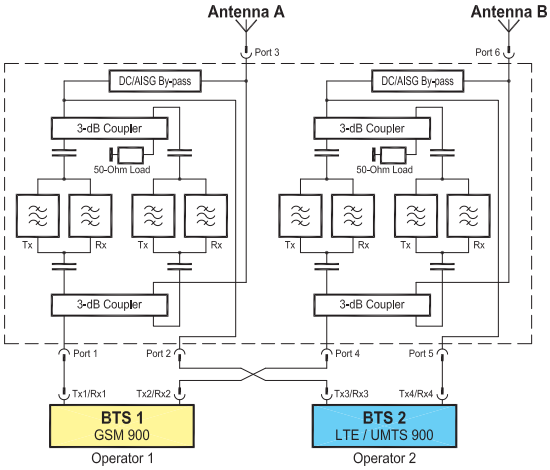


Frequency ordering information:
When ordering please specify the required Tx- and Rx- frequencies e.g. (tuning example 2)
Rx1/Rx2 880 – 892 / 903 – 915 MHz, Rx3/Rx4 895 – 900 MHz
Tx1/Tx2 925 – 937 / 948 – 960 MHz, Tx3/Tx4 940 – 945 MHz

Tuning Examples



Block Diagram



Technical Data

Type No.	78210930
Pass band GSM 900 LTE/UMTS 900	 Rx = 880 – 915 / Tx = 925 – 960 MHz (without assigned LTE/UMTS 900 5 MHz TX/Rx frequency blocks and ± 3 MHz guard bands) Rx = 880 ... 915 / Tx = 925 ... 960 MHz (factory tunable 5 MHz frequency blocks)
Guard band	3 MHz (between Tx/Rx1 and Tx/Rx3, between Tx/Rx2 and Tx/Rx4) – e.g. tuning example 2: Rx1 (Rx2) = 880 – 892 / 903 – 915 and Tx1 (Tx2) = 925 – 937 / 948 – 960 MHz Rx3 (Rx4) = 895 – 900 and Tx3 (Tx4) = 940 – 945 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	 < 0.6 dB (typically 0.2 dB) – see diagram I and II for tuning example 2 < 0.6 dB (typically 0.4 dB) – see diagram III and IV for tuning example 2
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	 > 30 dB (880 – 915 / 925 – 960 MHz)
VSWR	< 1.25 (pass bands)
Group delay variation GSM 900 LTE/UMTS 900	 < 20 ns (200 kHz) < 50 ns (5 MHz)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	 < 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +60 °C
Connectors	7-16 female (long neck)
Application	Indoor *or* outdoor (IP66)
DC/AISG transparency (switchable) Port 1 ↔ Port 3 / Port 4 ↔ Port 6 (default) Port 2 ↔ Port 3 / Port 5 ↔ Port 6 (default)	 Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 µs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Packing size	685 x 645 x 252 mm
Dimensions (w x h x d)	504 x 409 x 158.3 mm (without connectors, without mounting brackets)

Same-Band Combiner

KATHREIN
Antennen · Electronic

880 – 915 / 925 – 960 MHz	**880 ... 915 / 925 ... 960 MHz**
GSM 900	LTE / UMTS 900 (5 MHz Bandwidth)

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

Type No.	Description
784 10367	**50-Ohm load**

Clamp Set

50-Ohm load

Typical Attenuation Curves (Tuning Example 2)

BTS 1 (GSM 900)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

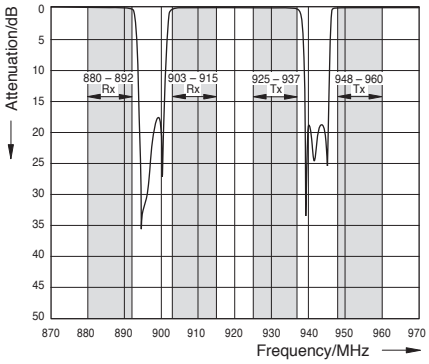
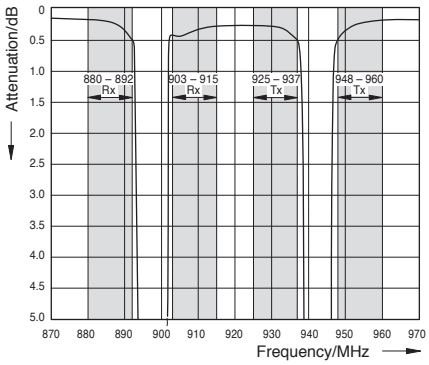


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (LTE/UMTS 900)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)

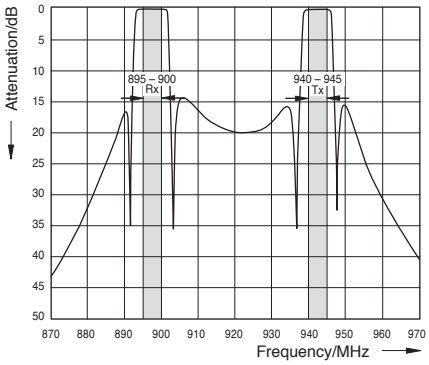
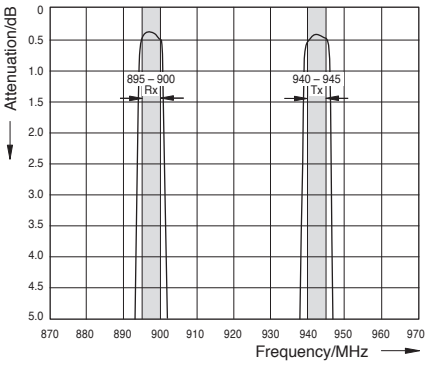
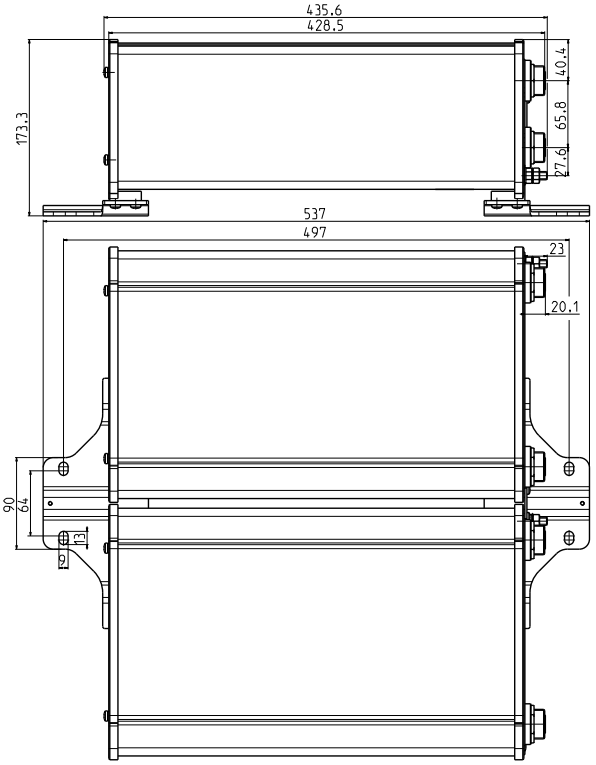


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)





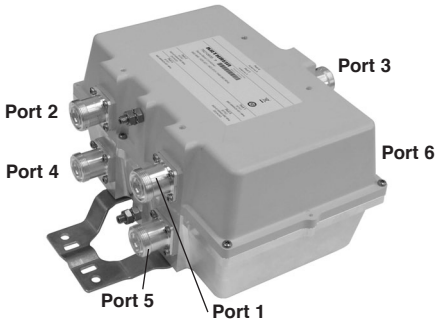
Same-Band Combiner

KATHREIN
Antennen · Electronic

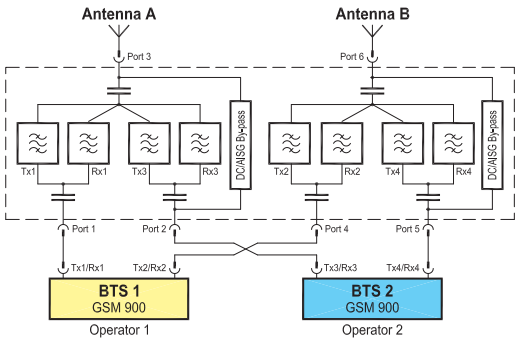
880 – 890 / 925 – 935 MHz
GSM900 (10 MHz Bandwidth)

902.5 – 915 / 947.5 – 960 MHz
GSM900 (12.5 MHz Bandwidth)

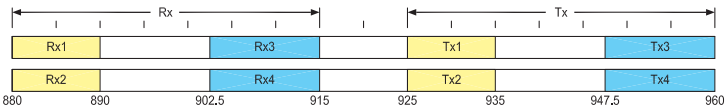
- Enables antenna and feeder sharing for two base stations in the same frequency band
- Suitable for two operators with frequency allocations within the same frequency band
- Very low Tx/Rx insertion loss compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG bypass for DTMA supply



Block Diagram



Tuning Diagram



Technical Data

Type No.	78210936
Pass band BTS 1 (GSM900 / Operator 1) BTS 2 (GSM900 / Operator 2)	 Rx1/Rx2 = 880 – 890 MHz, Tx1/Tx2 = 925 – 935 MHz Rx3/Rx4 = 902.5 – 915 MHz, Tx3/Tx4 = 947.5 – 960 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	 < 0.5 dB, typically 0.3 dB (880 – 890 MHz) / < 0.7 dB, typically 0.4 dB (925 – 935 MHz) < 0.7 dB, typically 0.5 dB (902.5 – 915 MHz) / < 0.5 dB, typically 0.3 dB (947.5 – 960 MHz)
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	 > 30 dB (880 – 890 / 902.5 – 915 / 925 – 935 / 947.5 – 960 MHz)
VSWR	< 1.2 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	 < 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +60 °C
Connectors	7-16 female (long neck)
Application	Indoor *or* outdoor (IP66)
DC/AISG transparency Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	 Stop Bypass (max. 2500 mA)
Lightning protection	3 kA, 10/350 µs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	6.9 kg
Dimensions (w x h x d)	275 x 176 x 140 mm (without connectors, without mounting brackets)

Same-Band Combiner

KATHREIN
Antennen · Electronic

880 – 890 / 925 – 935 MHz
GSM900 (10 MHz Bandwidth)

902.5 – 915 / 947.5 – 960 MHz
GSM900 (12.5 MHz Bandwidth)

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Type No.	Description
78410367	**50-Ohm load**

Clamp Set

50-Ohm load

Typical Attenuation Curves

BTS 1 (GSM900)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

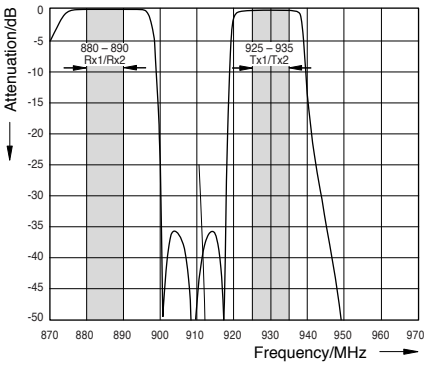
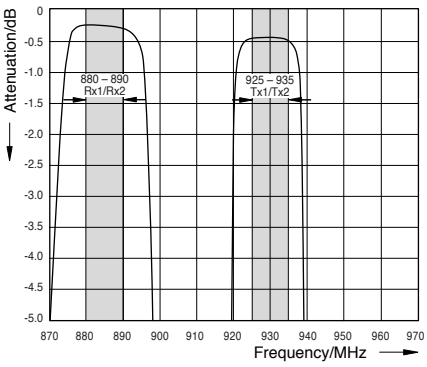


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (GSM900)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)

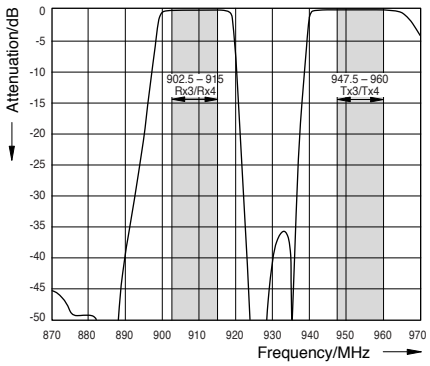
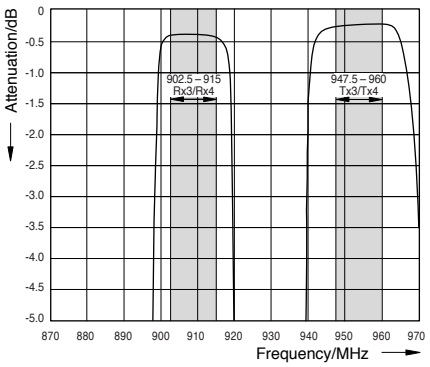
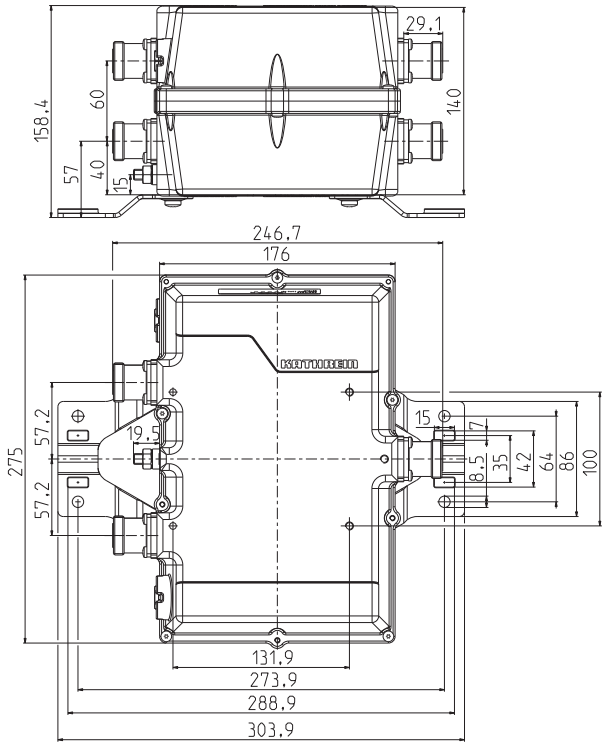


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)





Hybrid Ring Junction (180° Hybrid)
806 – 960 MHz / 1710 – 1880 MHz

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Antennen · Electronic

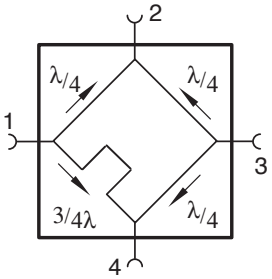
The hybrid ring junction can be used:

– as a power splitter with a ratio of 1:1,
– for the decoupled combining of two transmitters with arbitrarily low frequency spacing (at 3 dB loss),
– for the decoupled combining of two receivers with arbitrarily low frequency spacing,
– for the decoupled combining of two transmitter/receiver units, whose integrated duplexers are within the same frequency range,
– as component to form combiners.

Description:
The hybrid ring junction has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 4, port 3 is decoupled and without power if ports 2 and 4 are ideally matched. In practice an absorber of suitable power at port 3 is to be planned for according to the mismatch of ports 2 and 4.
Decoupled combining can be made via ports 1 and 3 or 2 and 4.

K6373621
790881

791 498



Technical Data

Type No.	K6373621	790881	791498
Frequency range	806 – 960 MHz	890 – 960 MHz	1710 – 1880 MHz
Attenuation 1 ↔ 2 or 1 ↔ 4	3 ±0.4 dB (see diagram I)	3 ±0.3 dB (see diagram I)	3 ±0.4 dB (see diagram I)
Attenuation 1 ↔ 3 or 2 ↔ 4	See diagram II		See diagram II
VSWR	< 1.2		< 1.3
Impedance	50 Ω		50 Ω
Input power	< 100 W per input		< 50 W per input
Connectors	N female		N female
Application	Indoor		Indoor
Mounting	With 2 screws (max. 4.5 mm diameter)		With 4 screws (max. 4.5 mm diameter)
Weight	0.32 kg		0.25 kg
Packing size	Approx. 160 x 40 x 105 mm		90 x 40 x 110 mm
Dimensions (w x h x d)	150 x 30 x 87 mm (including connectors)		80 x 26 x 106 mm (including connectors)

Note: VSWR and attenuation values are measured when the remaining ports are terminated with 50-Ω loads.

Hybrid Ring Junction (180° Hybrid)
806 – 960 MHz / 1710 – 1880 MHz

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Typical Attenuation Curves

K 63 73 621

Diagram I

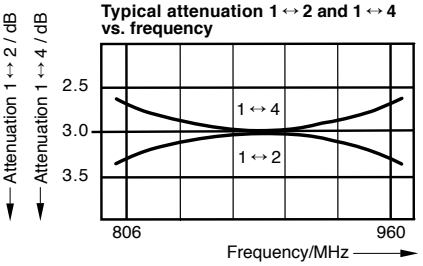
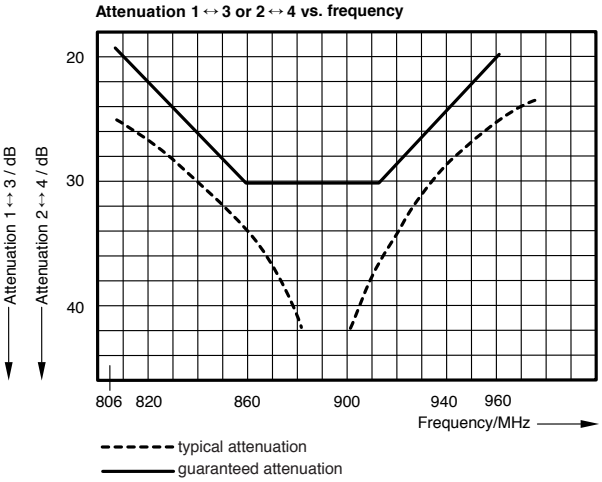


Diagram II



790881

Diagram I

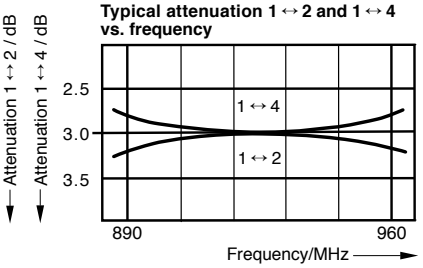
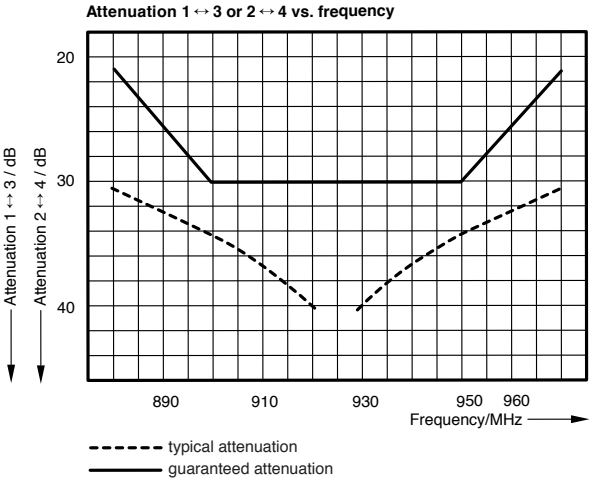


Diagram II



791498

Diagram I

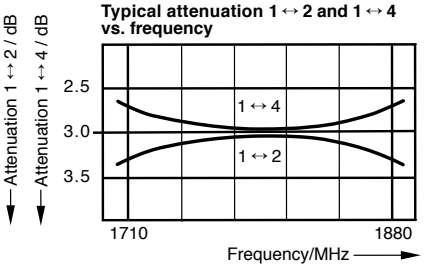
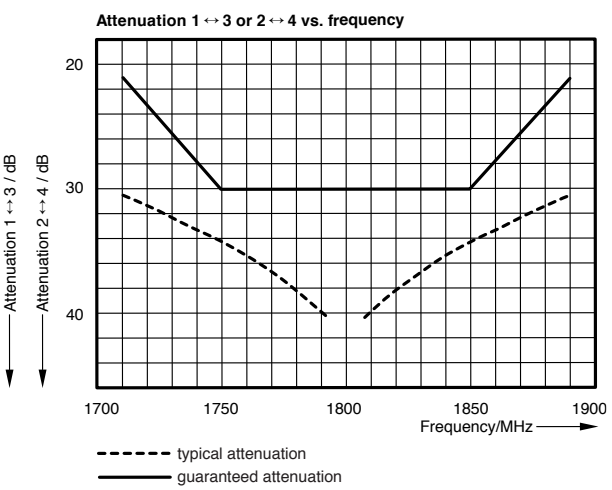


Diagram II



3-dB Coupler
Hybrid Combiner 2:2
698 – 2690 MHz

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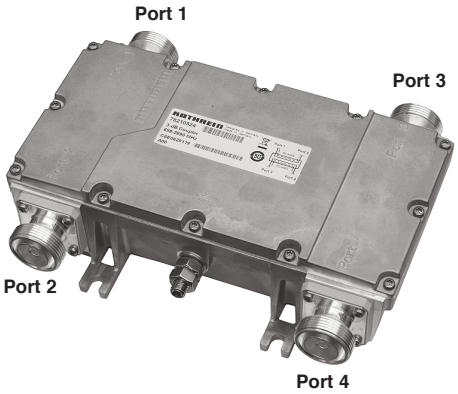
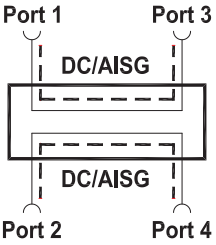
- Can be used for the decoupled combining of 2 transmitters onto a common antenna with frequency spacing as narrow as desired (3 dB loss) – see application example 1
- Can be used for the decoupled combining of 2 transmitters onto two antennas with frequency spacing as narrow as desired – see application example 2
- Can be used as a decoupled 2-way splitter – see application example 3
- Can be used as a frequency-independant 90° phase shifter (90° Hybrid)
- Suitable for indoor or outdoor applications
- DC/AISG bypass
- External DC stop available as an accessory



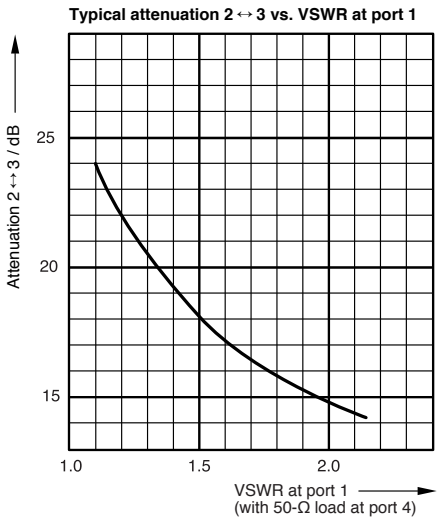


Technical Data

Type No.	782 10524
Frequency range	698 – 2690 MHz
Attenuation Port 1 ↔ Port 2 Port 1 ↔ Port 3 Port 2 ↔ Port 3	 3.1 ±0.5 dB 3.1 ±0.5 dB See diagram
Directivity	> 20 dB
VSWR	< 1.25
Impedance	50 Ω
Input power	< 150 W at each input port
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 ... +70 °C
Connectors	7-16 female
Application	Indoor *or* outdoor (IP66)
DC/AISG transparency	Bypass between Port 1 ↔ Port 3 / Port 2 ↔ Port 4 (max. 2500 mA) External DC stop available as an accessory
Mounting	With 4 screws (max. 6.5 mm diameter)
Weight	1.5 kg
Packing size	268 x 115 x 203 mm
Dimensions (w x h x d)	205.4 x 60 x 104 mm (without connectors and mounting feet)

Note:
VSWR and attenuation values only valid if all ports are terminated with 50-Ohm loads.

Diagram



Accessories (order separately)

Type No.	Description
78210850	DC stop
78210474	50-Ohm load (80 W)
78410367	50-Ohm load (1.5 W)

DC stop

50-Ohm load

50-Ohm load

3-dB Coupler
Hybrid Combiner 2:2
698 – 2690 MHz

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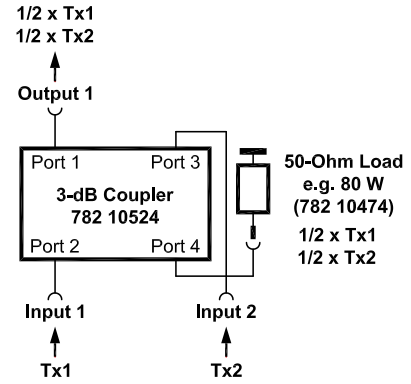
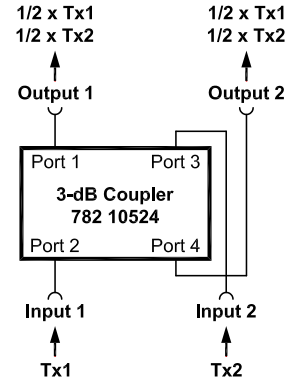
Application Example 1: Hybrid Combiner 2:1

Tx1 and Tx2 signals combined onto **one** output (antenna)
Half the power dissipated in absorber
(suitably dimensioned 50-Ohm load required - to be ordered separately)



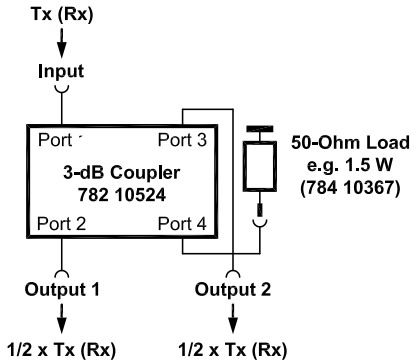
Application Example 2: Hybrid Combiner 2:2

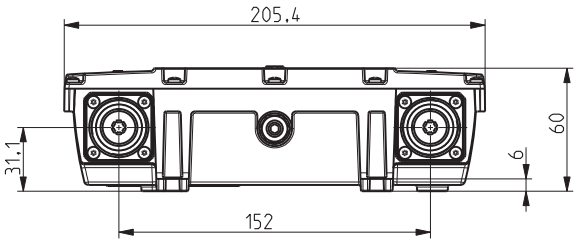
Tx1 and Tx2 signals combined and distributed equally
onto **two** outputs (antennas)

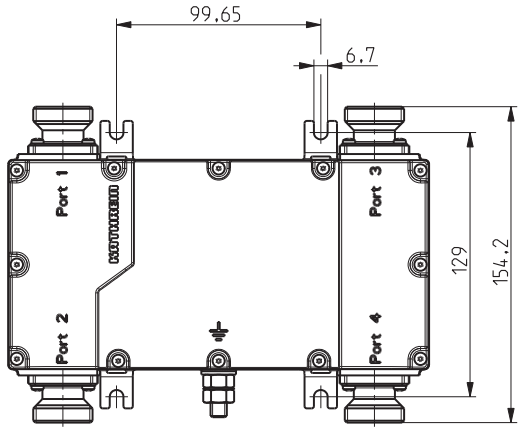


Appl. Example 3: Decoupled 2-way Splitter

Tx (or Rx) signal distributed equally onto two outputs
(suitably dimensioned 50-Ohm load required - to be ordered separately)







3-dB Coupler
Hybrid Combiner 2:2
806 – 960 MHz

KATHREIN
Antennen · Electronic

The 3-dB coupler can be used:

– as a decoupled power splitter with a ratio of 1:1,
– for the decoupled combining of two transmitters with frequency spacing as narrow as desired (at 3 dB loss),
– for the decoupled combining of two receivers with frequency spacing as narrow as desired,
– for the decoupled combining of two transmitter/receiver units, whose integrated duplexers are within the same frequency range,
– as a frequency-independent 90° phase shifter,
– as a component to form combiners.

Function:
The 3-dB coupler has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 3. Port 4 is decoupled and without power if ports 2 and 3 are ideally matched. In practice an absorber of suitable power at port 4 is to be planned in accordance with the mismatch of ports 2 and 3.
Decoupled combining can be achieved via the diagonally opposite ports 2 and 3 or 1 and 4.

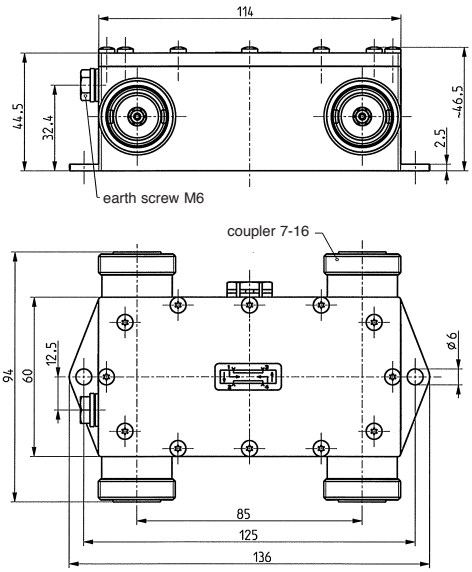
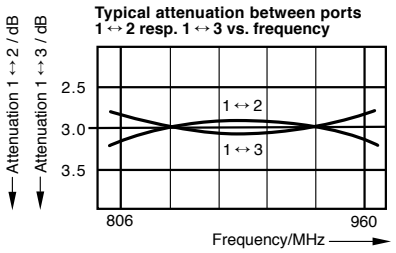
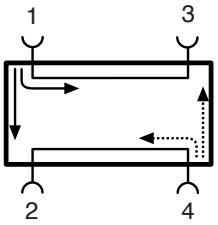


Diagram I



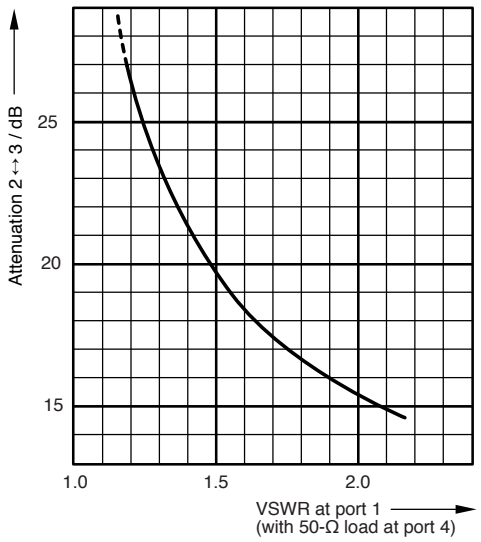


Technical Data

Type No.	793506
Frequency range	806 – 960 MHz
Attenuation 1 ↔ 2 / 1 ↔ 3	3 ±0.4 dB (see diagram I)
Attenuation 2 ↔ 3	See diagram II
Directivity	> 30 dB
VSWR	< 1.1
Impedance	50 Ω
Input power	< 500 W total power at *two* inputs, with max. 350 W at *one* input
Intermodulation products	**< –160 dBc** (3rd order; with 2 x 20 W)
Temperature range	–30 ... +70 °C
Connectors	7-16 female
Application	Indoor or **outdoor** (IP66)
Mounting	With 2 screws (max. 6 mm diameter)
Weight	1.8 kg
Packing size	160 x 95 x 65 mm
Dimensions (w x h x d)	136 x 46.5 x 94 mm (including connectors)

Note: VSWR and attenuation values are measured when the remaining ports are terminated with 50-Ω loads.

Diagram II



3-dB Coupler
Hybrid Combiner 2:2
1700 – 2200 MHz

KATHREIN
Antennen · Electronic

The 3-dB coupler can be used:

– as a decoupled power splitter with a ratio of 1:1,
– for the decoupled combining of two transmitters with frequency spacing as narrow as desired (at 3 dB loss),
– for the decoupled combining of two receivers with frequency spacing as narrow as desired,
– for the decoupled combining of two transmitter/receiver units, whose integrated duplexers are within the same frequency range,
– as a frequency-independent 90° phase shifter,
– as a component to form combiners.

Function:
The 3-dB coupler has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 3. Port 4 is decoupled and without power if ports 2 and 3 are ideally matched. In practice an absorber of suitable power at port 4 is to be planned in accordance with the mismatch of ports 2 and 3.
Decoupled combining can be achieved via the diagonally opposite ports 2 and 3 or 1 and 4.

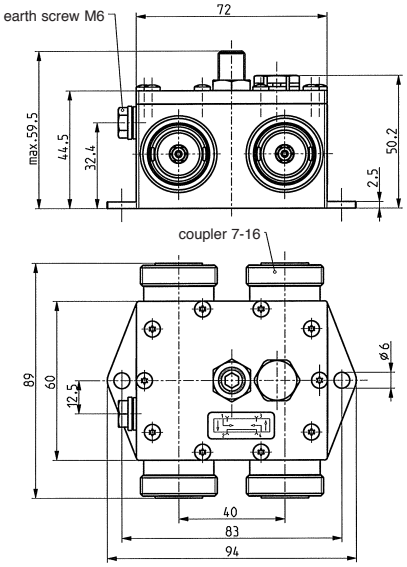
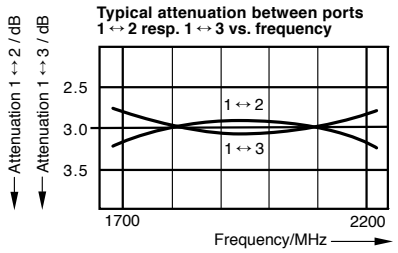
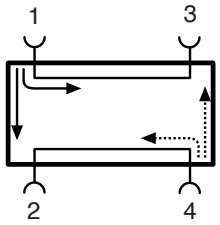


Diagram I



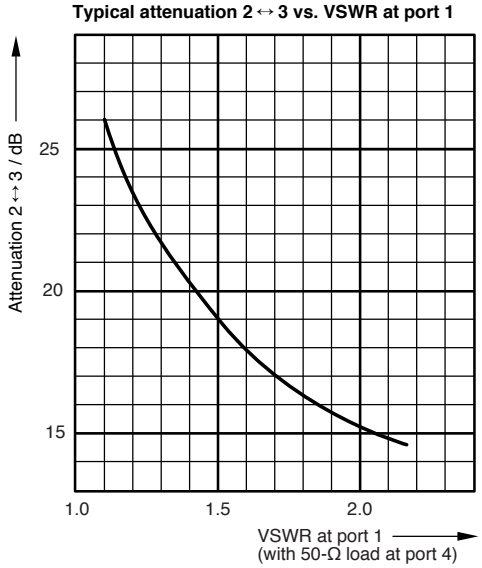


Technical Data

Type No.	793006
Frequency range	1700 – 2200 MHz
Attenuation 1 ↔ 2 / 1 ↔ 3	3 ±0.4 dB (see diagram I)
Attenuation 2 ↔ 3	See diagram II
Directivity	> 25 dB
VSWR	< 1.15
Impedance	50 Ω
Input power	< 300 W total power at *two* inputs, with max. 200 W at *one* input
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–30 ... +70 °C
Connectors	7-16 female
Application	Indoor or outdoor (IP66)
Mounting	With 2 screws (max. 5.5 mm diameter)
Weight	1.3 kg
Packing size	160 x 95 x 65 mm
Dimensions (w x h x d)	94 x 59.5 x 89 mm (including connectors)

Note: VSWR and attenuation values are measured when the remaining ports are terminated with 50-Ω loads.

Diagram II



3-dB Coupler
Hybrid Combiner 2:2
800 – 2200 MHz

KATHREIN
Antennen · Electronic

The 3-dB coupler can be used:

– as a decoupled power splitter with a ratio of 1 : 1,
– for the decoupled combining of two transmitters with frequency spacing as narrow as desired (at 3 dB loss),
– for the decoupled combining of two receivers with frequency spacing as narrow as desired,
– for the decoupled combining of two transmitter/receiver units whose integrated duplexers are within the same frequency range,
– as a frequency-independent 90° phase shifter,
– as a combiner component.

Function:
The 3-dB coupler has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into the ports 2 and 3. Port 4 is decoupled and without power if ports 2 and 3 are ideally matched. In practice an absorber of suitable power at port 4 is to be planned for according to the mismatch of ports 2 and 3.
Decoupled combining can be achived via the diagonally opposite ports 2 and 3 respectively 1 and 4.

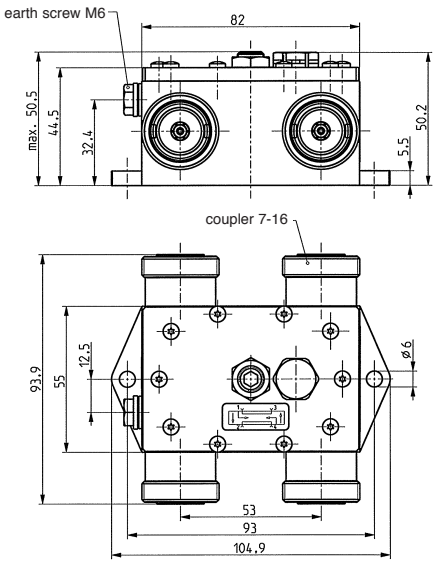
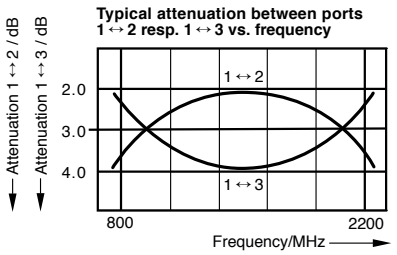
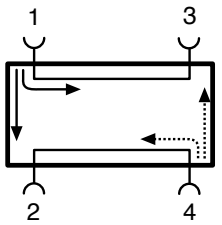


Diagram I



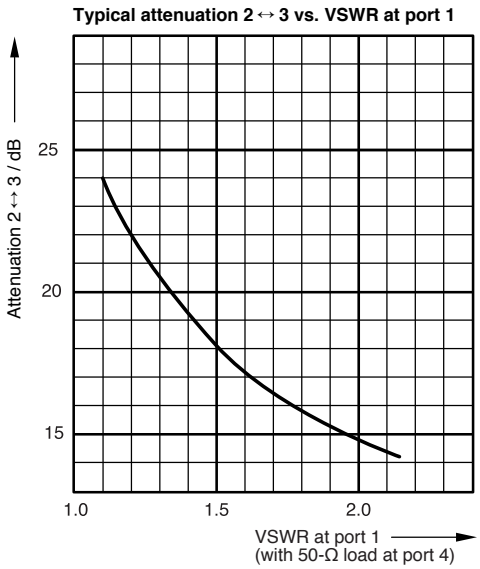


Technical Data

Type No.	793554
Frequency range	800 – 2200 MHz
Attenuation 1 ↔ 2 / ↔ 3	3 ±1.2 dB (see diagram I)
Attenuation 2 ↔ 3	See diagram II
Directivity	> 20 dB
VSWR	< 1.2
Impedance	50 Ω
Input power	< 300 W total power at *two* inputs, with max. 200 W at *one* input
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperatur range	–30 … +70 °C
Connectors	7-16 female
Application	Indoor or outdoor (IP66)
Mounting	With 2 screws (max. 5.5 mm diameter)
Weight	1.3 kg
Packing size	160 x 95 x 65 mm
Dimensions (w x h x d)	104.9 x 50.2 x 93.9 mm (including connectors)

Note: VSWR and attenuation values are measured when the remaining ports are terminated with 50-Ω loads.

Diagram II



System Components

Bias Tees
Measuring Directional Couplers
DC-Stops
Attenuators
50-Ω Loads
Power Distribution Unit

Summary of System Component Types

KATHREIN
Antennen · Electronic

System Components:

Description	Type No.	Frequency range	Max. input power	Page
DC Stop	793301	800 – 2170 MHz	750 W	312
DC Stop	78210850	250 – 2700 MHz	750 W	313
Bias Tee	793304	800 – 2170 MHz	250 W	314
Bias Tee AISG	78210429	800 – 2170 MHz	250 W	315
Bias Tee, outdoor	78210577	690 – 2700 MHZ	250 W	316
Bias Tee, outdoor (AISG)	78210578	690 – 2700 MHZ	250 W	317
Smart Bias Tee	78211053	690 – 2700 MHz	750 W	318, 319
Smart Bias Tee	78211054	690 – 2700 MHz	750 W	318, 319
Smart Bias Tee	78211055	690 – 2700 MHz	750 W	318, 319
Smart Bias Tee	78211056	690 – 2700 MHz	750 W	318, 319
Smart Bias Tee	78211063	690 – 2700 MHz	750 W	318, 319
Smart Bias Tee	78211064	690 – 2700 MHz	750 W	318, 319
Smart Bias Tee	78211065	690 – 2700 MHz	750 W	318, 319
Smart Bias Tee	78211066	690 – 2700 MHz	750 W	318, 319
50-Ω Load (N male)	K6226611	0 – 2700 MHz	0.5 W	322
50-Ω Load (7-16 male)	78410367	0 – 4000 MHz	1.5 W	322
50-Ω Load (7-16 female)	78410470	0 – 4000 MHz	1.5 W	322
50-Ω Load (N male)	K6226111	0 – 2700 MHz	2 W	322
50-Ω Load (N female)	K6226401	0 – 2700 MHz	10 W	322
50-Ω Load (N male)	K6226411	0 – 2700 MHz	10 W	322
50-Ω Load (N female)	K6226201	0 – 2700 MHz	25 W	323
50-Ω Load (N male)	K6226211	0 – 2700 MHz	25 W	323
50-Ω Load (7-16 female)	K6226207	0 – 2700 MHz	25 W	323
50-Ω Load (7-16 male)	K6226217	0 – 2700 MHz	25 W	323
50-Ω Load (N female)	K6226301	0 – 2700 MHz	50 W	323
50-Ω Load (N male)	K6226311	0 – 2700 MHz	50 W	323
50-Ω Load (7-16 female)	K6226307	0 – 2700 MHz	50 W	323
50-Ω Load (7-16 male)	K6226317	0 – 2700 MHz	50 W	323
50-Ω Load (N female)	K6226501	0 – 1000 MHz	100 W	323
50-Ω Load (N male)	K6226511	0 – 1000 MHz	100 W	323
50-Ω Load (7-16 female)	K6226507	0 – 1000 MHz	100 W	323
50-Ω Load (7-16 female) Low IM	78210474	800 – 2700 MHz	80 W	324
Attenuator 3 dB	78410235	0 – 4000 MHz	2 W	325
Attenuator 6 dB	78410236	0 – 4000 MHz	2 W	325
Attenuator 10 dB	78410237	0 – 4000 MHz	2 W	325
Attenuator 20 dB	78410238	0 – 4000 MHz	2 W	325
Attenuator 3 dB	791918	0 – 4000 MHz	15 W	325
Attenuator 6 dB	791919	0 – 4000 MHz	12 W	325
Attenuator 10 dB	791920	0 – 4000 MHz	10 W	325
Attenuator 20 dB	791921	0 – 4000 MHz	10 W	325
Measuring Directional Coupler	792972	824 – 960 MHz 960 – 2500 MHz	800 W 200 W	326

Description	Type No.	Power supply (DC input)	Page
Power Distribution Unit (PDU)	78210344	38 ... 72 V DC	320, 321

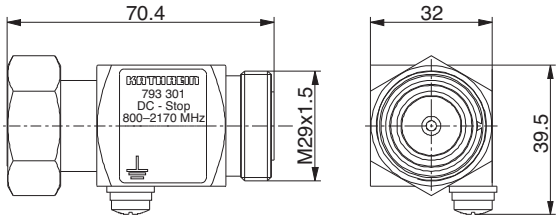
New Products

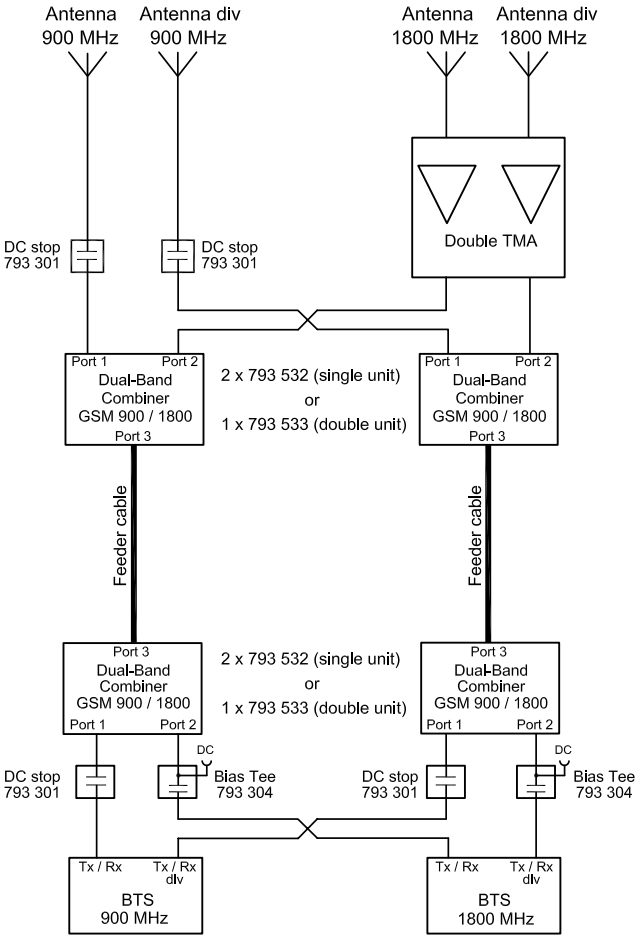
DC Stop
800 – 2170 MHz

KATHREIN
Antennen · Electronic

DC Stop is used in dual- or multi-band antenna systems where one or more antenna systems require a DC supply for an installed mast head amplifier. The DC Stop prevents DC voltage from being shorted within the non-biased antenna system(s) and isolates the corresponding base station output(s) from DC voltage.

- Low RF signal insertion loss
- High DC signal isolation from port 1 to port 2 and vice versa
- Suitable for indoor or outdoor applications

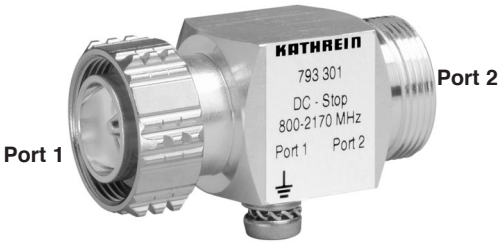




Application Example

Technical Data

Type No.	793 301
Frequency range	800 – 2170 MHz
Insertion loss Port 1 ↔ Port 2	< 0.1 dB (800 – 2170 MHz)
Isolation Port 1 ↔ Port 2	> 70 dB (DC)
VSWR	< 1.1 (800 – 2000 MHz) < 1.2 (2000 – 2170 MHz
Impedance	50 Ω
Input power	< 750 W (800 – 2170 MHz)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 ... +70 °C
Connectors Port 1 Port 2	 7-16 male 7-16 female
Application	Indoor or outdoor (IP 67)
Weight	0.32 kg
Dimensions (w x h x d)	70.4 mm x 39.5 mm x 32 mm (including connectors and earthing screw of 6 mm diameter)

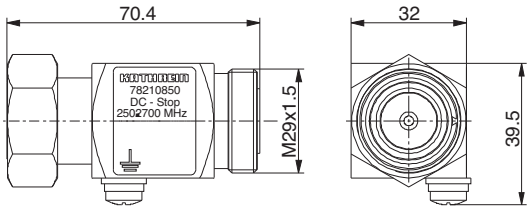


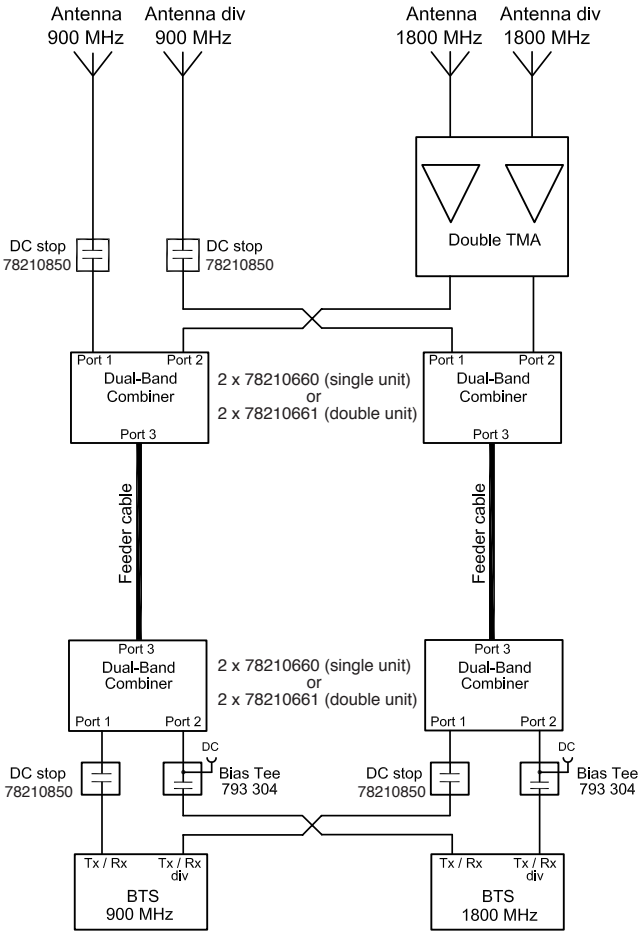
DC Stop
250 – 2700 MHz

KATHREIN
Antennen · Electronic

DC Stop is used in dual- or multi-band antenna systems where one or more antenna systems require a DC supply for an installed mast head amplifier. The DC Stop prevents DC voltage from being shorted within the non-biased antenna system(s) and isolates the corresponding base station output(s) from DC voltage.

- Low RF signal insertion loss
- High DC signal isolation from port 1 to port 2 and vice versa
- Suitable for indoor or outdoor applications





Application Example

Technical Data

Type No.	78210850
Frequency range	250 – 2700 MHz
Insertion loss Port 1 ↔ Port 2	< 0.1 dB (250 – 2700 MHz)
Isolation Port 1 ↔ Port 2	> 70 dB (DC)
VSWR	< 1.1 (380 – 2700 MHz) < 1.2 (250 – 380 MHz)
Impedance	50 Ω
Input power	< 750 W (250 – 2700 MHz)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 ... +70 °C
Connectors Port 1 Port 2	 7-16 male 7-16 female
Application	Indoor or outdoor (IP 67)
Weight	0.32 kg
Dimensions (w x h x d)	70.4 mm x 39.5 mm x 32 mm (including connectors and earthing screw of 6 mm diameter)

Bias Tee
800 – 2170 MHz

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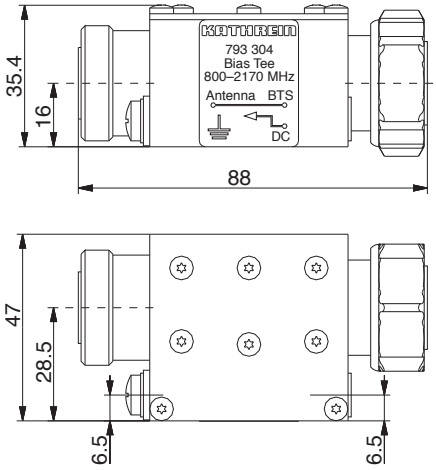
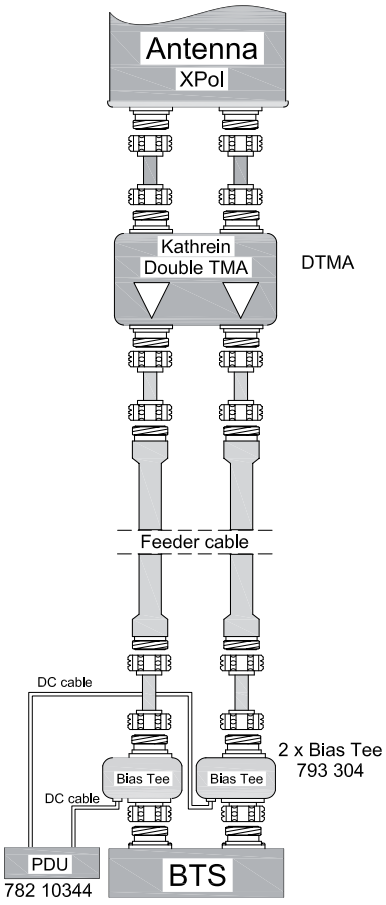
The Bias Tee is suitable to feed DC voltage into the feeder cable of a receiving and/or transmitting antenna system in order to provide the operating voltage for a mast head amplifier.

- The Bias Tee provides low RF signal insertion loss from the BTS to the antenna port and vice versa.
- The DC voltage is fed from the DC port to the antenna port while providing a high level of DC isolation from the DC to the BTS port and from the antenna to the BTS port.
- The measures taken to protect against static discharge and lightning ensure a high level of reliability and operational safety.



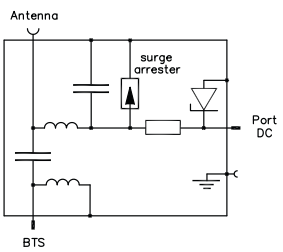


Application Example

Technical Data

Type No.	793304
Frequency range	800 – 2170 MHz
Insertion loss BTS ↔ Antenna	< 0.1 dB (800 – 2170 MHz)
Isolation BTS ↔ Antenna BTS ↔ DC	> 70 dB (DC) > 70 dB (DC)
VSWR	< 1.1 (800 – 2170 MHz)
Impedance	50 Ω
Input power BTS DC	< 250 W (800 – 2170 MHz) < 1000 mA / 0 ... +30 VDC
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Lightning protection	5 kA, 8/20 µs pulse
Temperature range	–40 ... +70 °C
Connectors BTS Antenna Port DC	 7-16 male 7-16 female SMB male
Application	Indoor
Weight	0.6 kg
Packing size	145 x 145 x 50 mm
Dimensions (w x h x d)	88 x 47 x 35.4 mm (including connectors and earthing screw of 6 mm diameter)

Port DC

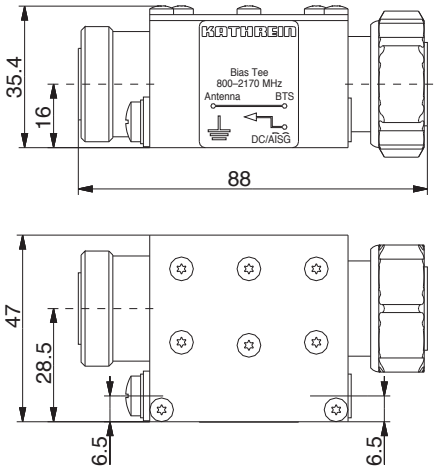


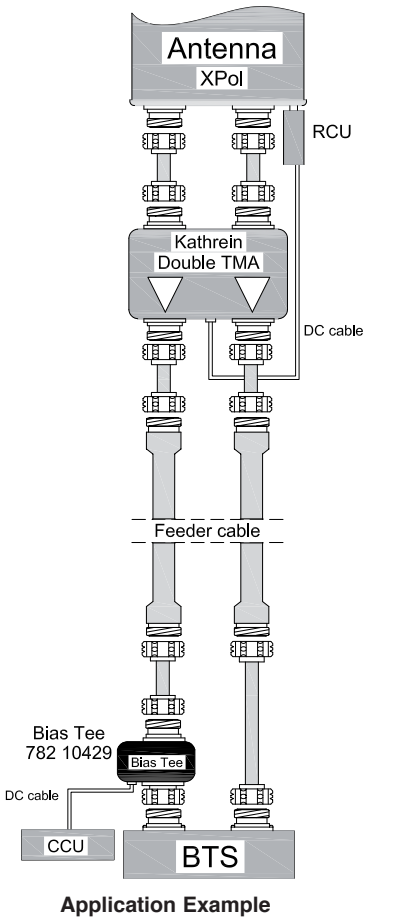
Bias Tee
800 – 2170 MHz

KATHREIN
Antennen · Electronic

The Bias Tee is suitable to feed DC voltage and AISG control signals into the feeder cable in order to provide operating voltage and control signals via the RF feeder cable to the TMA or RCU.

- The Bias Tee provides low RF signal insertion loss from the BTS to the antenna port and vice versa.
- The DC voltage and AISG control signal (2.176 MHz) is fed from the DC port to the antenna port while providing a high level of DC isolation from the DC to the BTS port and from the antenna to the BTS port.
- The measures taken in conjunction with the CCU-LOC to protect against static discharge and lightning ensure a high level of reliability and operational safety.



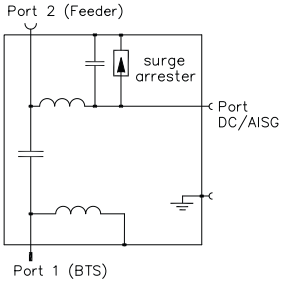


Application Example

Technical Data

Type No.	78210429
Frequency range	800 – 2170 MHz
Insertion loss BTS ↔ Antenna	< 0.1 dB (800 – 2170 MHz)
Isolation BTS ↔ Antenna BTS ↔ DC/AISG	> 70 dB (DC) > 70 dB (DC)
VSWR	< 1.1 (800 – 2170 MHz)
Impedance	50 Ω
Input power BTS DC/AISG	< 250 W (800 – 2170 MHz) < 1.8 A / 13 VDC < 0.8 A / 29 VDC
Lightning protection	3 kA, 10/350 µs pulse
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 ... +70 °C
Connectors Port 1 BTS Port 2 Antenna Port DC/AISG	 7-16 male 7-16 female SMB male
Application	Indoor
Weight	0.6 kg
Packing size	145 x 145 x 50 mm
Dimensions (w x h x d)	88 x 47 x 35.4 mm (including connectors and earthing screw of 6 mm diameter)

Port DC/AISG

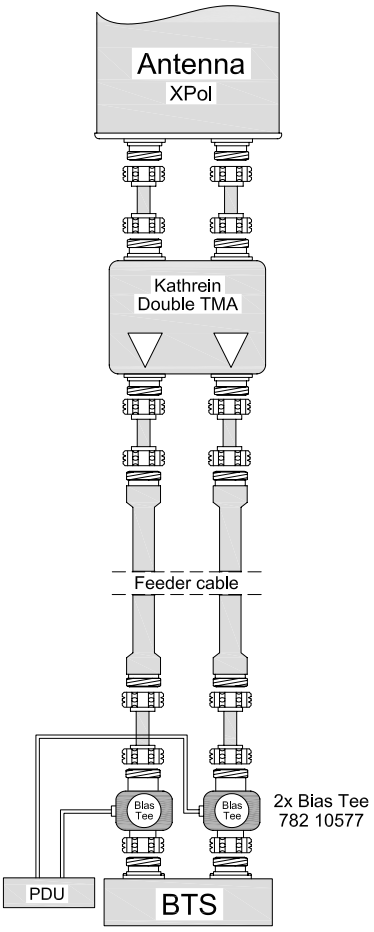


Bias Tee
690 – 2700 MHz

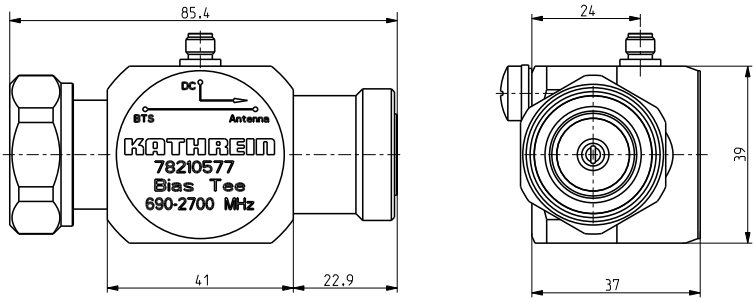
KATHREIN
Antennen · Electronic

The Bias Tee is suitable to feed DC voltage into the feeder ca-ble of a receiving and/or transmitting antenna system in order to provide the operating voltage for a mast head amplifier.

- The Bias Tee provides low RF signal insertion loss from the BTS to the antenna port and vice versa.
- The DC voltage is fed from the DC port to the antenna port while providing a high level of DC isolation from the DC to the BTS port and from the antenna to the BTS port.
- The measures taken to protect against static discharge and lightning ensure a high level of reliability and operational safety.

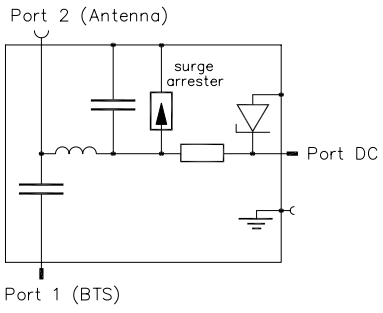


Application Example



Technical Data

Type No.	78210577
Frequency range	690 – 2700 MHz
Insertion loss Port 1 ↔ Port 2	 < 0.1 dB (690 – 2700 MHz)
Isolation Port 1 ↔ Port 2 Port 1 ↔ DC	 > 70 dB (DC) > 70 dB (DC)
VSWR	< 1.1 (690 – 2700 MHz)
Impedance	50 Ω
Input power Port 1 DC	 < 250 W (690 – 2700 MHz) < 1 A / 0 ... +30 VDC
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Lightning protection	3 kA, 10/350 µs pulse
Temperature range	–40 ... +70 °C
Connectors Port 1 (BTS) Port 2 (Antenna) Port DC	 7-16 male 7-16 female SMA female
Application	Indoor *or* outdoor (IP 66)
Weight	0.47 kg
Packing size	128 x 75 x 88 mm
Dimensions (w x h x d)	85.4 x 45 x 46.2 mm (including connectors and earthing screw of 6 mm diameter)

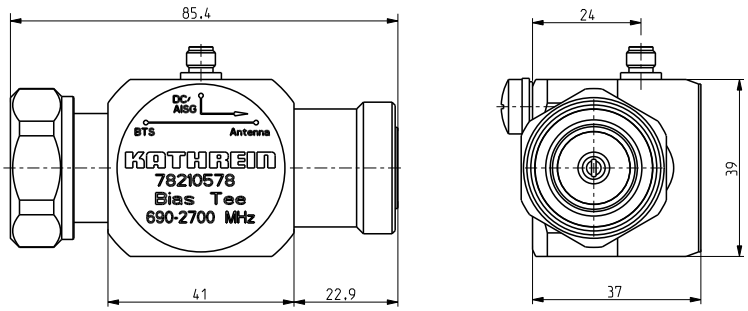


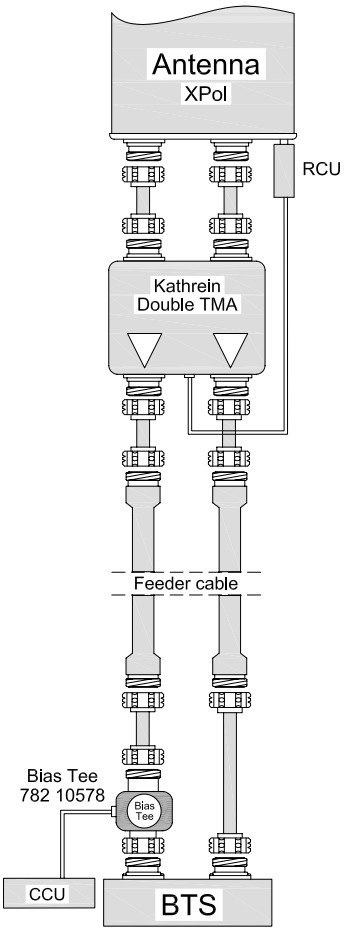
Bias Tee (AISG)
690 – 2700 MHz

KATHREIN
Antennen · Electronic

The Bias Tee is suitable to feed DC voltage and AISG control signals into the feeder cable in order to provide operating voltage and control signals via the RF feeder cable to the TMA or RCU.

- The Bias Tee provides low RF signal insertion loss from the BTS to the antenna port and vice versa.
- The DC voltage and AISG control signal (2.176 MHz) is fed from the DC port to the antenna port while providing a high level of DC isolation from the DC to the BTS port and from the antenna to the BTS port.
- The measures taken in conjunction with the CCU-LOC to protect against static discharge and lightning ensure a high level of reliability and operational safety.





Application Example

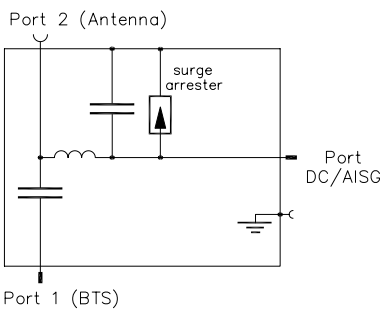
Technical Data

Type No.	78210578
Frequency range	690 – 2700 MHz
Insertion loss Port 1 ↔ Port 2	< 0.1 dB (690 – 2700 MHz)
Isolation Port 1 ↔ Port 2 Port 1 ↔ Port DC/AISG	> 70 dB (DC) > 70 dB (DC)
VSWR	< 1.1 (690 – 2700 MHz)
Impedance	50 Ω
Input power Port 1 Port DC/AISG	< 250 W (690 – 2700 MHz) < 1 A / 0 ... +30 VDC
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Lightning protection	3 kA, 10/350 µs pulse
Temperature range	–40 ... +70 °C
Connectors Port 1 (BTS) Port 2 (Antenna) Port DC/AISG	 7-16 male 7-16 female SMA female
Application	Indoor *or* outdoor (IP 66)
Weight	0.47 kg
Packing size	128 x 75 x 88 mm
Dimensions (w x h x d)	85.4 x 45 x 46.2 mm (including connectors and earthing screw of 6 mm diameter)

Port DC/AISG

Port 2
Antenna

Port 1
BTS



System Components

Smart Bias Tee
690 – 2700 MHz

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The **Smart Bias Tee** combines the performance of a standard Bias Tee (e.g. type 78210577) with the function of an additional modem (AISG standard) in order to provide either DC voltage as well as remote control signals via an RF feeder cable to a TMA or RCU.

The **Smart Bias Tee** provides low RF signal insertion loss from port 1 to port 2 and vice versa.The measures taken to protect against static discharge and lightning ensure a high level of reliability and operational safety.

- **78211053, 78211063:** +8 ... 14 VDC (DC on pin1) version for use near the BTS, in order to feed-in DC voltage and RCU control signals into a feeder cable
- **78211054, 78211064:** +8 ... 14 VDC (DC on pin1) version for use near the antenna, in order to control an RCU (only required if **no TMA** is in use)
- **78211055, 78211065:** +8 ... 30 VDC (DC on pin6) version for use near the BTS, in order to feed-in DC voltage and RCU control signals into a feeder cable
- **78211056, 78211066:** +8 ... 30 VDC (DC on pin6) version for use near the antenna, in order to control an RCU (only required if **no TMA** is in use)

Abbreviations:
RCU = **R**emote **C**ontrol **U**nit for remote electrical control of antenna tilt
BTS = **B**ase **T**ransceiver **S**tation
TMA = **T**ower **M**ounted **A**mplifier
AISG = **A**ntenna **I**nterface **S**tandards **G**roup
Port 1 = Port for BTS or for Antenna
Port 2 = Port for Feeder Cable
Port DC/RCU = **Port** for **DC** voltage and **R**emote **C**ontrol **U**nit signals

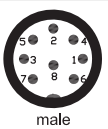
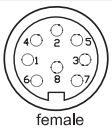
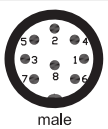
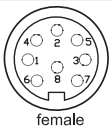
78211054
78211056

78211064
78211066

78211053
78211055

78211063
78211065

Pin connections

8-pin connector (IEC 60130-9)	782 11053 782 11063	782 11054 782 11064	782 11055 782 11065	782 11056 782 11066
	 male	 female	 male	 female
Pin 1	+8...+14 VDC in	+8...+14 VDC out	Not connected	Not connected
Pin 2	Not connected	Not connected	Not connected	Not connected
Pin 3	RS485-B	RS485-B	RS485-B	RS485-B
Pin 4	Not connected	Not connected	Not connected	Not connected
Pin 5	RS485-A	RS485-A	RS485-A	RS485-A
Pin 6	Not connected	Not connected	+8...+30 VDC in	+8...+30 VDC out
Pin 7	DC return (grounded)	DC return (grounded)	DC return (grounded)	DC return (grounded)
Pin 8	Not connected	Not connected	Not connected	Not connected

Technical Data

Type No.	**78211053** **+8 ... +14 VDC / BTS**	**78211054** **+8 ... +14 VDC / Antenna**	**78211055** **+8 ... +30 VDC / BTS**	**78211056** **+8 ... +30 VDC / Antenna**
Port 1: 7-16 male	BTS	Antenna	BTS	Antenna
Port 2: 7-16 female	Feeder	Feeder	Feeder	Feeder

Type No.	**78211063** **+8 ... +14 VDC / BTS**	**78211064** **+8 ... +14 VDC / Antenna**	**78211065** **+8 ... +30 VDC / BTS**	**78211066** **+8 ... +30 VDC / Antenna**
Port 1: 7-16 female	BTS	Antenna	BTS	Antenna
Port 2: 7-16 male	Feeder	Feeder	Feeder	Feeder

Frequency range	690 – 2700 MHz	
Insertion loss Port 1 ↔ Port 2	< 0.1 dB (690 – 2700 MHz)	
Isolation for DC and RCU signals Port 1 ↔ Port 2 Port 1 ↔ Port DC/RCU Port 2 ↔ Port DC/RCU	 > 70 dB > 70 dB > 0 dB	
VSWR	< 1.1 (690 – 2700 MHz)	
Impedance	50 Ω	
Input power Port 1 *or* port 2 Port DC/RCU	 < 750 W (690 – 2700 MHz) < 2.5 A / +8 ... +14 VDC	 < 750 W (690 – 2700 MHz) < 2.5 A / +8 ... +30 VDC
Power consumption	Typically 0.6 W	
Lightning protection	3 kA, 10/350 µs pulse	
Intermodulation products	< – 160 dBc (3rd order; with 2 x 20 W)	
Temperature range	–40 ... +60 °C	
Modem carrier frequency	2.176 MHz	
Application	Indoor *or* outdoor (IP 66)	
Weight	0.8 kg	
Packing size (w x h x d)	167 x 102 x 86 mm	
Dimensions (w x h x d)	81 x 81 x 46 mm (without connectors)	

Smart Bias Tee
690 – 2700 MHz

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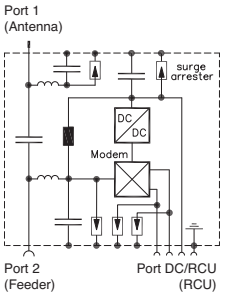
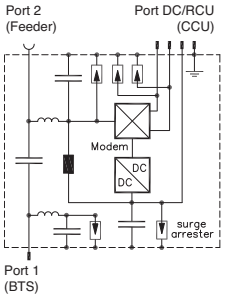
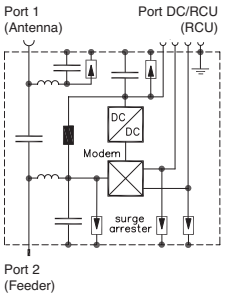
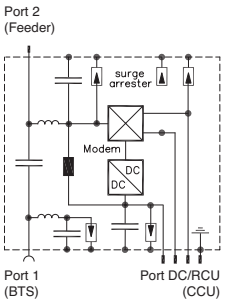
Block diagrams

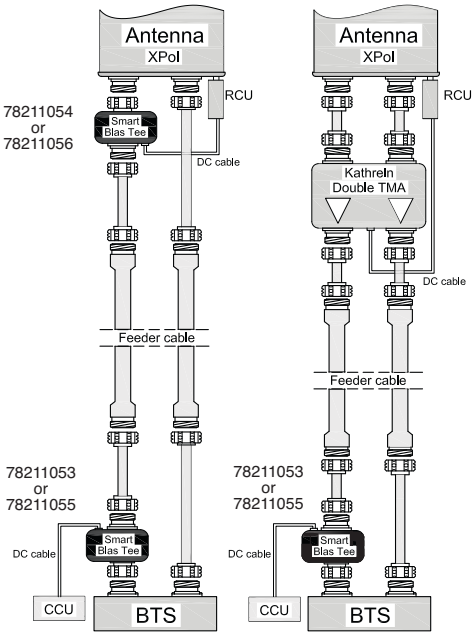


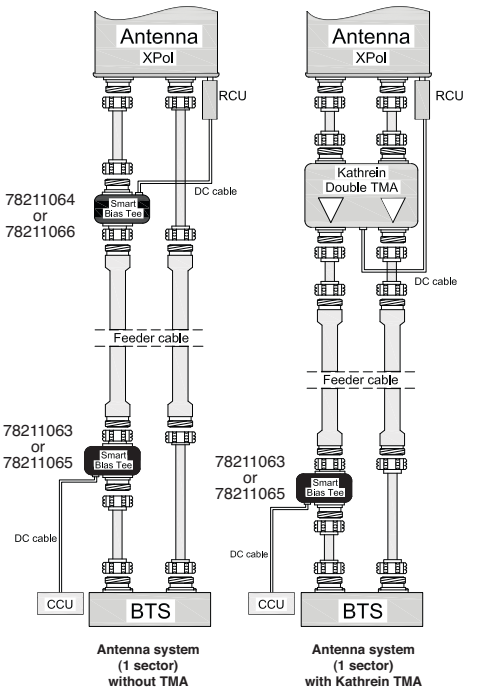






Application Examples





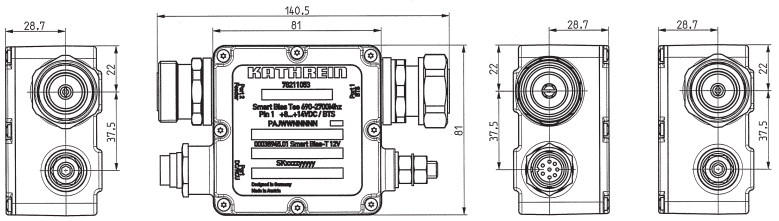
Please note:

The Smart Bias Tees are designed to operate under the environmental conditions as described in ETS 300 019-1-4 class 4.1 E and have passed environmental tests as recommended in ETS 300 019-2-4.

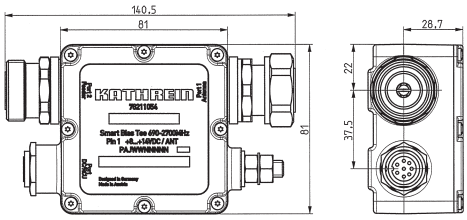
The installation team must be properly qualified and also be familiar with the relevant national safety regulations.

The coupling torque at 7-16 connectors is 25 – 30 Nm! Hold the smart bias tee housing securely while tightening the 7-16 locking nut.
The tightning torque for fixing the AISG connector must be 0.5 – 1.0 Nm ('hand-tightened').

Dimensional Drawings



78211053, 78211055
78211063, 78211065



78211054, 78211056
78211064, 78211066

Power Distribution Unit (PDU)

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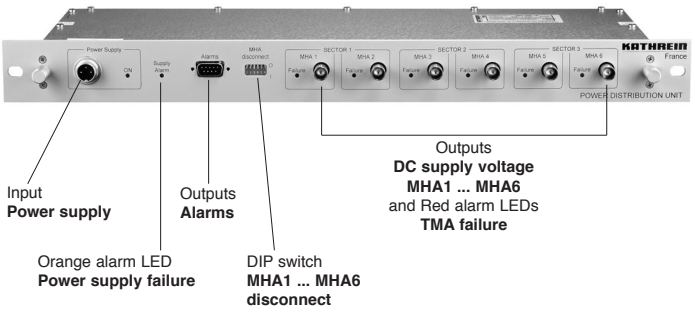
The PDU provides DC supply voltage and alarm interfacing for up to 6 TMAs/MHAs (Tower Mounted Amplifiers/Mast Head Amplifiers) with current window alarming.

- Suitable for low DC power requirements, e.g. Kathrein DTMA 78210612 (UMTS) or 78210580 (GSM1800)
- Not suitable for DTMA 78210440/78210442
- Alarm signals available on SubD 9-pin connector and LEDs
- Bias Tees and cable sets for connection of up to 6 Bias Tees for servicing 6 TMAs (or 3 DTMAs = double TMAs) are available as accessories



Alarm interface function: Under normal operating conditions each TMA pulls the nominal current from the PDU. In case of failure when a TMA consumes a current outside the specified alarm window, then an internal TMA circuit pulls an increased alarm current. Once the respective TMA failure detection threshold is registered by the PDU, then the following alarms are activated:

1. The DC supply voltage for the defective TMA is switched off.
2. The corresponding red alarm LED lights up.
3. The contacts 4 and 5 on the SubD 9-pin connector are closed. In addition, the respective pins 1 (TMA1), 2 (TMA2), 3 (TMA3), 6 (TMA4), 7 (TMA5), or 8 (TMA6) are grounded. This contact status can be used for monitoring purposes.

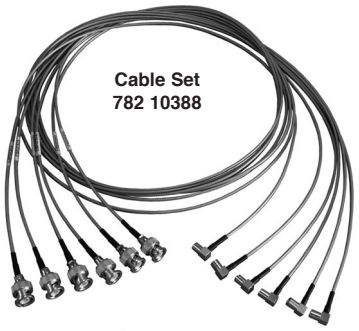
If required, the additional DIP switch can be used to override the individual alarm and turn off the respective TMA supply voltage (1 = supply voltage and red LED alarm OFF, 0 = supply voltage and red LED alarm ON).

Technical Data

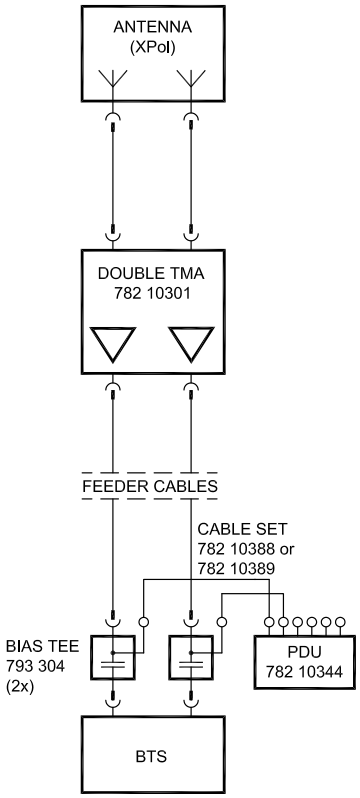
Type No.	78210344
Power supply (DC input)	38 ... 72 V DC
DC supply voltage (DC outputs to MHA1 ... MHA6)	6x +12 ±0.3 V / nominal current: **110 mA** ±20%
Failure detection threshold	**> 230 mA** ±10%
Alarms LED indicators	 Red LED ON = TMA failure at indicated DC output Orange LED ON = power supply failure (back-up power supply in use) Green LED ON = power supply ON
SubD 9-pin connector	Contact pins 4 + 5 closed when failure detection threshold is exceeded = MHA or power supply failure Contact pins 1 ... 3, 6 ... 8 grounded when failure detection threshold is exceeded = MHA failure
Electrical protection against	Reverse voltage on DC outputs Reverse polarity voltage, over-current and over-voltage on DC input (power supply)
Temperature range	–40 ... +60 °C
Connectors	Power supply: DIN 3-pin male DC supply voltage: BNC female (6 x) Alarms: SubD 9-pin
Scope of delivery	PDU, 3 m power supply cable with DIN 3-pin female connector (brown (+), blue (–), green-yellow (grd))
MTBF	> 450 000 hours
Mounting	With 2 screws (M6)
Application	Indoor (IP20)
Weight	2.2 kg
Dimensions (w x h x d)	19″ drawer, 2 height units, plug-in depth 171 mm

Accessories (order separately)

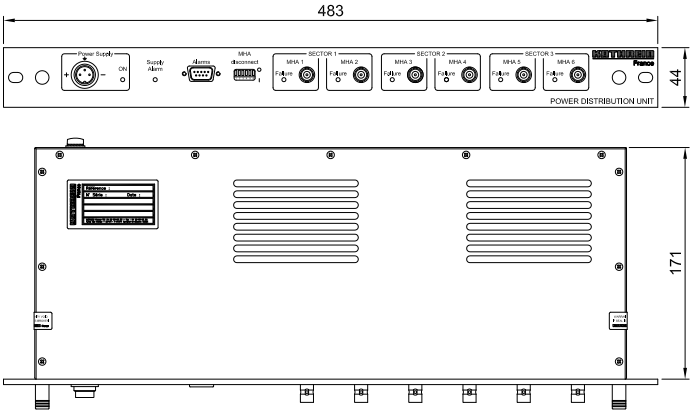
Type No.	Description	Technical data
78210388	**Cable set 2 m (6 cables)**	Lenth: 2.0 m Cable type: RG 316 Connectors: BNC male / SMB female Voltage drop at 110 mA nominal current: < 0.2 V
78210389	**Cable set 5 m (6 cables)**	Lenth: 5.0 m Cable type: RG 316 Connectors: BNC male / SMB female Voltage drop at 110 mA nominal current: < 0.2 V
793304	**Bias Tee**	Please see separate data sheet



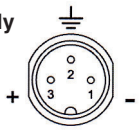
Bias Tee 793 304



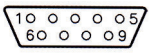
Application example
Antenna system (1 sector) with
Kathrein PDU 78210344,
Bias Tees 793304 and
UMTS Douple TMA 78210301



Detail
Power supply
connector



Detail
SupD 9-pin
connector



Compatibility List

Type No.	
900 MHz DTMA	
782 10440	Not compatible
782 10442	Not compatible
1800 MHz DTMA	
782 10555	Compatible
782 10556	Compatible
782 10557	Compatible
782 10558	Compatible
782 10580	Compatible
2100 MHz DTMA	
782 10151	Compatible
782 10152	Compatible
782 10153	Compatible
782 10154	Compatible
782 10561	Compatible
782 10562	Compatible
782 10563	Compatible
782 10564	Compatible
782 10565	Compatible
782 10566	Compatible
782 10567	Compatible
782 10568	Compatible
782 10569	Compatible
782 10570	Compatible
782 10571	Compatible
782 10579	Compatible
782 10610	Compatible
782 10612	Compatible
782 10613	Compatible
782 10652	Compatible
782 10653	Compatible

SubD 9-pin connector and LED alarms

		SubD 9-pin connector pin #									Red alarm LED #						Orange alarm LED	Green alarm LED
		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6		
MHA1	failure	grd	–	–			–	–	–	grd	ON	–	–	–	–	–	–	ON
	no failure	open	–	–			–	–	–	grd	OFF	–	–	–	–	–	–	ON
MHA2	failure	–	grd	–			–	–	–	grd	–	ON	–	–	–	–	–	ON
	no failure	–	open	–			–	–	–	grd	–	OFF	–	–	–	–	–	ON
MHA3	failure	–	–	grd			–	–	–	grd	–	–	ON	–	–	–	–	ON
	no failure	–	–	open			–	–	–	grd	–	–	OFF	–	–	–	–	ON
MHA4	failure	–	–	–			grd	–	–	grd	–	–	–	ON	–	–	–	ON
	no failure	–	–	–			open	–	–	grd	–	–	–	OFF	–	–	–	ON
MHA5	failure	–	–	–			–	grd	–	grd	–	–	–	–	ON	–	–	ON
	no failure	–	–	–			–	open	–	grd	–	–	–	–	OFF	–	–	ON
MHA6	failure	–	–	–			–	–	grd	grd	–	–	–	–	–	ON	–	ON
	no failure	–	–	–			–	–	open	grd	–	–	–	–	–	OFF	–	ON
Power supply	failure	–	–	–			–	–	–	grd	–	–	–	–	–	–	ON	ON
	no failure	–	–	–			–	–	–	grd	–	–	–	–	–	–	OFF	ON

4 | 5: contacts closed if at least 1 failure; contacts open if no failure

– contact status not defined
grd contact grounded

50-Ohm Load
0 ... 4000 MHz
0.5 ... 100 W

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- Standard 50-Ohm terminations for small and medium power
- Suitable for terminating open ports on RF equipment for indoor and/or outdoor applications

0.5 Watt *

Type No.	K6226611
Connector	N male
Frequency range	0 – 2700 MHz
VSWR 0 – 1000 MHz 1000 – 2000 MHz 2000 – 2700 MHz	< 1.08 < 1.15 < 1.20
Application	Indoor
Weight	40 g
Packing size	90 x 60 x 25 mm
Dimensions	33 / 21 mm diameter

K 62 26 61 1

1.5 Watt *

Type No.	78410367	78410470
Connector	7-16 male	7-16 female
Frequency range	0 – 4000 MHz	
VSWR 0 – 2000 MHz 2000 – 4000 MHz	< 1.10 < 1.30	
Application	Indoor *or* outdoor (IP65)	
Weight	120 g	
Packing size	Approx. 50 x 90 x 100 mm	
Dimensions	40 / 32 mm diameter	42 / 29 mm diameter

784 10367

2 Watt *

Type No.	K6226111
Connector	N male
Frequency range	0 – 2700 MHz
VSWR 0 – 1000 MHz 1000 – 2000 MHz 2000 – 2700 MHz	< 1.08 < 1.15 < 1.20
Application	Indoor
Weight	40 g
Packing size	90 x 60 x 25 mm
Dimensions	30 / 21 mm diameter

K 62 26 11 1

10 Watt *

Type No.	K6226401	K6226411
Connector	N female	N male
Frequency range	0 – 2700 MHz	
VSWR 0 – 1000 MHz 1000 – 2000 MHz 2000 – 2700 MHz	< 1.08 < 1.15 < 1.20	
Application	Indoor	
Weight	Approx. 250 g	
Packing size	50 x 90 x 100 mm	
Dimensions (w x h x d)	40 x 82 x 77 mm (including connector)	40 x 82 x 85 mm (including connector)

K 62 26 40 1

50-Ohm Load
0 ... 4000 MHz
0.5 ... 100 W

KATHREIN
Antennen · Electronic

25 Watt *

Type No.	K6226201	K6226211	K6226207	K6226217
Connector	N female	N male	7-16 female	7-16 male
Frequency range	0 – 2700 MHz			
VSWR 0 – 1000 MHz 1000 – 2000 MHz 2000 – 2700 MHz	< 1.08 < 1.15 < 1.20			
Application	Indoor			
Weight	Approx. 0.5 kg			
Packing size	50 x 100 x 135 mm			
Dimensions (w x h x d)	35 x 94 x 113 mm (incl. connector)	35 x 94 x 121 mm (incl. connector)	35 x 94 x 125 mm (incl. connector)	35 x 94 x 124 mm (incl. connector)

K 62 26 20 1

50 Watt *

Type No.	K6226301	K6226311	K6226307	K6226317
Connector	N female	N male	7-16 female	7-16 male
Frequency range	0 – 2700 MHz			
VSWR 0 – 1000 MHz 1000 – 2000 MHz 2000 – 2700 MHz	< 1.08 < 1.15 < 1.20			
Application	Indoor			
Weight	Approx. 0.8 kg			
Packing size	80 x 95 x 145 mm			
Dimensions (w x h x d)	67 x 90 x 130 mm (incl. connector)	67 x 90 x 138 mm (incl. connector)	67 x 90 x 134 mm (incl. connector)	67 x 90 x 133 mm (incl. connector)

K 62 26 30 1

100 Watt *

Type No.	K6226501	K6226511	K6226507
Connector	N female	N male	7-16 female
Frequency range	0 – 1000 MHz		
VSWR 0 – 1000 MHz	< 1.08		
Application	Indoor		
Weight	Approx. 2.4 kg		
Packing size	130 x 195 x 180 mm		
Dimensions (w x h x d)	114 x 153 x 156 mm (including connector)	114 x 161 x 156 mm (including connector)	114 x 170 x 156 mm (including connector)

K 62 26 50 1

***** Rated power at 40 °C ambient temperature. The max. power rating increases or decreases with falling or rising ambient temperature.

Note: The 50-Ohm load, type 782 010474, should be used if intermodulation requirements are of high priority.

50-Ohm Load
698 – 2700 MHz
80 W

KATHREIN
Antennen · Electronic

- Designed as 50-Ohm termination wherever improved intermodulation performance compared to standard loads is required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Built-in DC stop

Technical Data

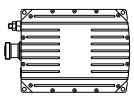
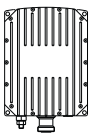
Type No.	78210474
Frequency range	698 – 2700 MHz
VSWR	< 1.12
Impedance	50 Ω
Input power	< 80 W (see table)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–40 … +55 °C
Connector	7-16 female (long neck)
Application	Indoor *or* outdoor (IP 66)
DC/AISG transparency	Built-in DC stop AISG: Attenuation up to 3 dB when used in a network
Mounting	Wall mounting: With 4 screws (max. 6.5 mm diameter) Mast mounting: With additional clamp set (see data sheet)
Weight	3.1 kg
Packing size	377 x 232 x 189 mm
Dimensions (w x h x d)	143.6 x 216 x 79.2 mm (including connector)

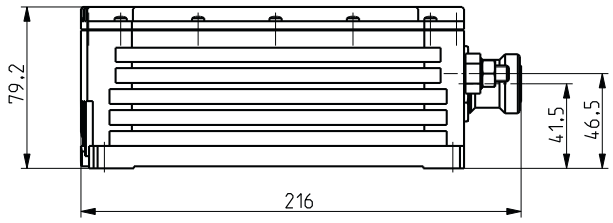
Note:
The RF port connector should always point downwards if mounted outdoors.

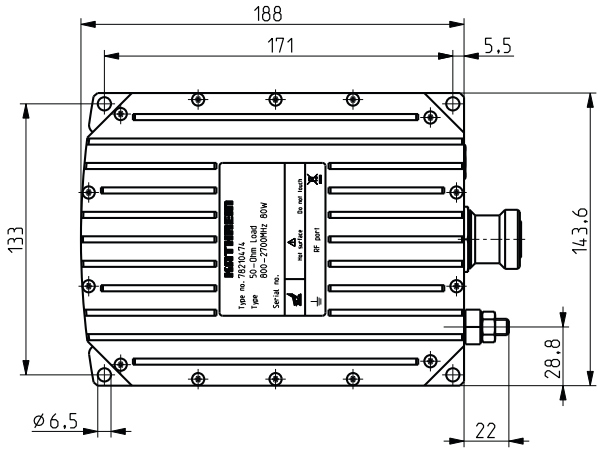
The input power rating of 80 W is specified at an ambient temperature of +40 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

The max. power rating increases or decreases with falling or rising ambient temperature and depending on horizontal or vertical mounting in accordance with the following table:

Max. input power

Max. ambient temperature	Mounted horizontally	Mounted vertically
		
+55 °C	50 W	60 W
+40 °C	70 W	**80 W**
+25 °C	90 W	100 W





Attenuator
2 – 15 W
0 – 4000 MHz

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Air-cooled attenuator for low power rating

- Signal attenuation for test, measuring or tuning purposes
- Good matching over large frequency range
- Closed metal housing, very stable and RF proof
- Free choice of mounting position due to convection-cooling

Technical Data

Type No.	78410235	78410236	78410237	78410238
Attenuation	3 ±0.3 dB	6 ±0.3 dB	10 ±0.3 dB	20 ±0.5 dB
Frequency range	0 – 4000 MHz			
VSWR	< 1.12			
Impedance	50 Ω			
Max. power	2 W			
Connectors	N			
IP rating	**IP65**			
Application	**Outdoor**			
Weight	60 g			
Dimensions (L x diameter)	49 x 21 mm			

Air-cooled attenuator for medium power rating

- Signal attenuation for test, measuring or tuning purposes
- Good matching over large frequency range
- Closed metal housing, very stable and RF proof
- Free choice of mounting position due to convection-cooling

Technical Data

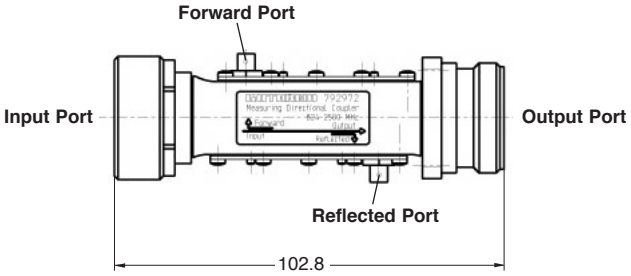
Type No.	791918	791919	791920	791921
Attenuation	3 ±0.3 dB	6 ±0.3 dB	10 ±0.3 dB	20 ±0.5 dB
Max. power	15 W	12 W	10 W	10 W
Frequency range	0 – 4000 MHz			
VSWR	< 1.15			
Impedance	50 Ω			
Connectors	N			
IP rating	**IP65**			
Application	**Outdoor**			
Weight	70 g			
Dimensions (L x diameter)	50 x 26 mm			

Measuring Directional Coupler
824 – 2500 MHz

KATHREIN
Antennen · Electronic

The Measuring Directional Coupler provides measurement ports for monitoring the forward and reflected power of a RF signal.

- Easy implementation into existing RF systems due to male/female connectors
- Input and output ports are reciprocal in nature
- Front panel mounting possible via flange
- Suitable for indoor applications



Technical Data

Type No.	792972
Frequency range	824 – 2500 MHz
Insertion loss Input port → Output port	< 0.05 dB (824 – 2500 MHz)
Coupling attenuation Input port → Forward port Output port → Reflected port	32.0 ±0.75 dB (824 – 960 MHz) 28.5 ±1.50 dB (1710 – 2500 MHz) 32.0 ±0.75 dB (824 – 960 MHz) 28.5 ±1.50 dB (1710 – 2500 MHz)
Directivity	> 28 dB (824 – 2200 MHz) > 25 dB (2200 – 2500 MHz)
VSWR Input port, Output port Forward port, Reflected port	< 1.04 (824 – 960 MHz) < 1.08 (960 – 2500 MHz) < 1.2 (824 – 2500 MHz)
Impedance	50 Ω
Input power	< 800 W (824 – 960 MHz) < 200 W (960 – 2500 MHz)
Intermodulation products	< –160 dBc (3rd order; with 2 x 20 W)
Temperature range	–20 … +55 °C
Connectors Input port Output port Forward port, Reflected port	 7-16 male 7-16 female MCX female
Application	Indoor
Mounting	Front panel mounting possible with 4 screws (max. 2.5 mm diameter)
Weight	0.26 kg
Dimensions (w x h x d)	32 x 32 x 102.3 mm

DTMAs

Summary of DTMA Types

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DTMAs:

Description	Type No.	Frequency range	Gain	Page
Single Mode AISG or CWA				
DTMA-800-12-AISG	78210430	UL: 832 – 862 / DL: 791 – 821 MHz	12 dB	329
DTMA-1800-12-CWA	78210580	UL: 1710 – 1785 / DL: 1805 – 1880 MHz	12 dB	330
DTMA-1800-12-AISG	78210581	UL: 1710 – 1785 / DL: 1805 – 1880 MHz	12 dB	331
DTMA-1900-850-BYP-12-AISG	78210406	UL: 1850 – 1910 / DL: 1930 – 1990 MHz Bypass: 806 – 896 MHz	12 dB	332
DTMA-UMTS-12-AISG	78211145	UL: 1920 – 1980 / DL: 2110 – 2170 MHz	12 dB	333
Dual Mode AISG and CWA				
DTMA-850-12-AISG-CWA	78210874	UL: 824 – 849 / DL: 869 – 894 MHz	12 dB	334
DTMA-900-12-32-AISG-CWA	78210440	UL: 880 – 915 / DL: 925 – 960 MHz	12/32 dB	335
DTMA-900-12-32-AISG-CWA	78210442	UL: 880 – 915 / DL: 925 – 960 MHz	12/32 dB	335
DTMA-1800-UMTS-12-AISG-CWA	78211103	UL: 1710 – 1785 / DL: 1805 – 1880 MHz	12 dB	336
DTMA-1800-UMTS-12-AISG-CWA	78211105	UL: 1710 – 1785 / DL: 1805 – 1880 MHz	12 dB	336
DTMA-1900-12-AISG-CWA	78210876	UL: 1850 – 1910 / DL: 1930 – 1990 MHz	12 dB	337
DTMA-AWS-12-AISG-CWA	78210877	UL: 1710 – 1770 / DL: 2110 – 2170 MHz	12 dB	338
DTMA-UMTS-BYP1800-12-AISG-CWA	78211102	UL: 1920 – 1980 / DL: 2110 – 2170 MHz	12 dB	339
DTMA-UMTS-BYP1800-12-AISG-CWA	78211104	UL: 1920 – 1980 / DL: 2110 – 2170 MHz	12 dB	339
DTMA-UMTS-BYP900/1800-12-AISG-CWA	78210652	UL: 1920 – 1980 / DL: 2110 – 2170 MHz Bypass: 870 – 960 MHz 1710 – 1880 MHz	12 dB	340, 341
DTMA-UMTS-BYP900/1800-12-AISG-CWA	78210653	UL: 1920 – 1980 / DL: 2110 – 2170 MHz Bypass: 870 – 970 MHz 1710 – 1880 MHz	12 dB	340, 341
DTMA-UMTS-12-AISG-CWA	78210610	UL: 1920 – 1980 / DL: 2110 – 2170 MHz	12 dB	342
DTMA-UMTS-12-AISG-CWA	78210612	UL: 1920 – 1980 / DL: 2110 – 2170 MHz	12 dB	342
DTMA-UMTS-12-AISG-CWA	78211120	UL: 1920 – 1980 / DL: 2110 – 2170 MHz	12 dB	342
DTMA-UMTS-24-AISG-CWA	78210613	UL: 1920 – 1980 / DL: 2110 – 2170 MHz	24 dB	343
DTMA-1800-UMTS-12-AISG-D	78210990	UL: 1920 – 1980 / DL: 2110 – 2170 MHz	12 dB	344, 345
DTMA-2600-12-AISG	78210860	UL: 2500 – 2570 / DL: 2620 – 2690 MHz	12 dB	346

New Products

UL = Up Link / DL = Down Link

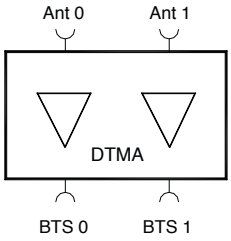
DTMA-800-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- **Compact line**
- Double unit for easy use with XPol antennas
- Supports AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

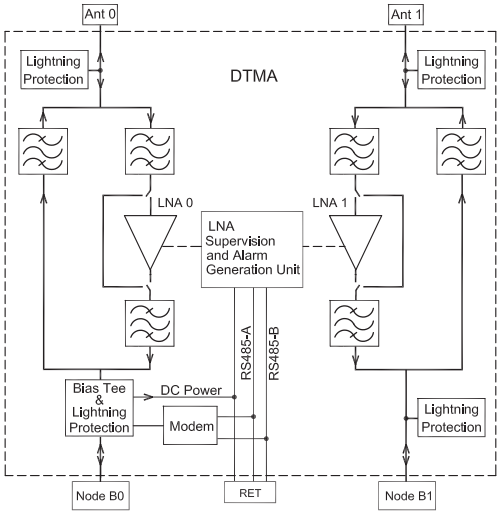
RET = **R**emote **E**lectrical **T**ilt
AISG = **A**ntenna **I**nterface **S**tandards **G**roup



Technical Data

Type No.	78210430 DTMA-800-12-AISG (12 dB gain)
Tx Characteristics	
Frequency range	791 – 821 MHz
Insertion loss	Typically 0.25 dB
Ripple	< 0.3 dB
Input power (per input)	< 100 W (+50 dBm) CW
Intermodulation products in Rx band	< –117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	832 – 862 MHz
Loss in bypass mode	Typically 2 dB
Return loss	> 16 dB (DC ON)
Gain	12 dB nominal
Noise figure	Typically 1.2 dB
3rd order intercept point (OIP3)	Typically 30 dBm
Environmental Characteristics	
Operating temperature range	–40 … +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3
DC and Alarm Characteristics	
DC supply	10 – 30 V
Operating current per DTMA (without RET)	Nom. 155 mA at 10 V / Nom. 60 mA at 30 V
Alarm management	AISG
Mechanical Characteristics	
Material	Aluminium housing
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	6.2 kg
Packing size	250 x 450 x 210 mm
Dimensions (w x h x d)	176 x 246.6 x 103.6 mm (without connectors, without mounting brackets)

* (see note on data sheet)



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

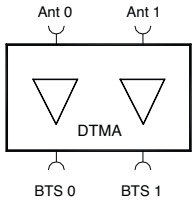
DTMA-1800-12-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- **Compact line**
- Double units for easy use with XPol antennas
- Alarm management: CWA
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

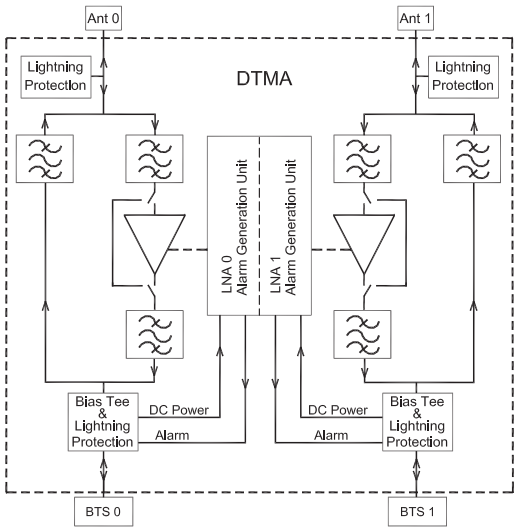
CWA = **C**urrent **W**indow **A**larm



Technical Data

Type No.	**78210580** **DTMA-1800-12-CWA (12 dB gain)**
Tx Characteristics	
Frequency range	1805 – 1880 MHz
Insertion loss	Typically 0.25 dB
Input power (per input)	< 200 W (+53 dBm) CW / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< –117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	1710 – 1785 MHz
Loss in bypass mode	Typically 1.7 dB (DC OFF)
Return loss	> 16 dB (DC ON)
Gain	12 dB nominal
Noise figure	Typically 1.0 dB
Output 1-dB compression point	> 10 dBm
3rd order intercept point (OIP3)	Typically 30 dBm
Environmental Characteristics	
Operating temperature range	–40 … +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3
DC and Alarm Characteristics	**CWA Mode**
DC supply	7 – 15 V
Operating current per DTMA (without RET)	Typically 80 mA
Alarm management	230 – 290 mA
Mechanical Characteristics	
Material	Aluminium housing
Connectors	7-16 female (long neck)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	4 kg
Packing size	405 x 235 x 175 mm
Dimensions (w x h x d)	218 x 169 x 74.3 mm (without connectors, without mounting brackets)

* see note on data sheet



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

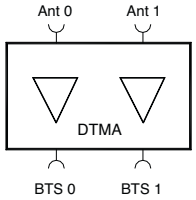
DTMA-1800-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- **Compact line**
- Double units for easy use with XPol antennas
- Supports AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

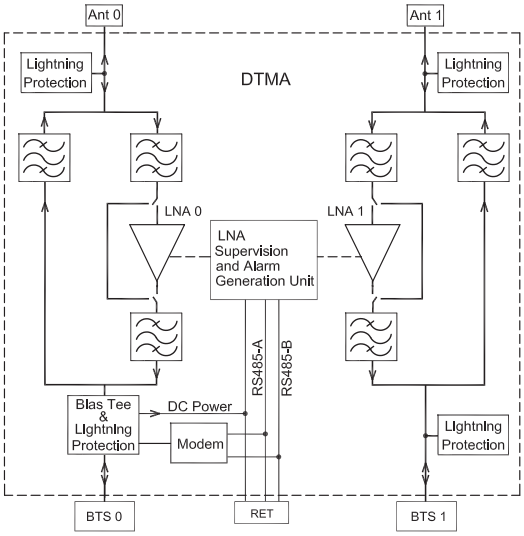
RET = **R**emote **E**lectrical **T**ilt
AISG = **A**ntenna **I**nterface **S**tandards **G**roup



Technical Data

Type No.	78210581 DTMA-1800-12-AISG (12 dB gain)
Tx Characteristics	
Frequency range	1805 – 1880 MHz
Insertion loss	Typically 0.25 dB
Input power (per input)	< 200 W (+53 dBm) CW / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< –117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	1710 – 1785 MHz
Loss in bypass mode	Typically 1.7 dB (DC OFF)
Return loss	> 16 dB (DC ON)
Gain	12 dB nominal
Noise figure	Typically 1.0 dB
Output 1-dB compression point	> 10 dBm
3rd order intercept point (OIP3)	Typically 30 dBm
Environmental Characteristics	
Operating temperature range	–40 … +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3
DC and Alarm Characteristics	**AISG Mode**
DC supply	10 – 30 V
Operating current per DTMA (without RET)	Nom. 130 mA at 10 V Nom. 50 mA at 30 V
Alarm management	AISG
Mechanical Characteristics	
Material	Aluminium housing
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	4 kg
Packing size	235 x 405 x 175 mm
Dimensions (w x h x d)	169 x 218 x 74.3 mm (without connectors, without mounting brackets)

* see note on data sheet



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

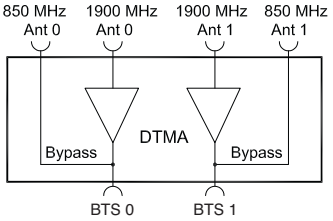
DTMA-1900-850 BYP-12-AISG

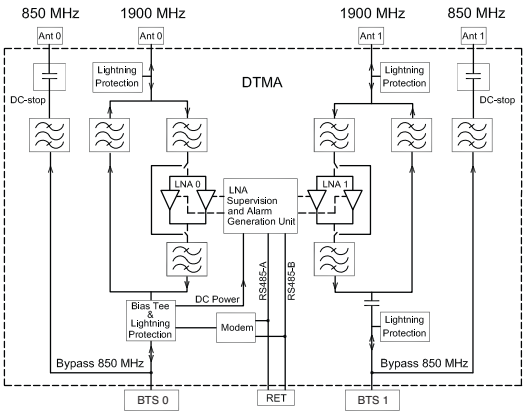
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- Double units for easy use with XPol antennas
- RF-Bypass feature for 850 MHz
- DC-stop integrated to 850 MHz ports
- Kathrein redundancy amplifier design for improved system reliability
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Compact size
- Suitable for antenna RET control according to AISG standard
- **DTMA DC supply and AISG feed via BTS 0 port for both TMAs**

RET = **R**emote **E**lectrical **T**ilt
AISG = **A**ntenna **I**nterface **S**tandards **G**roup
BYP = RF-**BYP**ass





Technical Data

Type No.	78210406 DTMA-1900-850 BYP-12-AISG (12 dB gain)
850 MHz Bypass	
Frequency range	806 – 896 MHz
Insertion loss	< 0.15 dB
Isolation to 1900 MHz	> 80 dB
Input power	500 W CW per input
Return loss	> 18 dB
1900 MHz DTMA	
Tx Characteristics	
Frequency range	1930 – 1990 MHz
Bandwidth	60 MHz
Insertion loss	< 0.5 dB at 80% of BW, a further 0.25 dB at 100% BW.
Input power	< 160 W (+52 dBm) CW per input < 1.6 kW (+62 dBm) Peak
Intermodulation products in Rx band	< –117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	1850 – 1910 MHz
Bandwidth	60 MHz
Loss in bypass mode	Typically 2.8 dB
Return loss	> 18 dB (DC ON) > 15 dB (DC OFF)
Gain **+22 ... +28 °C** –40 ... +65 °C	12 ±0.7 dB 12 ±1.3 dB
Noise figure **+22 ... +28 °C**	< 1.7 dB at 80% of BW, a further 0.3 dB at 100% BW.
Noise figure –40 ... +65 °C	< 2.2 dB at 80% of BW, a further 0.3 dB at 100% BW.
Output 1-dB compression point	> 15 dBm
3rd order intercept point (OIP3)	> 25 dBm
Environmental Characteristics	
Operating temperature range	–40 … +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours (per TMA)
EMC Lightning protection	ETS 300 342-3 5 kA, 8/20 µs RF connections and AISG port
DC and Alarm Characteristics	**Through BTS 0 Port only**
DC supply without RET	+12 V nominal (9 – 15 V, minus grounded) Typically 150 mA per TMA
Operating current per DTMA (without RET)	Nom. 130 mA at 10 V Nom. 50 mA at 30 V
Alarm management	According to AISG standard 1.1
Modem Characteristics	According to AISG standard 1.1 (Data rate: 9.6 kB)
Mechanical Characteristics	
Material	Aluminium housing
Connectors RF AISG (Compliance AISG 1.1)	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 1: +12 V nominal, pin 3: RS485B, pin 5: RS485A, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	Approx. 8.7 kg
Packing size	352 x 514 x 212 mm
Dimensions (w x h x d)	271 x 278 x 77.5 mm (without connectors, without mounting brackets)

* see note on data sheet

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

DTMA-UMTS-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

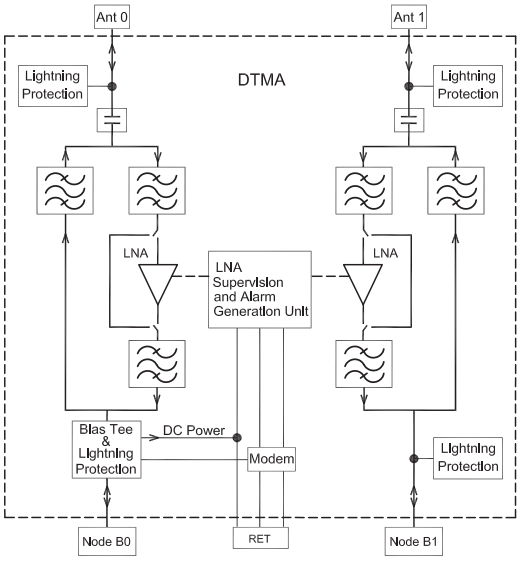
- **Slimeline design**
- Double units for easy use with XPol antennas
- Supports AISG 1.1 and 2.0 (default)
- AISG setting switchable
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Low weight

AISG = **A**ntenna **I**nterface **S**tandards **G**roup
RET = **R**emote **E**lectrical **T**ilt

Technical Data

Type No.	78211145 DTMA-UMTS-12-AISG (12 dB gain)
Tx Characteristics	
Frequency range	2110 – 2170 MHz
Insertion loss	Typically 0.2 dB
Ripple	< 0.1 dB
Input power (per input)	< 100 W (+50 dBm) CW / < 1.6 kW (+62 dBm) peak
Intermodulation products in RX band	< –117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	1920 – 1980 MHz
Loss in bypass mode	Typically 2.0 dB (DC OFF)
Return loss	> 18 dB (DC ON)
Gain	Typically 12 dB
Noise figure	Typically 1.4 dB
3rd order intercept point (OIP3)	Typically 30 dBm
Environmental Characteristics	
Operating temperature range	–40 ... +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3
DC and Alarm Characteristics	**AISG Mode**
DC supply	10 – 30 V
Operating current (without RET)	Nom. 130 mA at 10 V Nom. 50 mA at 30 V
Alarm management	AISG*
Mechanical Characteristics	
Material	Aluminium housing
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 30130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	3 kg
Packing size	217 x 397 x 170 mm
Dimensions (w x h x d)	138 x 191 x 71.6 mm (without connectors, without mounting brackets)

* see note on data sheet



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

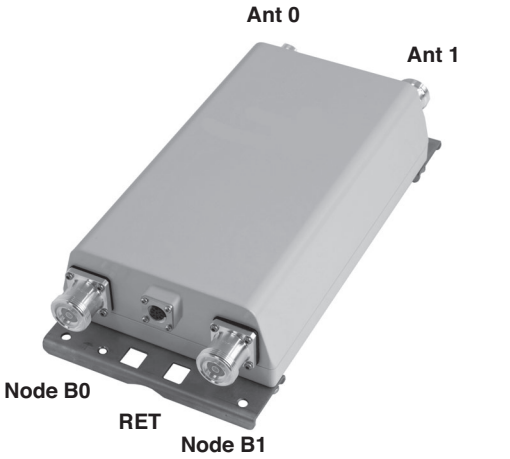
DTMA-850-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- AISG setting switchable
- CWA and AISG configurations
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

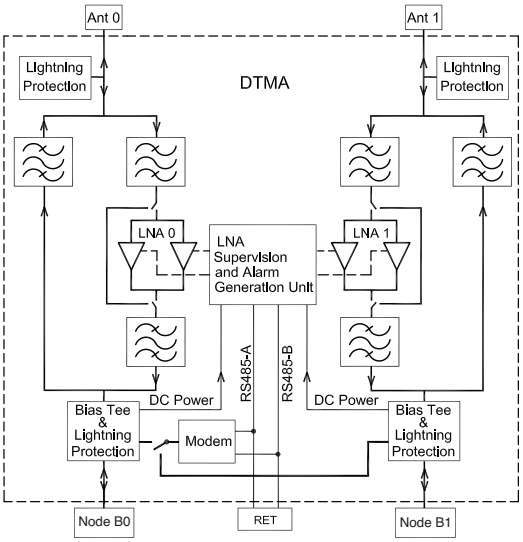
RET = Remote **E**lectrical **T**ilt
AISG = Antenna **I**nterface **S**tandard **G**roup
CWA = Current **W**indow **A**larm



Technical Data

Type No.	78210874 DTMA-850-12-AISG-CWA (12 dB gain)	
Tx Characteristics		
Frequency range	869 – 894 MHz	
Insertion loss	< 0.35 dB	
Input power (per input)	< 100 W (+50 dBm)	
Intermodulation products in Rx band	< –116 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	824 – 849 MHz	
Loss in bypass mode	Typically 1.5 dB (DC OFF)	
Return loss	> 18 dB (DC ON) / > 15 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	< 1.3 dB	
Output 1-dB compression point	> 10 dBm	
3rd order intercept point (OIP3)	Typically 25 dBm	
Environmental Characteristics		
Operating temperature range	–40 ... +65 °C	
IP rating	IP67	
MTBF	> 1 200 000 hours (per TMA)	
EMC	FCC Part 15	
DC and Alarm Characteristics	**CWA Mode**	**AISG Mode**
DC supply	9 – 19 V	9 – 30 V
Operating current per TMA	80 – 130 mA	Nom. 50 mA at 12 V
Alarm management	170 – 180 mA	AISG*
Mechanical Characteristics		
Material	Aluminium housing	
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	4.9 kg	
Packing size	400 x 250 x 150 mm	
Dimensions (w x h x d)	168 x 275 x 73 mm (without connectors, without mounting brackets)	

* see note on data sheet



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

DTMA-900-12-32-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- Double units for easy use with XPol antennas
- Gain setting switchable from 12 dB (default) to 32 dB
- Both versions support CWA, AISG 1.1 and AISG 2.0 (default)
  782 10440: CWA alarm 170 – 200 mA / 800 – 900 mA
  782 10442: CWA alarm 230 – 295 mA / 800 – 900 mA
- AISG and gain setting switchable as described on page 2
- CWA and AISG configurations as described on page 2
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

RET = **R**emote **E**lectrical **T**ilt
AISG = **A**ntenna **I**nterface **S**tandards **G**roup
CWA = **C**urrent **W**indow **A**larm

Technical Data

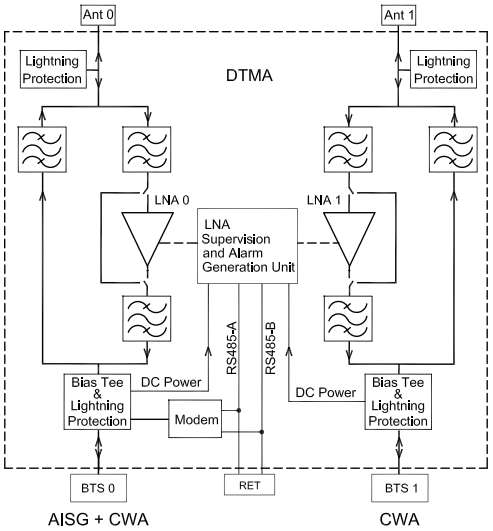
Type No.	CWA alarm 170 – 200 mA / 800 – 900 mA	**78210440** DTMA-900-12-32-AISG-CWA (12/32 dB gain)
	CWA alarm 230 – 295 mA / 800 – 900 mA	**78210442** DTMA-900-12-32-AISG-CWA (12/32 dB gain)

Tx Characteristics	
Frequency range	925 – 960 MHz
Insertion loss*	Typically 0.5 dB
Input power (per input)	< 180 W (+52.5 dBm) CW / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< –117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	880 – 915 MHz
Loss in by-pass mode	Typically 4 dB (DC OFF)
Return loss	> 16 dB (DC ON)
Gain	12/32 dB nominal
Noise figure	Typically 1.3 dB
Input 3rd order intercept point (IIP3)	Typically 5 dBm
Environmental Characteristics	
Operating temperature range	–40 … +55 °C
IP rating	IP 67
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3

DC and Alarm Characteristics	**CWA Mode**	**AISG Mode**
DC supply	8.5 – 19 V (12 dB gain) 8.5 – 15 V (32 dB gain)	10 – 30 V
Operating current per TMA (without RET)	80 – 130 mA (12 dB gain) 360 – 400 mA (32 dB gain)	< 110 mA (12 dB gain) < 350 mA (32 dB gain)
Alarm management 12 dB gain 32 dB gain	**782 10440:** 170 – 200 mA **782 10442:** 230 – 295 mA 800 – 900 mA	AISG*

Mechanical Characteristics	
Material	Aluminium housing
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: not connected)
Weight	8.7 kg
Packing size	342 x 579 x 212 mm
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Dimensions (w x h x d)	250 x 353 x 94 mm (without connectors, without mounting brackets)

* see note on data sheet



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

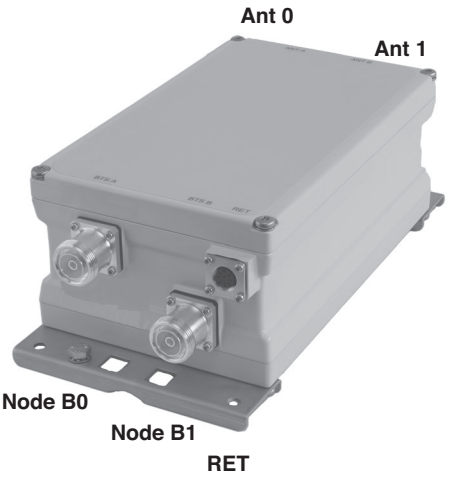
DTMA-1800-UMTS-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Built-in lightning protection
- AISG setting switchable
- CWA and AISG configurations

RET = Remote **E**lectrical **T**ilt
AISG = Antenna **I**nterface **S**tandard **G**roup
CWA = Current **W**indow **A**larm



Technical Data

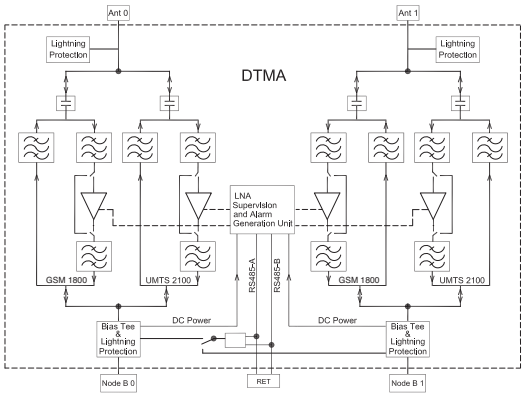
Type No.	CWA alarm 170 – 200 mA	**78211103** DTMA-1800-UMTS-12-AISG-CWA
Type No.	CWA alarm 230 – 295 mA	**78211105** DTMA-1800-UMTS-12-AISG-CWA

1800 MHz Tx Characteristics	
Frequency range	1805 – 1880 MHz
Insertion loss	Typically 0.5 dB
Input power (per input)	< 100 W (+50 dBm) / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< –116 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
1800 MHz Rx Characteristics	
Frequency range	1710 – 1785 MHz
Loss in bypass mode	Typically 2.0 dB
Return loss	> 18 dB (DC ON) / > 14 dB (DC OFF)
Gain	12 dB nominal
Noise figure	Typically 1.5 dB
3rd order intercept point (OIP3)	Typically 25 dBm
UMTS Tx Characteristics	
Frequency range	2110 – 2170 MHz
Insertion loss	Typically 0.3 dB
Input power (per input)	< 100 W (+50 dBm) / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< –116 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
UMTS Tx Characteristics	
Frequency range	1920 – 1980 MHz
Loss in bypass mode	Typically 2.0 dB
Return loss	> 18 dB (DC ON) / > 14 dB (DC OFF)
Gain	12 dB nominal
Noise figure	Typically 1.4 dB
3rd order intercept point (OIP3)	Typically 25 dBm
Environmental Characteristics	
Operating temperature range	–40 … +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours per TMA
EMC	According to ETS 300 342-3
Lightning protection	3 kA, 10/350 µs pulse

DC and Alarm Characteristics	**CWA Mode**	**AISG Mode**
DC supply	9 – 19 V DC	9 – 31 V DC
Operating current per DTMA (without RET)	80 – 120 mA	Nom. 300 mA at 10 V Nom. 100 mA at 30 V
Alarm management	**78211103:** 170 – 200 mA **78211105:** 230 – 295 mA	AISG*

Mechanical Characteristics	
Material	Aluminium housing
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 31 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	8 kg
Dimensions (w x h x d)	Approx. 168 x 274 x 120 mm (without connectors, without mounting brackets)

* see note on data sheet



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

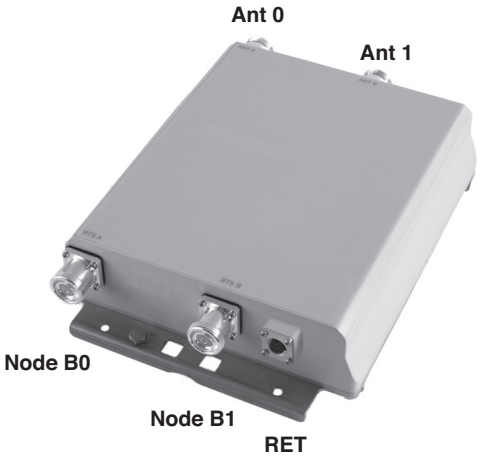
DTMA-1900-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- AISG setting switchable
- CWA and AISG configurations
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

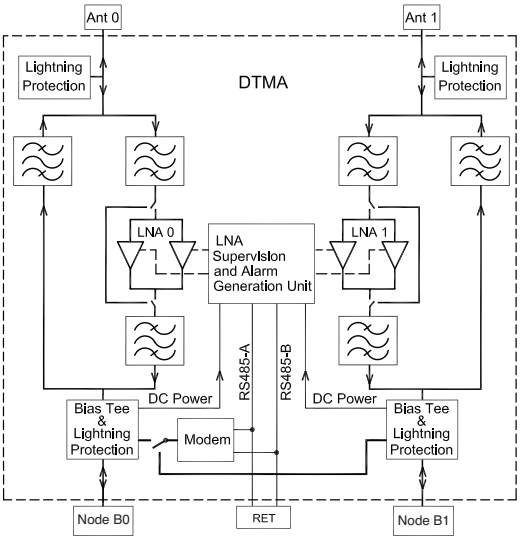
RET = Remote **E**lectrical **T**ilt
AISG = Antenna **I**nterface **S**tandard **G**roup
CWA = Current **W**indow **A**larm



Technical Data

Type No.	78210876 DTMA-1900-12-AISG-CWA (12 dB gain)	
Tx Characteristics		
Frequency range	1930 – 1990 MHz	
Insertion loss	< 0.3 dB	
Input power (per input)	< 100 W (+50 dBm)	
Intermodulation products in Rx band	< –116 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	1850 – 1910 MHz	
Loss in bypass mode	Typically 2.0 dB (DC OFF)	
Return loss	> 18 dB (DC ON) / > 15 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	< 1.4 dB	
Output 1-dB compression point	> 10 dBm	
3rd order intercept point (OIP3)	> 25 dBm	
Environmental Characteristics		
Operating temperature range	–40 ... +65 °C	
IP rating	IP67	
MTBF	> 1 200 000 hours (per TMA)	
EMC	FCC Part 15	
DC and Alarm Characteristics	**CWA Mode**	**AISG Mode**
DC supply	9 – 19 V	9 – 30 V
Operating current per TMA	80 – 130 mA	Nom. 50 mA at 12 V
Alarm management	170 – 180 mA	AISG*
Mechanical Characteristics		
Material	Aluminium housing	
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	4.6 kg	
Packing size	395 x 290 x 180 mm	
Dimensions (w x h x d)	168 x 275 x 61 mm (without connectors, without mounting brackets)	

* see note on data sheet



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

DTMAs

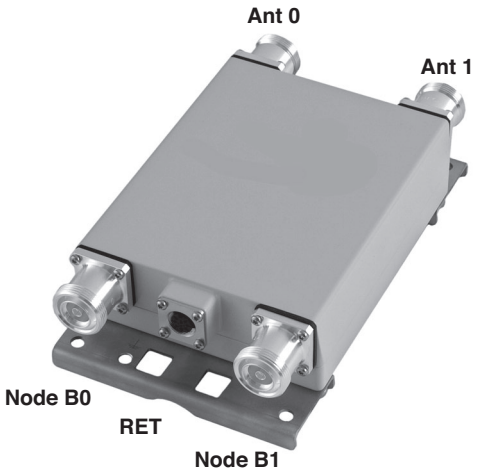
DTMA-AWS-12-AISG-CWA

Fullband Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- Double unit for easy use with XPol antennas
- Built-in lightning protection
- Compact size
- Suitable for antenna RET control according to AISG/3GPP standard
- AISG setting switchable
- CWA and AISG configuration
- Support CWA and AISG 1.1 and AISG 2.0 (default)

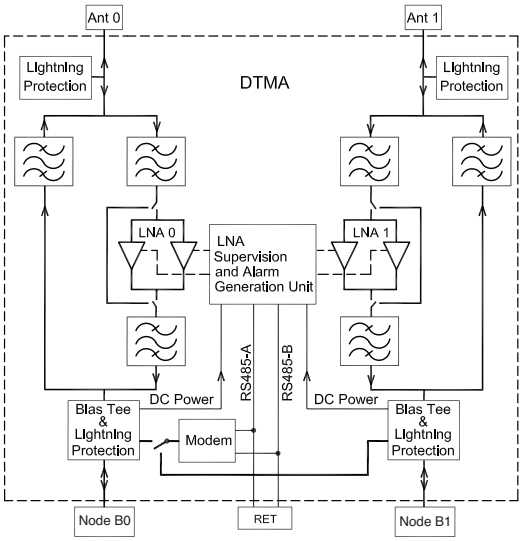
AISG = Antenna **I**nterface **S**tandard **G**roup
RET = Remote **E**lectrical **T**ilt
CWA = Current **W**indow **A**larm



Technical Data

Type No.	78210877 DTMA-AWS-12-AISG-CWA (12 dB gain)	
Tx Characteristics		
Frequency range	2110 – 2170 MHz	
Insertion loss	Typically 0.3 dB	
Ripple	< 0.1 dB	
Input power	< 100 W (+50 dBm)	
Intermodulation products in Rx band	< –125 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	1710 – 1770 MHz	
Loss in bypass mode	Typically 2.0 dB (DC OFF)	
Gain	12 dB nominal	
Return loss	> 18 dB (DC ON) / > 12 dB (DC OFF)	
Noise figure	< 1.3 dB	
Output 1-dB compression point	> 10 dBm	
3rd order intercept point (OIP3)	> 25 dBm	
Environmental Characteristics		
Operating temperature range	–40 ... +65 °C	
IP rating	IP67	
MTBF	> 1 200 000 hours (per TMA)	
EMC	According to EN 301 489-8	
DC and Alarm Characteristics	**CWA Mode**	**AISG Mode**
DC supply	9 – 19 V	9 – 30 V
Operating current	80 – 130 mA	Nom. 50 mA at 12 V
Alarm management	170 – 180 mA	AISG*
Mechanical Characteristics		
Material	Aluminium housing	
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 6: 9 – 30 V DC, pin 3: RS485B, pin 5: RS485A, pin 7: DC return, other pins: Not connected)	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	2.5 kg	
Packing size	325 x 240 x 130 mm	
Dimensions (w x h x d)	152 x 174 x 50 mm (without connectors, without mounting brackets)	

* see note on data sheet



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

DTMA-UMTS-BYP1800-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- Double units for easy use with XPol antennas
- RF-Bypass for 1800 MHz
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- AISG setting switchable
- CWA and AISG configuration
- Support CWA, AISG 1.1 and AISG 2.0 (default)

RET = **R**emote **E**lectrical **T**ilt
BYP = RF-**BYP**ass
AISG = **A**ntenna **I**nterface **S**tandards **G**roup
CWA = **C**urrent **W**indow **A**larm

Technical Data

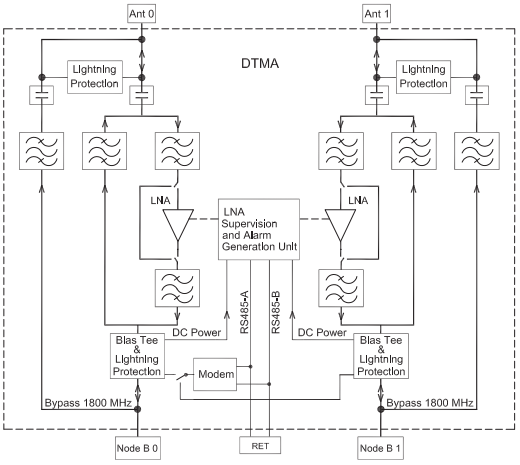
Type No.	CWA alarm 170 – 200 mA	**78211102** DTMA-UMTS-BYP1800-12-AISG-CWA (12 dB gain)
Type No.	CWA alarm 230 – 295 mA	**78211104** DTMA-UMTS-BYP1800-12-AISG-CWA (12 dB gain)

UMTS 2100 Tx Characteristics		
Frequency range		2110 – 2170 MHz
Insertion loss		< 0.4 dB (typically 0.3 dB)
Input power (per input)		< 100 W (+50 dBm)
Intermodulation products in Rx band		< –117 dBm (2 Tx carriers at +43 dBm)
Return loss		> 18 dB
UMTS 2100 Rx Characteristics		
Frequency range		1920 – 1980 MHz
Loss in bypass mode		Typically 2.9 dB (DC OFF)
Return loss		> 18 dB (DC ON) / > 14 dB (DC OFF)
Gain		12 dB nominal
Gain ripple		±0.35 dB (typically ±0.3 dB)
Noise figure		< 1.4 dB (+20 ... +30 °C)
3rd order intercept point (OIP3)		Typically 25 dBm
1800 MHz Bypass Characteristics		
Frequency range 1800		1710 – 1880 MHz
Insertion loss 1710–1880 MHz		< 0.4 dB (typically 0.2 dB)
Input power (per input)		< 100 W (+50 dBm)
Intermodulation products in Rx band		< –116 dBm (2 Tx carriers at +43 dBm)
Return loss		> 18 dB
Environmental Characteristics		
Operating temperature range		–40 … +65 °C
IP rating		IP67*
MTBF		> 1 000 000 hours per TMA
EMC		According to ETS 301 489-8
Lightning protection		3 kA, 10/350 µs pulse

DC and Alarm Characteristics	**CWA Mode**	**AISG Mode**
DC supply	9 – 19 V DC	9 – 30 V DC
Operating current	80 – 130 mA	Nom. 100 mA at 12 V
Alarm management	**78211102:** 170 – 200 mA **78211104:** 230 – 295 mA	AISG*

Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF	7-16 female (long neck)
	AISG	8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: Not connected)
Packing size		300 x 370 x 145 mm
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight		4 kg
Dimensions (w x h x d)		208 x 224 x 55 mm (without connectors, without mounting brackets)

* see note on data sheet



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

DTMA-UMTS-BYP900/1800-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier with 900 MHz and 1800 MHz Bypass

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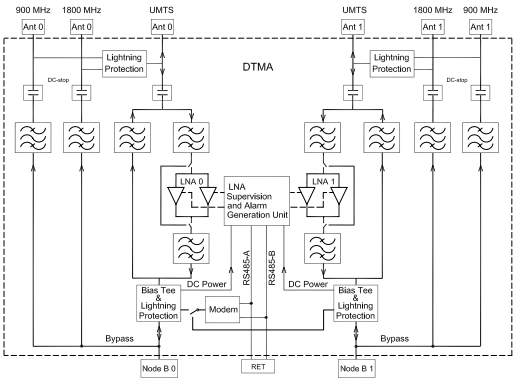
- Double units for easy use with XPol antennas
- Both versions support CWA, AISG 1.1 and AISG 2.0 (default)
  78210652: CWA alarm 170 – 200 mA
  78210653: CWA alarm 230 – 295 mA
- RF-Bypass for 900 MHz and 1800 MHz
- Integrated DC stops
- AISG setting switchable as described on data sheet
- CWA and AISG configurations as described on data sheet
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

RET = **R**emote **E**lectrical **T**ilt
AISG = **A**ntenna **I**nterface **S**tandards **G**roup
CWA = **C**urrent **W**indow **A**larm
BYP = RF-**BYP**ass

Technical Data

Type No.	CWA alarm 170 – 200 mA	**78210652** DTMA-UMTS-BYP900/1800-12-AISG-CWA (12 dB gain)	
	CWA alarm 230 – 295 mA	**78210653** DTMA-UMTS-BYP900/1800-12-AISG-CWA (12 dB gain)	
UMTS Tx Characteristics			
Frequency range		2110 – 2170 MHz	
Insertion loss		< 0.4 dB	
Return loss		> 18 dB	
Input power (per input)		< 100 W (+50 dBm) CW / < 1.6 kW (+62 dBm) peak	
Intermodulation products in Rx band		< –117 dBm (2 Tx carriers at +43 dBm)	
UMTS Rx Characteristics			
Frequency range		1920 – 1980 MHz	
Loss in bypass mode		< 3.0 dB (DC OFF)	
Return loss		> 16 dB (DC ON) / > 14 dB (DC OFF)	
Gain		12 ±0.7 dB (+22 ... +28 °C) / 12 ±1.3 dB (– 40 ... +60 °C)	
Gain ripple in 5 MHz bandwidth		< ±0.2 dB	
Noise figure*		< 1.3 dB (+22 ... +28 °C)	
Output 1-dB compression point		> 10 dBm	
3rd order intercept point (OIP3)		> 23 dBm	
Intermodulation products in Rx band		< –117 dBm (2 Tx carriers at +43 dBm)	
1800 MHz Bypass Characteristics			
Frequency range		1710 – 1880 MHz	
Insertion loss		< 0.3 dB	
Return loss		> 18 dB	
Isolation		> 80 dB (2400 – 2900 MHz) / > 60 dB (2110 – 2170 MHz) / > 50 dB (2010 – 2025 MHz) / > 50 dB (1920 – 1980 MHz) / > 80 dB (880 – 960 MHz)	
Input power (per input)		100 W CW / 300 W peak	
Intermodulation products in Rx band		< –117 dBm (2 Tx carriers at +43 dBm)	
900 MHz Bypass Characteristics			
Frequency range		870 – 970 MHz	
Insertion loss		< 0.3 dB	
Return loss		> 18 dB	
Isolation		> 30 dB (1710 – 1880 MHz) > 40 dB (1920 – 2900 MHz)	
Input power (per input)		100 W CW / 300 W peak	
Environmental Characteristics			
Operating temperature range		–40 … +60 °C	
IP rating		IP67 (see note on data sheet)	
MTBF		> 1 000 000 hours per TMA	
EMC		According to ETS 300 342-3	
DC and Alarm Characteristics		**CWA Mode**	**AISG Mode**
DC supply		9 – 19 V	9 – 30 V
Operating current per TMA (without RET)		80 – 140 mA	Nom. 95 mA at 9 V Nom. 35 mA at 30 V
Alarm management		**78210652:** 170 – 200 mA **78210653:** 230 – 295 mA	AISG
Mechanical Characteristics			
Material		Aluminium housing	
Connectors	RF	7-16 female (long neck)	
	AISG	8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: not connected)	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Dimensions (w x h x d)		222 x 316.9 x 108.5 mm (without connectors, without mounting brackets)	



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Clamp Set

Type No.	Description
78410367	**50-Ω load** 1.5 W / indoor or outdoor

50-Ω load

* Noise figure $\overline{NF} = \frac{NF_{1920\ MHz} + 2 \times NF_{1950\ MHz} + NF_{1980\ MHz}}{4}$

(Additional variation at –40 ... +60 °C: $\Delta\ \overline{NF} < 0.3$ dB)

DTMA-UMTS-BYP900/1800-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier with 900 MHz and 1800 MHz Bypass

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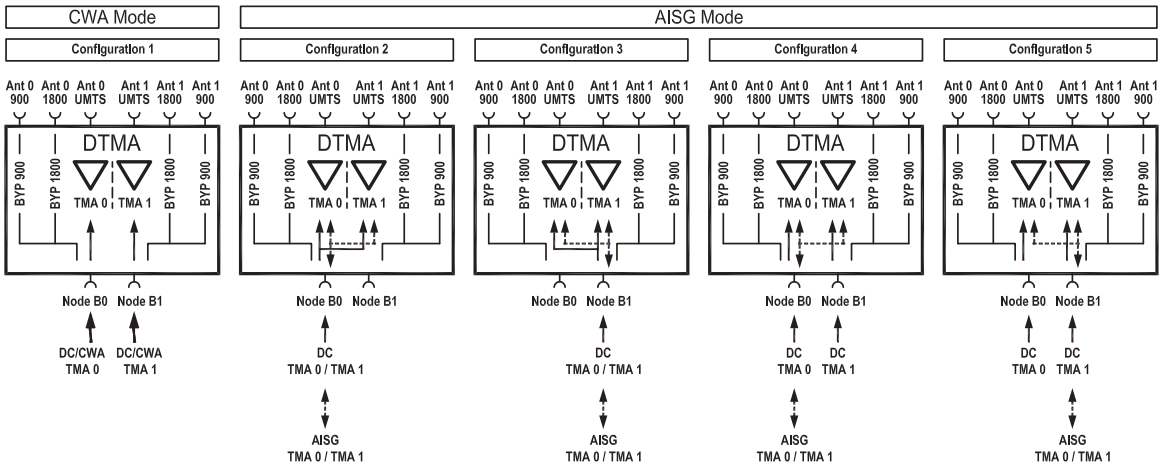
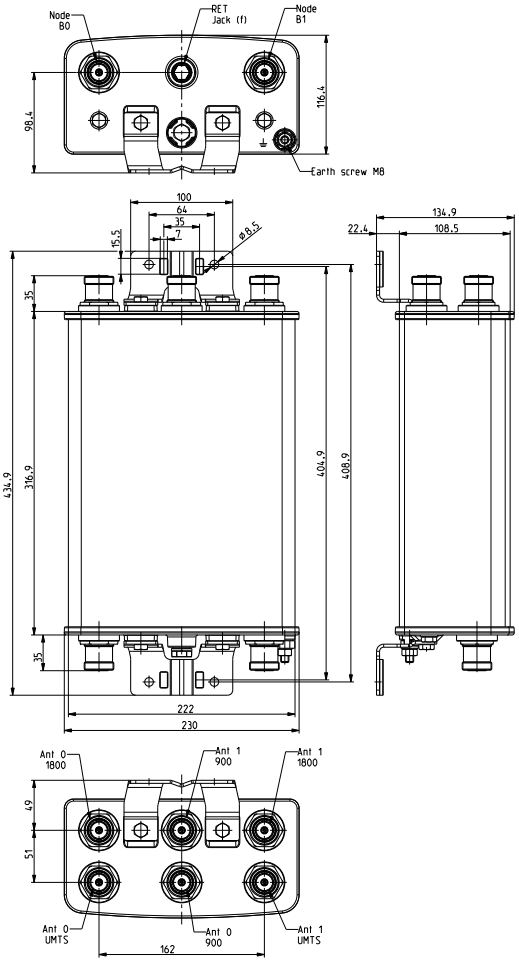
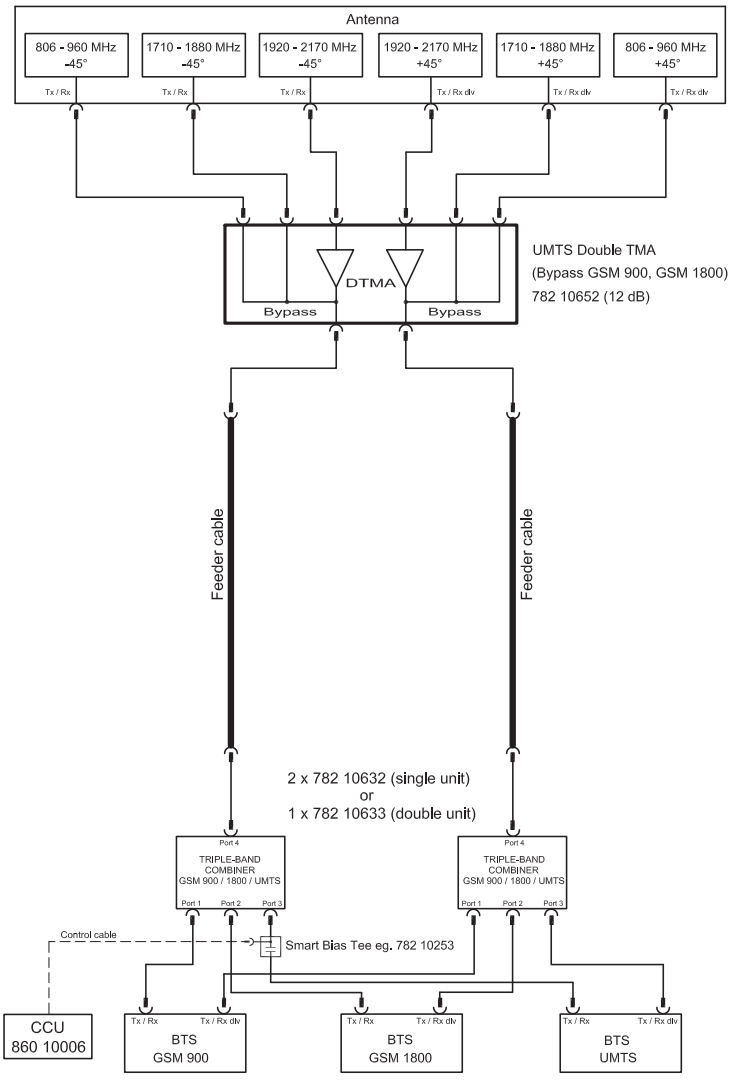
DC Supply, Current Window Alarm and AISG Configuration
(automatically chosen by the DTMA depending on incoming signals)





78210652, 78210653

Application Example



AISG Setting

The protocol of the software interface can be switched between AISG 2.0 / 3GPP and AISG 1.1 and vice versa with a vendor specific command (depending on default setting). If the primary station does not support the default setting, it has to be switched over before system start-up. Please contact Kathrein for further information.

DTMA-UMTS-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- **Slimline design**
- Double units for easy use with XPol antennas
- Both versions support CWA, AISG 1.1 and AISG 2.0
  782 10610 default setting: AISG 1.1
  782 10612 default setting: AISG 2.0
- AISG setting switchable as described on data sheet
- CWA and AISG configurations as described on data sheet
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

RET = **R**emote **E**lectrical **T**ilt
AISG = **A**ntenna **I**nterface **S**tandards **G**roup
CWA = **C**urrent **W**indow **A**larm

Technical Data

Type No.	Default setting AISG 1.1 170 – 200 mA	**78210610** DTMA-UMTS-12-AISG-CWA (12 dB gain)
	Default setting AISG 2.0 170 – 200 mA	**78210612** DTMA-UMTS-12-AISG-CWA (12 dB gain)
	Default setting AISG 2.0 230 – 295 mA	**78211120** DTMA-UMTS-12-AISG-CWA (12 dB gain)

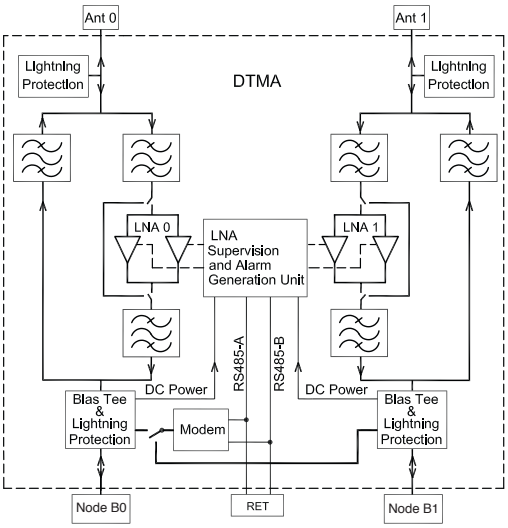
Tx Characteristics	
Frequency range	2110 – 2170 MHz
Insertion loss	< 0.3 dB (typically 0.15 dB)
Ripple	< 0.1 dB
Input power (per input)	< 100 W (+50 dBm) CW / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< –117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB

Rx Characteristics	
Frequency range	1920 – 1980 MHz
Loss in bypass mode	< 2.5 dB (DC OFF)
Return loss	> 18 dB (DC ON) / > 12 dB (DC OFF)
Gain	12 ±1.0 dB (+22 ... +28 °C) / 12 ±1.2 dB (– 40 ... +65 °C)
Gain ripple	< ±0.3 dB
Noise figure*	< 1.3 dB (+22 ... +28 °C)
Output 1-dB compression point	> 11 dBm
3rd order intercept point (OIP3)	> 25 dBm (typically 30 dBm)

Environmental Characteristics	
Operating temperature range	–40 … +65 °C
IP rating	IP67
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3

DC and Alarm Characteristics	**CWA Mode**	**AISG Mode**
DC supply	9 – 15 V	9 – 30 V
Operating current per TMA (without RET)	80 – 140 mA	Nom. 95 mA at 9 V Nom. 35 mA at 30 V
Alarm management		
78210610	170 – 200 mA	AISG
78210612	170 – 200 mA	
78211120	230 – 295 mA	

Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF	7-16 female (long neck)
	AISG	8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: not connected)
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight		3.8 kg
Packing size		262 x 502 x 214 mm
Dimensions (w x h x d)		160 x 205 x 63 mm (without connectors, without mounting brackets)



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

* Noise figure $\overline{NF} = \frac{NF_{1920\ MHz} + 2 \times NF_{1950\ MHz} + NF_{1980\ MHz}}{4}$

(Additional variation at –40 ... +65 °C: $\Delta\ \overline{NF} < 0.3$ dB)

DTMA-UMTS-24-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

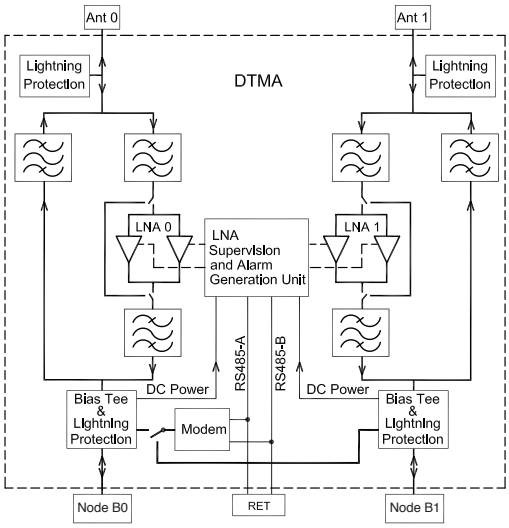
KATHREIN
Antennen · Electronic

- **Slimline design**
- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- AISG setting switchable as described on data sheet
- CWA and AISG configurations as described on data sheet
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

RET = **R**emote **E**lectrical **T**ilt
AISG = **A**ntenna **I**nterface **S**tandards **G**roup
CWA = **C**urrent **W**indow **A**larm

Technical Data

Type No.	78210613 DTMA-UMTS-24-AISG-CWA (24 dB gain)	
Tx Characteristics		
Frequency range	2110 – 2170 MHz	
Insertion loss	< 0.3 dB (typically 0.15 dB)	
Ripple	< 0.1 dB	
Input power (per input)	< 100 W (+50 dBm) CW / < 1.6 kW (+62 dBm) peak	
Intermodulation products in Rx band	< –117 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	1920 – 1980 MHz	
Loss in bypass mode	< 2.5 dB (DC OFF)	
Return loss	> 18 dB (DC ON) / > 12 dB (DC OFF)	
Gain	24 ±1.0 dB (+22 ... +28 °C) / 24 ±1.2 dB (– 40 ... +65 °C)	
Gain ripple	< ±0.3 dB	
Noise figure*	< 1.4 dB (+22 ... +28 °C)	
Output 1-dB compression point	> 18 dBm	
3rd order intercept point (OIP3)	> 25 dBm (typically 30 dBm)	
Environmental Characteristics		
Operating temperature range	–40 … +65 °C	
IP rating	IP67	
MTBF	> 1 000 000 hours (per TMA)	
EMC	According to ETS 300 342-3	
DC and Alarm Characteristics	**CWA Mode**	**AISG Mode**
DC supply	9 – 15 V	9 – 30 V
Operating current per TMA (without RET)	130 – 340 mA	Nom. 210 mA at 9 V Nom. 70 mA at 30 V
Alarm management	380 – 420 mA	AISG
Mechanical Characteristics		
Material	Aluminium housing	
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: not connected)	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	3.8 kg	
Packing size	262 x 502 x 214 mm	
Dimensions (w x h x d)	160 x 205 x 63 mm (without connectors, without mounting brackets)	



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

* Noise figure $\overline{NF} = \frac{NF_{1920\ MHz} + 2 \times NF_{1950\ MHz} + NF_{1980\ MHz}}{4}$

(Additional variation at –40 ... +60 °C: $\Delta\ \overline{NF} < 0.4$ dB)

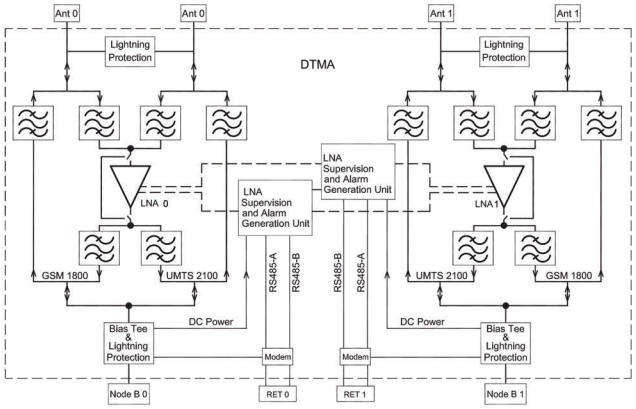
DTMA-1800-UMTS-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN
Antennen · Electronic

- **Compact line**
- Double unit for easy use with XXPol antennas
- Supports AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- DC Supply via Node B0, Node B1 or both
- Signaling
  Node B0: AISG communication with 1800 MHz BTS
  Node B1: AISG communication with 2100 MHz BTS

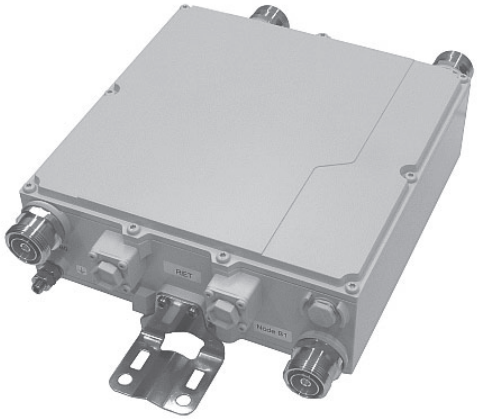
RET = **R**emote **E**lectrical **T**ilt
AISG = **A**ntenna **I**nterface **S**tandards **G**roup



Technical Data

Type No.	78210990 DTMA-1800-UMTS-12-AISG-D (12 dB gain)	
Tx Characteristics		
Frequency range	1805 – 1880 MHz	2110 – 2170 MHz
Insertion loss	Typ. 0.5 dB	Typ. 0.3 dB
Input power (per input)	< 100 W (+50 dBm)	
Intermodulation products in Rx band	< –117 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	1710 – 1785 MHz	1920 – 1980 MHz
Loss in bypass mode	Typically 2.3 dB (DC OFF)	
Return loss	> 16 dB (DC ON)	> 12 dB (DC OFF)
Gain	12 dB nominal	
Noise figure	Typ. 1.4 dB	Typ. 1.4 dB
3rd order intercept point (OIP3)	Typically 30 dBm	
Environmental Characteristics		
Operating temperature range	–40 … +65 °C	
IP rating	IP67*	
MTBF	> 1 000 000 hours (per TMA)	
EMC	According to ETS 300 342-3	
DC and Alarm Characteristics		
DC supply	10 – 30 V	
Operating current per DTMA (without RET)	Nom. 175 mA at 10 V Nom. 65 mA at 30 V	
Alarm management	AISG*	
Mechanical Characteristics		
Material	Aluminium housing	
Connectors RF	7-16 female (long neck)	
AISG	8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Dimensions (w x h x d)	220 x 220 x 80 mm (without connectors, without mounting brackets)	

* see note on data sheet



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734 360	34 – 60 mm
734 361	60 – 80 mm
734 362	80 – 100 mm
734 363	100 – 120 mm
734 364	120 – 140 mm
734 365	45 – 125 mm

DTMA-1800-UMTS-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

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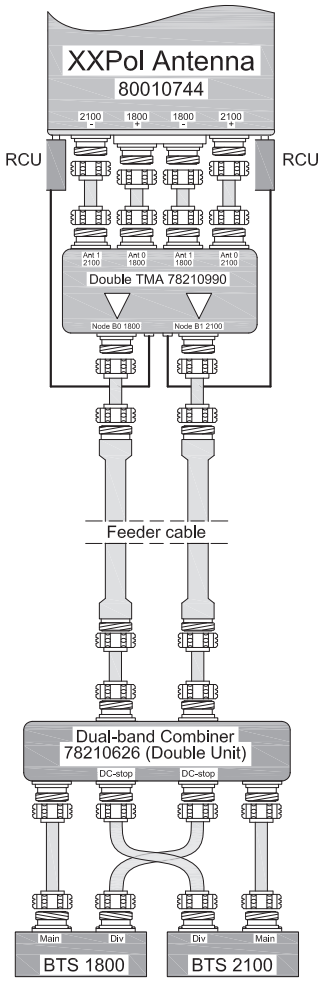
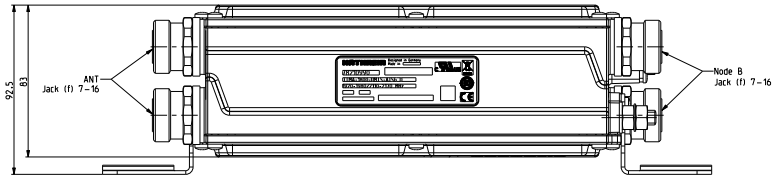
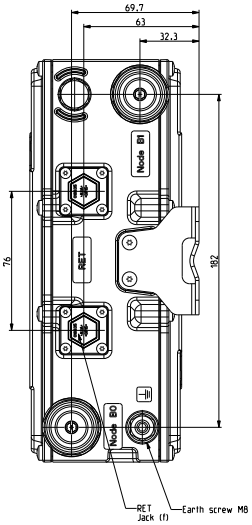
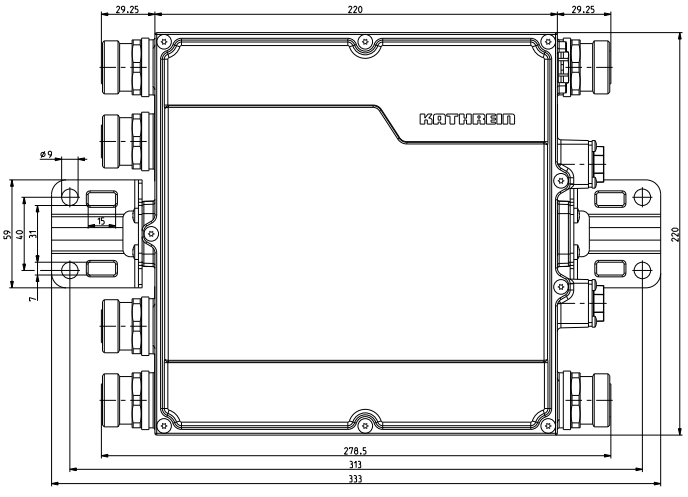
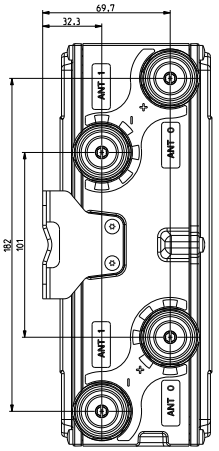


Application Example









DTMAs

DTMA-2600-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

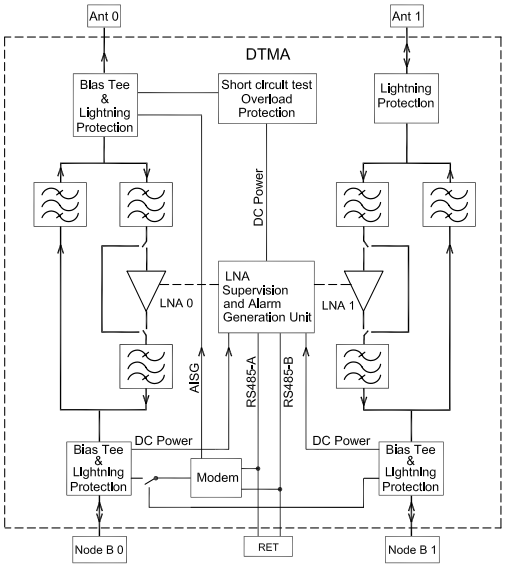
KATHREIN
Antennen · Electronic

- Double unit for easy use with XPol antennas
- Supports AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- DC/AISG bypass between ports “Node B0 or Node B1” and “Ant 0” for the support of RET integrated antennas (incl. short circuit protection)
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

RET = **R**emote **E**lectrical **T**ilt
AISG = **A**ntenna **I**nterface **S**tandards **G**roup

Technical Data

Type No.	78210860 DTMA-2600-12-AISG (12 dB gain)
Tx Characteristics	
Frequency range	2620 – 2690 MHz
Insertion loss	Typically 0.3 dB
Ripple	< 0.35 dB
Input power (per input)	< 100 W (+50 dBm) CW / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< –117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	2500 – 2570 MHz
Loss in bypass mode	Typically 2 dB
Return loss	> 18 dB (DC ON)
Gain	12 dB nominal
Noise figure	Typically 1.2 dB
Output 1-dB compression point	> 13 dBm
3rd order intercept point (OIP3)	Typically 30 dBm
Environmental Characteristics	
Operating temperature range	–40 … +65 °C
IP rating	IP67 (see note on data sheet)
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3
DC and Alarm Characteristics	
DC supply	10 – 30 V
Operating current per DTMA (without RET)	Nom. 175 mA at 10 V DC Nom. 70 mA at 30 V DC
Alarm management	AISG
Mechanical Characteristics	
Material	Aluminium housing
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	3.5 kg
Packing size	217 x 407 x 144 mm
Dimensions (w x h x d)	165.3 x 236.4 x 65.1 mm (without connectors, without mounting brackets)



Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm

Clamp Set

Subsidiaries/Affiliates

An actual list of Kathrein's current International Representatives can be found on our homepage: www.kathrein.de

Please contact for

Sales queries, orders, catalogues or CD-ROM:

Fax: +49 80 31 184-820
E-Mail: central.sales@kathrein.de

Technical Information:

Fax: +49 80 31 184-973
E-Mail: mobilcom@kathrein.de

9981.1767/1211/6/ZWT/MM Subject to alteration.

Internet: www.kathrein.de

KATHREIN-Werke KG · Phone +49 80 31 184-0 · Fax +49 80 31 184-973
Anton-Kathrein-Straße 1 – 3 · P.O. Box 10 04 44 · D-83004 Rosenheim · Germany

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