CATALOGUE 2016

68-520 MHz

Antennas and Antenna Line Products

MOBILE COMMUNICATION

KATHREIN

KATHREIN

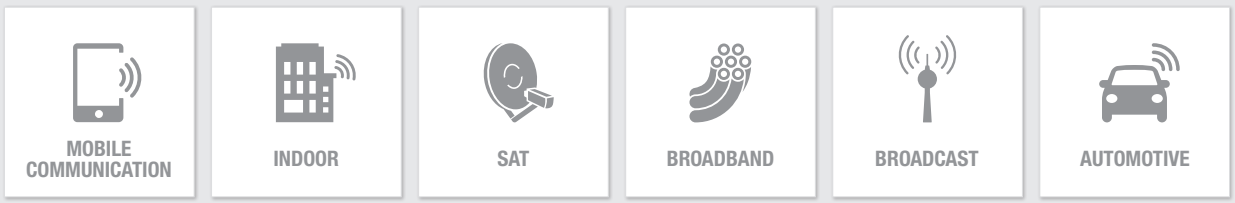
Who we are and what we stand for

Kathrein is a leading international specialist for reliable, high-quality communication technologies.

We are an innovation and technology leader in today's connected world. Our ability to provide solutions and systems enables people all over the world to communicate, access information and use media, whether at home, at the office or on the road. We cover a broad spectrum: from mobile communication, signal enhancement and data transmission in buildings, to fibre optic and cable networks and satellite reception technology, to radio and TV transmission and transmission and reception systems in vehicles.

As a hidden champion and family-owned enterprise, we have been working on the technologies of tomorrow since 1919. We take pride in our dedicated employees and our passion for customers and quality.

Our Solutions



Find out more about us at **www.kathrein.com**

Catalogue Issue 12/2015
All data published in previous catalogue issues hereby becomes invalid.
We reserve the right to make alterations in accordance with the requirements of our customers, therefore for binding data please check valid data sheets on our homepage:
www.kathrein.com

Please also see additional information on inside back cover.

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.

Our products are compliant to the EU Directive RoHS as well as to other environmentally relevant regulations (e.g. REACH).

Antennas

Directional Antennas	360–520 MHz	2 Ports 1 Port
Omnidirectional Antennas	370–470 MHz	1 Port
Indoor	370–470 MHz	1 Port
Electrical Accessories	Splitters and Tappers	
Mechanical Accessories	Clamps, Downtilt Kits, ...	
Technical Information		

Summary of Antenna Types

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The articles are listed by type number in numerical order.

Antenna Designs:
Antenna Families / RET-system
Distinguishing features

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Design	Small size and elegant design are the distinguishing features of Kathrein's antenna families.
Radome	The radomes cover the internal antenna components. Fiberglass material guarantees optimum performance with regards to stability, stiffness, UV resistance, painting and best 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
Large variety of half-power beam width, gain values	According to the antenna type selected, customer can choose from different half-power beam widths and different gain values.
Low intermodulation products (typ. <–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). Valid only where indicated in the catalogue!
Multi-functional installation hardware	Depending on the type, the antennas are equipped with up to 2 fixing points. Panels can be wall mounted without any additional hardware. For mast mounting, stainless steel 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).
Excellent grounding	The antennas are DC grounded according EN 50083-1.
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 / 3GPP standard, are compliant with the standard.
Omnidirectional Antennas: 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. Valid for Omnidirectional Antennas where indicated in the catalogue only.

Catalogue 2016 —>
Alterations to the Catalogue of 2015

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Not longer in the catalogue	Comments / Replacement
Directional Antennas 68–87.5 MHz	
K5319411	Can be ordered from Schomandl GmbH
K5319421	
K531741	
Directional Antennas 146–147 MHz	
K531921	Can be ordered from Schomandl GmbH
K531821	
K520721	
K523221	
Omnirectional Antennas 27–87.5 MHz	
K512472	Can be ordered from Schomandl GmbH
K5126411	
K5126421	
K5125421	
K552841	
Omnirectional Antennas 146–174 MHz	
K5125421	Can be ordered from Schomandl GmbH
K51262	
711530	
K552626	
K552627	
K552628	
K552921	
Electrical Accessories	
K5125421	Can be ordered from Schomandl GmbH
K51262	
Spare Parts (not part of the catalogue)	
K5125402	Can be ordered from Schomandl GmbH
K51264012	
K51264022	
K5126202	

Important Notice:

Starting 1st January 2016, the company Schomandl GmbH takes over our PMR product portfolio (2m/4m/8m Band applications).
The antennas indicated in the above list can now directly be ordered from Schomandl GmbH.
Our ALDs like e.g. Filter or Combiner are not affected by this change.

Please contact:

E-mail: sales@schomandl.com
Phone: +49 8106 – 3772510

For further information, please refer to www.schomandl.com

Summary – Directional Antennas 360 – 520 MHz

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Type					Type No.	Height [mm]	Input	Page
2-Port Antenna	380–500	65°	12dBi		741515	992	2 x 7-16 female	8
2-Port Antenna	380–470	65°	14dBi	0°–14°T	80010403	1999	2 x 7-16 female	9
2-Port Antenna	380–500	65°	15dBi		741516	2000	2 x 7-16 female	10
2-Port Antenna	380–470	68°	14.5dBi	6°T	742242	2000	2 x 7-16 female	11
2-Port Antenna	380–500	88°	10.5dBi		741517	1007	2 x 7-16 female	12
2-Port Antenna	380–500	88°	13.5dBi		741518	1997	2 x 7-16 female	13
1-Port Antenna	406–512	63°	9dBi		K733621	493	N female	14
1-Port Antenna	380–500	65°	12dBi		80010252	992	7-16 female	15
1-Port Antenna	380–500	65°	15dBi		80010253	2000	7-16 female	16
1-Port Antenna	380–430	115°	8.5dBi		739504	974	7-16 female	17
1-Port Antenna	380–430	115°	11.5dBi		739506	1934	7-16 female	18
1-Port Antenna	400–470	120°	9dBi		731291	992	7-16 female	19
1-Port LogPer	380–520	87°	9dBi		80010391	785	7-16 female	20
1-Port Corner	360–490	44°	11dBi		K731221	500	N female	21
1-Port RHCPol Helix	400–470	33°	12dBi		K735121	718	N female	22
Remote Electrical Tilt (RET) System								23

Panel 380–500
Dual Polarization X
Half-power Beam Width 65°

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2-Port Antenna 380–500 65° 12dBi

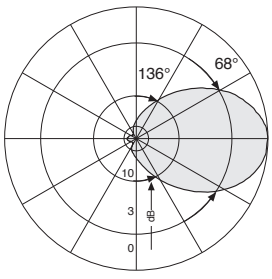
Type No.	741515	
	380–500	
Frequency range	380 – 430 MHz	430 – 500 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	11.5 dBi	12 dBi
Half-power beam width Copolar +45°/–45°	Horizontal: 68° Vertical: 37°	Horizontal: 65° Vertical: 32°
Front-to-back ratio	> 25 dB	
Isolation	> 30 dB	
Impedance	50 Ω	
VSWR	< 1.5	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	

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

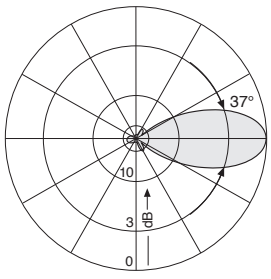
Ice protection: Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

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

380 – 430 MHz: +45°/–45° Polarization

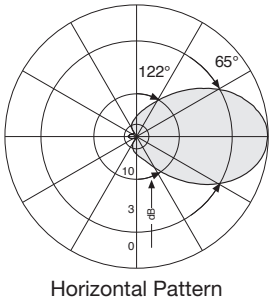


Horizontal Pattern

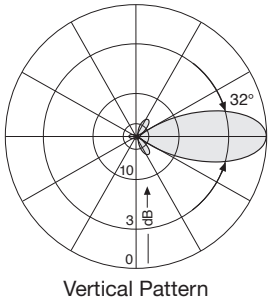


Vertical Pattern

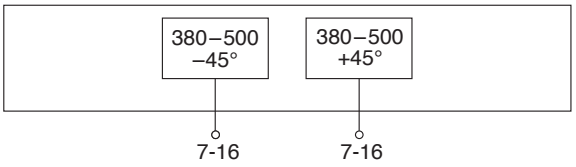
430 – 500 MHz: +45°/–45° Polarization



Horizontal Pattern



Vertical Pattern



Mechanical specifications	
Input	2 x 7-16 female
Connector position	Rearside
Wind load	Frontal: 500 N (at 150 km/h) Lateral: 220 N (at 150 km/h) Rearside: 715 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	992 / 492 / 190 mm
Category of mounting hardware	M (Medium)
Weight	12 kg
Packing size	1140 x 523 x 252 mm

For more information about additional mounting accessories please refer to page 51

Panel 380–470
Dual Polarization X
Half-power Beam Width 65°
Adjust. Electrical Downtilt 0°–14°

set by hand or by optional RCU (Remote Control Unit)

2-Port Antenna 380–470 65° 14dBi 0°–14°T

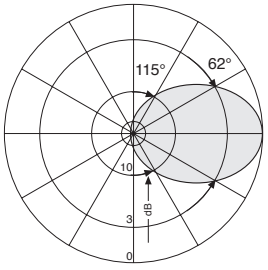
Type No.	80010403	
Frequency range	380–470	
	380 – 430 MHz	430 – 470 MHz
Polarization	+45°, –45°	+45°, –45°
Gain (dBi)	13.5 ... 13 ... 12.5	14 ... 13.5 ... 13
Tilt	0° ... 7° ... 14°	0° ... 7° ... 14°
Horizontal Pattern:		
Half-power beam width	66°	62°
Front-to-back ratio, copolar (180° ±30°)	> 25 dB	
Cross polar ratio 0°	Typically: 25 dB	
Maindirection ±60°	> 10 dB	
Vertical Pattern:		
Half-power beam width	22°	19°
Electrical tilt	0° – 14°, continuously adjustable	
Isolation	> 30 dB	
Impedance	50 Ω	
VSWR	< 1.5	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	400 W (at 50 °C ambient temperature)	

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

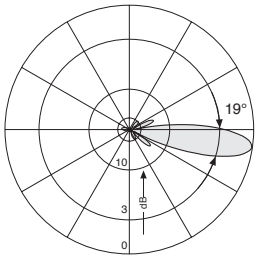
Ice protection: Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

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

430 – 470 MHz: +45°/–45° Polarization

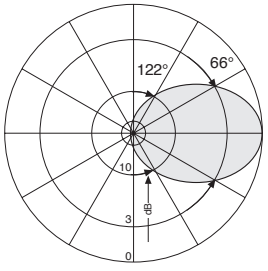


Horizontal Pattern

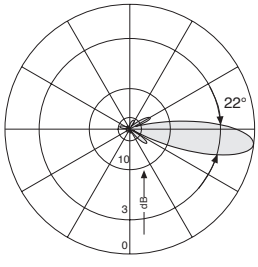


Vertical Pattern
0° – 14° electrical downtilt

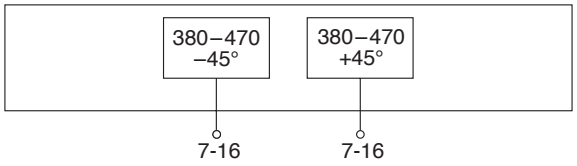
380 – 430 MHz: +45°/–45° Polarization



Horizontal Pattern



Vertical Pattern
0° – 14° electrical downtilt



Mechanical specifications	
Input	2 x 7-16 female
Connector position	Bottom
Adjustment mechanism	1 x, Position bottom continuously adjustable
Wind load	Frontal: 1160 N (at 150 km/h) Lateral: 480 N (at 150 km/h) Rearside: 1870 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	1999 / 575 / 199 mm
Category of mounting hardware	H (Heavy)
Weight	22 kg
Packing size	2250 x 640 x 225 mm

For more information about additional mounting accessories please refer to page 51

Panel 380–500
Dual Polarization X
Half-power Beam Width 65°

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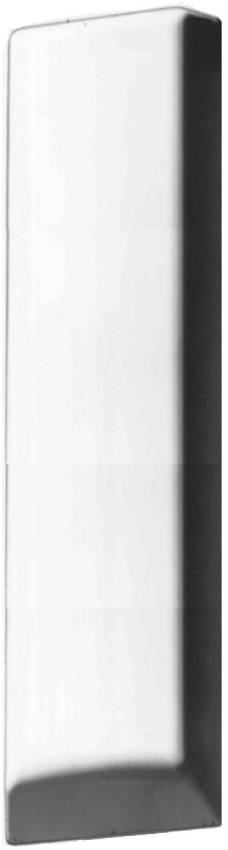
2-Port 380–500 65° 15dBi

Type No.	741516	
	380–500	
Frequency range	380 – 430 MHz	430 – 500 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	14.5 dBi	15 dBi
Half-power beam width Copolar +45°/–45°	Horizontal: 65° Vertical: 18°	
Front-to-back ratio	> 25 dB	
Isolation	> 30 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)	

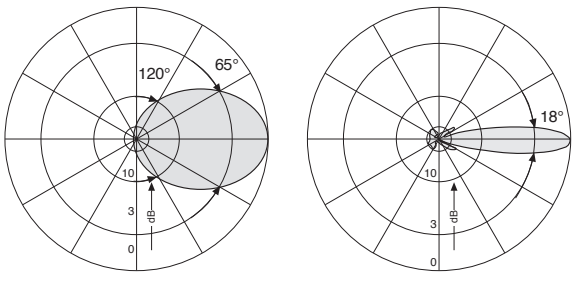


Material: Radiator: Tin-plated copper.
Reflector screen: Weather-proof aluminum.
Radome: Fiberglass, colour: Grey.
All screws and nuts: Stainless steel.

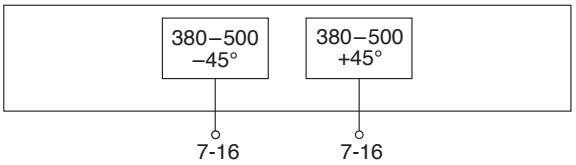
Ice protection: Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

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

+45°/–45° Polarization



Horizontal Pattern Vertical Pattern



Mechanical specifications	
Input	2 x 7-16 female
Connector position	Rearside
Wind load	Frontal: 1100 N (at 150 km/h) Lateral: 440 N (at 150 km/h) Rearside: 1540 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	2000 / 492 / 190 mm
Category of mounting hardware	H (Heavy)
Weight	19 kg
Packing size	2080 x 523 x 252 mm

For more information about additional mounting accessories please refer to page 51

Panel 380–470
Dual Polarization X
Half-power Beam Width 65°
Fixed Electrical Downtilt 6°

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2-Port Antenna 380–470 65° 14.5dBi 6°T

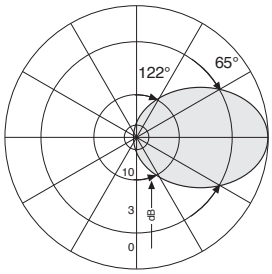
Type No.	742242	
Frequency range	380–470	
	380 – 430 MHz	430 – 470 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	2 x 14.5 dBi	2 x 14.7 dBi
Half-power beam width Copolar +45°/–45°	Horizontal: 68° Vertical: 18°	Horizontal: 65° Vertical: 17°
Electrical tilt	6°	6°
Front-to-back ratio, copolar	> 25 dB	> 24 dB
Isolation	> 30 dB	> 30 dB
Impedance	50 Ω	50 Ω
VSWR	< 1.5	< 1.5
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc
Max. power per input	500 W (at 50 °C ambient temperature)	

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

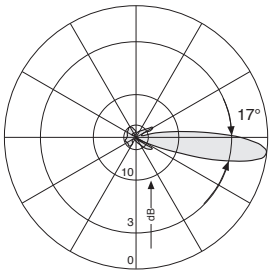
Ice protection: Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

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

430 – 470 MHz: +45°/–45° Polarization

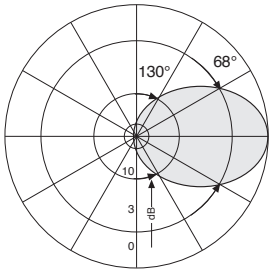


Horizontal Pattern

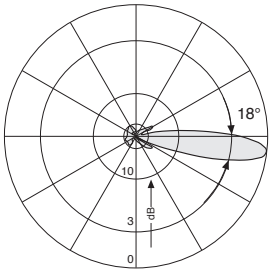


Vertical Pattern
6° electrical downtilt

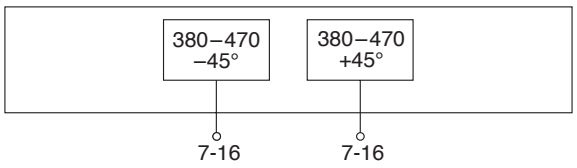
380 – 430 MHz: +45°/–45° Polarization



Horizontal Pattern



Vertical Pattern
6° electrical downtilt



Mechanical specifications	
Input	2 x 7-16 female
Connector position	Rearside
Wind load	Frontal: 1100 N (at 150 km/h) Lateral: 440 N (at 150 km/h) Rearside: 1540 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	2000 / 492 / 190 mm
Category of mounting hardware	H (Heavy)
Weight	19 kg
Packing size	2080 x 523 x 252 mm

For more information about additional mounting accessories please refer to page 51

Panel 380–500
Dual Polarization X
Half-power Beam Width 88°

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2-Port Antenna 380–500 88° 10.5dBi

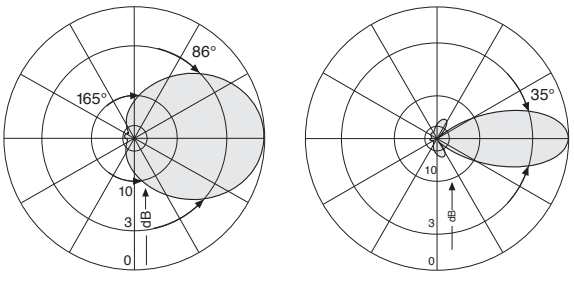
Type No.	741517	
	380–500	
Frequency range	380 – 430 MHz	430 – 500 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	2 x 10 dBi	2 x 10.5 dBi
Half-power beam width Copolar +45°/–45°	Horizontal: 88° Vertical: 40°	Horizontal: 86° Vertical: 35°
Front-to-back ratio, copolar	> 20 dB	> 20 dB
Isolation	> 30 dB	> 30 dB
Impedance	50 Ω	50 Ω
VSWR	< 1.5	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	

Material: Reflector screen: Weather-proof aluminum. Radome: Fiberglass, colour: Grey. All screws and nuts: Stainless steel.

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.

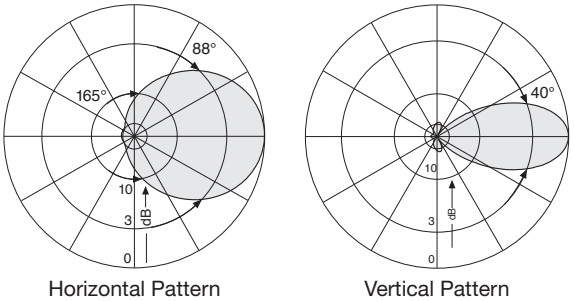
Grounding: The metal parts of the antenna including the mounting kit and the inner conductors are DC grounded.

430 – 500 MHz: +45°/–45° Polarization

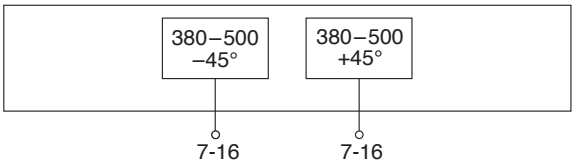


Horizontal Pattern Vertical Pattern

380 – 430 MHz: +45°/–45° Polarization



Horizontal Pattern Vertical Pattern



Mechanical specifications	
Input	2 x 7-16 female
Connector position	Bottom
Wind load	Frontal: 365 N (at 150 km/h) Lateral: 210 N (at 150 km/h) Rearside: 540 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	1007 / 317 / 193 mm
Category of mounting hardware	M (Medium)
Weight	10.5 kg
Packing size	1140 x 330 x 240 mm

For more information about additional mounting accessories please refer to page 51

Panel 380–500
Dual Polarization X
Half-power Beam Width 88°

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2-Port Antenna 380–500 88° 13.5dBi

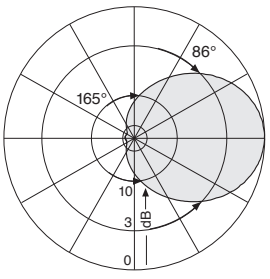
Type No.	741518	
	380–500	
Frequency range	380 – 430 MHz	430 – 500 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	2 x 13 dBi	2 x 13.5 dBi
Half-power beam width Copolar +45°/–45°	Horizontal: 88° Vertical: 20°	Horizontal: 86° Vertical: 17°
Front-to-back ratio, copolar	> 20 dB	> 20 dB
Isolation	> 30 dB	> 30 dB
Impedance	50 Ω	50 Ω
VSWR	< 1.5	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	

Material: Reflector screen: Weather-proof aluminum. Radome: Fiberglass, colour: Grey. All screws and nuts: Stainless steel.

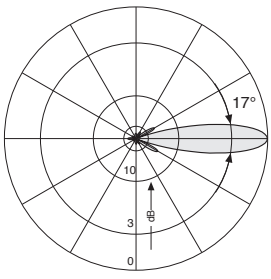
Ice protection: Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

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

430 – 500 MHz: +45°/–45° Polarization

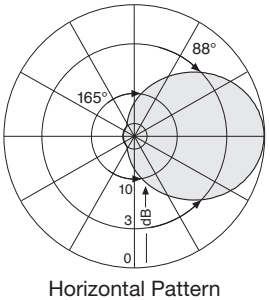


Horizontal Pattern

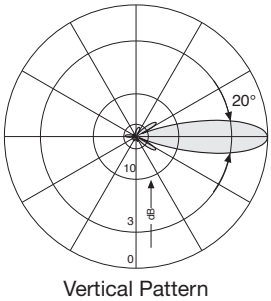


Vertical Pattern

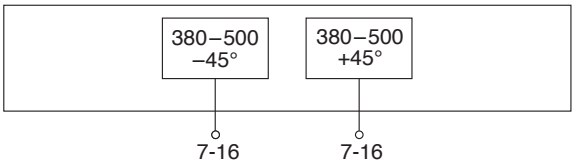
380 – 430 MHz: +45°/–45° Polarization



Horizontal Pattern



Vertical Pattern



Mechanical specifications	
Input	2 x 7-16 female
Connector position	Bottom
Wind load	Frontal: 800 N (at 150 km/h) Lateral: 480 N (at 150 km/h) Rearside: 1150 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	1997 / 317 / 193 mm
Category of mounting hardware	H (Heavy)
Weight	18.5 kg
Packing size	2130 x 330 x 240 mm

For more information about additional mounting accessories please refer to page 51

Panel
Vertical Polarization
Half-power Beam Width

406–512

V

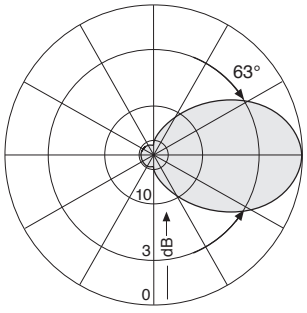
63°

KATHREIN

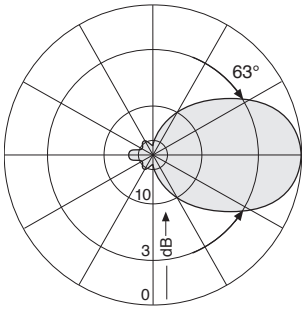
1-Port Antenna 406–512 63° 9dBi

Type No.	K733621
Frequency range	406 – 512 MHz
Polarization	Vertical
Gain	9 dBi
Half-power beam width	H-plane: 63° E-plane: 63°
Impedance	50 Ω
VSWR	< 1.4
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power per input	500 W (at 50 °C ambient temperature)

Arrays:	This antenna is especially suitable as a component in arrays to achieve various radiation patterns.
Scope of supply:	Antenna including two weather-proof covers for straight and elbow connector, but without mounting hardware.
Material:	Dipoles and reflector screen: Weather-resistant aluminum. Radome: Fiberglass, colour: White. All screws and nuts: Stainless steel.
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 including the mounting kit are DC grounded. The inner conductor is capacitively coupled.



Horizontal Pattern



Vertical Pattern

Mechanical specifications	
Input	N female
Connector position	Rearside
Wind load	Frontal: 220 N (at 150 km/h) Lateral: 90 N (at 150 km/h) Rearside: 330 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	493 / 493 / 206 mm
Category of mounting hardware	M (Medium)
Weight	6 kg
Packing size	620 x 510 x 275 mm

For more information about additional mounting accessories please refer to page 51

Multi-band Panel
Vertical Polarization
Half-power Beam Width

380–500

V

65°

KATHREIN

1-Port Antenna 380–500 65° 12dBi

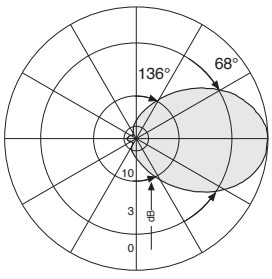
Type No.	80010252	
	380–500	
Frequency range	380 – 430 MHz	430 – 500 MHz
Polarization	Vertical	Vertical
Gain	11.5 dBi	12 dBi
Half-power beam width Copolar +45°/–45°	Horizontal: 68° Vertical: 37°	Horizontal: 63° Vertical: 32°
Front-to-back ratio	> 18 dB	> 20 dB
Impedance	50 Ω	
VSWR	< 1.5	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	

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

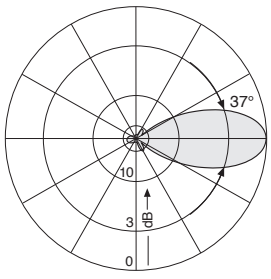
Ice protection: Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

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

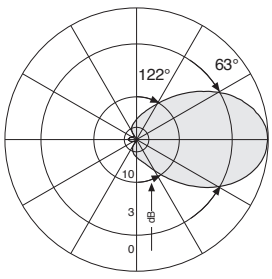
380 – 430 MHz



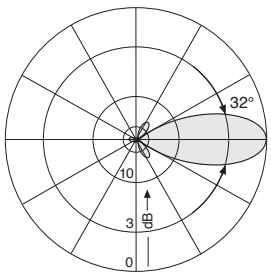
Horizontal Pattern



Vertical Pattern



Horizontal Pattern



Vertical Pattern

Mechanical specifications	
Input	1 x 7-16 female
Connector position	Rearside
Wind load	Frontal: 500 N (at 150 km/h) Lateral: 220 N (at 150 km/h) Rearside: 715 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	992 / 492 / 190 mm
Category of mounting hardware	M (Medium)
Weight	12 kg
Packing size	1140 x 523 x 252 mm

For more information about additional mounting accessories please refer to page 51

Multi-band Panel
Vertical Polarization
Half-power Beam Width

380–500

V

65°

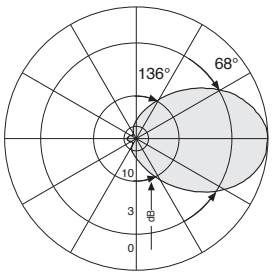
KATHREIN

1-Port Antenna 380–500 65° 15dBi

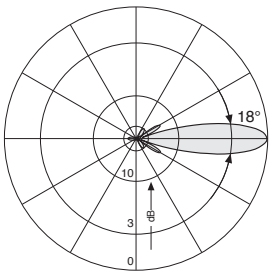
Type No.	80010253	
	380–500	
Frequency range	380 – 430 MHz	430 – 500 MHz
Polarization	Vertical	Vertical
Gain	14.5 dBi	15 dBi
Half-power beam width Copolar +45°/–45°	Horizontal: 68° Vertical: 18°	Horizontal: 63° Vertical: 16°
Front-to-back ratio	> 20 dB	
Impedance	50 Ω	
VSWR	< 1.5	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	

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

380 – 430 MHz

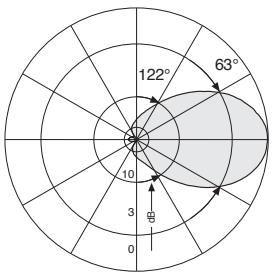


Horizontal Pattern

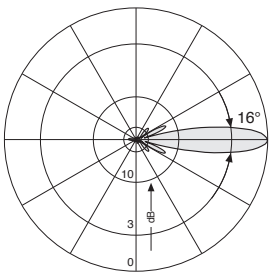


Vertical Pattern

430 – 500 MHz



Horizontal Pattern



Vertical Pattern

Mechanical specifications	
Input	1 x 7-16 female
Connector position	Rearside
Wind load	Frontal: 1100 N (at 150 km/h) Lateral: 440 N (at 150 km/h) Rearside: 1540 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	2000 / 492 / 190 mm
Category of mounting hardware	H (Heavy)
Weight	20 kg
Packing size	2080 x 523 x 252 mm

For more information about additional mounting accessories please refer to page 51

Panel
Vertical Polarization
Half-power Beam Width

380–430

V

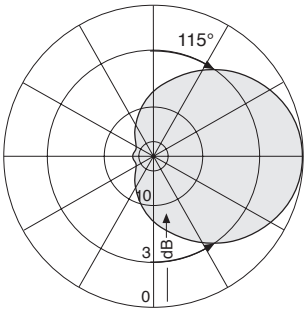
115°

KATHREIN

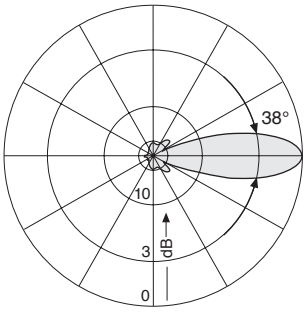
1-Port Antenna 380–430 115° 8.5dBi

Type No.	739504
Frequency range	380 – 430 MHz
Polarization	Vertical
Gain	8.5 dBi
Half-power beam width	Horizontal: 115° Vertical: 38°
Front-to-back ratio	> 18 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)

Material:	Reflector screen: Weather-proof aluminum. Radome: Fiberglass, colour: Grey. All screws and nuts: Stainless steel.
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.



Horizontal Pattern



Vertical Pattern

Mechanical specifications	
Input	1 x 7-16 female
Connector position	Bottom
Wind load	Frontal: 260 N (at 150 km/h) Lateral: 120 N (at 150 km/h) Rearside: 420 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	974 / 258 / 103 mm
Category of mounting hardware	M (Medium)
Weight	4.5 kg
Packing size	1102 x 272 x 160 mm

For more information about additional mounting accessories please refer to page 51

Panel
Vertical Polarization
Half-power Beam Width

380–430

V

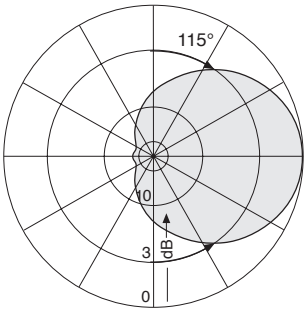
115°

KATHREIN

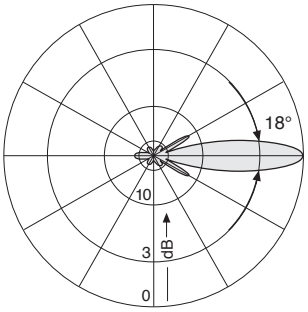
1-Port Antenna 380–430 115° 11.5dBi

Type No.	739506
Frequency range	380 – 430 MHz
Polarization	Vertical
Gain	11.5 dBi
Half-power beam width	Horizontal: 115° Vertical: 18°
Front-to-back ratio	> 18 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)

Material:	Reflector screen: Weather-proof aluminum. Radome: Fiberglass, colour: Grey. All screws and nuts: Stainless steel.
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.



Horizontal Pattern



Vertical Pattern

Mechanical specifications	
Input	1 x 7-16 female
Connector position	Rearside
Wind load	Frontal: 550 N (at 150 km/h) Lateral: 250 N (at 150 km/h) Rearside: 930 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	1934 / 258 / 103 mm
Category of mounting hardware	M (Medium)
Weight	9 kg
Packing size	2062 x 272 x 160 mm

For more information about additional mounting accessories please refer to page 51

Panel
Vertical Polarization
Half-power Beam Width

400–470

V

120°

KATHREIN

1-Port Antenna 400–470 120° 9dBi

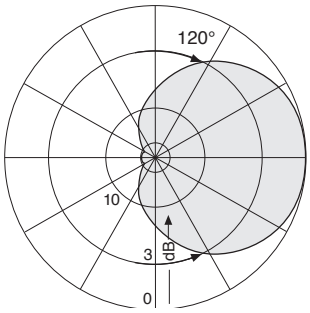
Type No.	731291
Frequency range	400 – 470 MHz
Polarization	Vertical
Gain	9 dBi
Half-power beam width	H-plane: 120° E-plane: 50°
Impedance	50 Ω
VSWR	< 1.5
Max. power per input	500 W (at 50 °C ambient temperature)

Scope of supply: Antenna including two weather-proof covers for straight and elbow connector, but without mounting hardware.

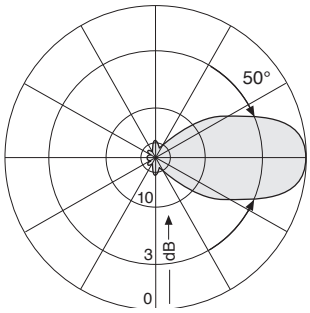
Material: Dipole system: Brass and copper.
Reflector screen: Weather-resistant aluminum.
Radome: Fiberglass, colour: White.
All screws and nuts: Stainless steel.

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.



Horizontal Pattern



Vertical Pattern

Mechanical specifications	
Input	1 x 7-16 female
Connector position	Rearside
Wind load	Frontal: 500 N (at 150 km/h) Lateral: 220 N (at 150 km/h) Rearside: 715 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	992 / 492 / 190 mm
Category of mounting hardware	M (Medium)
Weight	9 kg
Packing size	1145 x 505 x 255 mm

For more information about additional mounting accessories please refer to page 51

Logarithmic-periodic
Vertical Polarization
Half-power Beam Width

380–520

V

87°

KATHREIN

1-Port LogPer 380–520 87° 9dBi

Type No.	80010391		
Frequency range	380 – 410 MHz	410 – 470 MHz	470 – 520 MHz
Polarization	Vertical		
Gain	9.2 dBi	9 dBi	8.7 dBi
Half-power beam width	Horizontal: 80° Vertical: 61°	Horizontal: 85° Vertical: 60°	Horizontal: 88° Vertical: 59°
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)		

Scope of supply: Antenna with weather protective casing for straight connectors.

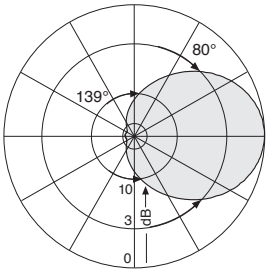
Material: Radiator: Weather resistant aluminium.
Radome: Fiberglass, colour: White.
All screws and nuts: Stainless steel.

Attachment: To tubular masts of 50 – 380 mm diameter depending on the separate available clamps.

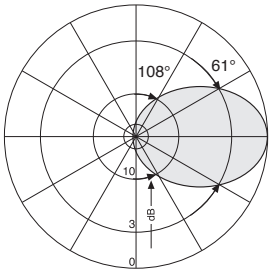
Ice protection: Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

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

380 – 410 MHz

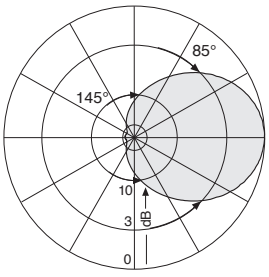


Horizontal Pattern

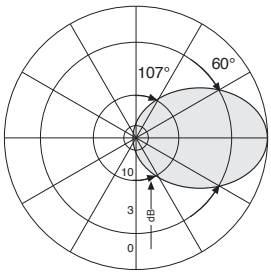


Vertical Pattern

410 – 470 MHz

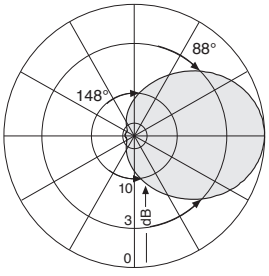


Horizontal Pattern

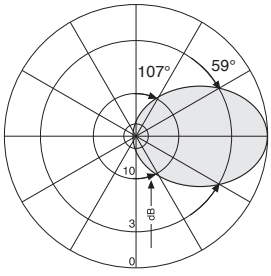


Vertical Pattern

470 – 520 MHz



Horizontal Pattern



Vertical Pattern

Mechanical specifications	
Input	7-16 female
Connector position	Rearside, pointing downwards
Wind load	Frontal: 54 N (at 150 km/h) Lateral: 150 N (at 150 km/h)
Max. wind velocity	180 km/h
Height/width/depth	785 / 400 / 400 mm
Weight	6 kg
Packing size	915 x 485 x 485 mm

For more information about additional mounting accessories please refer to page 51

Corner-reflector Antenna 360–490
Vertical Polarization V
Half-power Beam Width 44°

KATHREIN

1-Port Corner 360–490 44° 11dBi

Type No.	K731221
Frequency range	360 – 490 MHz
Polarization	Vertical
Gain	11 dBi
Half-power beam width	H-plane: 44° E-plane: 67°
Impedance	50 Ω
VSWR	< 1.5 at 360 – 490 MHz < 1.3 at 400 – 470 MHz
Max. power per input	180 W (at 50 °C ambient temperature)

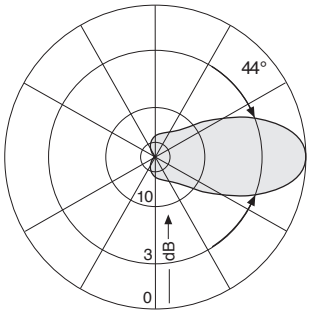
Scope of supply: Antenna with weather protective casing for straight connectors, mounting kit included.

Material: Radiator and reflector: Weather-resistant aluminum.
Mounting U-bold: Stainless steel.
All screws and nuts: Stainless steel.

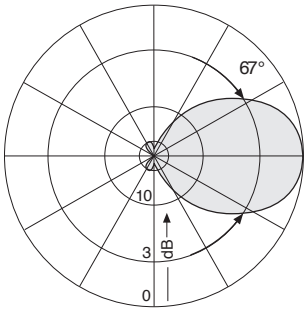
Attachment: To tubular masts of 30 – 54 mm diameter using supplied U-bolts.

Special features: The reflector screen folds together for transport.

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



Horizontal Pattern



Vertical Pattern

Mechanical specifications	
Input	N female
Wind load	140 N (at 150 km/h)
Max. wind velocity	150 km/h
Height/width/depth	500 / 1155 / 577 mm
Weight	2.8 kg
Packing size	842 x 524 x 187 mm

Helix Antenna
Right Handed Circular Polarization
Half-power Beam Width

400–470

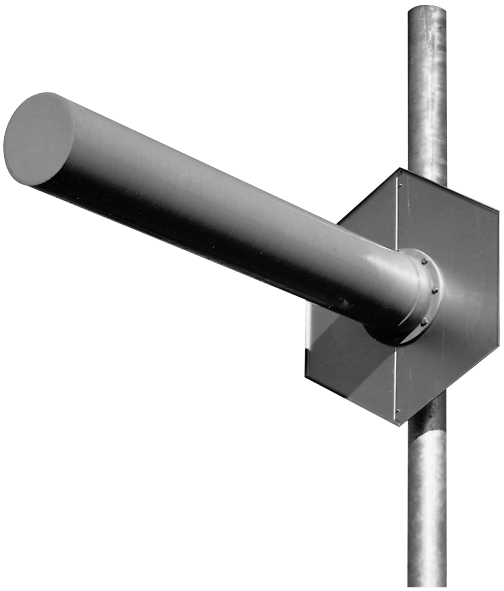
RHC

33°

KATHREIN

1-Port RHCPol Helix 400–470 33° 12dBi

Type No.	K735121
Frequency range	400 – 470 MHz
Polarization	Right handed circular
Gain	12 dBi (ref. to the circularly polarized isotropic antenna)
Half-power beam width	33°
Impedance	50 Ω
VSWR	< 1.2
Max. power per input	500 W (at 50 °C ambient temperature)



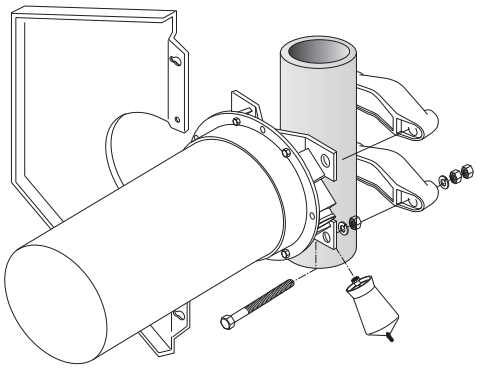
Scope of supply: Antenna with weather protective casing for straight connectors, mounting kit included.

Material: Antenna: Copper band helix in protective fiberglass tube, colour: Grey.
Reflector screen: Weather-resistant aluminum.
Attachment construction: Hot dip galvanized steel.
All screws and nuts: Stainless steel.

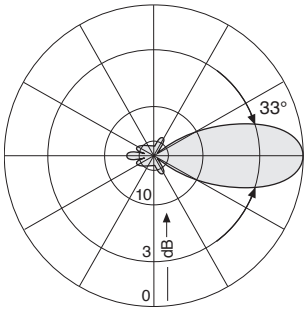
Attachment: To tubular masts of 60 – 125 mm diameter using supplied U-bolts.

Special features: The reflector screen is made of two parts and can be removed for transport.

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



Mounting Instructions



Relative field strength in mid-band

Mechanical specifications		
Input	N female	
Wind load	Frontal: Lateral:	450 N (at 150 km/h) 175 N (at 150 km/h)
Max. wind velocity	200 km/h	
Length / tube dia.	1540 / 204 mm	
Reflector diameter	718 mm	
Weight	12 kg	
Packing size	1684 x 388 x 277 mm	

Network planning is becoming ever more complicated, even for TETRA/TETRAPOL systems. The challenge for wireless network operators is to balance coverage, capacity, call quality and costs, in order to gain maximum revenue from their network.
The possibility of coverage adjustment through the vertical antenna pattern is thus a very important aspect for mobile communication planners. Kathrein's Remote Electrical Tilt (RET) system represents the latest antenna system technology.

RET components:
– Remote Control Unit (RCU)
– Central Control Unit (CCU)
– Control cable
– DC power and signal splitter
– Lightning protection device
– Earthing clamp

Advantage of Kathrein's RET system:
– Easy network extension as no special installation teams are required

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

AISG
Antenna Interface Standards Group

3GPP
A GLOBAL INITIATIVE

For further infomation please contact:
mobilcom@kathrein.de

Summary – Omnidirectional Antennas 370 – 470 MHz

KATHREIN

Type					Type No.	Height [mm]	Input	Page
1-Port Omni	370–430	360°	2dBi		737003	555	N female	26
1-Port Omni	406–470	360°	2dBi		K751121	510	N female	26
1-Port Omni	380–406	360°	5dBi		80010448	1400	7-16 female	27
1-Port Omni	380–400	360°	5dBi		K751537	1612	7-16 female	28
1-Port Omni	406–430	360°	5dBi		K7515211	1273	N female	29
1-Port Omni	440–470	360°	5dBi		K7515221	1144	N female	29
1-Port Omni	380–400	360°	7dBi		80010392	2104	7-16 female	30
1-Port Omni	406–430	360°	7dBi		728888	2016	7-16 female	31
1-Port Omni	440–470	360°	7dBi		721388	2016	N female	31
1-Port Omni	440–470	360°	7dBi		720880	2016	7-16 female	31
1-Port Omni	380–400	360°	7.5dBi		K751637	2840	7-16 female	32
1-Port Omni	380–400	360°	7.5dBi	8.5°T	737545	3282	7-16 female	33
1-Port Omni	380–400	360°	8dBi	5°T	80010434	3282	7-16 female	34
1-Port Omni	410–430	360°	8dBi	8.5°T	737546	3114	7-16 female	35
1-Port Omni	450–470	360°	8.5dBi		742155	3113	7-16 female	36
1-Port Omni	380–470	360°	4dBi		K752921	315	N female	37

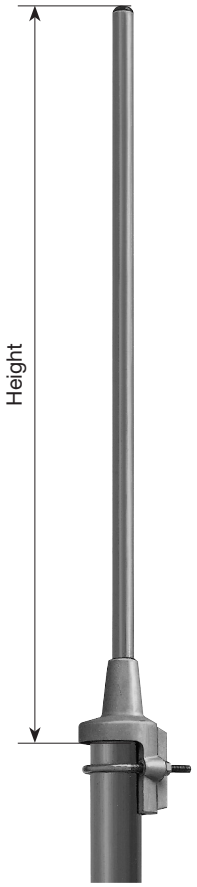
737003: 1-Port Omni 370–430 360° 2dBi
K751121: 1-Port Omni 406–470 360° 2dBi

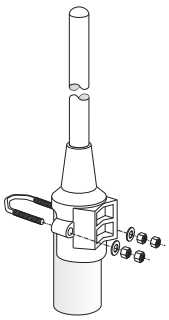
Type No.	737003	K751121
Frequency range	370 – 430 MHz	406 – 470 MHz
Polarization	Vertical	
Gain	2 dBi	
Impedance	50 Ω	
VSWR	370 – 380 MHz: < 1.6 380 – 430 MHz: < 1.5	< 1.5
Intermodulation IM3	< –150 dBc (2 x 37 dBm carrier)	
Max. power	100 W (at 50 °C ambient temperature)	

Material: Radiator: Brass.
Radome: Fiberglass, dia. 21 mm, colour: Grey.
Base: Aluminum.
Mounting U-bolt and all screws and nuts: Stainless steel.

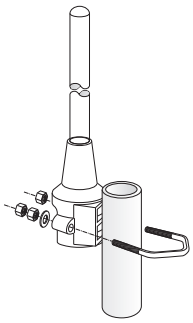
Mounting: The antenna can be attached in two ways with the supplied mounting kit:
1. On the tip of a tubular mast of 40 – 54 mm diameter (connecting cable runs inside the mast).
2. Laterally at the tip of a tubular mast of 20 – 54 mm diameter (connecting cable runs outside the mast).

Grounding: All metal parts of the antenna including the mounting kit are DC grounded.

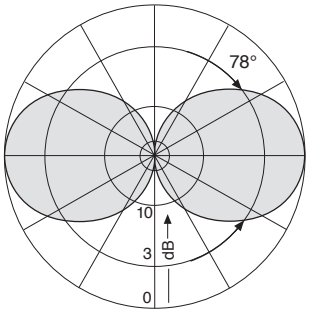




On the tip of a tubular mast



Laterally at the tip of a tubular mast



Vertical Pattern

Mechanical specifications	737003	K751121
Input	N female	
Connector position	Bottom	
Weight	1.0 kg	0.8 kg
Radome diameter	21 mm	
Wind load	20 N (at 150 km/h)	
Max. wind velocity	200 km/h	
Packing size [mm]	112 x 97 x 654	112 x 97 x 614
Height [mm]	555	515

Omnidirectional Antenna
Vertical Polarization

380–406

V

KATHREIN

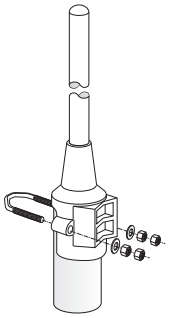
1-Port Omni 380–406 360° 5dBi

Type No.	80010448
Frequency range	380 – 406 MHz
Polarization	Vertical
Gain	5 dBi
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)

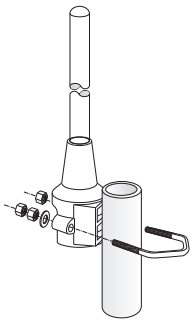
Material: Radiator: Brass.
Radome: Fiberglass colour: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

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).

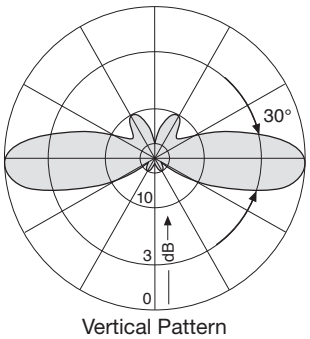
Grounding: All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded.



On the tip of a tubular mast



Laterally at the tip of a tubular mast



Vertical Pattern

Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Wind load	43 N (at 150 km/h)
Max. wind velocity	200 km/h
Height	1386 mm
Radome diameter	21 mm
Weight	1.5 kg
Packing size	112 x 97 x 1516 mm

Omnidirectional Antenna
Vertical Polarization

380–400

V

KATHREIN

1-Port Omni 380–400 360° 5dBi

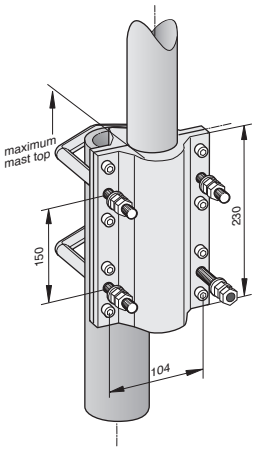
Type No.	K751537 602404
Frequency range	380 – 400 MHz
Polarization	Vertical
Gain	5 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power per input	500 W (at 50 °C ambient temperature)

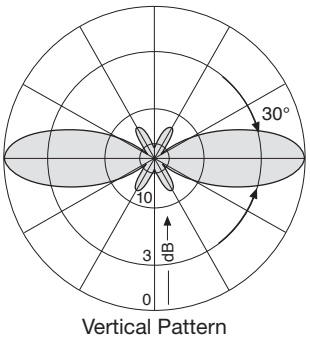
Material: Radiator: Copper and brass.
Radome: Fiberglass, colour: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

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

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 mm² copper.





Vertical Pattern

Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Wind load	140 N (at 150 km/h)
Max. wind velocity	200 km/h
Height	1612 mm
Radome diameter	51 mm
Weight	5.5 kg
Packing size	1878 x 206 x 152 mm

Side-mounting brackets see catalogue part “Mechanical Accessories”

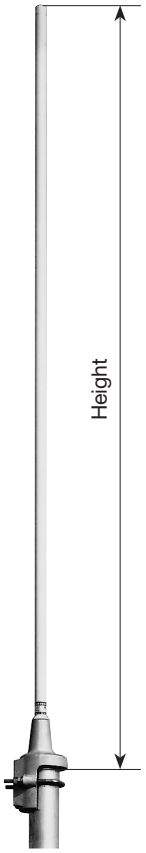
K7515211: 1-Port Omni 406–430 360° 5dBi
K7515221: 1-Port Omni 440–470 360° 5dBi

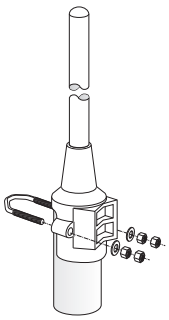
Type No.	K7515211 601379	K7515221 600770
Frequency range	406 – 430 MHz	440 – 470 MHz
Polarization	Vertical	
Gain	5 dBi	
Impedance	50 Ω	
VSWR	< 1.5	
Max. power	55 W (at 50 °C ambient temperature)	

Material: Radiator: Brass.
Radome: Fiberglass, dia. 21 mm, colour: Grey.
Base: Aluminum.
Mounting U-bolt and all screws and nuts: Stainless steel.

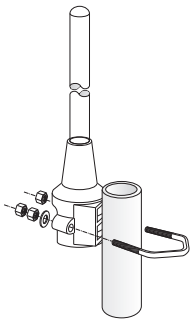
Mounting: The antenna can be attached in two ways with the supplied mounting kit:
1. On the tip of a tubular mast of 40 – 54 mm diameter (connecting cable runs inside the mast).
2. Laterally at the tip of a tubular mast of 20 – 54 mm diameter (connecting cable runs outside the mast).

Grounding: All metal parts of the antenna including the mounting kit are DC grounded.

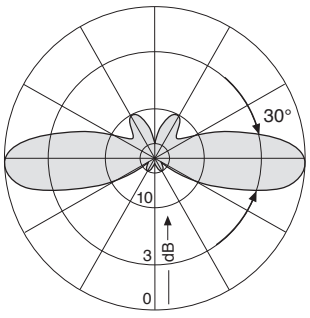




On the tip of a tubular mast



Laterally at the tip of a tubular mast



Vertical Pattern

Mechanical specifications	K7515212	K7515221
Input	N female	
Connector position	Bottom	
Weight	1.2 kg	
Wind load	40 N (at 150 km/h)	35 N (at 150 km/h)
Max. wind velocity	200 km/h	
Packing size [mm]	1350 x 110 x 100	1250 x 110 x 100
Height [mm]	1273	1144

Omnidirectional Antenna
Vertical Polarization

380–400

V

KATHREIN

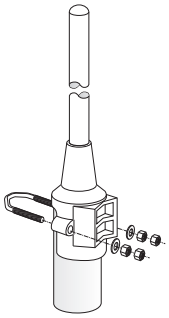
1-Port Omni 380–400 360° 7dBi

Type No.	80010392
Frequency range	380 – 400 MHz
Polarization	Vertical
Gain	7 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power per input	200 W (at 50 °C ambient temperature)

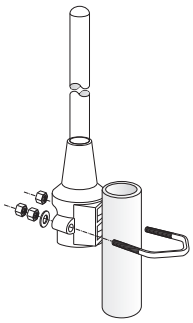
Material: Radiator: Brass.
Radome: Fiberglass colour: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

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).

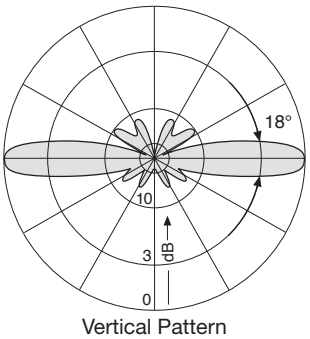
Grounding: All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded.



On the tip of a tubular mast



Laterally at the tip of a tubular mast



Vertical Pattern

Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Wind load	60 N (at 150 km/h)
Max. wind velocity	180 km/h
Height	2104 mm
Radome diameter	21 mm
Weight	1.9 kg
Packing size	112 x 97 x 2226 mm

Side-mounting brackets see catalogue part “Mechanical Accessories”

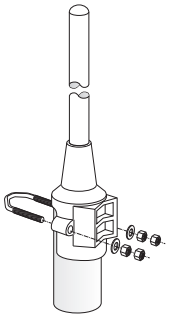
721388, 720880: 1-Port Omni 440–470 360° 7dBi
728888: 1-Port Omni 406–430 360° 7dBi

Type No.	721388 / 720880	728888
Frequency range	440 – 470 MHz	406 – 430 MHz
Polarization	Vertical	
Gain	7 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)	

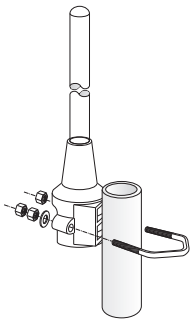
Material: Radiator: Brass.
Radome: Fiberglass colour: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

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).

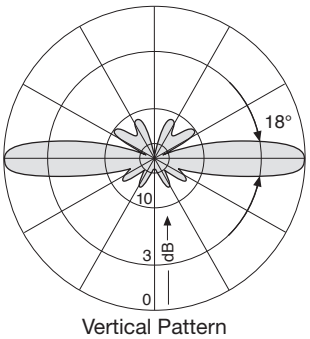
Grounding: All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded.



On the tip of a tubular mast



Laterally at the tip of a tubular mast



Vertical Pattern

Mechanical specifications

N female / 7-16 female	721388 / 720880	728888
Connector position	Bottom	
Wind load	60 N (at 150 km/h)	
Max. wind velocity	200 km/h	
Height	2016 mm	
Radome diameter	21 mm	
Weight	1.6 kg	
Packing size	112 x 97 x 2124 mm	

Omnidirectional Antenna
Vertical Polarization

380–400

V

KATHREIN

1-Port Omni 380–400 360° 7.5dBi

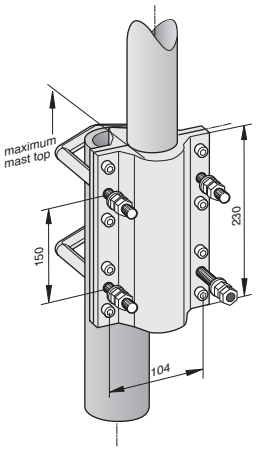
Type No.	K751637 602397
Frequency range	380 – 400 MHz
Polarization	Vertical
Gain	7.5 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power per input	500 W (at 50 °C ambient temperature)

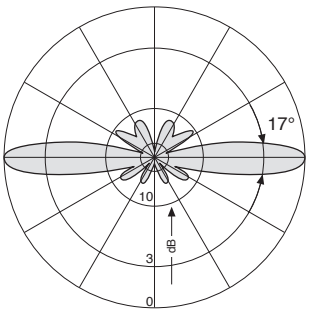
Material: Radiator: Copper and brass.
Radome: Fiberglass, colour: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

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

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 mm² copper.





Vertical Pattern

Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Wind load	200 N (at 150 km/h)
Max. wind velocity	200 km/h
Height	2840 mm
Radome diameter	51 mm
Weight	8.0 kg
Packing size	3316 x 148 x 112 mm

Side-mounting brackets see catalogue part “Mechanical Accessories”

Omnidirectional Antenna
Vertical Polarization
Fixed Electrical Downtilt

380–400

V

8.5°

KATHREIN

1-Port Omni 380–400 360° 7.5dBi 8.5°T

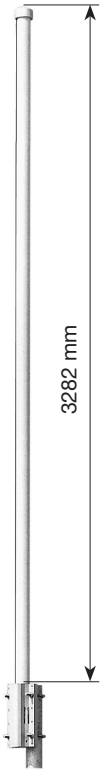
Type No.	737545
Frequency range	380 – 400 MHz
Polarization	Vertical
Gain	7.5 dBi
Electrical tilt	8.5°, fixed
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power per input	500 W (at 50 °C ambient temperature)

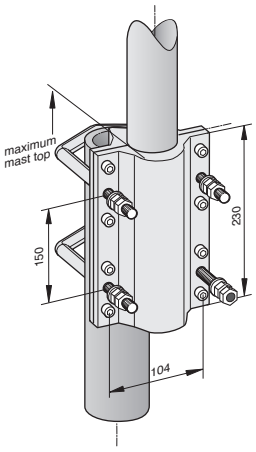
Material: Radiator: Copper and brass.
Radome: Fiberglass, colour: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

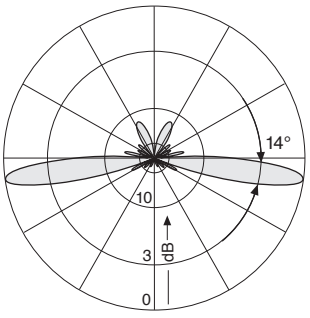
Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

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 mm² copper.







Vertical Pattern
8.5° electrical downtilt

Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Wind load	230 N (at 150 km/h)
Max. wind velocity	180 km/h
Height	3282 mm
Radome diameter	51 mm
Weight	8.0 kg
Packing size	3550 x 148 x 112 mm

Omnidirectional Antenna
Vertical Polarization
Fixed Electrical Downtilt

380–400

V

5°

KATHREIN

1-Port Omni 380–400 360° 8dBi 5°T

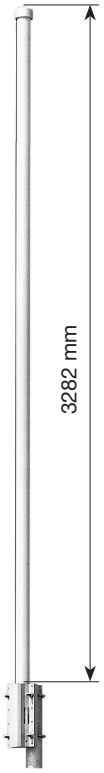
Type No.	80010434
Frequency range	380 – 400 MHz
Polarization	Vertical
Gain	8 dBi
Electrical tilt	5°, fixed
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power per input	500 W (at 50 °C ambient temperature)

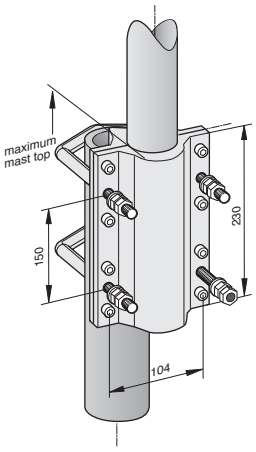
Material: Radiator: Copper and brass.
Radome: Fiberglass, colour: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

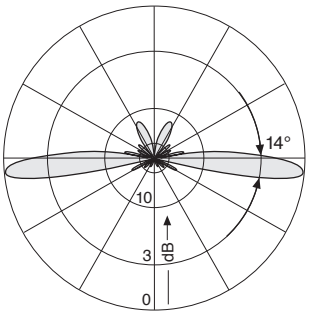
Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).

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 mm² copper.







Vertical Pattern
5° electrical downtilt

Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Wind load	230 N (at 150 km/h)
Max. wind velocity	180 km/h
Height	3282 mm
Radome diameter	51 mm
Weight	8.5 kg
Packing size	3550 x 148 x 112 mm

Side-mounting brackets see catalogue part “Mechanical Accessories”

Omnidirectional Antenna
Vertical Polarization
Fixed Electrical Downtilt

410–430

V

8.5°

KATHREIN

1-Port Omni 410–430 360° 8dBi 8.5°T

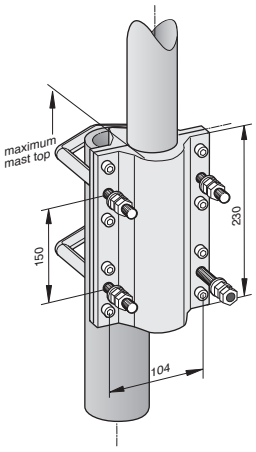
Type No.	737546
Frequency range	410 – 430 MHz
Polarization	Vertical
Gain	8 dBi
Electrical tilt	8.5°, fixed
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power per input	500 W (at 50 °C ambient temperature)

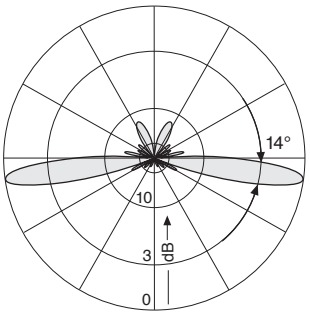
Material: Radiator: Copper and brass.
Radome: Fiberglass, colour: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

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

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 mm² copper.





Vertical Pattern
8.5° electrical downtilt

Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Wind load	220 N (at 150 km/h)
Max. wind velocity	180 km/h
Height	3114 mm
Radome diameter	51 mm
Weight	8.0 kg
Packing size	3376 x 196 x 102 mm

Omnidirectional Antenna
Vertical Polarization

450–470

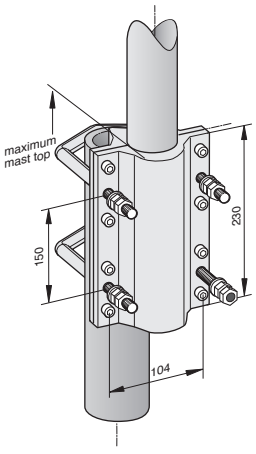
V

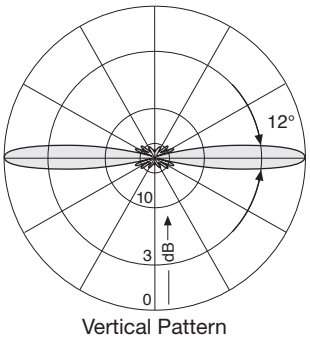
KATHREIN

1-Port Omni 450–470 360° 8.5dBi

Type No.	742155
Frequency range	450 – 470 MHz
Polarization	Vertical
Gain	8.5 dBi
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)

Material:	Radiator: Copper and brass. Radome: Fiberglass, colour: 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 50 – 94 mm diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).
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 mm² copper.





Vertical Pattern

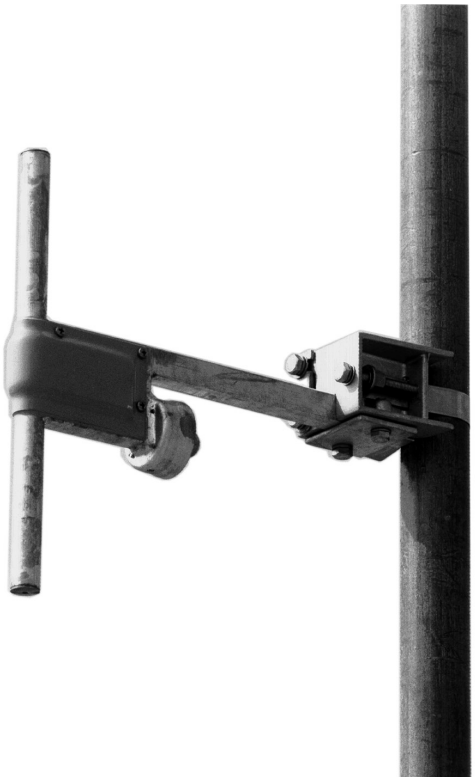
Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Wind load	220 N (at 150 km/h)
Max. wind velocity	180 km/h
Height	3113 mm
Radome diameter	51 mm
Weight	8.0 kg
Packing size	3379 x 206 x 152 mm

Side-mounting brackets see catalogue part “Mechanical Accessories”

Half-wave Dipole Side-mounted 380–470
Vertical Polarization V

KATHREIN

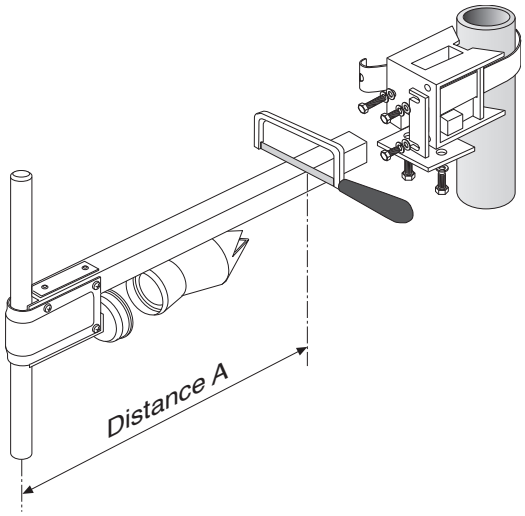
- Omnidirectional antenna with variable antenna-to-mast distance.
- Depending on the distance of the radiator from the mast edge and also on the mast diameter, various radiation patterns can be achieved.

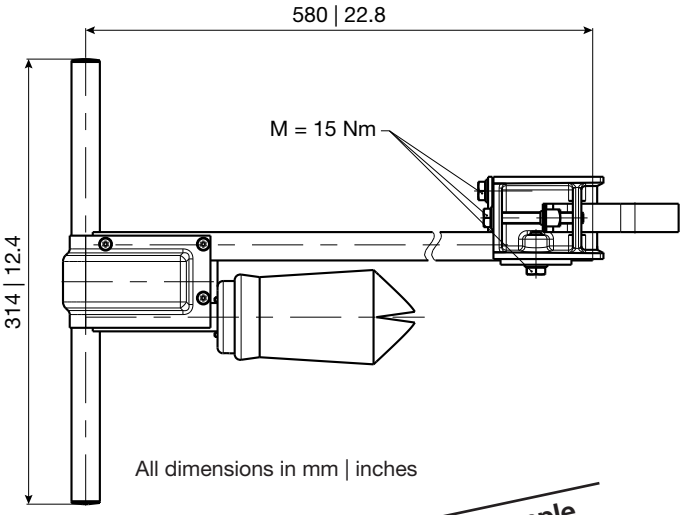


1-Port Omni 380–470 360° 4dBi

Type No.		K752921 600773
Frequency range	MHz	380 – 470
Polarization		Vertical
Gain	dBi	4
Impedance	Ω	50
VSWR		400 – 470 MHz: < 1.5 380 – 400 MHz: < 1.5; A = λ/4 380 – 400 MHz: < 2.0; A > λ/4
Max. power per input	W	450 (at 50 °C ambient temperature)

Material:	Radiator: Hot-dip galvanized steel. Horizontal support pipe: Stainless steel. Mount: Aluminum. Tightening band and all screws and nuts: Stainless steel. Feedpoint radome: Fiberglass.
Attachment:	To tubular masts of 60–320 mm | 2.4–12.6 inches diameter using supplied stainless steel tightening band (20 mm wide, 0.8 mm gauge) | (0.8 inches wide, 0.03 inches gauge).
Special features:	The distance from tubular mast to radiator is adjustable from 170–580 mm | 6.7–22.8 inches.
Grounding:	All metal parts of the antenna including the inner conductor and the supplied mount are DC grounded.
Horizontal radiation pattern:	Depending on the distance A (edge of pipe mast to dipole) – see sketch.





All dimensions in mm | inches

For worked sample please refer to page 64

Mechanical specifications		
Input		N female
Wind load (at 150 km/h)	N lbf	40 9
Max. wind velocity	km/h mph	200 124
Length	mm inches	315 12.4
Weight	kg lb	1.6 3.5
Packing size	mm inches	880 x 330 x 100 34.6 x 13.0 x 3.9

Summary – Indoor Antennas
Vertical Polarization

KATHREIN

Type				Type No.	Height [mm]	Input	Page
Indoor Omnidirectional Antennas – Single-band							
1-Port Omni	370–430	360°	2dBi	737003	555	N female	26
1-Port Omni	380–405	360°	2dBi	80010277	77	N female	40
1-Port Omni	405–430	360°	2dBi	80010339	77	N female	40
1-Port Indoor	406–430	360°	2dBi	737299	400	cable termination	41
1-Port Omni	406–470	360°	2dBi	K751121	510	N female	26
1-Port Omni	450–470	360°	2dBi	80010632	77	N female	40
1-Port Indoor	450–470	360°	2dBi	736831	360	cable termination	42
Indoor Directional Antennas – Single-band							
1-Port Indoor	380–405	90°	7dBi	80010278	302	N female	43
1-Port Indoor	405–430	90°	7dBi	80010330	302	N female	43
1-Port Indoor	440–470	90°	7dBi	80010633	302	N female	43

Indoor Omnidirectional Antennas
Vertical Polarization

380...470

V

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• The antennas need no additional groundplane.

80010277: 1-Port Indoor 380–405 360° 2dBi
80010339: 1-Port Indoor 405–430 360° 2dBi
80010632: 1-Port Indoor 450–470 360° 2dBi

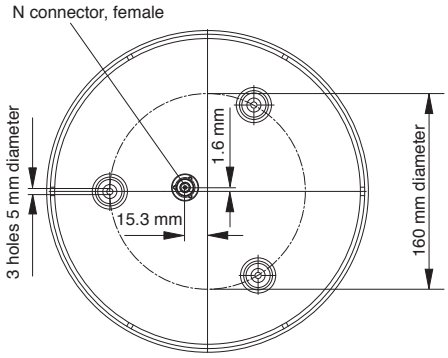
Type No.	80010277	80010339	80010632
Frequency range	380 – 405 MHz	405 – 430 MHz	450 – 470 MHz
Polarization	Vertical	Vertical	Vertical
Gain	Approx. 2 dBi	Approx. 2 dBi	Approx. 2 dBi
Impedance	50 Ω	50 Ω	50 Ω
VSWR	< 2.0	< 2.0	< 2.0
Max. power	50 W (at 50 °C ambient temperature)		
Input	1 x N female		
Protection class	IP 30		
Weight	429 g		
Packing size	267 x 267 x 114 mm		
Diameter	258 mm		
Height	77 mm (without connector)		

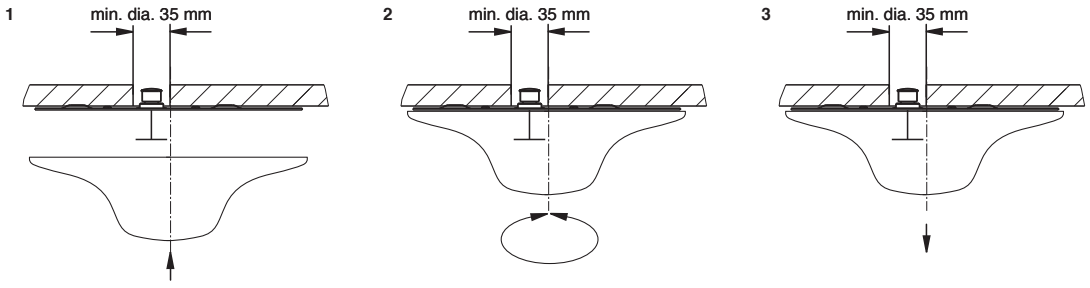
Material: Reflector: Aluminium.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.

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.

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

Available accessories: Power splitters (380 – 512 MHz)





Press radome against installed reflector.

Rotate radome until it locks in place.

Pull downwards to remove radome.

1-Port Indoor 406–430 360° 2dBi

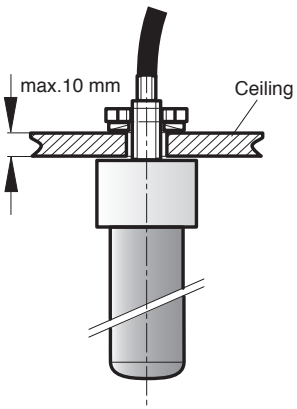
Type No.	737299
Frequency range	406 – 430 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	< 1.5
Max. power per input	50 W (at 50 °C ambient temperature)

Material: Dipole: Brass.
Radome: Fiberglass, colour: White.
Additional mounting plate: Aluminum.

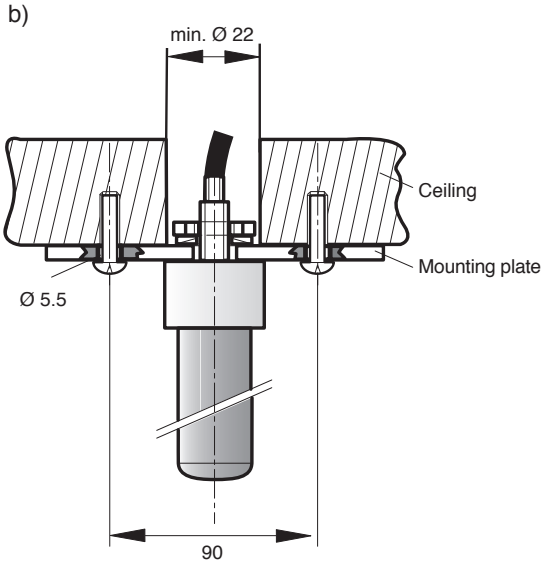
Mounting:
a) Single-hole mounting (12 mm diameter) on surface of up to 10 mm thickness.
b) On surfaces of more than 10 mm thickness, by means of mounting plate included in the scope of delivery.

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

a)



b)



Mechanical specifications	
Input	Cable RG 58/CU of 1 m length, grey, connector is not supplied
Height	400 mm
Radome diameter	20 mm
Mounting plate	115 x 25 mm
Weight	0.25 kg
Packing size	Foil: 650 x 130 mm

Indoor Omnidirectional Antenna Vertical Polarization

450–470

V

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1-Port Indoor 450–470 360° 2dBi

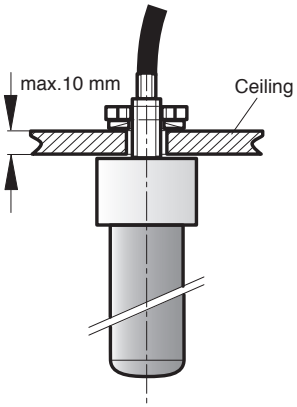
Type No.	736831
Frequency range	450 – 470 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	< 1.5
Max. power per input	50 W (at 50 °C ambient temperature)

Material: Dipole: Brass.
Radome: Fiberglass, colour: White.
Additional mounting plate: Aluminum.

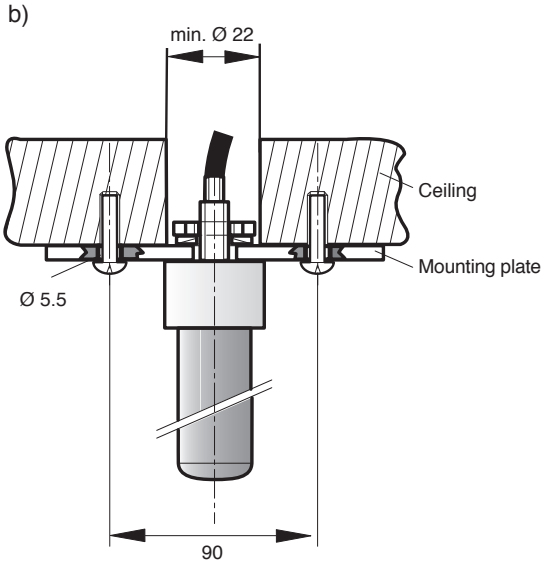
Mounting:
a) Single-hole mounting (12 mm diameter) on surface of up to 10 mm thickness.
b) On surfaces of more than 10 mm thickness, by means of mounting plate included in the scope of delivery.

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

a)



b)



Mechanical specifications	
Input	Cable RG 58/CU of 1 m length, grey, connector is not supplied
Height	360 mm
Radome diameter	20 mm
Mounting plate	115 x 25 mm
Weight	0.23 kg
Packing size	Foil: 650 x 130 mm

Indoor Directional Antennas 380...470
Vertical Polarization V
Half-power Beam Width 90°

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80010278: 1-Port Indoor 380–405 90° 7dBi
80010330: 1-Port Indoor 405–430 90° 7dBi
80010633: 1-Port Indoor 450–470 90° 7dBi

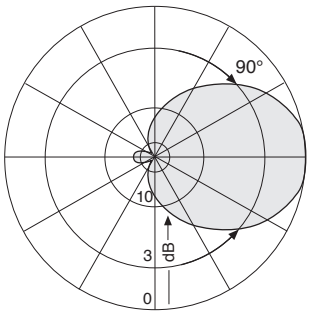
Type No.	80010278	80010330	80010633
Frequency range	380 – 405 MHz	405 – 430 MHz	450 – 470 MHz
Polarization	Vertical	Vertical	Vertical
Gain	Approx. 7 dBi	Approx. 7 dBi	Approx. 7 dBi
Half-power beam width	Horizontal: Approx. 90°	Horizontal: Approx. 90°	Horizontal: Approx. 90°
Impedance	50 Ω	50 Ω	50 Ω
VSWR	< 2.0	< 2.0	< 2.0
Max. power	50 W (at 50 °C ambient temperature)		
Input	N female connector		
Protection class	IP 30		
Weight	1390 g		
Packing size	315 x 252 x 62 mm		
Height/width/depth	302 x 243 x 50 mm		

Material: Reflector: Copper.
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.

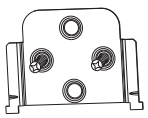
Grounding: All metal parts including the inner conductor are DC grounded.

Available accessories: Power splitters (380 – 512 MHz)

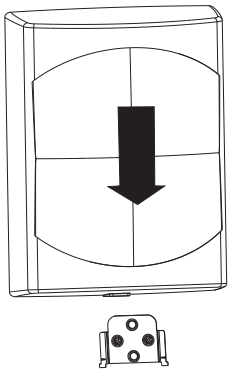


Horizontal Pattern

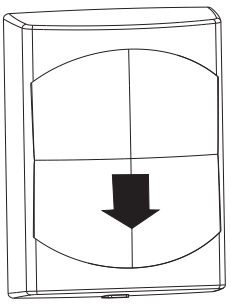
Mounting:



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 down to the stop.

Summary – Electrical Accessories 380...5920 MHz

KATHREIN

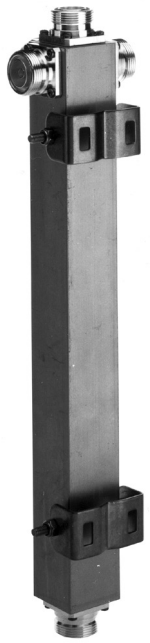
Type		Type No.	Frequency Range	Height	Input	Max. Power	Page
Splitters: 450 MHz							
2-way Splitter	450 MHz	K6320221	380 – 512 MHz	409 mm	N female	500 W	46
2-way Splitter	450 MHz	K6320227	380 – 512 MHz	409 mm	7-16 female	1000 W	46
3-way Splitter	450 MHz	K6320231	380 – 512 MHz	409 mm	N female	500 W	46
3-way Splitter	450 MHz	K6320237	380 – 512 MHz	409 mm	7-16 female	1000 W	46
4-way Splitter	450 MHz	K6320241	380 – 512 MHz	409 mm	N female	500 W	46
4-way Splitter	450 MHz	K6320247	380 – 512 MHz	409 mm	7-16 female	1000 W	46
Splitters: 380–3800 MHz							
2-way Splitter	380 MHz	86010130	380 – 3800 MHz	275 mm	N female	200 W	47
2-way Splitter	380 MHz	86010131	380 – 3800 MHz	275 mm	7-16 female	700 W	47
Tappers: Continuously adjustable ratio							
Multi-band Tapper 380–960/1695–2700/ 3400–3800/4920–5920 5.0–20.0dB		86010160	380 – 960 MHz 1695 – 2700 MHz 3400 – 3800 MHz 4920 – 5920 MHz	160 mm	N female	100 W	48

For outdoor and indoor use.
2-way Splitter 390/420/450
3-way Splitter 390/420/450
4-way Splitter 390/420/450

Type No.	K6320221 602383	K6320227 602384	K6320231 602385	K6320237 602386	K6320241 602387	K6320247 602388
Connector (female)	N	7-16	N	7-16	N	7-16
Max. power	500 W	1000 W	500 W (at 50 °C ambient temperature)	1000 W	500 W	1000 W
For connecting ... antennas	2		3		4	
Frequency range	380 – 512 MHz					
VSWR	< 1.1					
Impedance	50 Ω					
Insertion loss	< 0.05 dB					
Max. size	409 x 82 x 82 mm					
Packing size	425 x 93 x 107 mm					

Material: Case: Aluminum.
Inner conductor: Brass.

Mounting: Bracket for wall mounting included in the scope of supply.
For mounting to tubular masts use clamps as listed below (order separately).



K6320247

Clamps (order separately)

Type	Description	Remarks
734360	2 clamps	Mast: 30 – 55 mm diameter
734361	2 clamps	Mast: 55 – 75 mm diameter
734362	2 clamps	Mast: 75 – 95 mm diameter
734363	2 clamps	Mast: 95 – 115 mm diameter
734364	2 clamps	Mast: 115 – 135 mm diameter

734364

Low-loss Power Splitters Multi-band

KATHREIN

For indoor and outdoor use.

2-way Splitter 380–3800

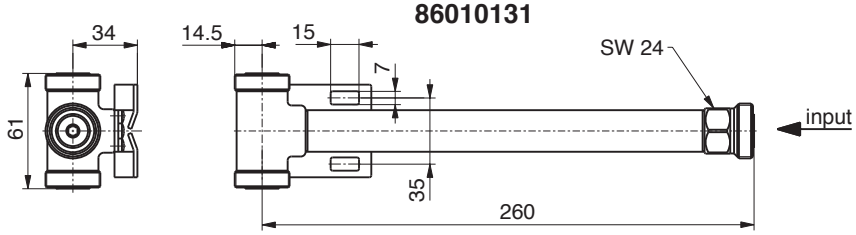
Type No.	86010130	86010131
Connector (female)	N	7-16
Max. power (at 50 °C ambient temperature)	200 W	700 W
For connecting ... antennas	2	
Frequency range	380 – 3800 MHz	
VSWR	< 1.5	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Impedance	50 Ω	
Insertion loss	< 0.05 dB	
Weight	750 g	870 g
Packing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

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

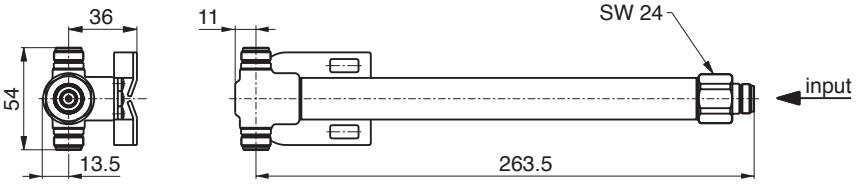
86010130

86010131

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

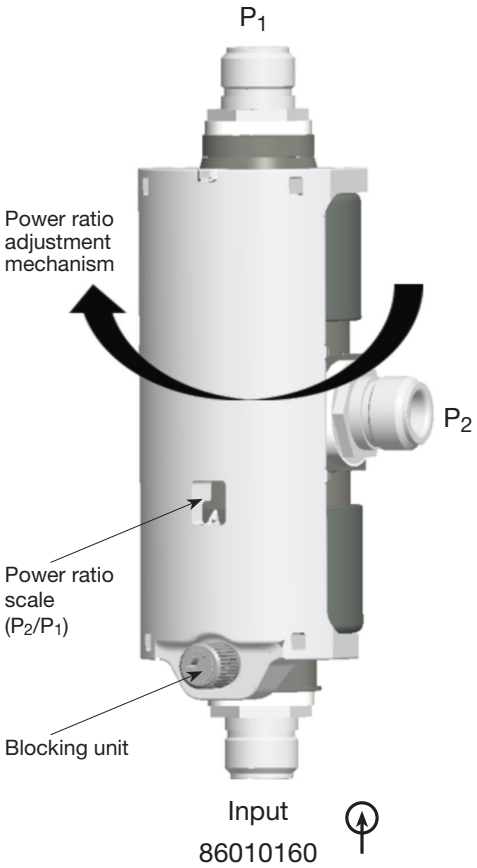
For indoor and outdoor use.

2-way Tapper 380–960/1695–2700/3400–3800/4920–5920

Type No.	86010160
Frequency range	380 – 960 MHz 1695 – 2700 MHz 3400 – 3800 MHz 4920 – 5920 MHz
Power ratio between outputs (P_2 / P_1)	–5 dB to –20 dB continuously adjustable
For connecting ... antennas	2
Insertion loss	380 – 960 MHz: < 0.2 dB 1695 – 2700 MHz: < 0.2 dB 3400 – 3800 MHz: < 0.5 dB 4920 – 5920 MHz: < 0.7 dB
Impedance	50 Ω
VSWR	380 – 960 MHz: < 1.5 1695 – 2700 MHz: < 1.5 3400 – 3800 MHz: < 2.0 4920 – 5920 MHz: < 2.3
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
Environmental conditions	Indoor, outdoor use
Protection class	IP 65
Profile diameter	50 mm
Packing size	190 x 80 x 60 mm
Max. size	160 / 70 / 55 mm (including connectors)

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission only between input and port P_1.



Splitting table (typical values)

P_2 / P_1 [dB]	Splitting ratio P_1 / P_2	Splitting attenuation P_1 / P_{Input} [dB]	Splitting attenuation P_2 / P_{Input} [dB]
–5	3.2	–1.3	–6.3
–6	4	–1.05	–7.05
–7	5	–0.85	–7.85
–8	6.3	–0.7	–8.7
–9	8	–0.6	–9.6
–10	10	–0.5	–10.5
–11	12.6	–0.4	–11.4
–12	15.8	–0.35	–12.35
–13	20	–0.25	–13.25
–14	25.1	–0.2	–14.2
–15	31.6	–0.15	–15.15
–16	39.8	–0.14	–16.14
–17	50.1	–0.12	–17.12
–18	63.1	–0.11	–18.11
–19	79.4	–0.1	–19.1
–20	100.0	–0.09	–20.09

Summary – Mechanical Accessories
Clamps, Downtilt Kits ...

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

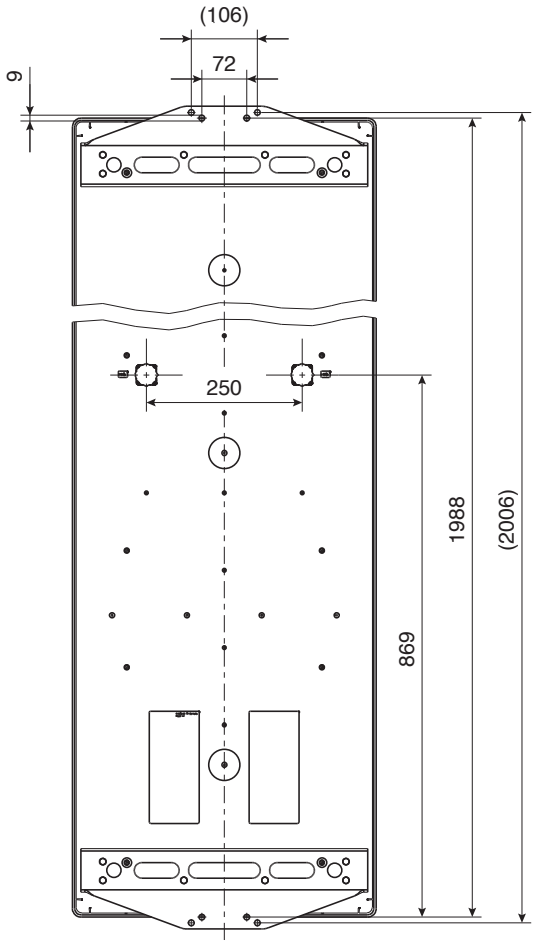
Dimensions of Panels

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

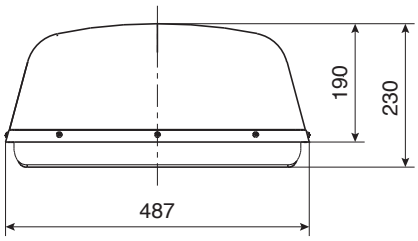
www.kathrein.com
→ Mobile Communication Solutions

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

Back view

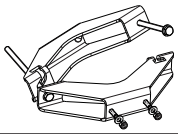
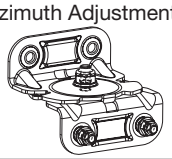
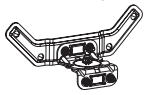
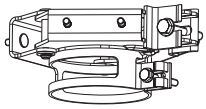
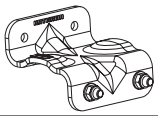


Bottom view



Product Line of Mounting Parts

KATHREIN

Type	Windload Classification	Pole Diameter in mm	Type No.	Remark	Page
Clamp 	light / medium	∅ 28 – 60	731651		52
	light / medium / heavy	∅ 42 – 115	738546		
	light / medium / heavy	∅ 110 – 220	85010002		
		∅ 210 – 380	85010003		
Downtilt kit 	light / medium		737978		53
Downtilt kit 	heavy		85010008		54
Azimuth Adjustment Kit 	light / medium		85010014	Pole mounting adjustment angle ±30° (additional clamp needed)	55
	heavy		85010015		
Azimuth Adjustment Kit 	light / medium		85010016	Wall mounting adjustment angle ±30°	55
	heavy		85010017		
3 Sector Clamp 	light / medium	∅ 88.9	742263		56
		∅ 88.9	742317		
		∅ 114.3	742033		
		∅ 139.7	742034		
	heavy	∅ 114.3	85010058		
		∅ 139.7	85010059		
Offset 	light / medium		85010060	Clearance between pole and antenna (additional clamp needed)	57
	heavy		85010061		

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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

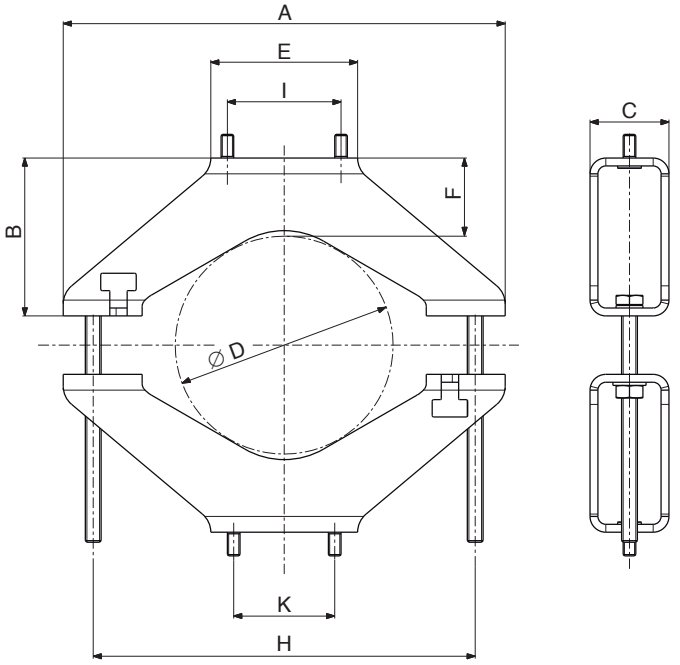
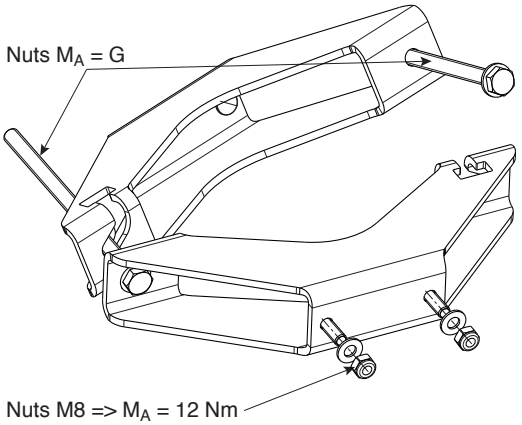
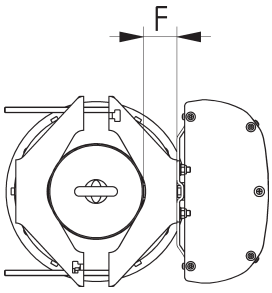


Figure similar to 85010002





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” and “M”)

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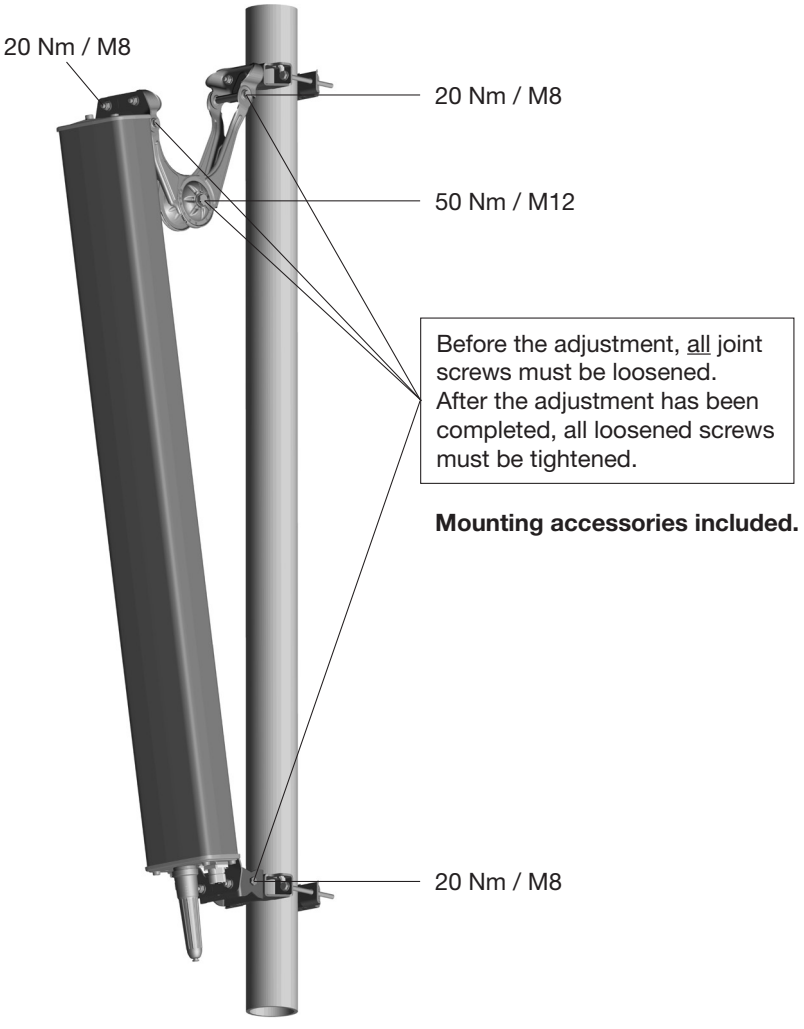
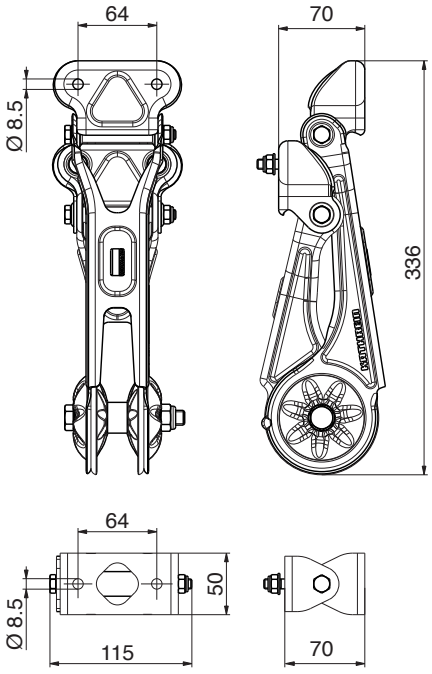
Downtilt kit

Type No.	737978
Preferred range of use	– Panel antennas with attached mounting plates – **Downtilt kit without scale for universal use**
Weight	2.3 kg
Material	Hot-dip galvanized steel
Screws	Hot-dip galvanized steel / stainless steel
Nuts / washers	Stainless steel





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

Mounting this downtilt kit enlarges the spacing between mast and antenna by 70 mm.

Use the downtilt kit together with the clamps as described in the antenna datasheet.

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

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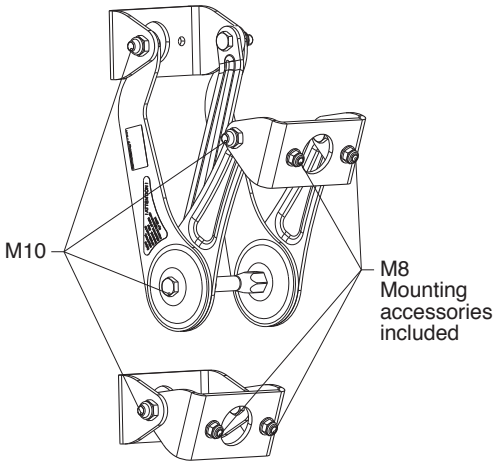
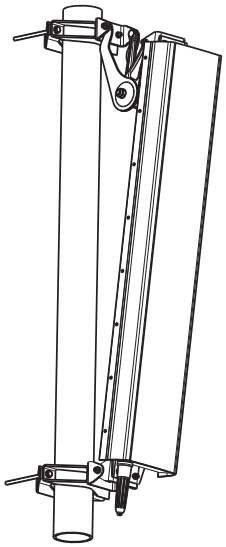
Special downtilt kit for Panel antennas with a higher wind load.



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	4.3 kg
Material	Hot-dip galvanized steel
Screws	Hot-dip galvanized steel / stainless steel
Nuts	Stainless steel

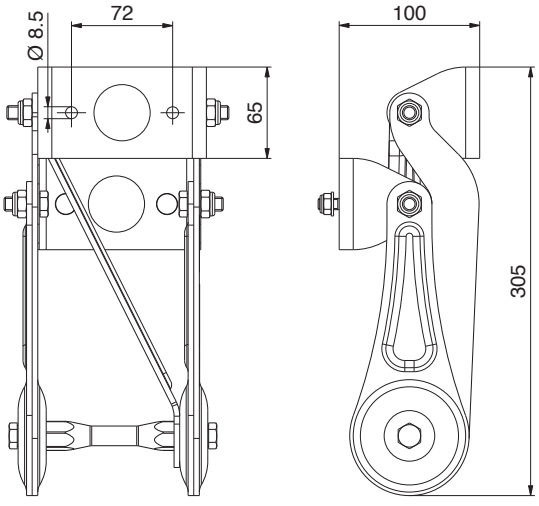


Recommended mast clamps:

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

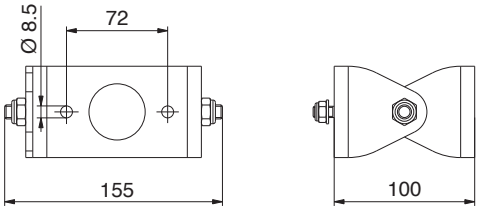
Recommended torque for all bolted connections:

Screw size	**Torque**
M8	20 Nm
M10	50 Nm



Maximum acceptable load:

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



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

Mounting this downtilt kit enlarges the spacing between mast and antenna by 100 mm.

Use the downtilt kit together with the clamps as described in the antenna datasheet.

All Panels
Mounting Hardware
Azimuth Adjustment Kits

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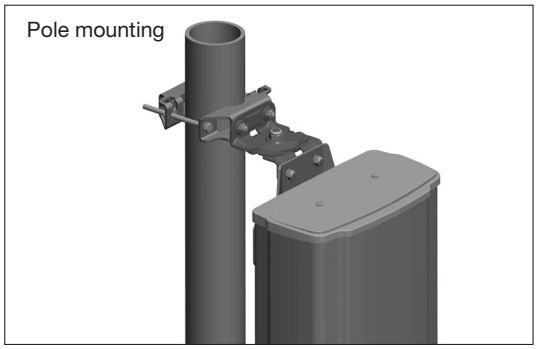

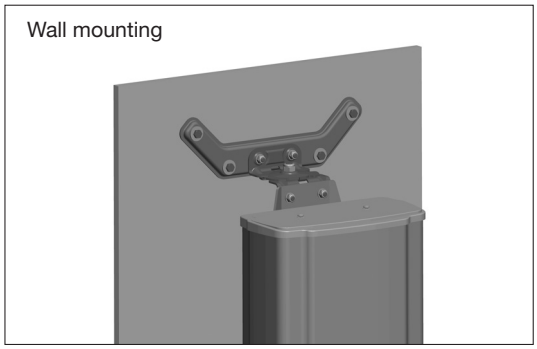

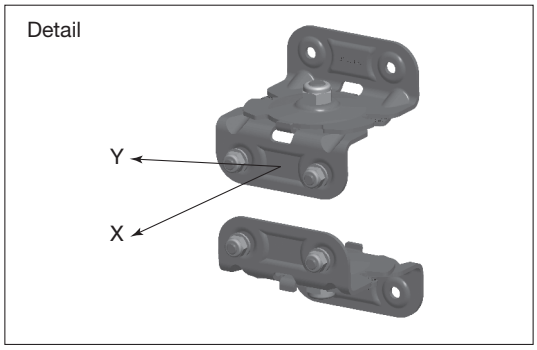

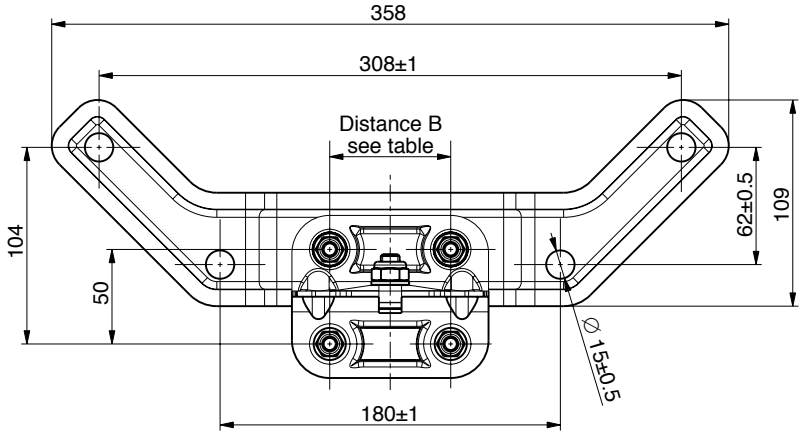

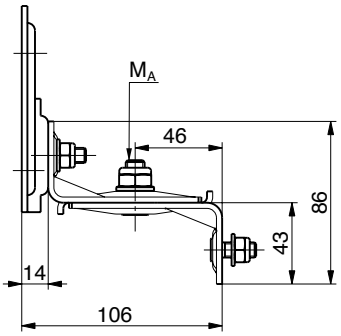

The azimuth adjustment kit for pole mounting can be mounted with all suitable clamps, 3-Sector clamps and 2x Panel mounting kits (with the latter only as an interface between mounting kit and antenna).

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.	
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

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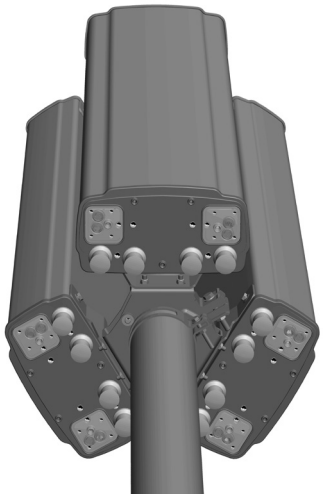
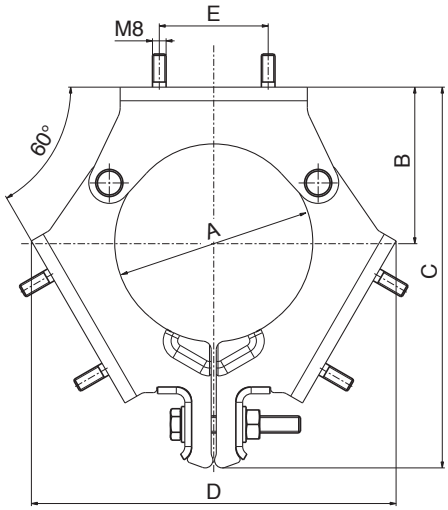
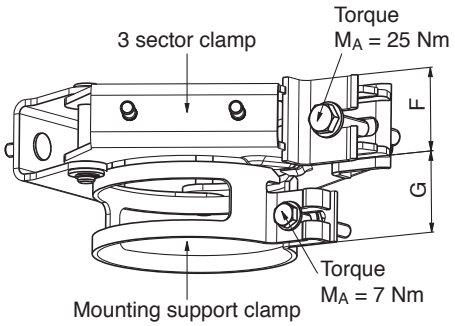
- Slim and unobstrusive design.
- Nearly cylindrical optical appearance with small outer diameter.
- Suitable for all Panels with an antenna housing width less than 400 mm (H_{max}).
  Please note:
  Panels with connector position “Rearside” fit only with downtilt kit, azimuth adjustment kit or offset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

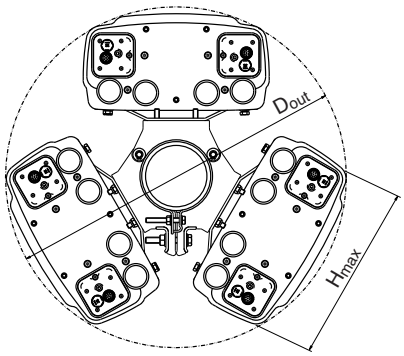






Type No.	A	B	C	D	E	F	G	H_{max}	Weight
742263	88.9	65	180	168	64	50	45	280	4 kg
742317	88.9	88	213	199	64	50	45	361	4 kg
742033	114.3	92	217	207	64	50	45	375	4 kg
742034	139.7	100	236	228	64	50	45	400	4 kg
85010058	114.3	92	217	207	72	50	45	375	4 kg
85010059	139.7	100	236	228	72	50	45	400	4 kg

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



Bottom view without downtilt kit

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 / threaded stud – 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”)

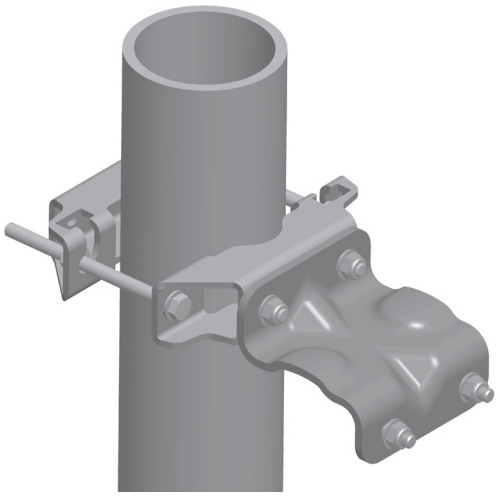
Type No.	85010058	85010059
Angle between antennas	120°	120°
Suitable for mast diameter	114.3 mm	139.7 mm
Number of pieces	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp
Material – 3 sector clamp – Mounting support clamp – Screws / threaded stud – Nuts	 Hot-dip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

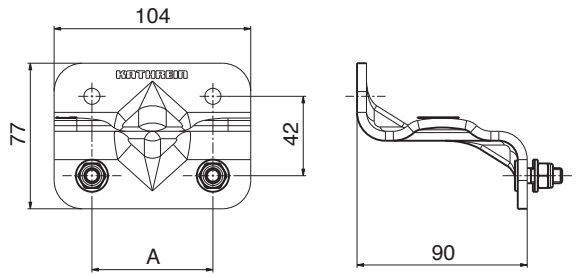
KATHREIN

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.

GPS Azimuth Adjustment Tool

KATHREIN

GPS based Azimuth Adjustment tool to azimuth base station antennas in the field.

- Compatible to all Panel Antennas
- Easy to adapt onto an Antenna
- Compact size
- No cabeling neccessary

Type No.	86010157
GPS Sensor Specification	
Receiver Type	L1, C/A code, with carrier Phase smoothing
Channels	Two 12-channel, parallel tracking
SBAS Tracking	2-channel, parallel tracking
Used Geodetic System	WGS 84
Update Rate	10 Hz (10 measurement values per sec.)
Horizontal Accuracy	< 1.0 m 95% confidence (DGPS [1]) < 2.5 m 95% confidence
Heading Accuracy [2]	± 0.8°
Tilt Accuracy [3]	± 0.25°
Orthometric Hight Accuracy [4]	± 1 m
First start	max 12 min. (primary initalisation of almanac)
Cold Start	< 60 s (no almanac or RTC)
Warm Start	< 20 s typical (almanac or RTC)
Heading Fix	< 10 s typical (valid position)
Interface	W-LAN (802.11); RS 232 (optional)
Power Supply	LiPo-Battery (14.8 V, 2200 mAh)
Input Voltage	18 – 28 VDC
Power Consumption	5 W nominal; 36 W charging mode
Protection class	IP 54
Operating Temperature	–10 °C to +50 °C
Storage Temperature	–10 °C to +60 °C
Charging Temperature	0 °C to +35 °C
Certifications	FCC; CE
Dimensions (L x W x H)	580 (900 deployed) x 116 x 65 mm
Weight	3.1 kg

[1] Depends on multipath environment, number of satellites in view; satellite geometry, ionospheric activity and use of SBAS.
[2] Depends on multipath environment, number of satellites in view; satellite geometry, ionospheric activity.
[3] After calibration.
[4] Based on a 40 second time constant.

GPS Azimuth Adjustment Tool

KATHREIN

Type No.	86010157
Tablet Specification	
Model	Fieldbook
Display	
LCD Size	10” TFT LCD
Brightness	Best-in-class sunlight readable Display - ECR 11.19 at 50.000 lux
Max Resolution	1366 (H) x 768 (V)
Touch Screen	Polarized capacitive type
Operating System	Android 4.x
Memory	32 GB eMMC Flash + 1 GB SDRAM
Storage	Micro SD Slot
Communication	
W-LAN	802.11 b/g/n
Bluetooth	Bluetooth 4.0
Modem	3.5 G
RFID	HF RFID; ISO 14443A; ISO 14443B; ISO 15693; NFC
Data Collection	
Barcode	1D laser / 2D imager scan eingine
Camera (Back)	5 megapixels CMOS camera
Camera (Front)	1.2 megapixels CMOS camera
I/O Interface	
Audio	1 x 1.5 W speaker; 1 x Digital Mic
Expansion	1 x USB 2.0; 1 x DC Jack
Power	Internal Smart Lithium Polymer battery, 10000 mAH, 3.7 V
Environment	
Operating Temperatur	–10 °C to +40 °C
Storage Temperatur	–10 °C to +60 °C
Drop Survival	1.8 m
Protection class	IP 65 & MIL-STD810G
Certification	CE / FCC / UL
Dimensions (L x W x H)	287 x 189 x 28 mm
Weight	1.1 kg

Scope of Supply	GPS Azimuth Adjustment Tool; Tablet PC;Adapterplates; Charging Device; Storage and carrying bag; Cables
Shipment Dimension (L x W x H)	735 x 300 x 350 mm
Shipment Weight	5.2 kg

Please note:

The installation team must be properly qualified and also be familiar with the relevant national safety regulations! Non-observance of these instructions may damage or destroy the devices. Death or severe injuries may occur!
The details given in the product documentation must be carefully followed during the installation and operation of the GPS Azimuth Adjustment Tool (read the product documentation thoroughly before connecting the GPS Azimuth Adjustment Tool to the power supply).

The tablet is included in the scope of supply

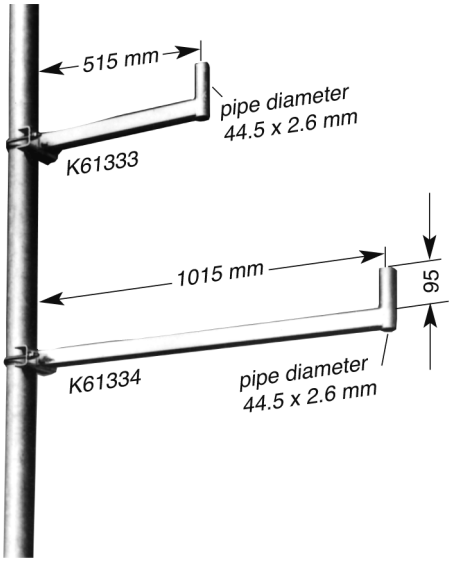
Accessories
Stand-off Brackets

KATHREIN

When mounted to the tip of a mast, the antennas described in this catalogue radiate horizontally in a circular fashion. However, they can also be mounted laterally to a mast by using an extension bracket. Depending on the spacing and the mast diameter, various types of radiation patterns can be achieved.
(For further information please see the “Technical Information” part of our catalogue on pages 64 and 65)

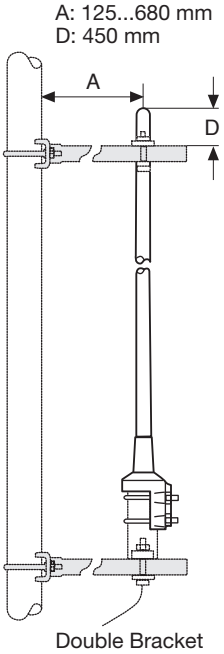
Bracket with fixed spacing

Type No.	K61333	716192	K61334	713645
Weight	2 kg	7 kg	3.2 kg	8.5 kg
Distance A:	500 mm		1000 mm	
Suitable for antennas with a maximum wind load of	215 N (at 150 km/h)		85 N (at 150 km/h)	
Suitable for antennas with	mounting kit to pipe masts of 20 – 54 mm diameter			
Attachment	By means of mounting kit (supplied) to pipes of			
	55 mm – 105 mm	105 mm – 265 mm	55 mm – 105 mm	105 mm – 265 mm
Material	Hot-dip galvanized steel.			
Wind load	36 N (at 150 km/h)		60 N (at 150 km/h)	



Bracket with adjustable spacing A

Implementation	Stand-off	Double stand-off	
	Fig. A	Fig. B	Fig. C
Type No.	K613311	K613321	737398
Weight	6.6 kg	13.7 kg	6 kg
Distance A: min. max.	125 mm 680 mm		100 mm 240 mm
Suitable for	antennas with mounting kit to pipe masts of		
	20 – 54 mm diameter	30 – 90 mm diameter	50 – 94 mm diameter
Attachment	By means of mounting kit (supplied) to pipes of		
	55 mm – 105 mm diameter		40 – 105 mm diameter
Material	Hot-dip galvanized steel.		
Wind load	45 N (at 150 km/h)	100 N (at 150 km/h)	65 N (at 150 km/h)



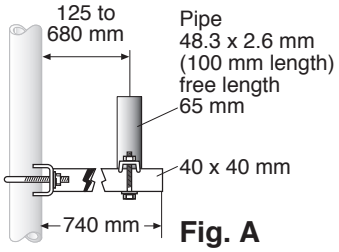


Fig. A

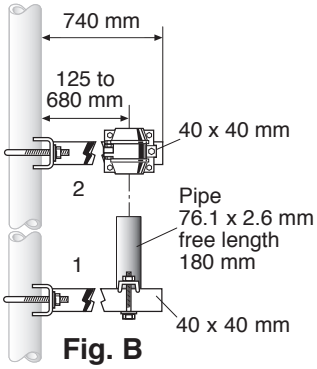


Fig. B

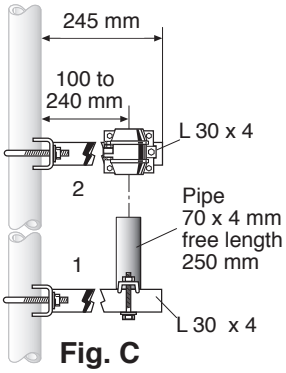


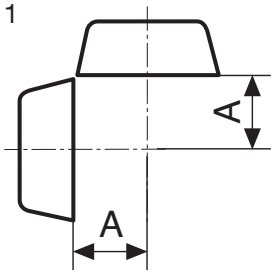
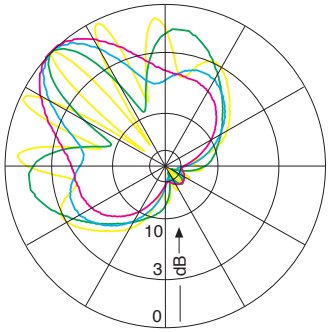
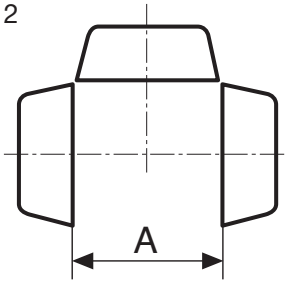
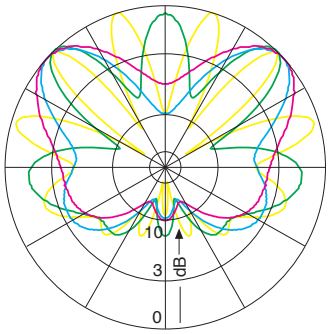
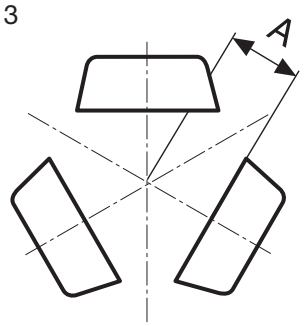
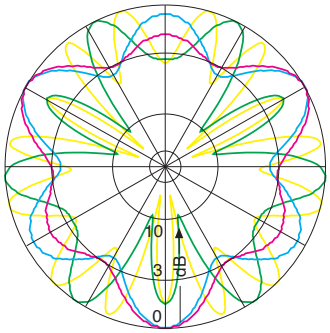
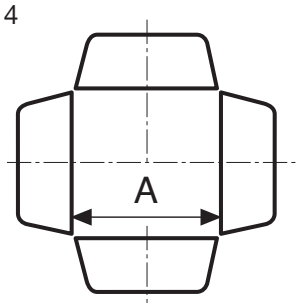
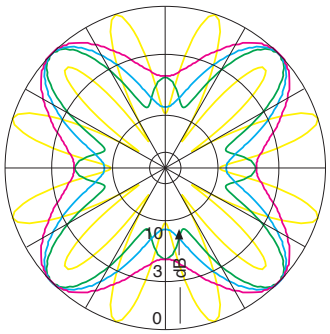
Fig. C

Summary of Technical Information

KATHREIN

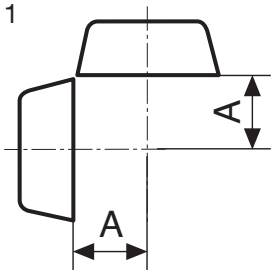
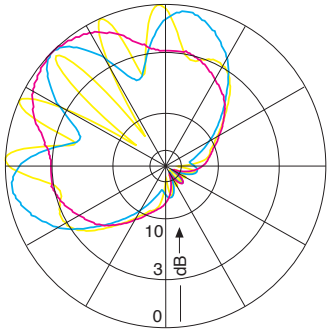
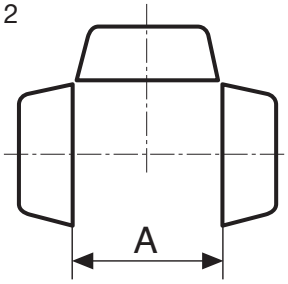
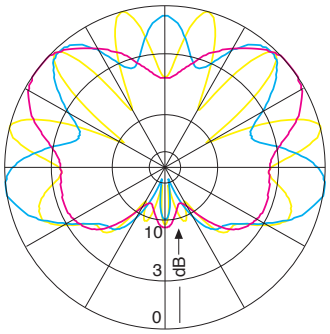
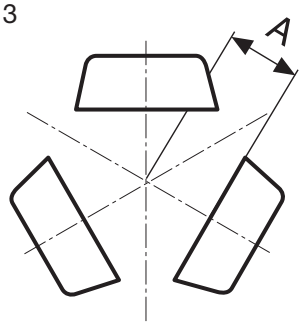
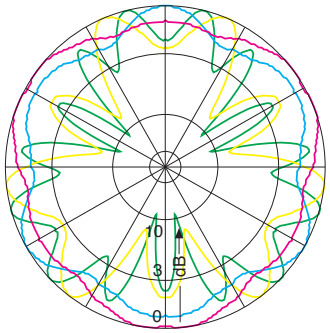
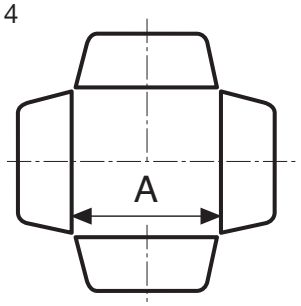
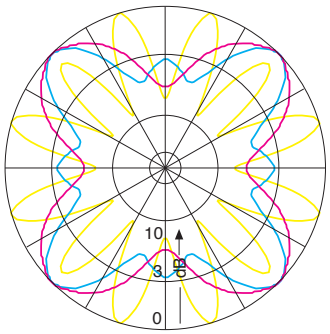
Examples of Radiation Patterns at 390 MHz with Combinations of Panels 741517 (XPol)

KATHREIN

Arrangement	Horizontal Radiation Pattern	Technical Data	
1 		**Distance A**	100 % rel. field strength corresponds to a gain of
		0.16 m	9.85 dBi
		0.25 m	9.95 dBi
		0.5 m	9.45 dBi
		1.5 m	9.55 dBi
2 		**Distance A**	100 % rel. field strength corresponds to a gain of
		0.32 m	7.75 dBi
		0.5 m	8.15 dBi
		1.0 m	7.85 dBi
		2.0 m	7.95 dBi
3 		**Distance A**	100 % rel. field strength corresponds to a gain of
		0.16 m	5.85 dBi
		0.22 m	5.75 dBi
		0.65 m	6.55 dBi
		1.1 m	6.35 dBi
4 		**Distance A**	100 % rel. field strength corresponds to a gain of
		0.32 m	6.15 dBi
		0.5 m	7.15 dBi
		0.8 m	7.65 dBi
		2.1 m	7.35 dBi

Examples of Radiation Patterns at 390 MHz with Combinations of Panels 80010252 (VPol)

KATHREIN

Arrangement	Horizontal Radiation Pattern	Technical Data	
1 		**Distance A**	100 % rel. field strength corresponds to a gain of
		0.25 m	9.55 dBi
		0.5 m	9.35 dBi
		1.5 m	9.85 dBi
2 		**Distance A**	100 % rel. field strength corresponds to a gain of
		0.5 m	8.05 dBi
		1.0 m	7.75 dBi
		2.0 m	8.35 dBi
3 		**Distance A**	100 % rel. field strength corresponds to a gain of
		0.16 m	5.45 dBi
		0.22 m	5.75 dBi
		0.65 m	6.95 dBi
		1.1 m	6.95 dBi
4 		**Distance A**	100 % rel. field strength corresponds to a gain of
		0.5 m	6.85 dBi
		0.8 m	7.35 dBi
		2.1 m	7.45 dBi

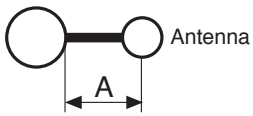
Radiation Patterns
for Side-mounted Omnidirectional Antennas

KATHREIN

Examples of horizontal radiation patterns for different mast diameters where A = 0.25 λ; 0.5 λ; 0.75 λ. Examples also apply for antenna K75292.

Distance A:

Tubular mast

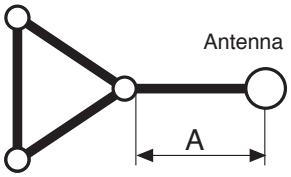


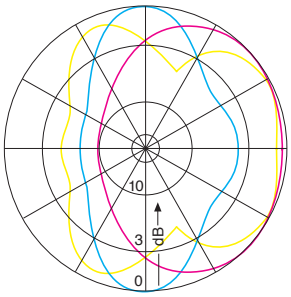
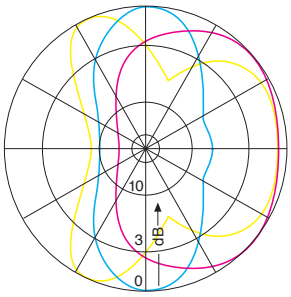
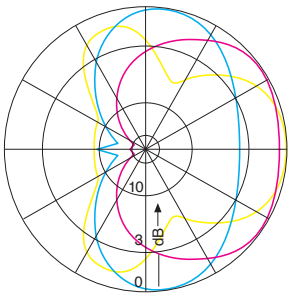
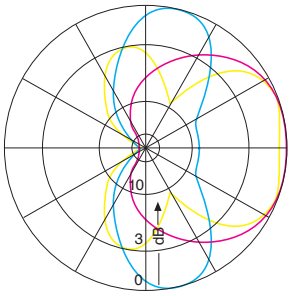
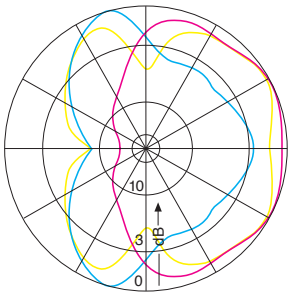
A = 0.25 λ

A = 0.5 λ

A = 0.75 λ

Triangular lattice mast

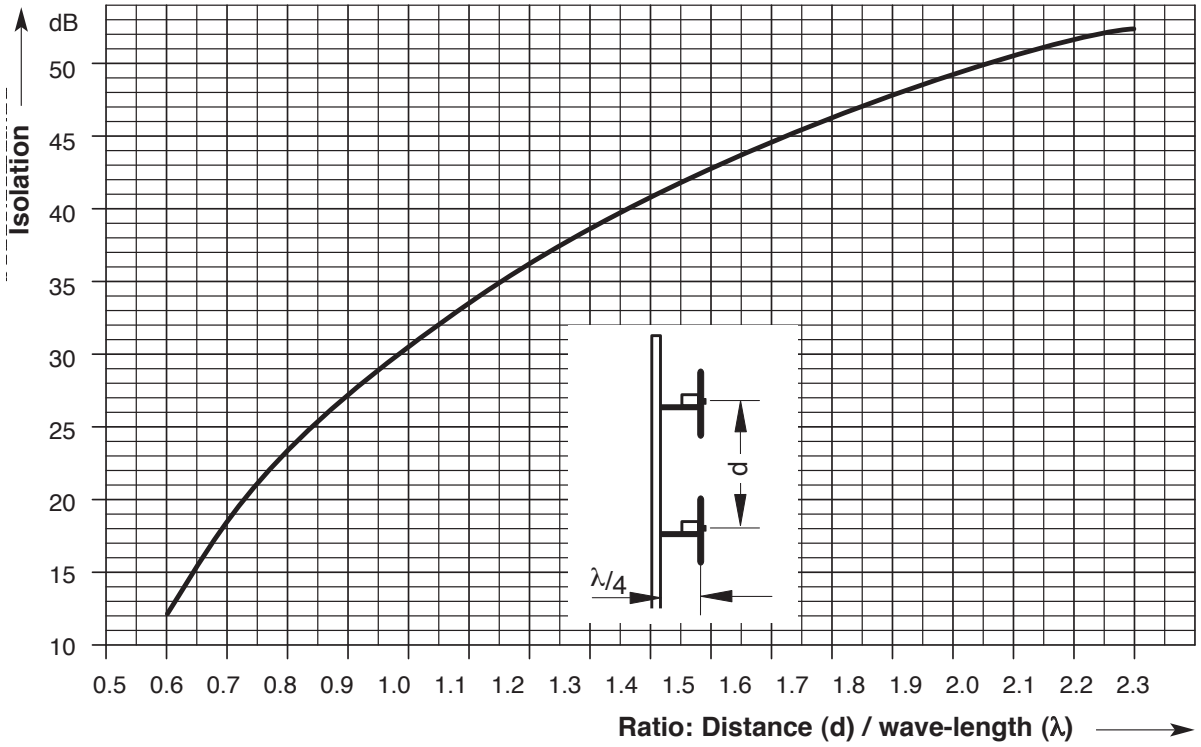


Mast diameter	Horizontal Radiation Pattern
60 m	
160 m	
250 m	
600 m	
Triangular lattice mast with side length of 500 mm	

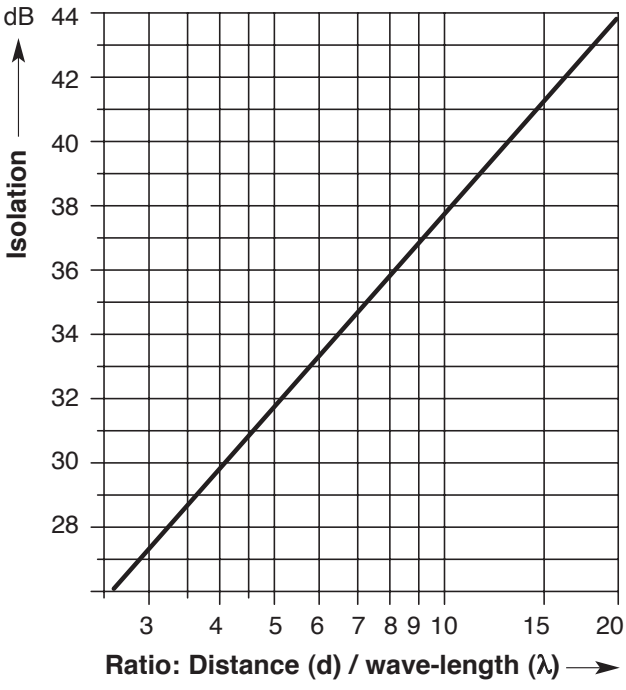
Isolation Between Two Half-wave Dipoles

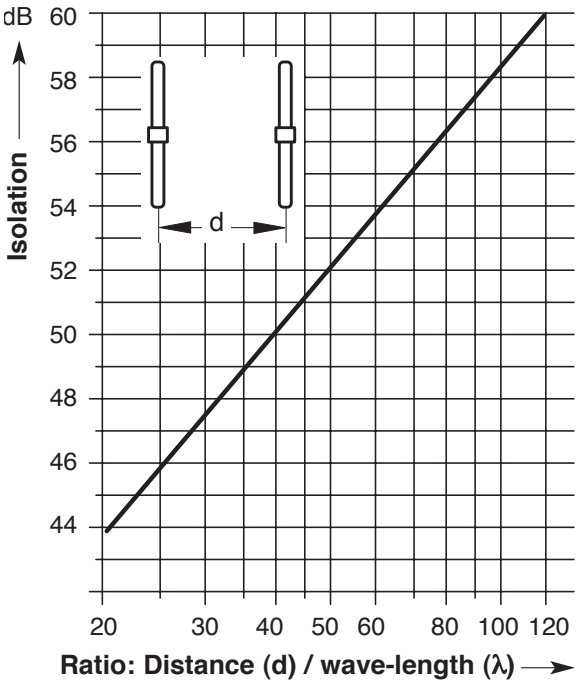
KATHREIN

Isolation between two half-wave dipoles, vertically polarized and positioned vertically in line above each other on one common mast.



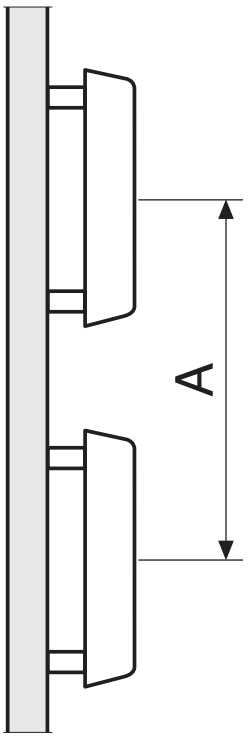
Isolation between two vertically polarized half-wave dipoles mounted laterally.



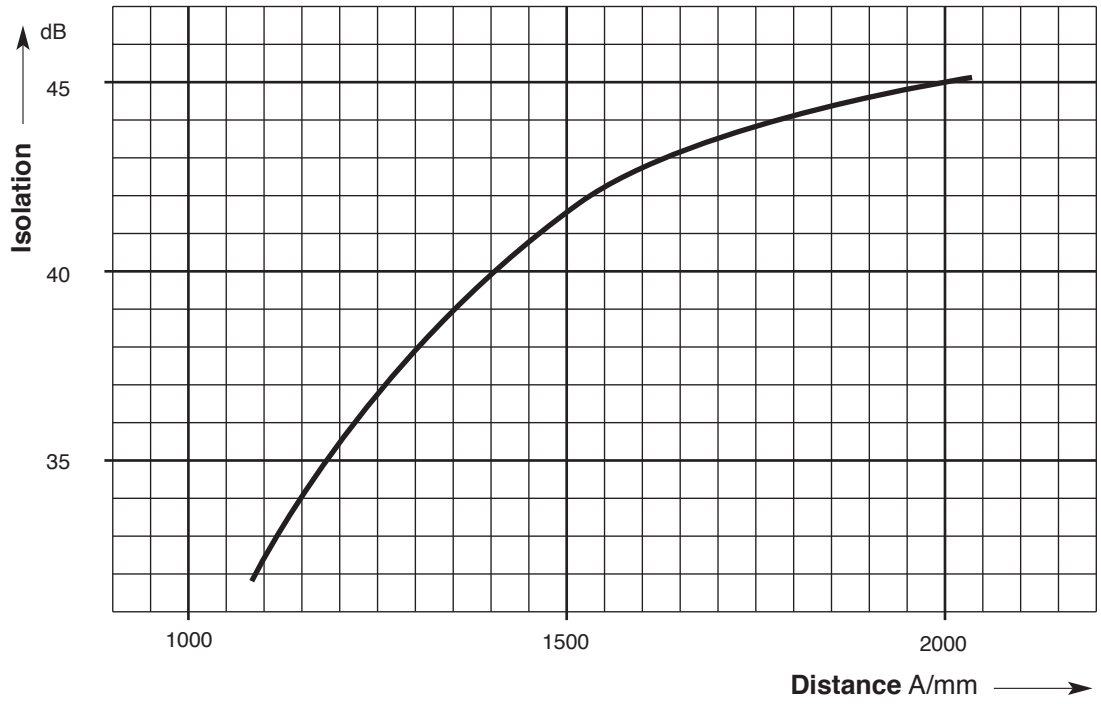


Isolation
of Two Vertically Stacked Panels 80010252

KATHREIN

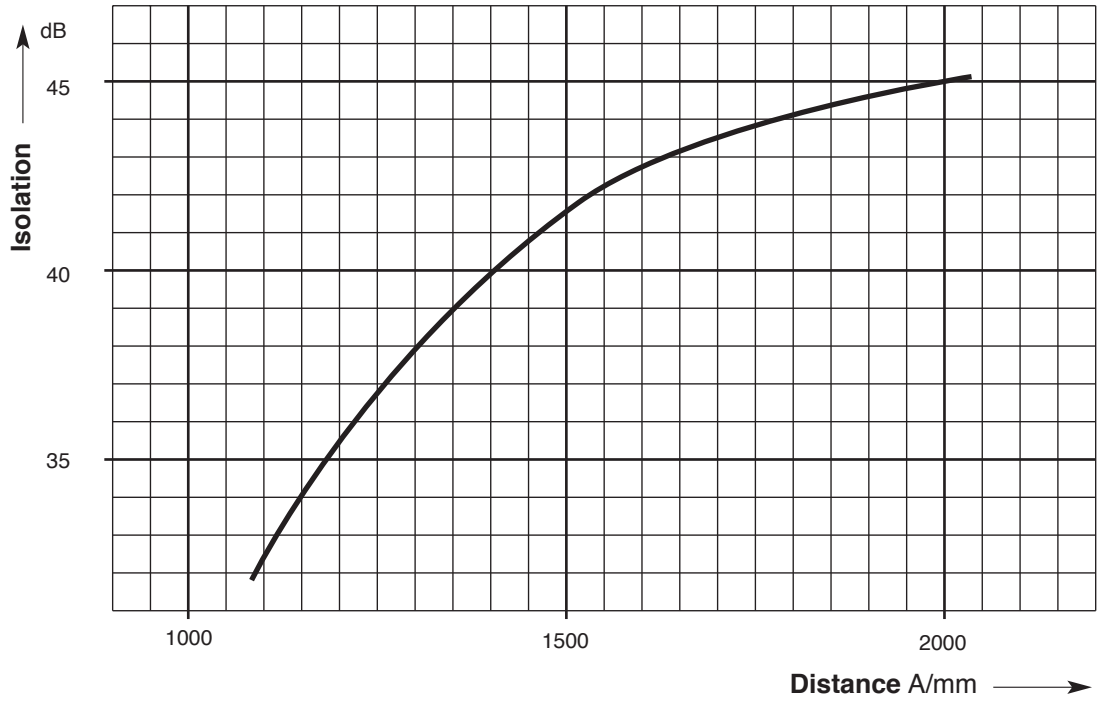


Isolation depends on vertical spacing A (at 450 MHz)

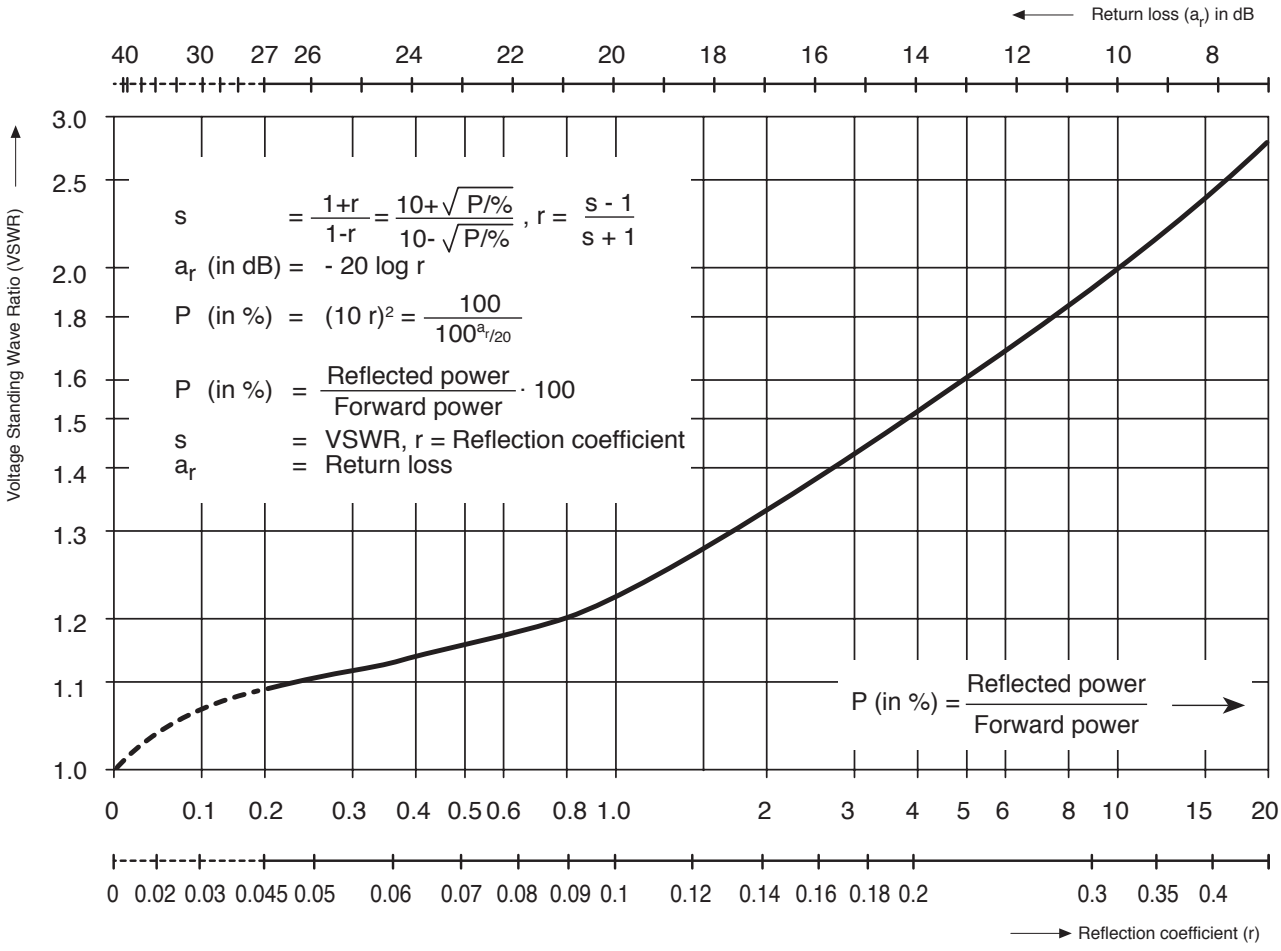


Antenna Gain, VSWR / Reflected power

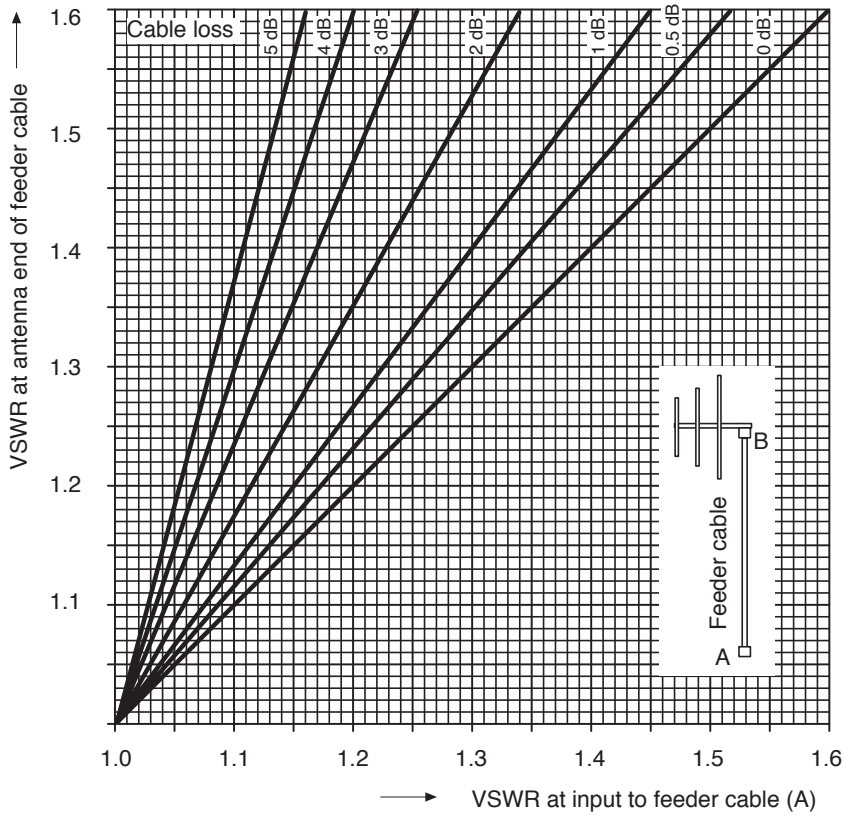
Isolation depends on vertical spacing A (at 450 MHz)



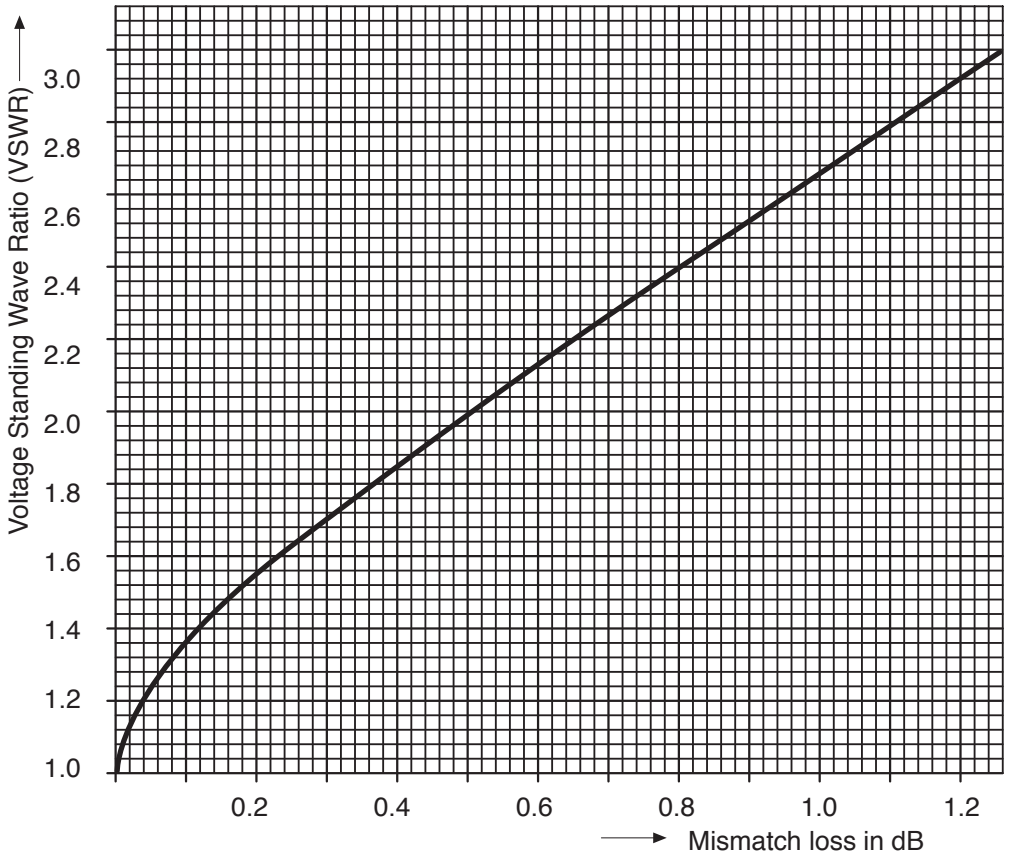
Voltage Standing Wave Ratio (VSWR) vs Reflected power



Reduction of VSWR as a result of feeder cable attenuation



Mismatch loss vs VSWR



Antenna Line Products

Filters

68 - 87.5 MHz
146 - 174 MHz
380 - 470 MHz

Filters

Duplexers

68 ... 87.5 MHz
146 ... 174 MHz
380 ... 470 MHz

Duplexers

Multiband Combiners and Transmitter Combiners

Filter Transmitter Combiners
Hybrid Tansmitter Combiners
Multiband Combiners

Combiners

System Components

3-dB Couplers
4.7-dB, 6-dB, 7-dB, 10-dB Couplers
Hybrid Ring Junctions
Decoupled Power Splitters
Circulators
DC-Stops
Attenuators
50-Ω Loads

System Components

Receiver Multicouplers

146 - 174 MHz
380 - 470 MHz

Receiver Multicoupler

Combiner Systems

Combiner Systems

Summary of Types

KATHREIN

The articles are listed by type number in numerical order.

Summary of Articles

Filters:

Description	Type No.	Frequency range ... tunable bandwidth	Max. input power	Page
2-cavity Band-pass Filter	K641241	68 ... 87.5 MHz	50 W	72, 73
3-cavity Band-pass Filter	K641341	68 ... 87.5 MHz	50 W	72, 73
Band-pass Filter	K6421451	68 ... 87.5 MHz	200 W	74, 75
S-P Filter	K6421461	68 ... 87.5 MHz	200 W	76, 77
S-P Filter	K6421471	68 ... 87.5 MHz	200 W	76, 77
2-cavity Band-pass Filter	790965	146 ... 174 MHz	75 W	78, 79
3-cavity Band-pass Filter	790964	146 ... 174 MHz	100 W	78, 79
Band-pass Filter	K6421251	146 ... 174 MHz	200 W	80, 81
S-P Filter	792119	146 ... 174 MHz	15 W	82, 83
S-P Filter	K6421261	146 ... 174 MHz	200 W	82, 83
2-cavity Band-pass Filter	790967	380 ... 470 MHz	50 W	84, 85
3-cavity Band-pass Filter	790966	380 ... 470 MHz	50 W	84, 85
Band-pass Filter	K6521251	380 ... 470 MHz	200 W	86, 87
S-P Filter	K6521261	380 ... 470 MHz	200 W	88, 89

Band-pass Filter
68 ... 87.5 MHz

KATHREIN

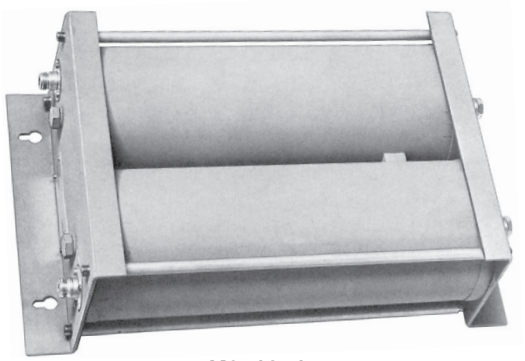
The band-pass filter is suitable for use as a receiving or transmitting filter for **one** receiver or transmitter.

It can be used:
- to improve the input selectivity of receivers and amplifiers,
- to increase the isolation of transmitters, whose respective antennas are mounted close together,
- to suppress noise side bands and inter-modulation products,
- as a combiner component.

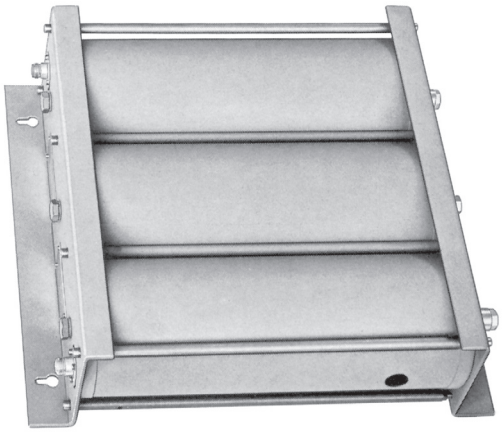
Design and construction:
The band-pass filter consists of two or three high Q capacitively coupled resonators. The pass band frequency and the insertion loss are tunable.

Filter characteristics:
Narrow pass band with low insertion loss, high stop band attenuation, variable filter response corresponding to the desired stop band attenuation.

Tuning:
The band-pass filter is tuned to the desired pass band frequency and insertion loss at the factory. Please specify desired pass band frequency and insertion loss (curve A, B) when ordering.
The band-pass filter can also be tuned on site using the supplied instructions.



K641241



K641341

Technical Data

Type No.	**K641241** **2-cavity band-pass filter**		**K641341** **3-cavity band-pass filter**	
Frequency range	68 ... 87.5 MHz			
Insertion loss at f_o	1 ... 2 dB, tunable			
	Tuning examples			
	1.0 dB curve **A**	**2.0 dB** curve **B**	**1.5 dB** curve **A**	**2.0 dB** curve **B**
VSWR	< 1.2 (at operating frequency)			
Impedance	50 Ω			
Input power	< 50 W	< 25 W	< 50 W	< 25 W
Temperature range	-30 ... +60 °C			
Temperature coefficient	< 18 x 10^{-6} / °C			
Connectors	N female			
Material	Brass, silver-plated			
Colour	Grey (RAL 7032)			
Installation	With 4 screws (max. 6 mm diameter)			
Weight	16 kg		24 kg	
Packing size	315 mm x 195 mm x 828 mm		435 mm x 195 mm x 828 mm	
Dimensions (w x h x d)	240 mm x 124 mm x 710 mm (with connectors)		360 mm x 124 mm x 710 mm (with connectors)	

Band-pass Filter
68 ... 87.5 MHz
Typical attenuation curves

KATHREIN

Tuning examples:

2-cavity band-pass filter
K 64 12 41

Diagram I:

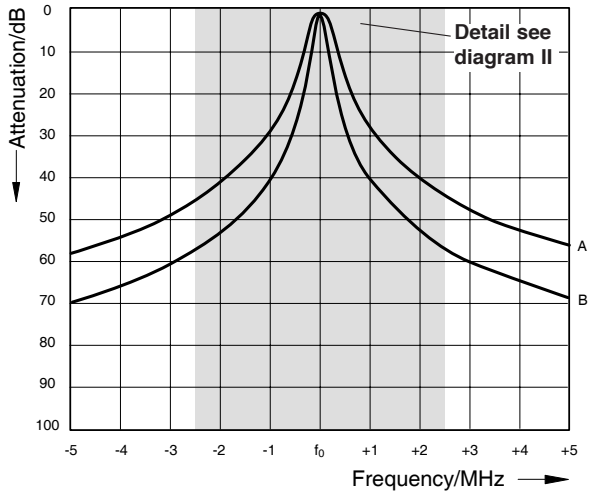


Diagram II:

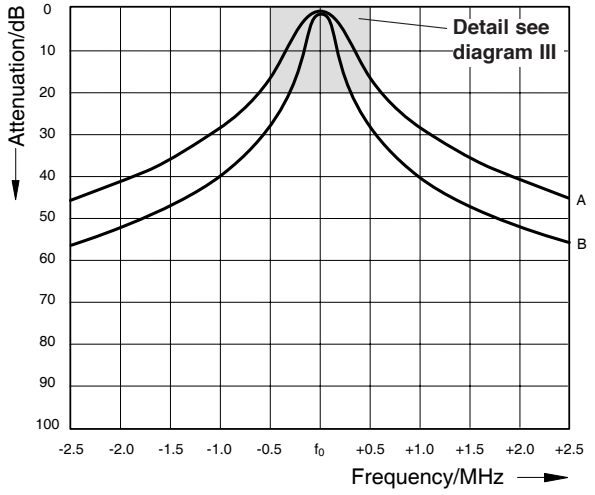
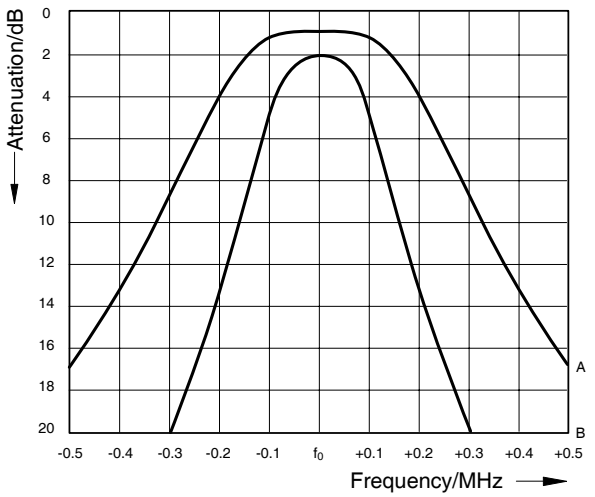


Diagram III:



3-cavity band-pass filter
K 64 13 41

Diagram IV:

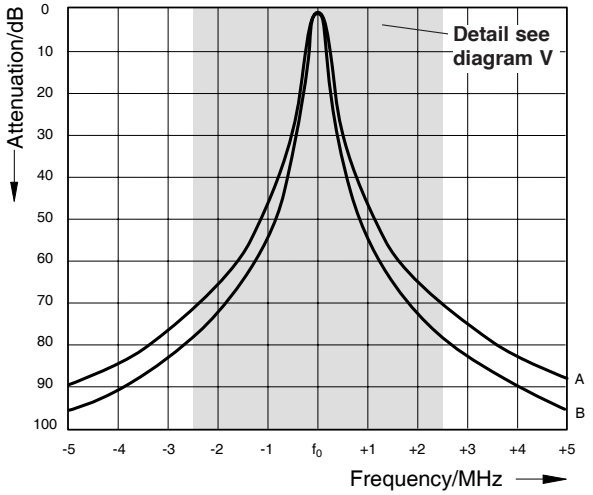


Diagram V:

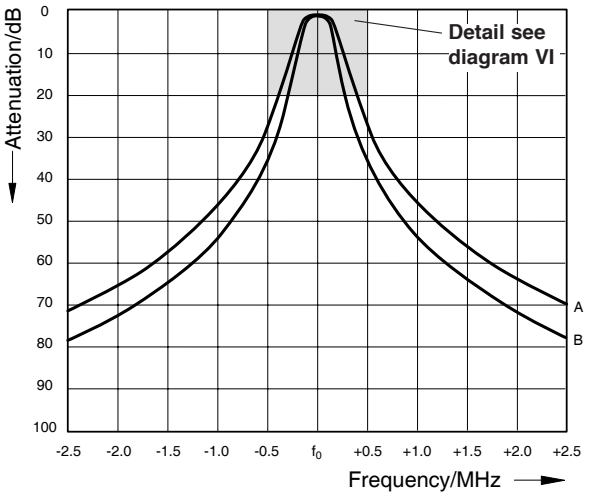
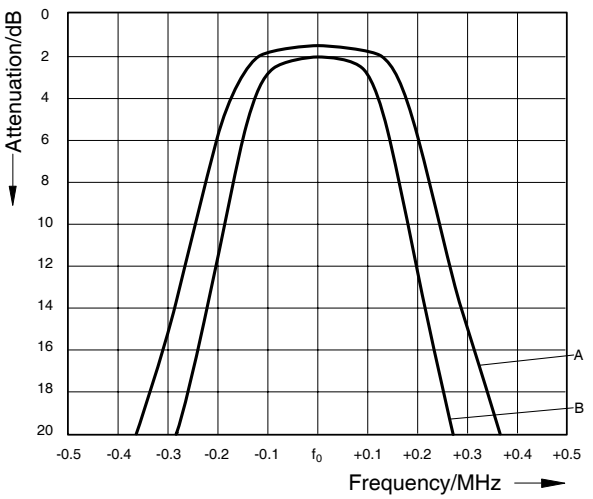


Diagram VI:



Band-pass Filter
68 ... 87.5 MHz

KATHREIN

The band-pass filter is suitable for use as a receiving or transmitting filter for **one** receiver or transmitter.

It can be used:
- to improve the input selectivity of receivers and amplifiers,
- to increase the isolation of transmitters, whose respective antennas are mounted close together,
- to suppress noise side bands and intermodulation products,
- as a combiner component.

Design and construction:
The band-pass filter is designed as a temperature stabilized λ/4 coaxial resonator. The pass band frequency and the insertion loss are tunable.

Filter characteristics:
Narrow pass band with low insertion loss, high stop band attenuation, variable filter response corresponding to the desired stop band attenuation.

Combination of several band-pass filters:
Several band-pass filters can be interconnected using cables of an electrical length of λ/4. This causes an increase in the edge steepness of the filter curve as well as the bandwidth of the pass band. The individual filters are tuned to the center frequency of the complete filter.

Insertion loss of the filter combination = Sum insertion loss of the individual filters + cable attenuation of the interconnecting cables (about 0.1 dB per cable).
Stop band attenuation of the filter combination = Sum stop band attenuation of individual filters + additional stop band attenuation.

If the stop band attenuation of the individual filters exceeds 10 dB, approximately the following applies:
additional stop band attenuation =
(n - 1) x 5 dB;
n = number of individual filters.
For special applications band-pass filters can also be interconnected with S-P filters.

Tuning:
The band-pass filter is tuned to the desired pass band frequency and insertion loss at the factory. Please specify desired pass band frequency **and** insertion loss (curve A, B, C, D) when ordering.

The band-pass filter can also be tuned on site using the supplied instructions.

K6421451

Technical Data

Type No.	**K6421451**			
Frequency range	68 ... 87.5 MHz			
Insertion loss at f_o	0.5 ... 2 dB, tunable			
	Tuning examples			
	0.5 dB curve **A**	**1.0 dB** curve **B**	**1.5 dB** curve **C**	**2.0 dB** curve **D**
VSWR	< 1.5 (at operating frequency)			
Impedance	50 Ω			
Input power	< 200 W			
Temperature range	-30 ... +60 °C			
Effect of temperature	< 0.2 kHz / °C			
Connectors	N female			
Material	Outer conductor: Aluminium Inner conductor: Brass, silver-plated			
Installation	Free standing or wall mounting with mounting angles			
Attached hardware	Band-pass filter with 2 mounting angles and 2 connecting pieces			
Weight	16 kg			
Packing size	207 mm x 1660 mm x 207 mm			
Dimensions (w x h x d)	190 mm x max. 1500 mm x 190 mm (with tuning rod)			

Band-pass Filter
68 ... 87.5 MHz
Typical attenuation curves

KATHREIN

Tuning examples:

Diagram I:

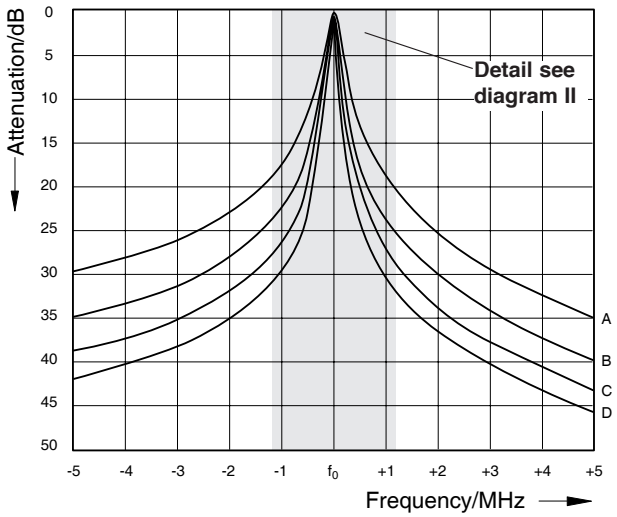


Diagram II:

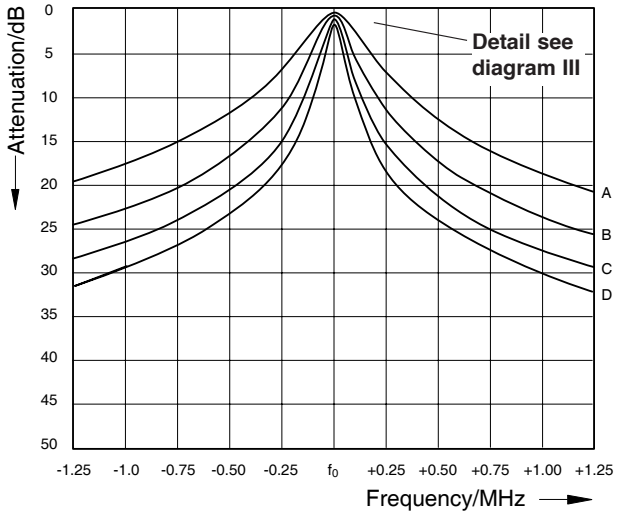
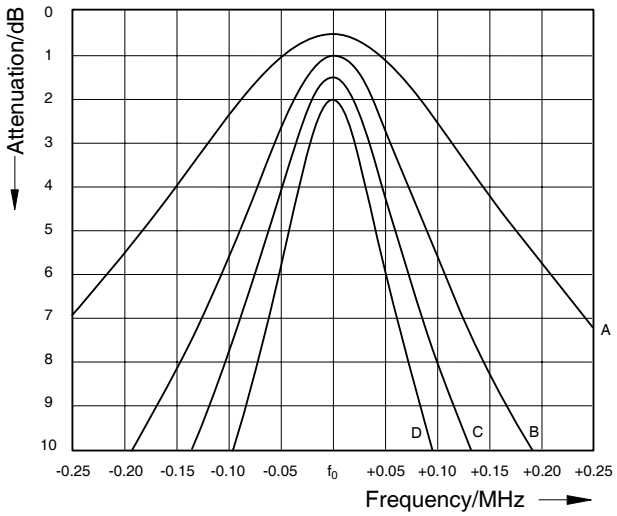


Diagram III:



S-P Filter
68 ... 87.5 MHz

KATHREIN

The S-P filter (Stop-Pass filter) is used to attenuate interfering signals located extremely close to the operational frequency.

It can be used:
- in the transmission path to suppress side band noise and to attenuate intermodulation products at the receiving frequencies,
- in the receiving path to attenuate transmitting frequencies,
- as a component for combiners with very low frequency spacing.

Design and construction:
The S-P filter is designed as a high Q temperature stabilized λ/4 coaxial resonator. Using a special temperature stabilized coupling, high stop band attenuation can be adjusted very close to the pass band frequency.

Filter characteristics:
Narrow pass band with low insertion loss, high stop band attenuation at the stop band frequency. Even in case of very small spacing between the pass band and the stop band frequency a high stop band attenuation is achieved, which can not be achieved using standard band-pass filters of the same size.

Combination of several S-P filters:
Several S-P filters can be interconnected by cables with an electrical length of λ/4.

Insertion loss of the filter combination = Sum insertion loss of the individual filters + cable attenuation of the interconnecting cables (about 0.1 dB per cable). Stop band attenuation of the filter combination = Sum stop band attenuation of the individual filters + additional stop band attenuation.

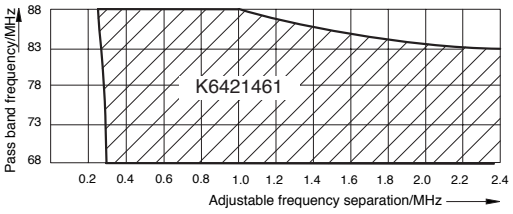
If the stop band attenuation of the individual filters exceeds 10 dB, approximately the following applies:
additional stop band attenuation =
(n - 1) x 5 dB;
n = number of individual filters.
For special applications S-P filters can also be interconnected with band-pass filters.

Tuning:
The S-P filter is tuned to the desired pass band and stop band frequency at the factory. Please specify desired pass band **and** stop band frequency when ordering.

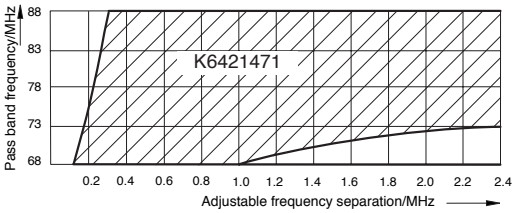
The S-P filter can also be tuned on site using the supplied instructions.

Customized versions
For special applications S-P filters for even lower frequency spacing or lower insertion loss are available.

Pass band frequency
<u>below</u> the stop band frequency



Pass band frequency
<u>above</u> the stop band frequency



K6421461
K642 471

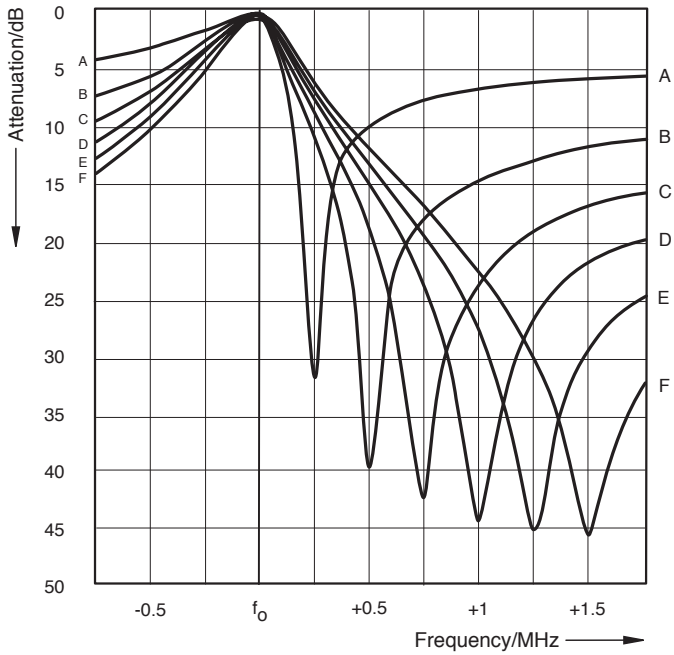
Technical Data

Type No.	K6421461	K6421471
Frequency range	68 ... 87.5 MHz	
Insertion loss	0.5 ±0.15 dB	
VSWR	< 1.5 (at operating frequency)	
Impedance	50 Ω	
Input power	< 200 W	
Temperature range	-20 ... +60 °C	
Effect of temperature	< 0.2 kHz / °C	
Connectors	N female	
Material	Outer conductor: Aluminium Inner conductor: Brass, silver-plated	
Installation	Free standing or mall mounting	
Attached hardware	S-P filter with 2 mounting angles and 2 connecting pieces	
Weight	16 kg	
Packing size	210 mm x 1660 mm x 210 mm	
Dimensions (w x h x d)	190 mm x max. 1500 mm x 190 mm (with tuning rod)	

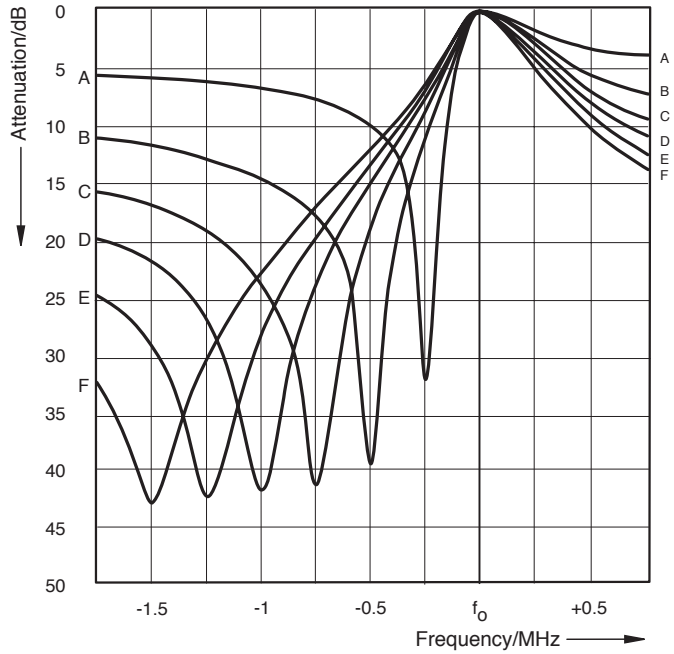
S-P Filter
68 ... 87.5 MHz
Typical attenuation curves

Tuning examples:

K6421461



K6421471



Curve	Frequency spacing pass band frequency / stop band frequency
A	0.25 MHz
B	0.50 MHz
C	0.75 MHz
D	1.00 MHz
E	1.25 MHz
F	1.50 MHz

Band-pass Filter
146 ... 174 MHz

KATHREIN

The band-pass filter is suitable for use as a receiving or transmitting filter, for **one or several** receivers or transmitters.

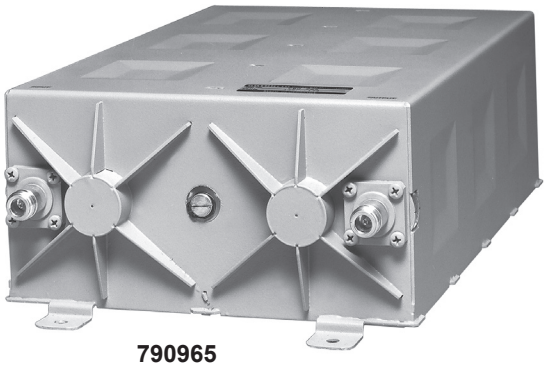
It can be used:
- to improve the input selectivity of receivers and amplifiers,
- to increase the isolation of transmitters, whose respective antennas are mounted close together,
- to suppress noise side bands and intermodulation products,
- as a combiner component.

Design and construction:
The band-pass filter consists of two or three high Q inductively coupled resonators. The pass band frequency and the insertion loss are tunable.

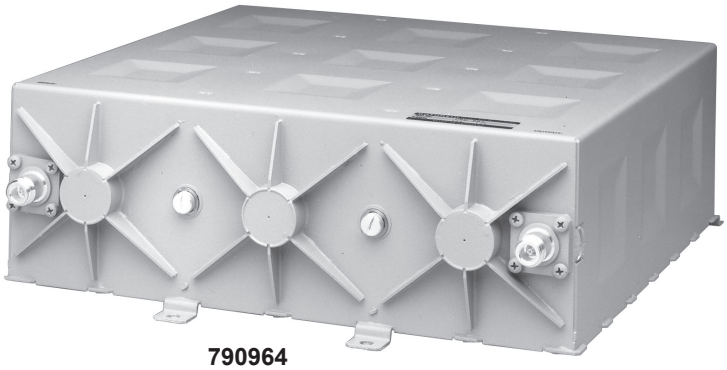
Filter characteristics:
Narrow pass band with low insertion loss, high stop band attenuation, variable filter response corresponding to the desired stop band attenuation.

Tuning:
The band-pass filter is tuned to the desired pass band frequency and insertion loss at the factory. Please specify desired pass band frequency **and** insertion loss (curve A, B, C) when ordering.

The band-pass filter can also be tuned on site using the supplied instructions.



790965



790964

Technical Data

Type No.	**790965** **2-cavity band-pass filter**			**790964** **3-cavity band-pass filter**		
Frequency range	146 ... 174 MHz					
Insertion loss at f_o	1 ... 2 dB, tunable					
	Tuning examples					
	1.0 dB curve **A**	**1.5 dB** curve **B**	**2.0 dB** curve **C**	**1.0 dB** curve **A**	**1.5 dB** curve **B**	**2.0 dB** curve **C**
VSWR	< 1.3 (at operating frequency)					
Impedance	50 Ω					
Input power	< 75 W	< 50 W	< 25 W	< 100 W	< 75 W	< 50 W
Temperature range	-30 ... +60 °C					
Effect of temperature	-1.4 kHz / °C					
Connectors	N female, silver-plated					
Material	Brass, silver-plated					
Colour	Grey (RAL 7032)					
Installation	With 3 screws (max. 8 mm diameter)			With 4 screws (max. 8 mm diameter)		
Weight	5.7 kg			8.4 kg		
Packing size	500 mm x 190 mm x 320 mm			500 mm x 190 mm x 440 mm		
Dimensions (w x h x d)	419 mm x 121 mm x 232 mm (with connectors)			419 mm x 121 mm x 345 mm (with connectors)		

Band-pass Filter
146 ... 174 MHz
Typical attenuation curves

KATHREIN

Tuning examples:

2-cavity band-pass filter 790965

Diagram I:

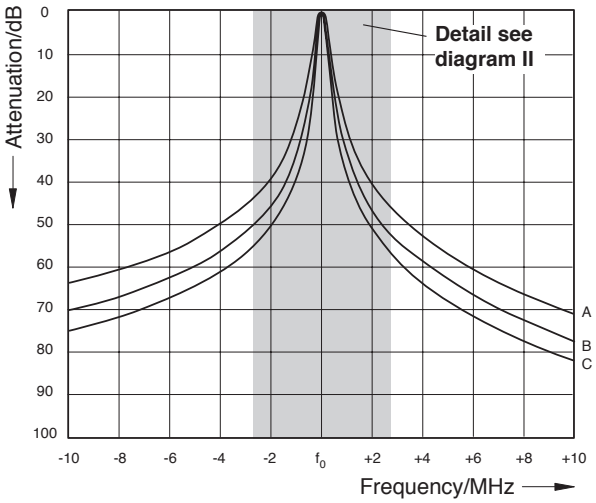


Diagram II:

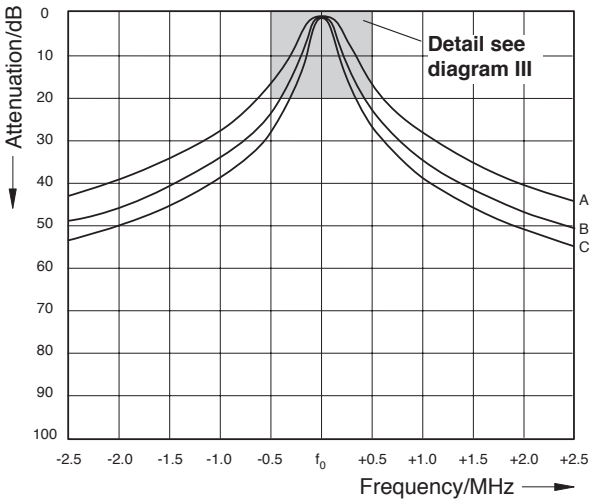
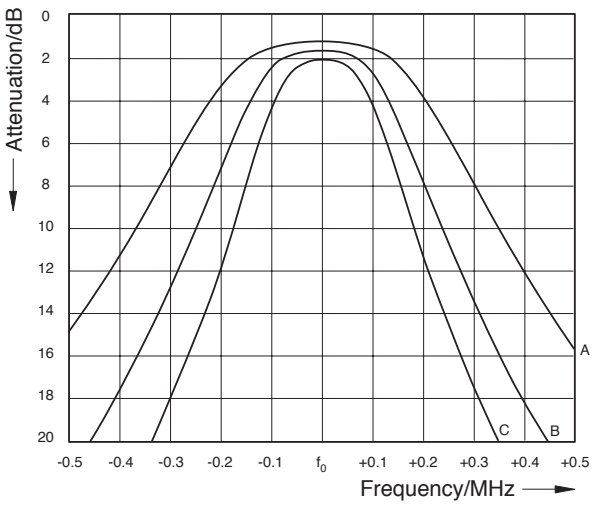


Diagram III:



3-cavity band-pass filter 790964

Diagram IV:

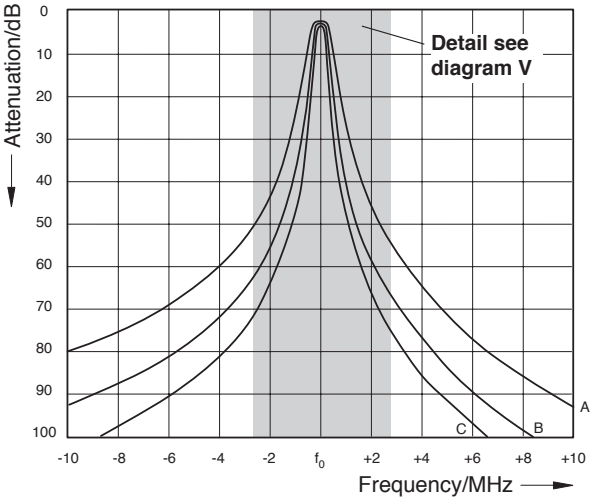


Diagram V:

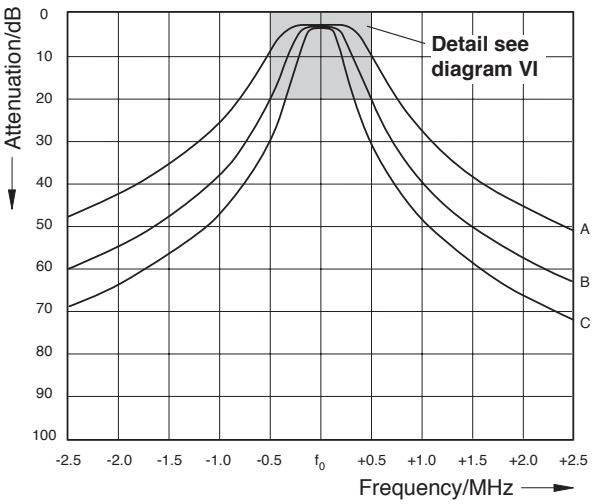
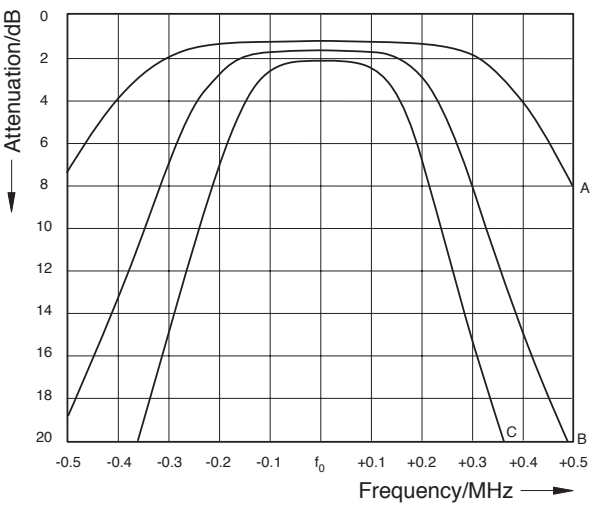


Diagram VI:



Band-pass Filter
146 ... 174 MHz

KATHREIN

The band-pass filter is suitable for use as a receiving or transmitting filter for **one** receiver or transmitter.

It can be used:
- to improve the input selectivity of receivers and amplifiers,
- to increase the isolation of transmitters, whose respective antennas are mounted close together,
- to suppress noise side bands and intermodulation products,
- as a combiner component.

Design and construction:
The band-pass filter is designed as a temperature stabilized λ/4 coaxial resonator. The pass band frequency and the insertion loss are tunable.

Filter characteristics:
Narrow pass band with low insertion loss, high stop band attenuation, variable filter response corresponding to the desired stop band attenuation.

Combination of several band-pass fiters:
Several band-pass filters can be interconnected using cables of an electrical length of λ/4. This causes an increase in the edge steepness of the filter curve as well as the bandwidth of the pass band. The individual filters are tuned to the center frequency of the complete filter.

Insertion loss of the filter combination = Sum insertion loss of the individual filters + cable attenuation of the interconnecting cables (about 0.1 dB per cable).
Stop band attenuation of the filter combination = Sum stop band attenuation of individual filters + additional stop band attenuation.

If the stop band attenuation of the individual filters exceeds 10 dB, approximately the following applies:
additional stop band attenuation =
(n - 1) x 5 dB;
n = number of individual filters.
For special applications band-pass filters can also be interconnected with S-P filters.

Tuning:
The band-pass filter is tuned to the desired pass band frequency and insertion loss at the factory. Please specify desired pass band frequency and insertion loss (curve A, B, C, D) when ordering.

The band-pass filter can also be tuned on site using the supplied instructions.

Technical Data

Type No.	**K6421251**			
Frequency range	146 ... 174 MHz			
Insertion loss at f_o	0.5 ... 2 dB, tunable			
	Tuning examples			
	0.5 dB curve **A**	**1.0 dB** curve **B**	**1.5 dB** curve **C**	**2.0 dB** curve **D**
VSWR	< 1.5 (at operating frequency)			
Impedance	50 Ω			
Input power	< 200 W			
Temperature range	-30 ... +60 °C			
Effect of temperature	< 0.4 kHz / °C			
Connectors	N female			
Material	Outer conductor: Aluminium Inner conductor: Brass, silver-plated			
Installation	Free standing or wall mounting with mounting angles			
Attached hardware	Band-pass filter with 2 mounting angles and 2 connecting pieces			
Weight	9 kg			
Packing size	207 mm x 865 mm x 207 mm			
Dimensions (w x h x d)	190 mm x max. 770 mm x 190 mm (with tuning rod)			

Band-pass Filter
146 ... 174 MHz
Typical attenuation curves

KATHREIN

Tuning examples:

Diagram I:

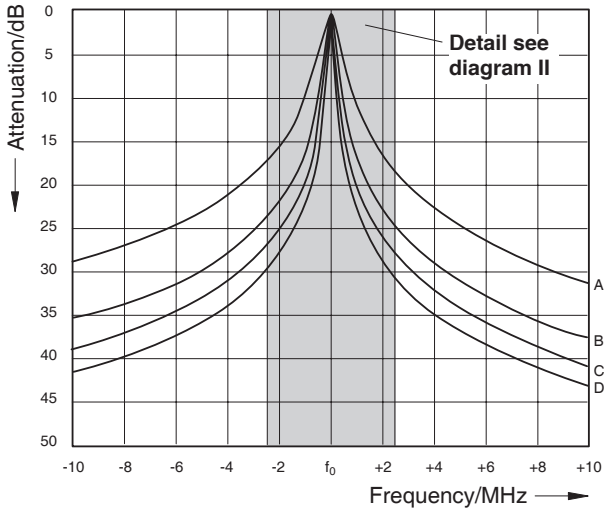


Diagram II:

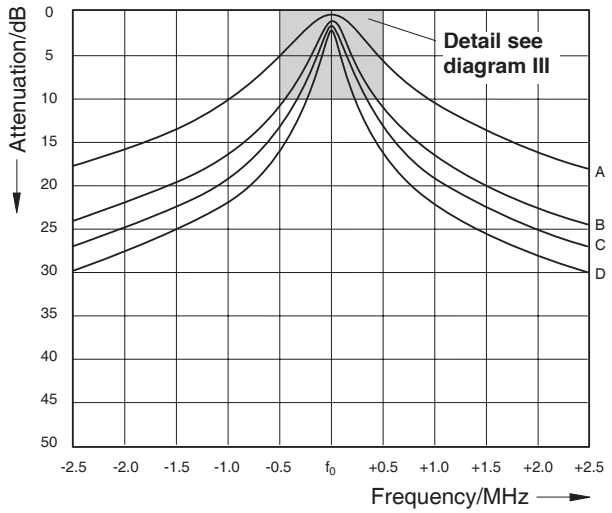
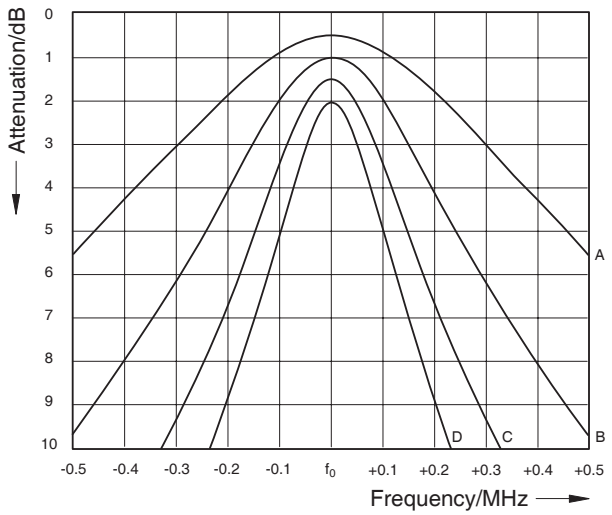


Diagram III:



S-P Filter
146 ... 174 MHz

KATHREIN

The S-P filter (Stop-Pass filter) is used to attenuate interfering signals located extremely close to the operational frequency.

It can be used:
- in the transmission path to suppress side band noise and to attenuate intermodulation products at the receiving frequencies,
- in the receiving path to attenuate transmitting frequencies,
- as a component for combiners with very low frequency spacing.

Design and construction:
The S-P filter is designed as a high Q temperature stabilized λ/4 coaxial resonator. Using a special temperature stabilized coupling, high stop band attenuation can be adjusted very close to the pass band frequency.

Filter characteristics:
Narrow pass band with low insertion loss, high stop band attenuation at the stop band frequency. Even in case of very small spacing between the pass band and the stop band frequency a high stop band attenuation is achieved, which can not be achieved using standard band-pass filters of the same size.

Combination of several S-P filters:
Several S-P filters can be interconnected by cables with an electrical length of λ/4.

Insertion loss of the filter combination = Sum insertion loss of the individual filters + cable attenuation of the interconnecting cables (about 0.1 dB per cable). Stop band attenuation of the filter combination = Sum stop band attenuation of the individual filters + additional stop band attenuation.

If the stop band attenuation of the individual filters exceeds 10 dB, approximately the following applies:
additional stop band attenuation =
(n – 1) x 5 dB;
n = number of individual filters.
For special applications S-P filters can also be interconnected with band-pass filters.

Tuning:
The S-P filter is tuned to the desired pass band and stop band frequency at the factory. Please specify desired pass band **and** stop band frequency when ordering.

The S-P filter can also be tuned on site using the supplied instructions.

K6421261
792119

Technical Data

Type No.	792119	K6421261
Frequency range	146 ... 174 MHz	
Frequency spacing: Pass band / stop band frequency	60 - 150 kHz [1] 150 - 300 kHz [2] > 300 kHz [3]	> 300 kHz
Insertion loss	< 1.0 dB	0.5 ±0.15 dB
VSWR	< 1.5 (at operating frequency)	
Impedance	50 Ω	
Input power	< 15 W [1] < 100 W [2] < 200 W [3]	< 200 W
Temperature range	0 ... +35 °C [1] 0 ... +50 °C [2] -20 ... +60 °C [3]	-20 ... +60 °C
Effect of temperature	< 0.4 kHz / °C	
Connectors	N female	
Material	Outer conductor: Aluminium Inner conductor: Brass, silver-plated	
Installation	Free standing or wall mounting	
Attached hardware	S-P filter with 2 mounting angles and 2 connecting pieces	
Weight	Approx. 9 kg	
Packing size	207 mm x 865 mm x 207 mm	
Dimensions (w x h x d)	190 mm x max. 770 mm x 190 mm (with tuning rod)	

S-P Filter
146 ... 174 MHz
Typical attenuation curves

Tuning examples:

792119

Diagram I:

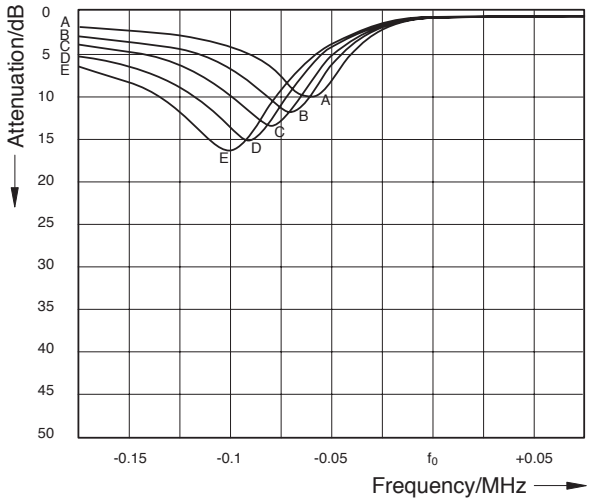
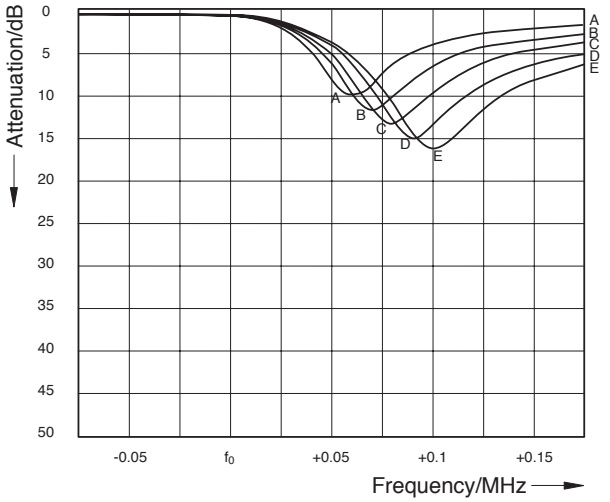


Diagram II:



K6421261

Diagram I:

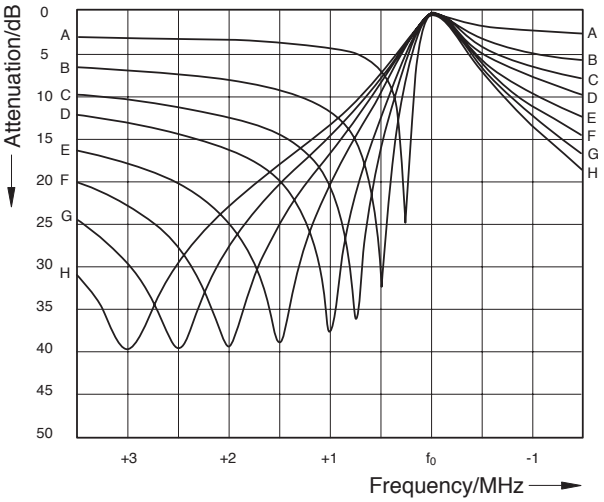
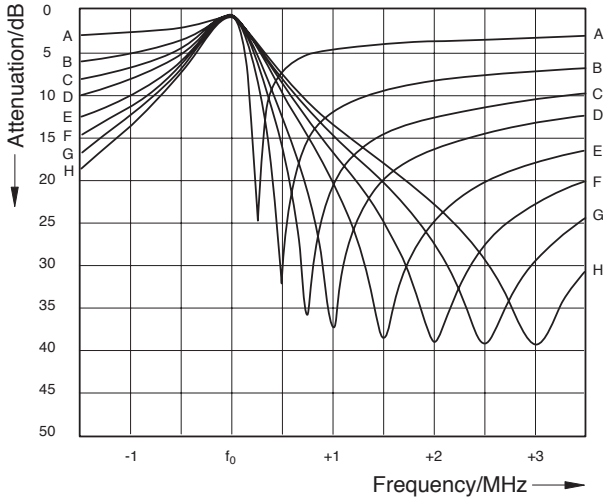


Diagram II:



Band-pass Filter
380 ... 470 MHz

KATHREIN

The band-pass filter is suitable as receiving or transmitting filter, for **one or more** transmitting or receiving channels.

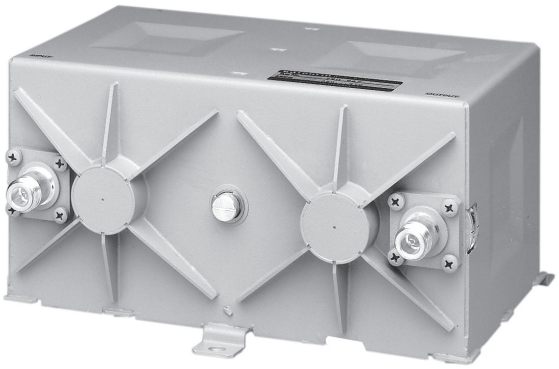
It can be used:
- to improve the input selectivity of receivers and amplifiers,
- to increase the isolation of transmitters, whose respective antennas are mounted close together,
- to suppress noise sidebands and intermodulation products,
- as a component to form combiners.

Design and construction:
The band-pass filter consists of two or three high Q inductively coupled resonators. The pass band frequency, the coupling between the resonators as well as the input and output coupling are adjustable.

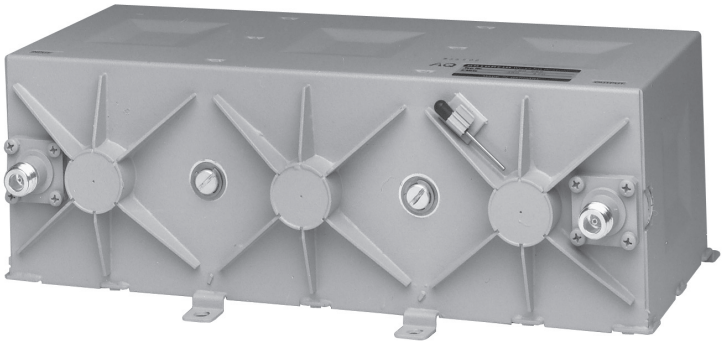
Filter characteristics:
Narrow pass band range with low insertion loss, high stop band attenuation, variable filter response corresponding to the desired stop band attenuation.

Tuning:
The band-pass filter is tuned to the desired pass band frequency and insertion loss at the factory. Please specify desired pass band frequency and insertion loss (curve A, B, C) when ordering.

The band-pass filter can also be tuned on site using the supplied instructions.



790967



790966

Technical Data

Type No.	**790967** **2-cavity band-pass filter**			**790966** **3-cavity band-pass filter**		
Frequency range	380 ... 470 MHz					
Insertion loss	1 ... 2 dB, tunable					
	1.0 dB curve **A**	**1.5 dB** curve **B**	**2.0 dB** curve **C**	**1.0 dB** curve **A**	**1.5 dB** curve **B**	**2.0 dB** curve **C**
VSWR	< 1.3 (at operating frequency)					
Impedance	50 Ω					
Input power	< 50 W	< 35 W	< 25 W	< 75 W	< 50 W	< 35 W
Temperature range	-30 ... +60 °C					
Effect of temperature	-2.5 kHz / °C					
Connectors	N female, silver-plated					
Material	Brass, silver-plated					
Colour	Grey (RAL 7032)					
Installation	With 3 screws (M6)			With 4 screws (M6)		
Weight	3.2 kg			4.5 kg		
Packing size	310 mm x 210 mm x 310 mm			410 mm x 215 mm x 255 mm		
Dimensions (w x h x d)	232 mm x 121 mm x 188 mm (with connectors)			345 mm x 121 mm x 188 mm (with connectors)		

Band-pass Filter
380 ... 470 MHz
Typical attenuation curves

KATHREIN

Tuning example:

2-cavity band-pass filter 790967

Diagram I:

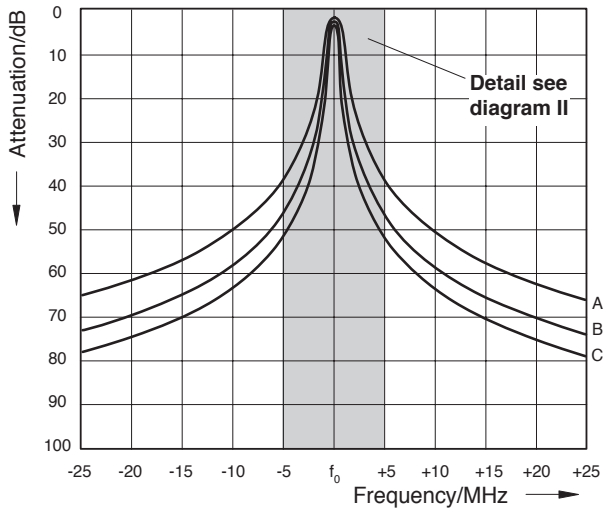


Diagram II:

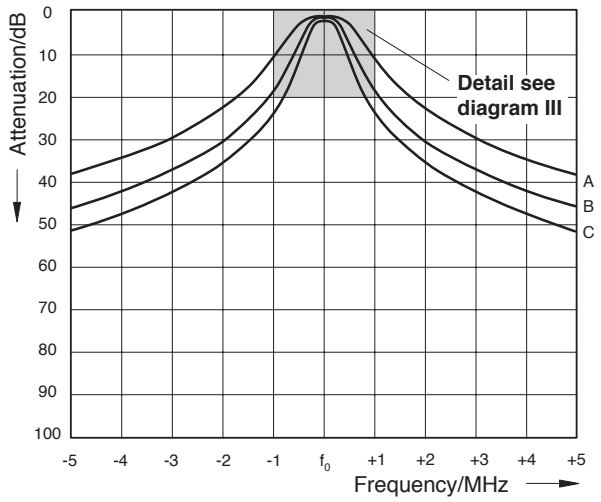
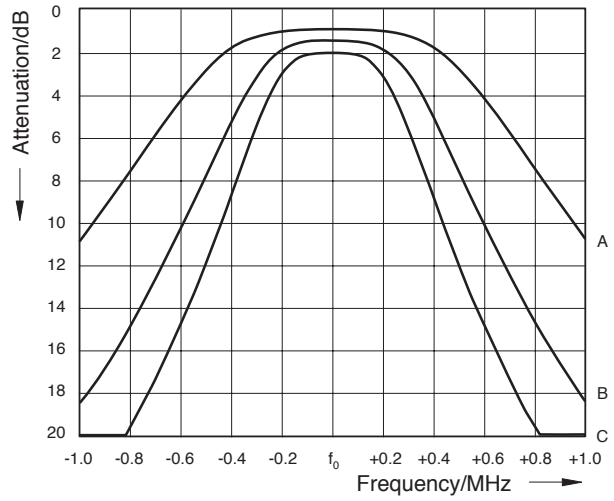


Diagram III:



3-cavity band-pass filter 790966

Diagram I:

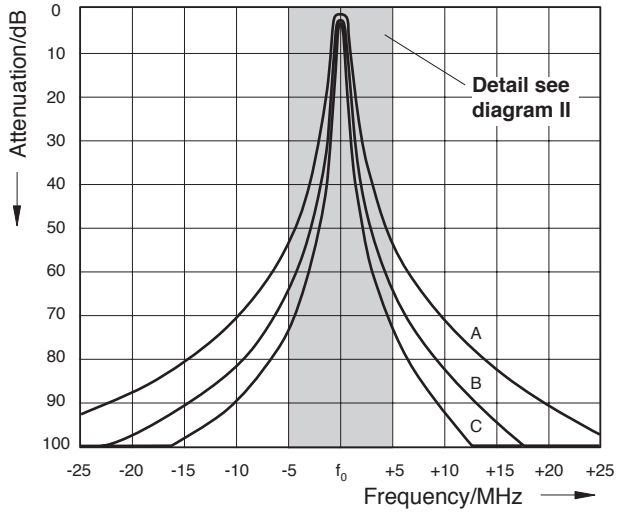


Diagram II:

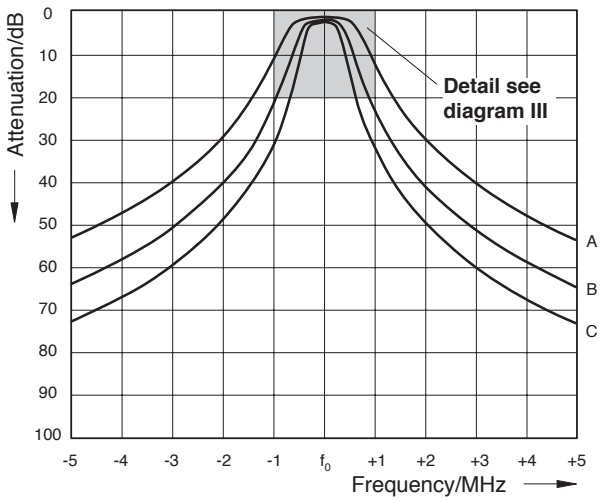
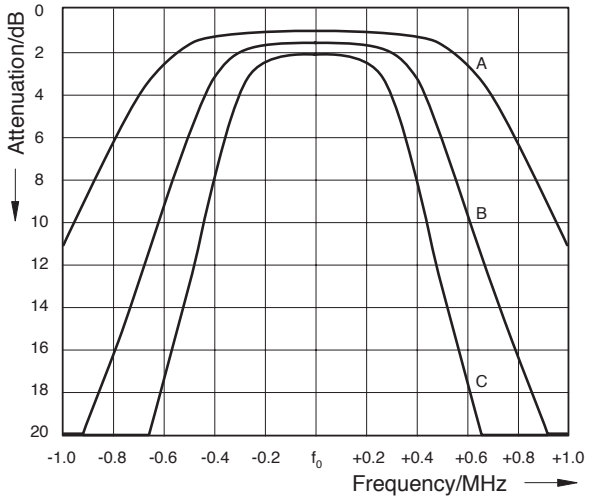


Diagram III:



Band-pass Filter
380 ... 470 MHz

KATHREIN

The band-pass filter is suitable as receiving or transmitting filter, for **one** transmitting or receiving channel.

It can be used:
- to improve the input selectivity of receivers and amplifiers,
- to increase the isolation of transmitters, whose respective antennas are mounted close together,
- to suppress noise sidebands and intermodulation products,
- as a component to form combiners.

Design and construction:
The band-pass filter is designed as a temperature stabilized λ/4 coaxial resonator. The pass band frequency as well as the input and output coupling are adjustable.

Filter characteristics:
Narrow pass band range with low insertion loss, high stop band attenuation, variable filter response corresponding to the desired stop band attenuation.

Combination of several band-pass filters:
Several band-pass filters can be interconnected using cables of an electrical length of λ/4. This causes an increase in the edge steepness of the filter curve as well as the bandwidth of the pass band. The individual filters are tuned to the center frequency of the complete filter.

Insertion loss of the filter combination = Sum insertion loss of the individual filters + cable attenuation of the interconnecting cables (about 0.1 dB per cable).
Stop band attenuation of the filter combination = Sum stop band attenuation of individual filters + additional stop band attenuation.

If the stop band attenuation of the individual filters exceeds 10 dB, approximately the following applies:
additional stop band attenuation = (n – 1) x 5 dB;
n = number of individual filters.
For special applications band-pass filters can also be interconnected with S-P filters.

Tuning:
The band-pass filter is tuned to the desired pass band frequency and insertion loss at the factory. Please specify desired pass band frequency and insertion loss (curve A, B, C, D) when ordering.
The pass band filter can also be tuned on site using the supplied instructions.

Technical Data

Type No.	**K6521251**			
Frequency range	380 ... 470 MHz			
Insertion loss at f_O	0.5 ... 2 dB, tunable			
	Tuning examples			
	0.5 dB curve **A**	**1.0 dB** curve **B**	**1.5 dB** curve **C**	**2.0 dB** curve **D**
VSWR	< 1.5 (at pass band frequency)			
Impedance	50 Ω			
Input power	< 200 W			
Temperature range	-30 ... +60 °C			
Effect of temperature	< 1.2 kHz / °C			
Connectors	N female			
Material	Outer conductor: Aluminium Inner conductor: Brass, silver-plated			
Mounting	Free standing or wall mounting with mounting angles			
Attached hardware	Band-pass filter with 2 mounting angles and 2 connecting pieces			
Weight	5 kg			
Packing size	210 mm x 490 mm x 210 mm			
Dimensions (w x h x d)	190 mm x max. 380 mm x 190 mm (with tuning rod)			

Band-pass Filter
380 ... 470 MHz
Typical attenuation curves

KATHREIN

Tuning example:

Diagram I:

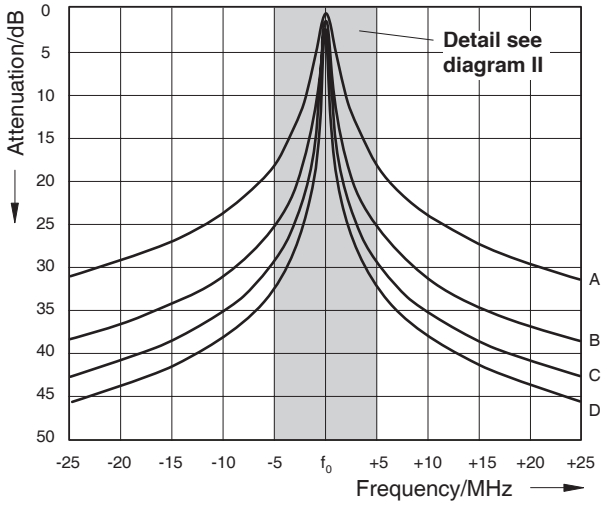


Diagram II:

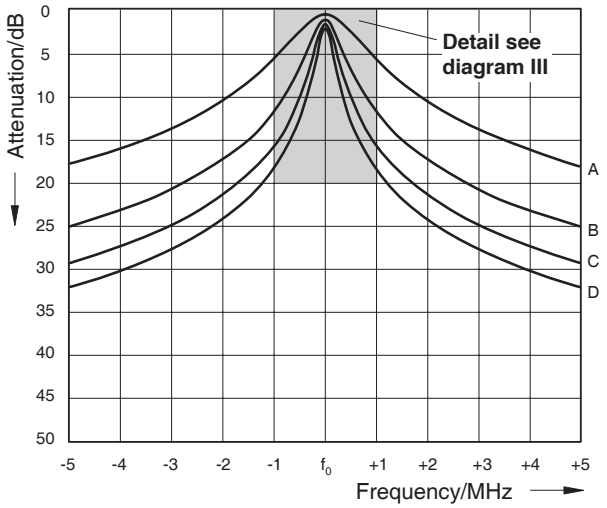
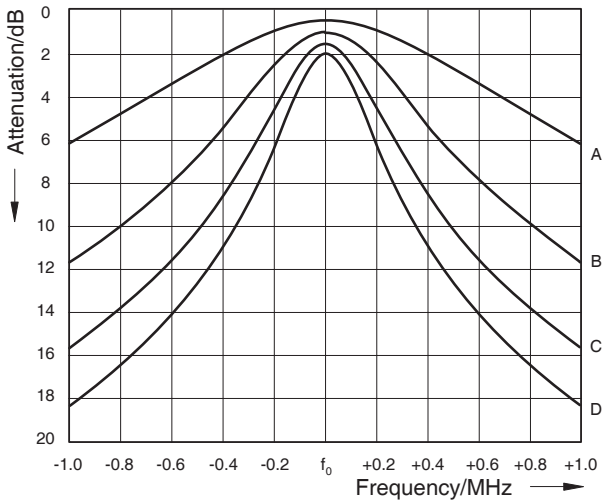


Diagram III:



S-P Filter
380 ... 470 MHz

KATHREIN

The S-P filter (Stop-Pass filter) is used to attenuate interfering signals lying extremely close to the operating frequency.

It can be used:
- in the transmission path to suppress side band noise and to attenuate intermodulation products at the receiving frequencies,
- in the receiving path to attenuate transmitting frequencies,
- as a component for combiners with very narrow frequency spacing.

Design and construction:
The S-P filter is designed as a high Q temperaturestabilized λ/4 coaxial resonator. Using a special temperature-stabilized coupling, high stop band attenuation can be adjusted very close to the pass band frequency.

Filter characteristics:
Narrow pass band range with low insertion loss, high stop band attenuation at the stop band frequency. Even in case of very narrow spacing between the pass band and the stop band frequency, a high stop band attenuation is achieved, which cannot be achieved using standard band-pass filters of the same size.

Combination of several S-P filters:
Several S-P filters can be interconnected by usingcables with an electrical length of λ/4.

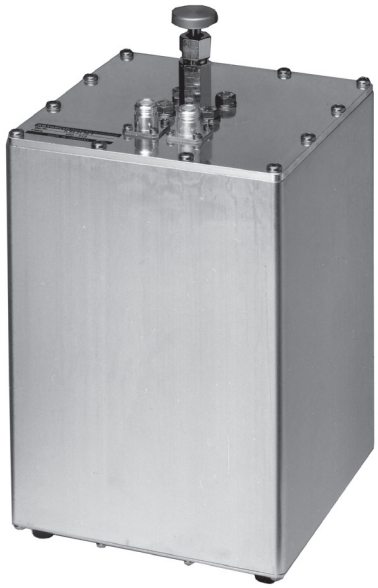
Insertion loss of the filter combination = Sum of insertion loss of the individual filters + cable attenuation of the interconnecting cables (about 0.1 dB per cable). Stop band attenuation of the filter combination = Sum of stop band attenuation of the individual filters + additional stop band attenuation.

If the stop band attenuation of the individual filters exceeds 10 dB, the following approximately applies:
additional stop band attenuation = (n – 1) x 5 dB;
n = number of individual filters.
For special applications S-P filters can also be interconnected by using band-pass filters.

Tuning:
The S-P filter is tuned to the desired pass band and stop band frequency at the factory. Please specify desired pass band **and** stop band frequency when ordering.

The S-P filter can also be tuned on site using the instructions supplied.

Customized versions
For special applications S-P filters for even narrower frequency spacing or lower insertion loss are available.

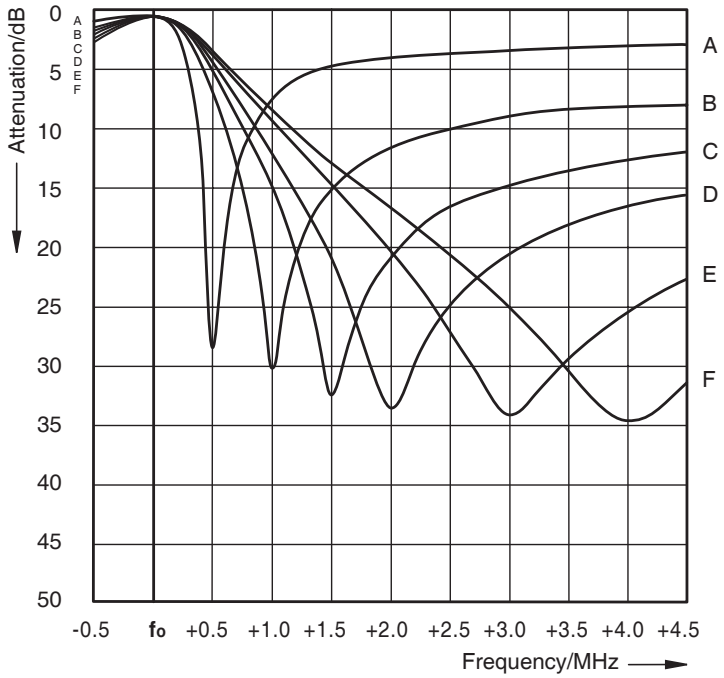


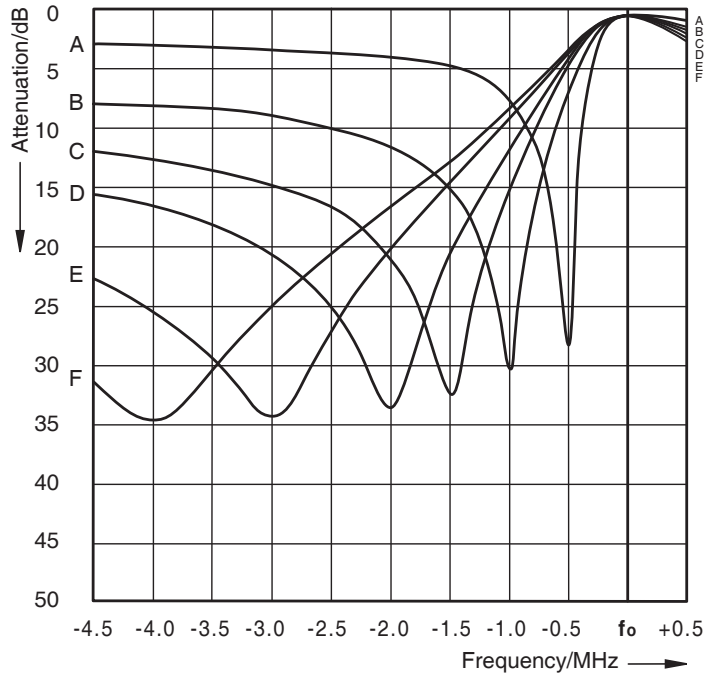
Technical Data

Type No.	K6521261
Frequency range	380 ... 470 MHz
Insertion loss	0.5 ±0.15 dB
VSWR	< 1.5 (at pass band frequency)
Impedance	50 Ω
Input power	< 200 W
Temperature range	-20 ... +60 °C
Effect of temperature	< 1.2 kHz / °C
Connectors	N female
Material	Outer conductor: Aluminium Inner conductor: Brass, silver-plated
Installation	Free standing or mall mounting
Supplied hardware	S-P filter with 2 mounting angles and 2 connecting pieces
Weight	5 kg
Packing size	210 mm x 490 mm x 210 mm
Dimensions (w x h x d)	190 mm x max. 350 mm x 190 mm (with tuning rod)

S-P Filter
380 ... 470 MHz
Typical attenuation curves

Tuning example:





Curve	Frequency spacing pass band frequency / stop band frequency
A	0.50 MHz
B	1.00 MHz
C	1.50 MHz
D	2.00 MHz
E	3.00 MHz
F	4.00 MHz

Summary of Articles

Duplexers:

Description	Type No.	Frequency range ... tunable bandwidth - fixed bandwidth (not tunable)	Max. input power	Page
Duplexer	719069	68 ... 87.5 MHz	100 W	92, 93
Duplexer	K644143	68 ... 87.5 MHz	200 W	94
Duplexer	K644144	68 ... 87.5 MHz	200 W	94
Duplexer	719628	146 ... 174 MHz	100 W	96, 97
Duplexer	718388	146 ... 174 MHz	100 W	96, 97
Duplexer	K644123	146 ... 174 MHz	200 W	95
Duplexer	K644124	146 ... 174 MHz	200 W	95
Duplexer	719785	380 ... 470 MHz	100 W	98, 99
Duplexer	718290	380 ... 470 MHz	100 W	98, 99
Duplexer	718313	380 ... 470 MHz	100 W	100, 101
Duplexer	719237	380 ... 470 MHz	100 W	100, 101
Duplexer (TETRA, TETRAPOL)	78210361	380 - 385 / 390 - 395 MHz	200 W	102, 103
Duplexer (TETRA, TETRAPOL)	78210362	382 - 387 / 392 - 397 MHz	200 W	102, 103
Duplexer (TETRA, TETRAPOL)	78210363	385 - 390 / 395 - 400 MHz	200 W	102, 103
Duplexer (TETRA, TETRAPOL)	78210371	380 - 385 / 390 - 395 MHz	200 W	102, 103
Duplexer (TETRA, TETRAPOL)	78210372	382 - 387 / 392 - 397 MHz	200 W	102, 103
Duplexer (TETRA, TETRAPOL)	78210373	385 - 390 / 395 - 400 MHz	200 W	102, 103
Duplexer (TETRA, TETRAPOL)	78210364	410 - 415 / 420 - 425 MHz	200 W	104, 105
Duplexer (TETRA, TETRAPOL)	78210365	415 - 420 / 425 - 430 MHz	200 W	104, 105
Duplexer (TETRA, TETRAPOL)	78210374	410 - 415 / 420 - 425 MHz	200 W	104, 105
Duplexer (TETRA, TETRAPOL)	78210375	415 - 420 / 425 - 430 MHz	200 W	104, 105
Duplexer (TETRA, TETRAPOL)	78210366	450 - 455 / 460 - 465 MHz	200 W	106, 107
Duplexer (TETRA, TETRAPOL)	78210367	455 - 460 / 465 - 470 MHz	200 W	106, 107
Duplexer (TETRA, TETRAPOL)	78210376	450 - 455 / 460 - 465 MHz	200 W	106, 107
Duplexer (TETRA, TETRAPOL)	78210377	455 - 460 / 465 - 470 MHz	200 W	106, 107
Duplexer (4 Resonators)	K654125	380 ... 470 MHz	200 W	108
Duplexer (6 Resonators)	K654126	380 ... 470 MHz	200 W	108

Duplexer
68 ... 87.5 MHz

KATHREIN

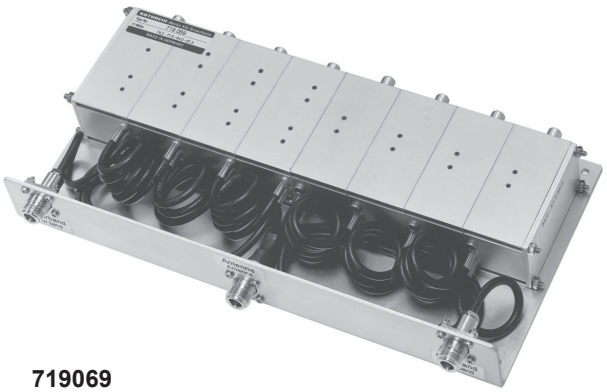
The duplexer is suited to combine **one** transmitter with **one or more** receivers to a common antenna.

Design and construction:
The duplexer consists of a 4-cavity S-P filter (Stop-Pass filter) for the low band and a 4-cavity S-P filter for the high band. The two S-P filters are interconnected to a common antenna output using cables of defined electrical lengths.

The S-P filters are designed to allow the transmitter to operate in the low band as well as the high band.

Tuning:
The duplexer, because of its special construction can only be tuned at the factory. Special requests like other duplex spacings, switching bandwidths or attenuation values can be taken into account.

When ordering please specify the desired high **and** low band frequencies.



719069

Technical Data

Type No.	**719069**				
Number of resonators	4 + 4				
Frequency range	68 ... 87.5 MHz				
	Tuning examples				
Duplex spacing	**2 MHz**	**6 MHz**	**9.8 MHz**		
Switching bandwidth	**0.1 MHz ***	**1.0 MHz**	**2.5 MHz**	**3.3 MHz**	**4.0 MHz**
Insertion loss [1]	< 1.8 dB	< 1.0 dB	< 1.0 dB	< 1.0 dB	< 1.2 dB
Isolation [2]	> 65 dB	> 75 dB	> 80 dB	> 70 dB	> 65 dB
VSWR	< 1.4 (at operatimg frequency)				
Impedance	50 Ω				
Input power [3]	< 100 W (-30 ... +55 °C) / < 50 W (+55 ... +70 °C) * < 50 W (-30 ... +55 °C) / < 30 W (+55 ... +70 °C)				
Temperature range	-30 ... +70 °C				
Connectors	N female				
Material	S-P resonators: Aluminium / copper, silver-plated				
Cable	RG 223/U				
Installation	With 4 screws (max. 4 mm diameter)				
Weight	2.75 kg				
Packing size	362 mm x 60 mm x 245 mm				
Dimensions (w x h x d)	350 mm x 50 mm x 190 mm (with connectors)				

[1] Low band ↔ Antenna / High band ↔ Antenna
[2] Low band ↔ High band
[3] Low band *or* High band

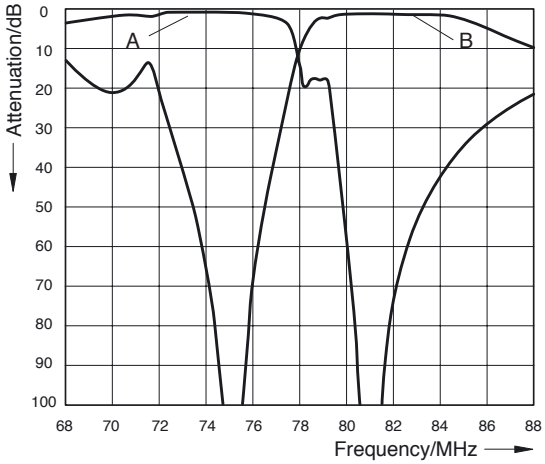
Duplexer
68 ... 87.5 MHz

KATHREIN

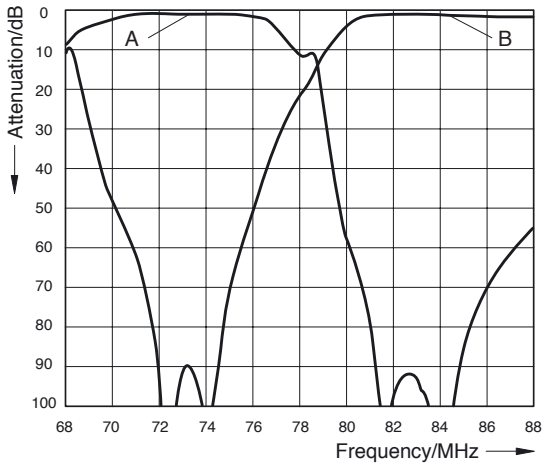
Tuning examples:

Duplexer 719069

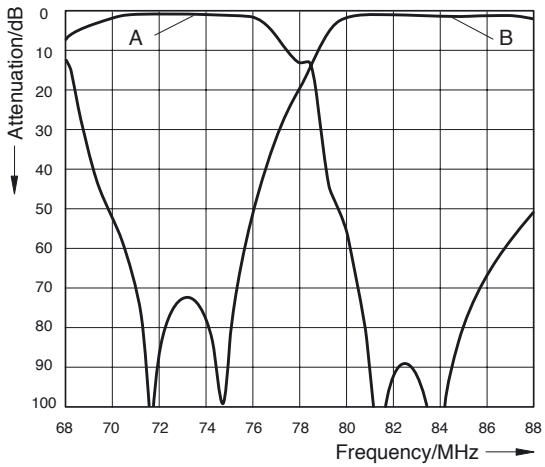
Duplex spacing: 6.0 MHz
Switching bandwidth: 1.0 MHz



Duplex spacing: 9.8 MHz
Switching bandwidth: 2.5 MHz



Duplex spacing: 9.8 MHz
Switching bandwidth: 4.0 MHz



A: Low band ↔ Antenna
B: High band ↔ Antenna

Duplexer
68 ... 87.5 MHz

KATHREIN

The duplexer is suited to combine transmitters and receivers (or transmitter and transmitter or receiver and receiver) to a common antenna.

It can be used :
- for very small frequency spacing,
- to obtain very high stop band attenuation (more than 100 dB) at very low insertion loss.

Design and construction:
The duplexer consists of four or six S-P filters K 64 21 46 1 / K 64 21 47 1 and interconnecting cables of defined length, depending on the operating frequencies. The S-P filters consist of temperature stabilized λ/4 coaxial resonators. Using a specially temperature stabilized coupling a high stop band attenuation can be adjusted very close to the pass band frequency.

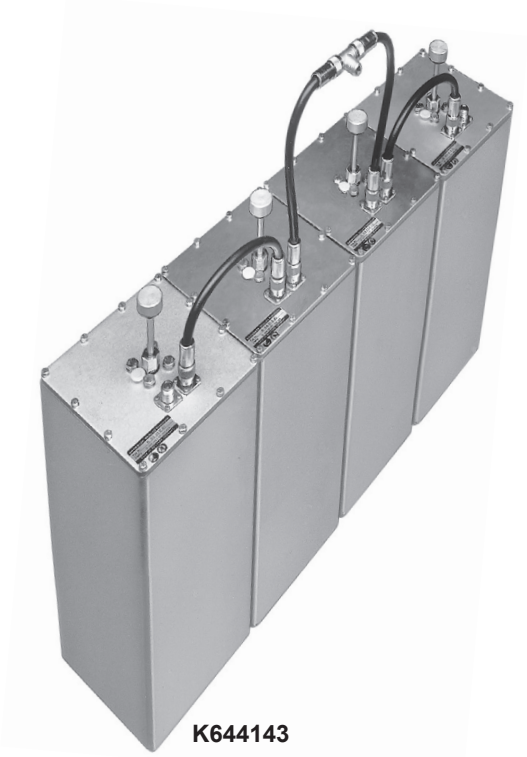
Tuning:
The stop band attenuation is dependent on the frequency spacing and the number of S-P filters. The stop band attenuation for four or six S-P filters can be read from the diagram.

The duplexer is tuned to the desired pass band frequencies at the factory. When ordering please specify the pass band frequencies.

The duplexer can also be tuned on site using the supplied instructions.

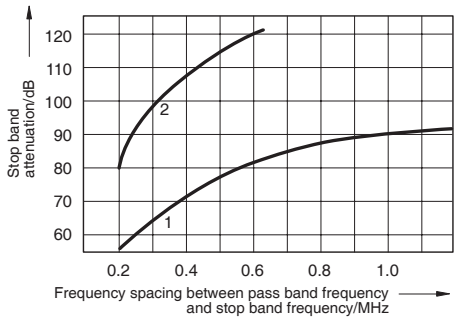
Installation:
The duplexer can be used as a stand alone unit or wall mounted using the supplied brackets. The individual S-P filters can be connected to each other using the supplied straps.

Custom versions:
For special applications more than six S-P filters can be combined.



K644143

Typical attenuation curves
Tuning examples:



Technical Data

Type No.	K644143	K644144
Number of resonators	4	6
Frequency range	68 ... 87.5 MHz	
Insertion loss	1.0 ±0.2 dB	1.5 ±0.3 dB
VSWR	< 1.4 (at operating frequency)	
Impedance	50 Ω	
Input power	< 200 W	
Effect of temperature	< 0.2 kHz / °C	
Temperature range	-30 ... +60 °C	
Material	Outer conductor: Aluminium Inner conductor: Brass, silver-plated	
Connectors	N female	
Weight	65 kg	97 kg
Packing size by mm	4x 210 x 1660 x 210	6x 210 x 1660 x 210
Dimensions (w x h x d) by mm	190 x max. 1500 x 760 (with tuning rods)	190 x max. 1500 x 1140 (with tuning rods)
Attached hardware	S-P filter with interconnecting cables, 2 brackets and 2 straps for each resonator	

Number of resonators	Curve	Insertion loss	Type No.
4	1	1.0 dB	**K644143**
6	2	1.5 dB	**K644144**

Duplexer
146 ... 174 MHz

KATHREIN

The duplexer is suited to combine transmitters and receivers (or transmitter and transmitter or receiver and receiver) to a common antenna.

It can be used :
- for very small frequency spacing,
- to obtain very high stop band attenuation (more than 100 dB) at very low insertion loss.

Design and construction:
The duplexer consists of four or six S-P filters K 64 21 26 1 and interconnecting cables of defined length, depending on the operating frequencies. The S-P filters consist of temperature stabilized λ/4 coaxial resonators. Using a specially temperature stabilized coupling a high stop band attenuation can be adjusted very close to the pass band frequency.

Tuning:
The stop band attenuation is dependent on the frequency spacing and the number of S-P filters. The stop band attenuation for four or six S-P filters can be read from the diagram.

The duplexer is tuned to the desired pass band frequencies at the factory. When ordering please specify the pass band frequencies.

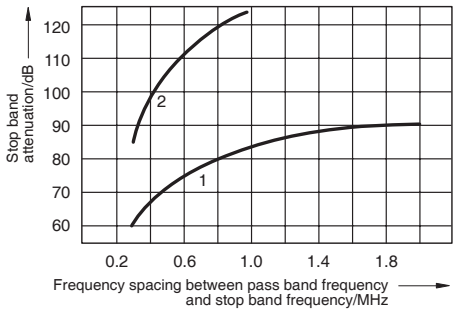
The duplexer can also be tuned on site using the supplied instructions.

Installation:
The duplexer can be used as a stand alone unit or wall mounted using the supplied brackets. The individual S-P filters can be connected to each other using the supplied straps.

Custom versions:
For special applications more than six S-P filters can be combined.

K644123

Typical attenuation curves
Tuning examples:



Number of resonators	Curve	Insertion loss	Type No.
4	1	1.0 dB	**K644123**
6	2	1.5 dB	**K644124**

Technical Data

Type No.	K644123	K644124
Number of resonators	4	6
Frequency range	146 ... 174 MHz	
Insertion loss	1.0 ±0.2 dB	1.5 ±0.3 dB
VSWR	< 1.4 (at operating frequency)	
Impedance	50 Ω	
Input power	< 200 W	
Effect of temperature	< 0.4 kHz / °C	
Temperature range	-30 ... +60 °C	
Material	Outer conductor: Aluminium Inner conductor: Brass, silver-plated	
Connectors	N female	
Weight	36.5 kg	54.5 kg
Packing size	4x 210 mm x 865 mm x 210 mm	6x 210 mm x 1660 mm x 210 mm
Dimensions (w x h x d)	190 mm x max. 770 mm x 760 mm (with tuning rods)	190 mm x max. 770 mm x 1140 mm (with tuning rods)
Attached hardware	S-P filter with interconnecting cables, 2 brackets and 2 straps for each resonator	

Duplexer
146 ... 174 MHz

KATHREIN

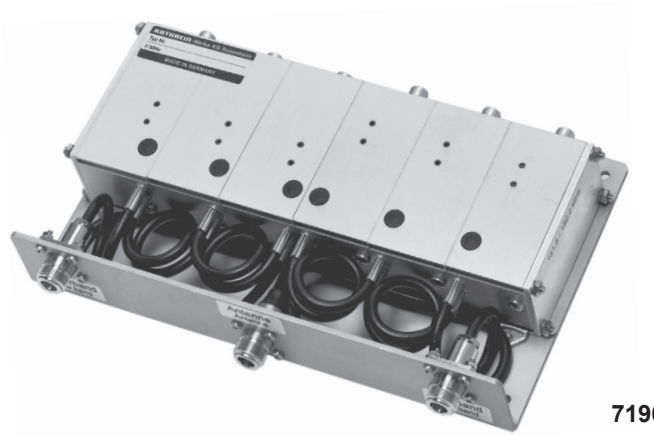
The duplexer is suited to combine **one** transmitter with one or **several** receivers to a common antenna.

Design and construction:
The duplexer consists of a 3-cavity or 4-cavity S-P filter (Stop-Pass filter) for the low band and a 3-cavity or 4-cavity S-P filter for the high band. The two S-P filters are interconnected to a common antenna output using cables of defined electrical lengths.

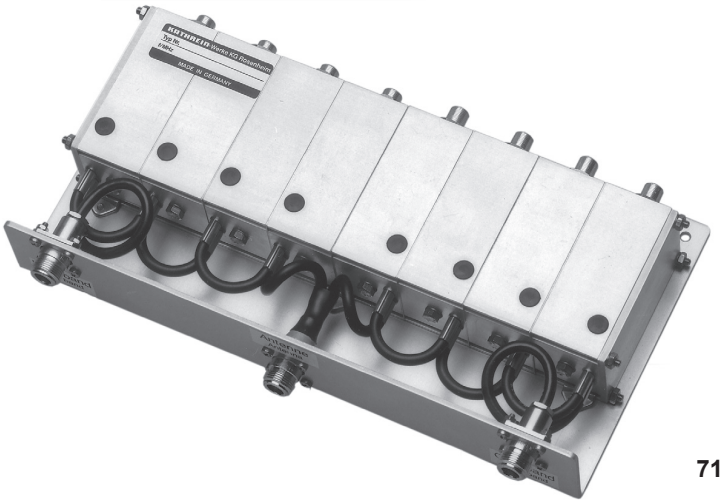
The S-P filters are designed to allow the transmitter to operate in the low band or in the high band.

Tuning:
The duplexer, because of its special construction can only be tuned at the factory.
Special requests like other duplex spacings, switching bandwidths or attenuation values can be taken into account.

When ordering please specify the desired high and low band frequencies.



719628



718388

Technical Data

Type No.	**719628**					**718388**				
Number of resonators	3 + 3					4 + 4				
Frequency range	146 ... 174 MHz									
	Tuning examples									
Duplex spacing	**3.5 MHz**	**4.6 MHz**			**6 MHz**	**3 MHz**	**4.6 MHz**			**6 MHz**
Switching bandwidth	**0.1 MHz**	**0.1 MHz**	**0.5 MHz**	**1.0 MHz**	**1.0 MHz**	**0.1 MHz***	**0.5 MHz**	**1.0 MHz***	**1.9 MHz***	**2.0 MHz**
Insertion loss [1]	< 1.5 dB	< 1.0 dB	< 1.2 dB	< 1.3 dB	< 1.2 dB	< 1.6 dB	< 1.5 dB	< 1.6 dB	< 2.3 dB	< 1.5 dB
Isolation [2]	> 65 dB	> 75 dB	> 65 dB	> 60 dB	> 65 dB	> 70 dB	> 75 dB	> 65 dB	> 60 dB	> 65 dB
VSWR	< 1.4 (at operating frequency)									
Impedance	50 Ω									
Input power [3]	< 100 W (-30 ... +55 °C) / < 50 W (+55 ... +70 °C) * < 50 W (-30 ... +55 °C) / < 30 W (+55 ... +70 °C)									
Temperature range	-30 ... +70 °C									
Connectors	N female									
Material	S-P resonators: Aluminium / copper, silver-plated; cable: RG 223/U									
Installation	With 4 screws (max. 4 mm diameter)									
Weight	2.1 kg					2.75 kg				
Packing size	275 mm x 60 mm x 245 mm					360 mm x 60 mm x 245 mm				
Dimensions (w x h x d)	263 mm x 50 mm x 170 mm (with connectors)					350 mm x 50 mm x 170 mm (with connectors)				

[1] Low band ↔ Antenna / High band ↔ Antenna
[2] Low band ↔ High band
[3] Low band *or* High band

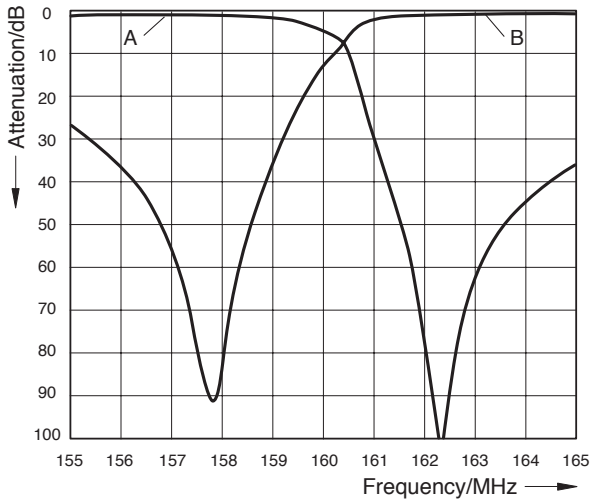
Duplexer
146 ... 174 MHz
Typical attenuation curves

KATHREIN

Tuning examples:

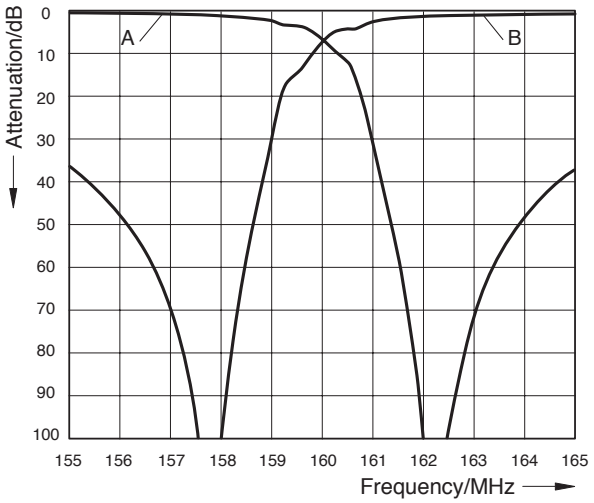
Duplexer 719628

Duplex spacing: 4.6 MHz
Switching bandwidth: 0.1 MHz

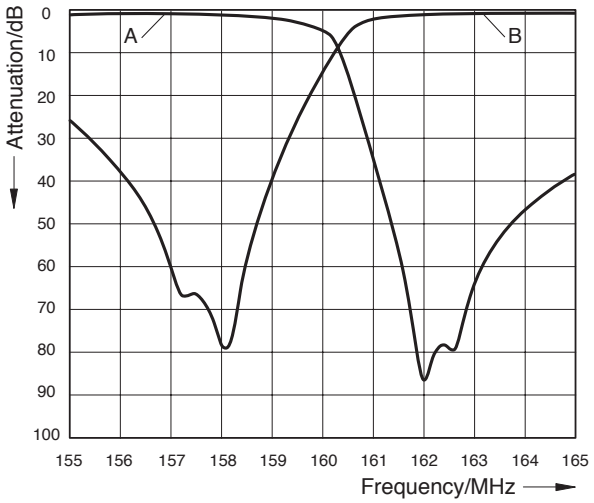


Duplexer 718388

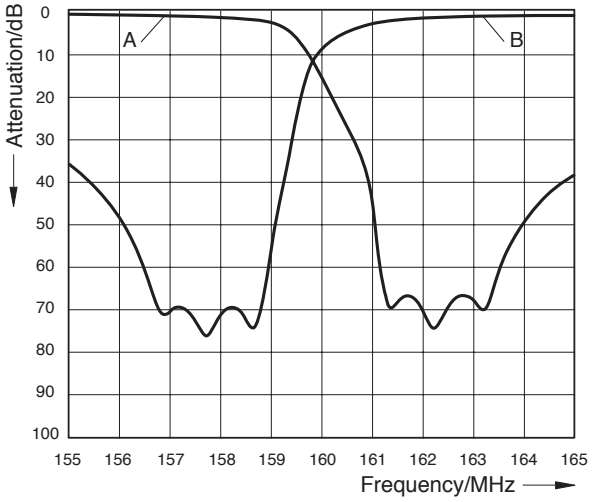
Duplex spacing: 4.6 MHz
Switching bandwidth: 0.5 MHz



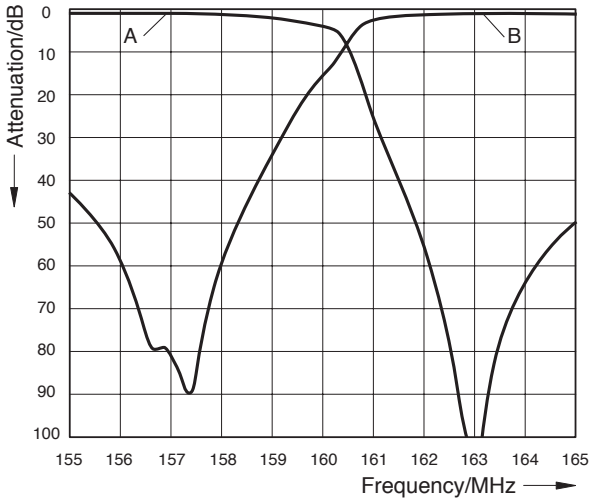
Duplex spacing: 4.6 MHz
Switching bandwidth: 1.0 MHz



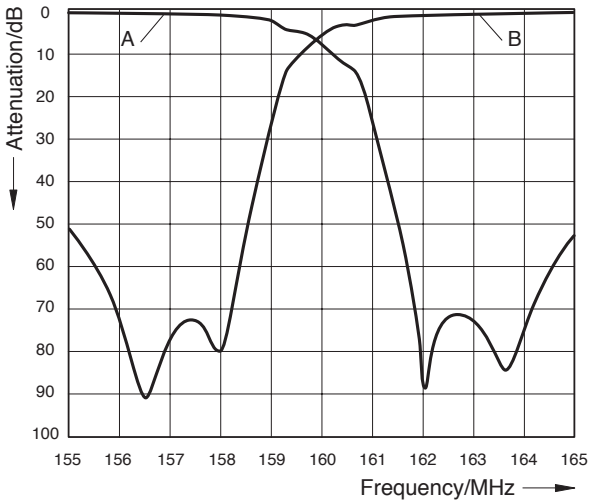
Duplex spacing: 4.6 MHz
Switching bandwidth: 1.9 MHz



Duplex spacing: 6.0 MHz
Switching bandwidth: 1.0 MHz



Duplex spacing: 6.0 MHz
Switching bandwidth: 2.0 MHz



A: Low band ↔ antenna
B: High band ↔ antenna

Duplexer
380 ... 470 MHz

KATHREIN

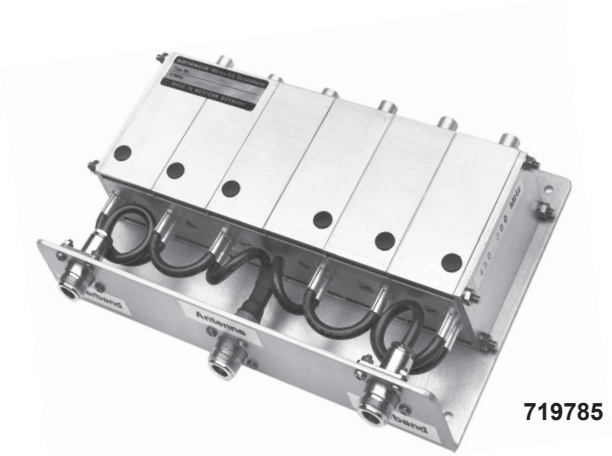
The duplexer is suited to combine **one** transmitter with **one or more** receivers to a common antenna.

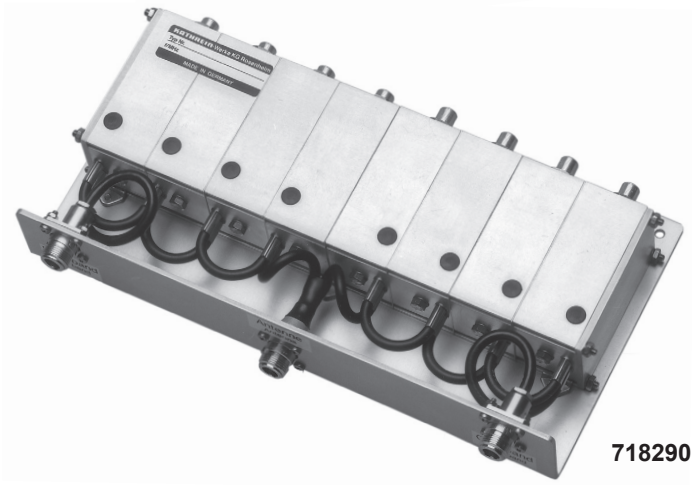
Design and construction:
The duplexer consists of a 3-cavity or 4-cavity S-P filter (Stop-Pass filter) for the low band and a 3-cavity or 4-cavity S-P filter for the high band. The two S-P filters are interconnected to a common antenna output using cables of defined electrical lengths.

The S-P filters are designed to allow the transmitter to operate in the low band as well as the high band.

Tuning:
The duplexer, because of its special construction can only be tuned at the factory. Special requests like other duplex spacings, switching bandwidths or attenuation values can be taken into account.

When ordering please specify the desired high **and** low band frequencies.


719785


718290

Technical Data

Type No.	719785					718290					
Number of resonators	3 + 3					4 + 4					
Frequency range	380 ... 470 MHz										
Duplex spacing	5 MHz		10 MHz			5 MHz		10 MHz			
Switching bandwidth	0.2 MHz	0.5 MHz	0.5 MHz	1.0 MHz	2.0 MHz	0.5 MHz*	1.0 MHz*	2.0 MHz	3.0 MHz	4.0 MHz	5.0 MHz*
Insertion loss [1]	< 1.2 dB	< 1.5 dB	< 0.7 dB	< 0.8 dB	< 1.0 dB	< 1.6 dB	< 1.8 dB	< 1.0 dB	< 1.2 dB	< 1.5 dB	< 1.8 dB
Isolation [2]	> 65 dB	> 60 dB	> 75 dB	> 70 dB	> 65 dB	> 70 dB	> 60 dB	> 80 dB	> 75 dB	> 70 dB	> 60 dB
VSWR	< 1.4										
Impedance	50 Ω										
Input power [3]	< 100 W (-30 ... +55 °C) / < 50 W (+55 ... +70 °C) * < 50 W (-30 ... +55 °C) / < 30 W (+55 ... +70 °C)										
Temperature range	-30 ... +70 °C										
Connectors	N female										
Material	S-P resonators: Aluminium / brass										
Cable	RG 223/U										
Installation	With 4 screws (M4)										
Weight	1.9 kg					2.5 kg					
Packing size	280 mm x 60 mm x 250 mm					410 mm x 85 mm x 205 mm					
Dimensions (w x h x d)	230 mm x 50 mm x 170 mm (with connectors)					300 mm x 50 mm x 170 mm (with connectors)					

[1] Low band ↔ Antenna / High band ↔ Antenna
[2] Low band ↔ High band
[3] Low band *or* High band

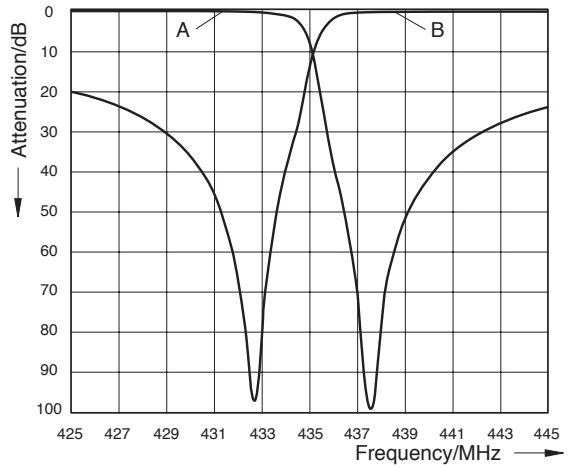
Duplexer
380 ... 470 MHz
Typical attenuation curves

KATHREIN

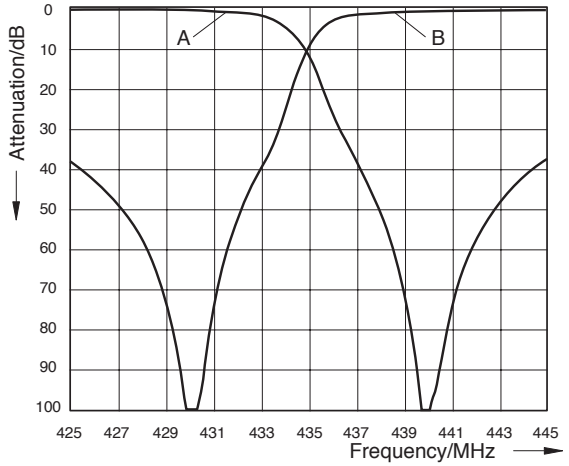
Tuning examples:

Duplexer 719785

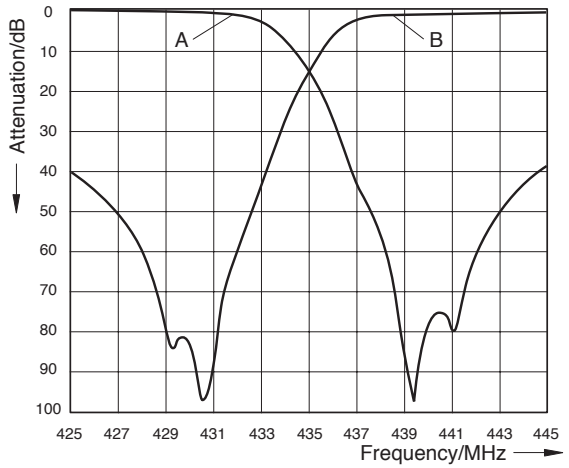
Duplex spacing : 5 MHz
Switching bandwidth: 0.5 MHz



Duplex spacing : 10 MHz
Switching bandwidth: 1.0 MHz

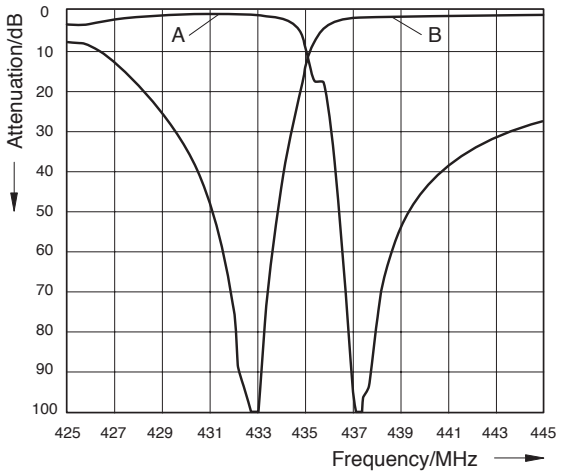


Duplex spacing : 10 MHz
Switching bandwidth: 2.0 MHz

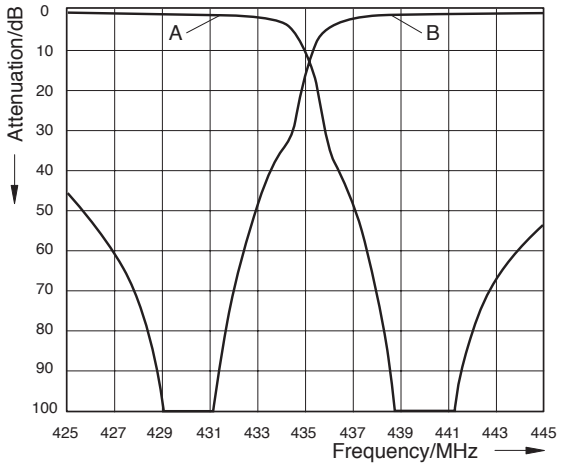


Duplexer 718290

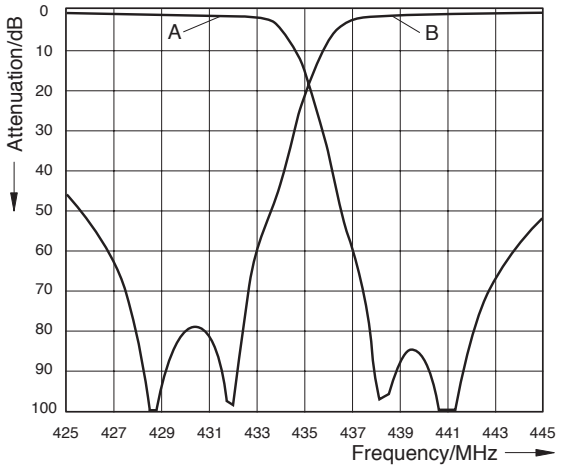
Duplex spacing : 5 MHz
Switching bandwidth: 1.0 MHz



Duplex spacing : 10 MHz
Switching bandwidth: 2.0 MHz



Duplex spacing : 10 MHz
Switching bandwidth: 4.0 MHz



A: Low band ↔ Antenna
B: High band ↔ Antenna

Duplexer
380 ... 470 MHz

KATHREIN

The duplexer is suited to combine **one or more** transmitters with one or more receivers to a common antenna.

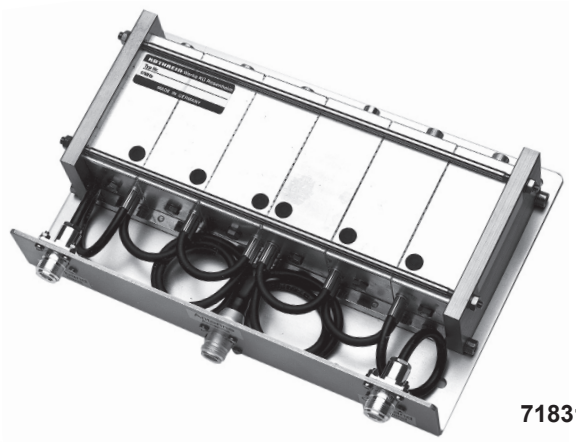
It can also be used to combine two transmitters to a common antenna.

Design and construction:
The duplexer consists of a 3-cavity or 4-cavity S-P filter (Stop-Pass filter) for the low band and a 3-cavity or 4-cavity S-P filter for the high band. The two S-P filters are interconnected to a common antenna output using cables of defined electrical lengths.

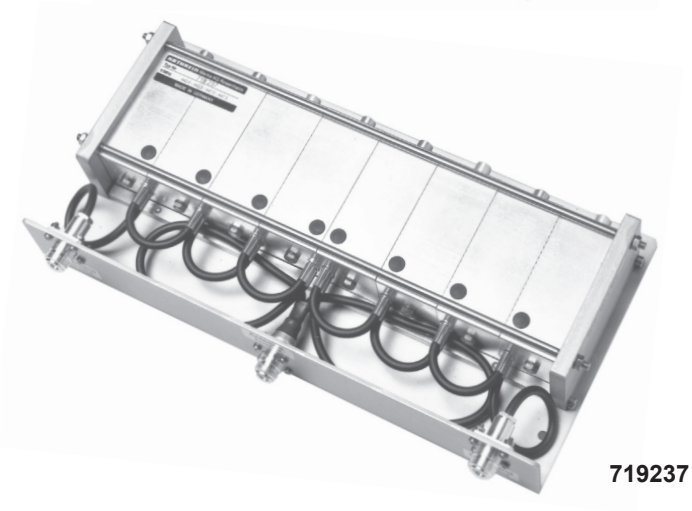
The S-P filters are designed to allow the transmitter to be operated in the low band or the high band.

Tuning:
The duplexer, because of its special construction can only be tuned at the factory. Special requests like other duplex spacings, switching bandwidths or attenuation values can be taken into account.

When ordering please specify the desired high **and** low band frequencies.



718313



719237

Technical Data

Type No.	718313					719237					
Number of resonators	3 + 3					4 + 4					
Frequency range	380 ... 470 MHz										
Duplex spacing	**5 MHz**		**10 MHz**			**5 MHz**		**10 MHz**			
Switching bandwidth	**0.2 MHz**	**0.5 MHz**	**0.5 MHz**	**1.0 MHz**	**2.0 MHz**	**0.5 MHz***	**1.0 MHz***	**2.0 MHz**	**3.0 MHz**	**4.0 MHz**	**5.0 MHz***
Insertion loss [1]	< 1.2 dB	< 1.5 dB	< 0.7 dB	< 0.8 dB	< 1.0 dB	< 1.6 dB	< 1.8 dB	< 1.0 dB	< 1.2 dB	< 1.5 dB	< 1.8 dB
Isolation [2]	> 65 dB	> 60 dB	> 75 dB	> 70 dB	> 65 dB	> 70 dB	> 60 dB	> 80 dB	> 75 dB	> 70 dB	> 60 dB
VSWR	< 1.4										
Impedance	50 Ω										
Input power [3]	< 100 W (-30 ... +55 °C) / < 50 W (+55 ... +70 °C) * < 50 W (-30 ... +55 °C) / < 30 W (+55 ... +70 °C)										
Temperature range	-30 ... +70 °C										
Connectors	N female, silver-plated										
Material	S-P resonators: Brass, silver-plated										
Cable	RG 223/U										
Installation	With 4 screws (M5)										
Weight	2.9 kg					3.8 kg					
Packing size	410 mm x 85 mm x 205 mm					410 mm x 85 mm x 205 mm					
Dimensions (w x h x d)	270 mm x 58 mm x 190 mm (with connectors)					350 mm x 58 mm x 190 mm (with connectors)					

[1] Low band ↔ Antenna / High band ↔ Antenna
[2] Low band ↔ High band
[3] Input power of the low band or the high band or total sum of the input power of the low band and the high band.

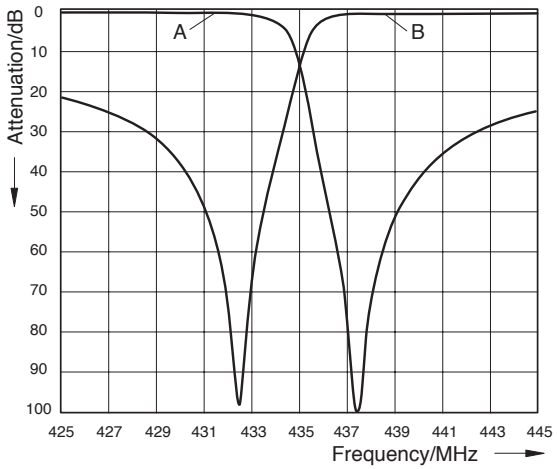
Duplexer
380 ... 470 MHz
Typical attenuation curves

KATHREIN

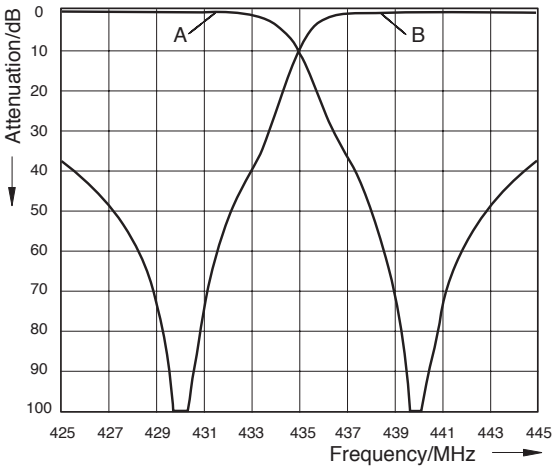
Tuning examples:

Duplexer 718313

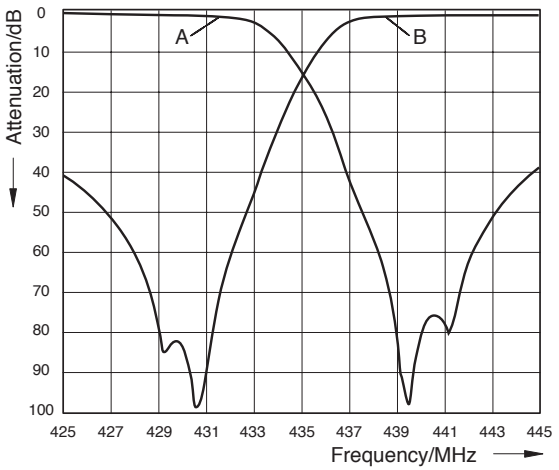
Duplex spacing : 5 MHz
Switching bandwidth: 0.5 MHz



Duplex spacing : 10 MHz
Switching bandwidth: 1.0 MHz

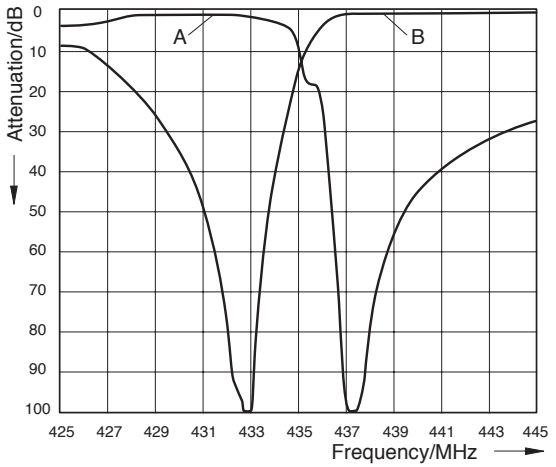


Duplex spacing : 10 MHz
Switching bandwidth: 2.0 MHz

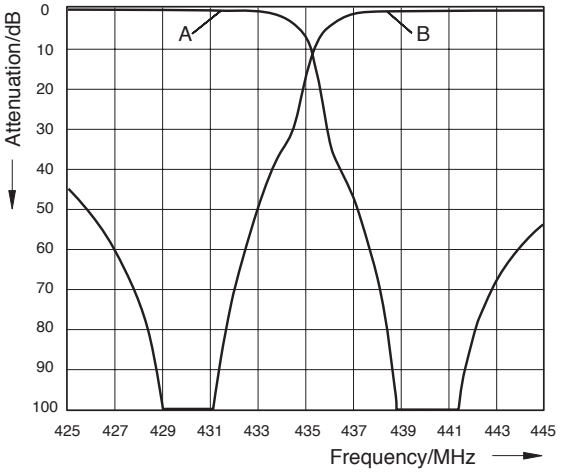


Duplexer 719237

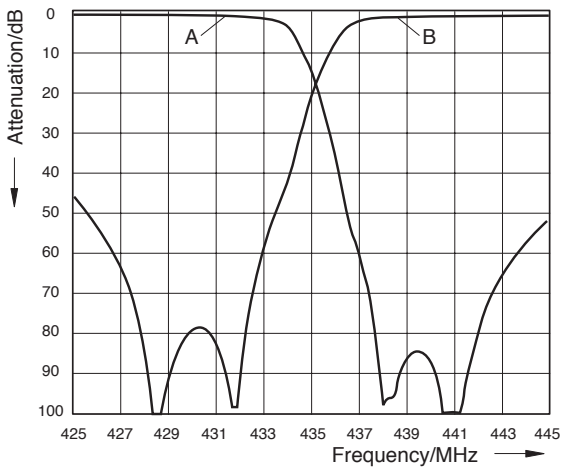
Duplex spacing : 5 MHz
Switching bandwidth: 1.0 MHz



Duplex spacing : 10 MHz
Switching bandwidth: 2..0 MHz



Duplex spacing : 10 MHz
Switching bandwidth: 4.0 MHz



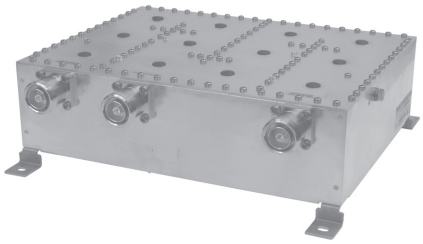
A: Low band ↔ Antenna
B: High band ↔ Antenna

Duplexer

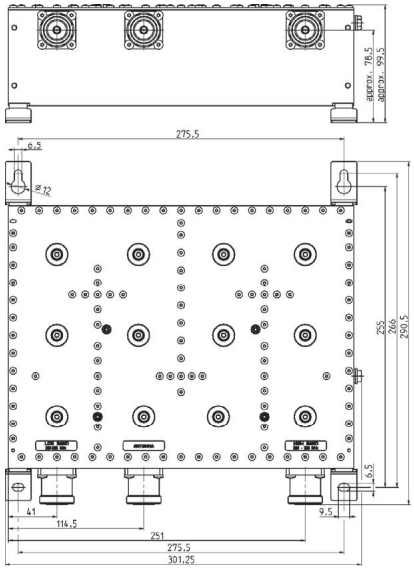
380 - 385 / 390 - 395 MHz (TETRA, TETRAPOL)
382 - 387 / 392 - 397 MHz (TETRA, TETRAPOL)
385 - 390 / 395 - 400 MHz (TETRA, TETRAPOL)

- Designed to combine/split TETRAor TETRAPOLTx 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
- 19” drawers available as accessories

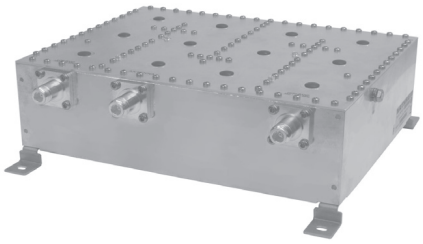
78210361
78210362
78210363



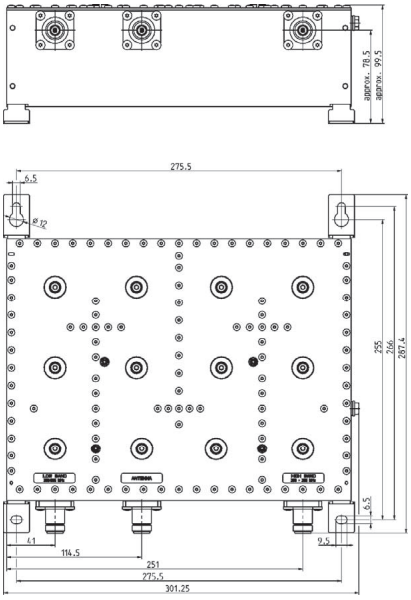
Low band Antenna High band



78210371
78210372
78210373



Low band Antenna High band



Technical Data

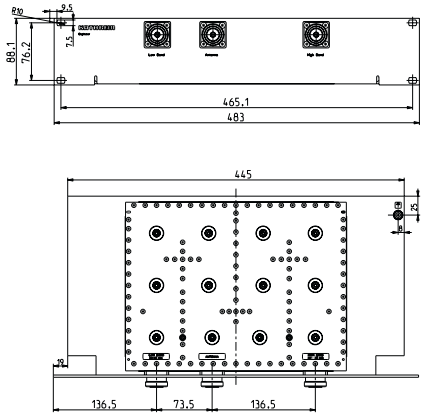
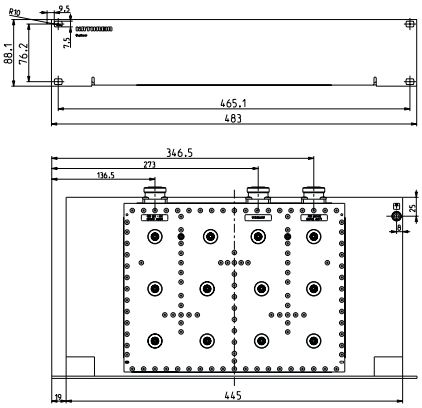
Type No. 7-16 female / N female	78210361 / 78210371	78210362 / 78210372	78210363 / 78210373
Pass band Low band High band	 380 - 385 MHz 390 - 395 MHz	 382 - 387 MHz 392 - 397 MHz	 385 - 390 MHz 395 - 400 MHz
Insertion loss Antenna → Low band High band → Antenna	 < 0.8 dB (380 - 385 MHz) < 0.8 dB (390 - 395 MHz)	 < 0.8 dB (382 - 387 MHz) < 0.8 dB (392 - 397 MHz)	 < 0.8 dB (385 - 390 MHz) < 0.8 dB (395 - 400 MHz)
Isolation Low band → High band	 > 65 dB (380 - 385 / 390 - 395 MHz)	 > 65 dB (382 - 387 / 392 - 397 MHz)	 > 65 dB (385 - 390 / 395 - 400 MHz)
VSWR	< 1.25 (380 - 385 / 390 - 395 MHz)	< 1.25 (382 - 387 / 392 - 397 MHz)	< 1.25 (385 - 390 / 395 - 400 MHz)
Phase tracking	± 3.5° (pass bands)		
Impedance	50 Ω		
Input power	< 200 W (low band *or* high band, with max 8 carriers)		
Intermodulation products	< -150 dBc (3rd order; with 2 x 20 W)		
Temperature range	-20 ... +60 °C		
Application	Indoor		
Special features	Built-in DC stop between all ports		
Mounting	With 4 screws (max. 6 mm diameter)		
Weight	5.4 kg		
Packing size	409 x 378 x 152 mm		
Dimensions	782 10361, 782 10362, 782 10363: 301.3 x 99.5 x 290.5 mm (including connectors and mounting feed) 782 10371, 782 10372, 782 10373: 301.3 x 99.5 x 287.4 mm (including connectors and mounting feed)		

Duplexer

380 - 385 / 390 - 395 MHz (TETRA, TETRAPOL)
382 - 387 / 392 - 397 MHz (TETRA, TETRAPOL)
385 - 390 / 395 - 400 MHz (TETRA, TETRAPOL)

KATHREIN

Accessories (order separately)

Type No.	**78210370** **19” drawer**	**78210380** **19” drawer**
Application	Suitable for duplexers 78210361, 78210362, 78210363, 78210371, 78210372, 78210373 to be mounted with connectors pointing	
	to front	**to rear**
Dimensions	19” drawer, 2 height units, plug-in depth max. 253 mm	
Weight	Approx. 1 kg	
Mounting note	**Remove mounting feet from duplexer and reuse 4 of 8 screws (M3 x 8 countersunk screw) for mounting the duplexer on the 19” drawer**	
Phase tracking		

Typical Attenuation Curves

78210361 / 78210371

Diagram I

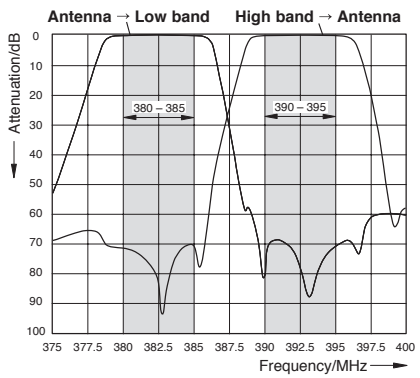
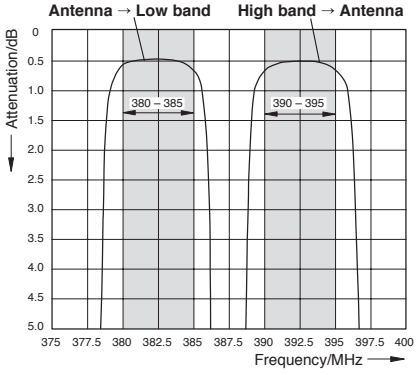


Diagram II



78210362 / 78210372

Diagram I

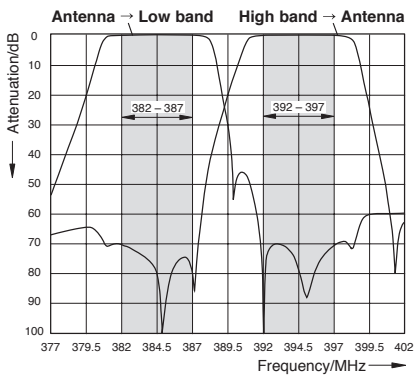
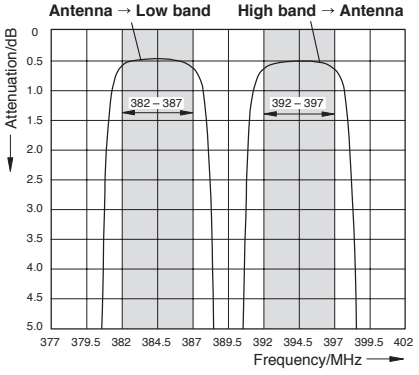


Diagram II



78210363 / 78210373

Diagram I

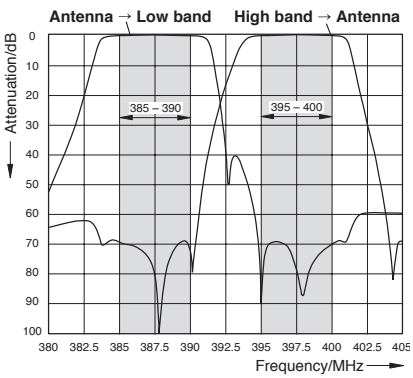
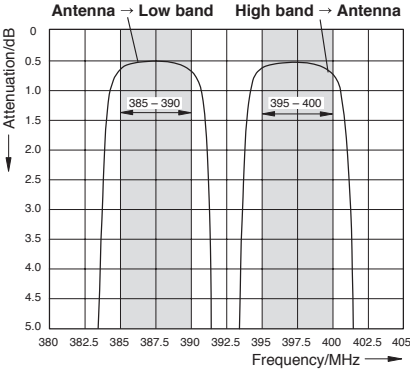


Diagram II



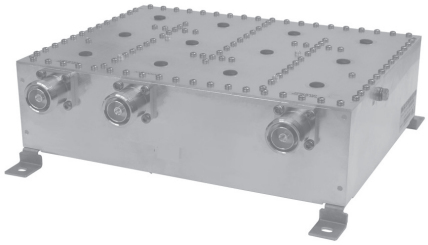
Duplexer
410 - 415 / 420 - 425 MHz (TETRA, TETRAPOL)
415 - 420 / 425 - 430 MHz (TETRA, TETRAPOL)

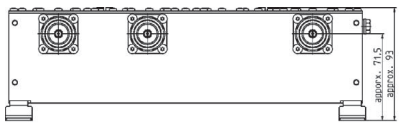
KATHREIN

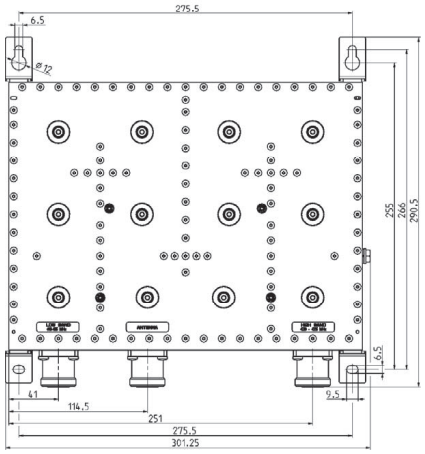
The Duplexer is designed to combine/split TETRA or TETRAPOL Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- Suitable for indoor applications
- Built-in DC stop between all ports
- 19” drawers available as accessories

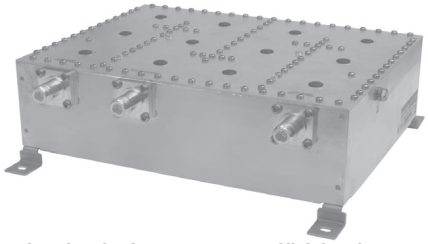
78210364
78210365

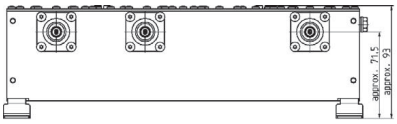


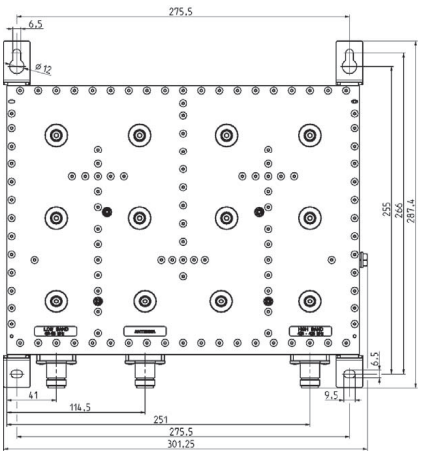




78210374
78210375







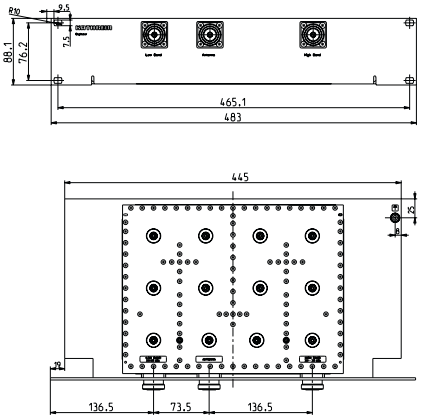
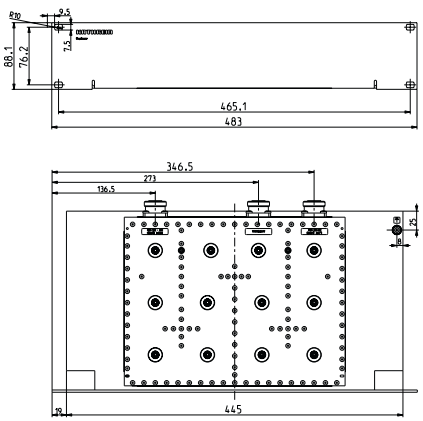
Technical Data

Type No. **7-16 female** **N female**	**78210364** **78210374**	**78210365** **78210375**
Pass band Low band High band	 410 - 415 MHz 420 - 425 MHz	 415 - 420 MHz 425 - 430 MHz
Insertion loss Antenna → Low band High band → Antenna	 < 0.8 dB (410 - 415 MHz) < 0.8 dB (420 - 425 MHz)	 < 0.8 dB (415 - 420 MHz) < 0.8 dB (425 - 430 MHz)
Isolation Low band → High band	 > 65 dB (410 - 415 / 420 - 425 MHz)	 > 65 dB (415 - 420 / 425 - 430 MHz)
VSWR	< 1.25 (410 - 415 / 420 - 425 MHz)	< 1.25 (415 - 420 / 425 - 430 MHz)
Impedance	50 Ω	
Input power	< 200 W (low band *or* high band, with max 8 carriers)	
Intermodulation products	< -150 dBc (3rd order; with 2 x 20 W)	
Temperature range	-20 ... +60 °C	
Application	Indoor	
Special features	Built-in DC stop between all ports	
Mounting	With 4 screws (max. 6 mm diameter)	
Weight	5.2 kg	
Packing size	409 x 378 x 152 mm	
Dimensions	782 10364, 782 10365: 301.3 x 93 x 290.5 mm (including connectors and mounting feed) 782 10374, 782 10375: 301.3 x 93 x 287.5 mm (including connectors and mounting feed)	

Duplexer
410 - 415 / 420 - 425 MHz (TETRA, TETRAPOL)
415 - 420 / 425 - 430 MHz (TETRA, TETRAPOL)

KATHREIN

Accessories (order separately)

Type No.	78210370 19" drawer	78210380 19" drawer
Application	Suitable for duplexers 78210364, 78210365, 78210374, 78210375 to be mounted with connectors pointing	
	to front	**to rear**
Dimensions	19" drawer, 2 height units, plug-in depth max. 253 mm	
Weight	Approx. 1 kg	
Mounting note	**Remove mounting feet from duplexer and reuse 4 of 8 screws (M3 x 8 countersunk screw) for mounting the duplexer on the 19" drawer**	
Phase tracking		

Typical Attenuation Curves

78210364 / 78210374

Diagram I

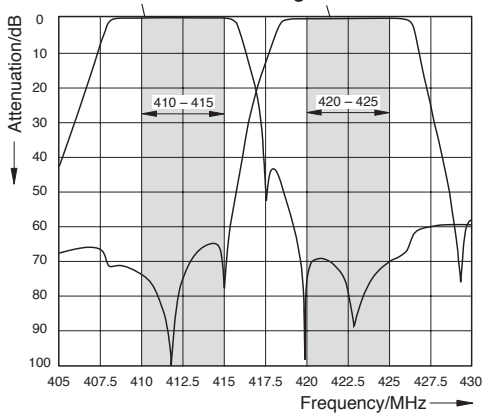
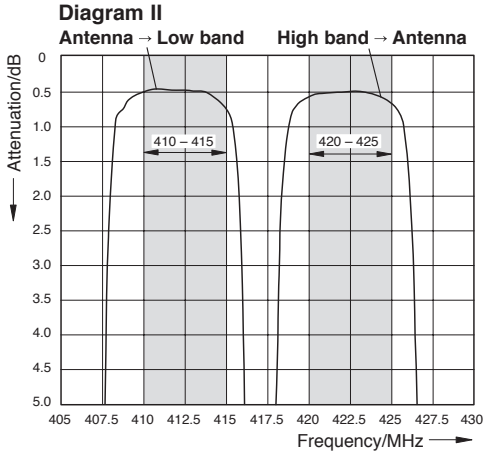


Diagram II



78210365 / 782103757

Diagram I

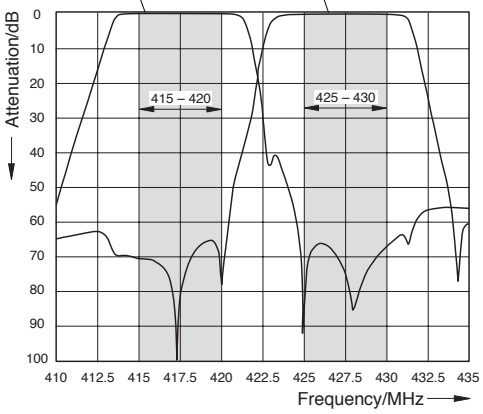
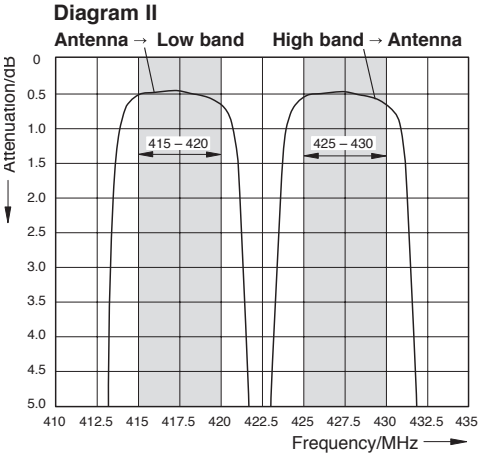


Diagram II

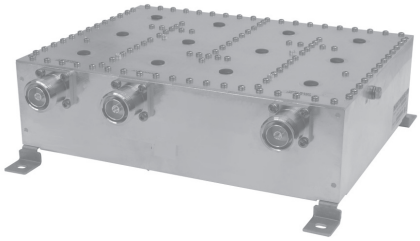


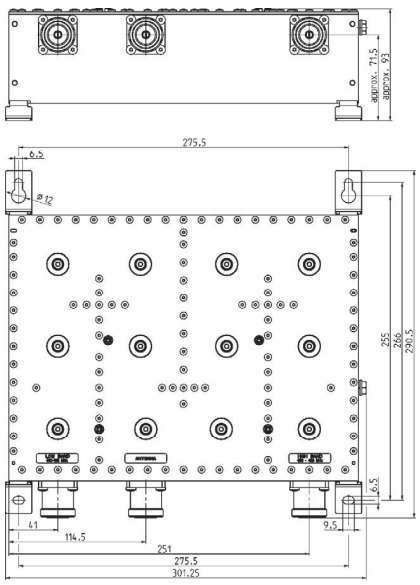
Duplexer
450 - 455 / 460 - 465 MHz (TETRA, TETRAPOL)
455 - 460 / 465 - 470 MHz (TETRA, TETRAPOL)

The Duplexer is designed to combine/split TETRA or TETRAPOL Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

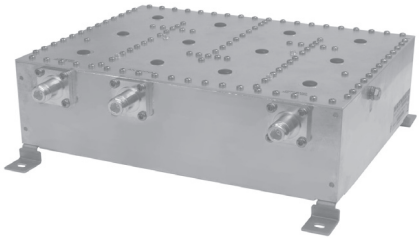
- Suitable for indoor applications
- Built-in DC stop between all ports
- 19″ drawers available as accessories

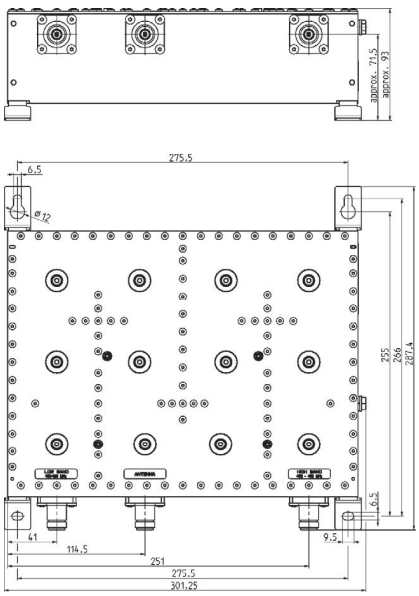
78210366
78210367





78210376
78210377





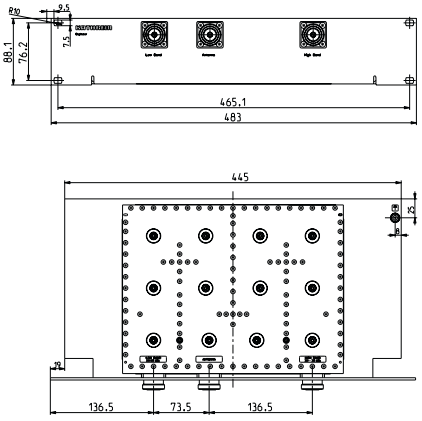
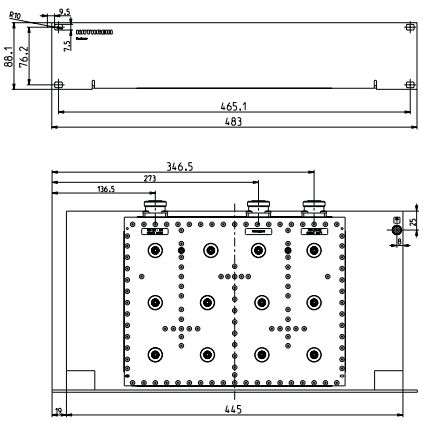
Technical Data

Type No. 7-16 female / N female	78210366 / 78210376	78210367 / 78210377
Pass band Low band High band	 450 - 455 MHz 460 - 465 MHz	 455 - 460 MHz 465 - 470 MHz
Insertion loss Antenna → Low band High band → Antenna	 < 0.8 dB (450 - 455 MHz) < 0.8 dB (460 - 465 MHz)	 < 0.8 dB (455 - 460 MHz) < 0.8 dB (465 - 470 MHz)
Isolation Low band → High band	 > 65 dB (450 - 455 / 460 - 465 MHz)	 > 65 dB (455 - 460 / 465 - 470 MHz)
VSWR	< 1.25 (450 - 455 / 460 - 465 MHz)	< 1.25 (455 - 460 / 465 - 470 MHz)
Impedance	50 Ω	
Input power	< 200 W (low band *or* high band, with max 8 carriers)	
Intermodulation products	< -150 dBc (3rd order; with 2 x 20 W)	
Temperature range	-20 ... +60 °C	
Application	Indoor	
Special features	Built-in DC stop between all ports	
Mounting	With 4 screws (max. 6 mm diameter)	
Weight	5.2 kg	
Packing size	409 x 378 x 152 mm	
Dimensions	782 10366, 782 10367: 301.3 x 93 x 290.5 mm (including connectors and mounting feed) 782 10376, 782 10377: 301.3 x 93 x 287.5 mm (including connectors and mounting feed)	

Duplexer
450 - 455 / 460 - 465 MHz (TETRA, TETRAPOL)
455 - 460 / 465 - 470 MHz (TETRA, TETRAPOL)

KATHREIN

Accessories (order separately)

Type No.	78210370 19” drawer	78210380 19” drawer
Application	Suitable for duplexers 78210366, 78210367, 78210376, 78210377 to be mounted with connectors pointing	
	to front	**to rear**
Dimensions	19” drawer, 2 height units, plug-in depth max. 253 mm	
Weight	Approx. 1 kg	
Mounting note	**Remove mounting feet from duplexer and reuse 4 of 8 screws (M3 x 8 countersunk screw) for mounting the duplexer on the 19” drawer**	
Phase tracking		

Typical Attenuation Curves

78210366 / 78210376

Diagram I

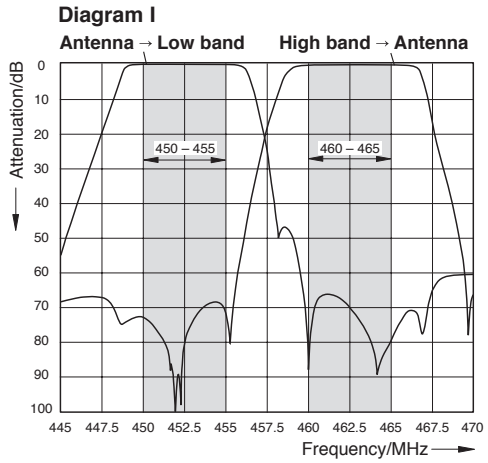
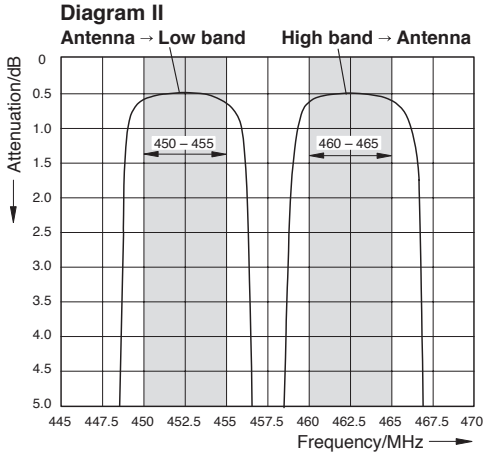


Diagram II



78210367 / 78210377

Diagram I

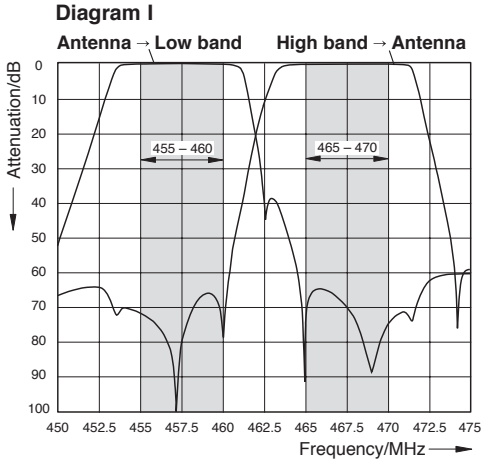
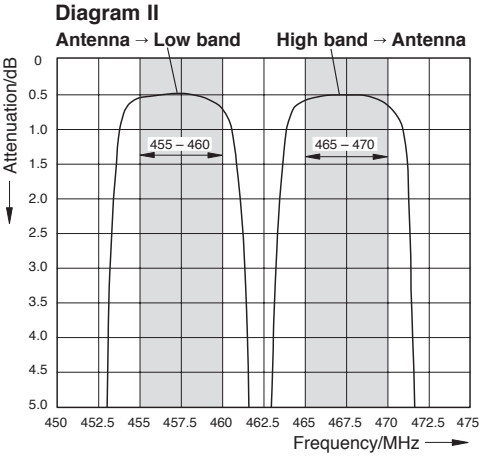


Diagram II



Duplexer
380 ... 470 MHz

KATHREIN

The duplexer is suited to combine transmitters and receivers (or transmitter and transmitter or receiver and receiver) to a common antenna.

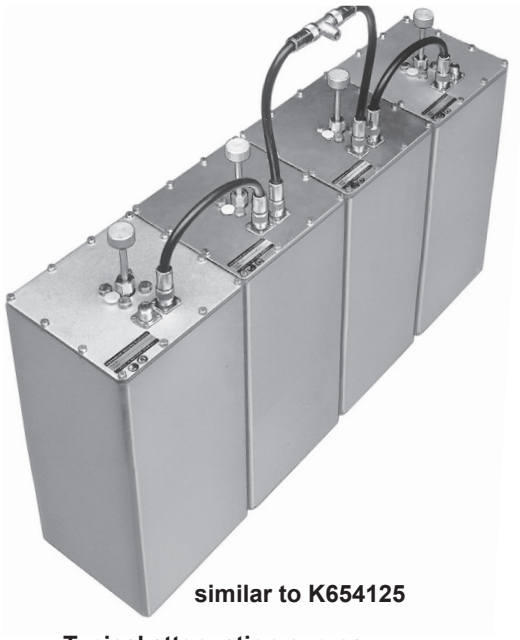
It can be used:
- for very small frequency spacing,
- to obtain very high stop band attenuation (more than 100 dB) at very low insertion loss.

Design and construction:
The duplexer consists of four or six S-P filters K 65 21 26 1 and interconnecting cables of defined length, depending on the operating frequencies. The S-P filters consist of temperature stabilized λ/4 coaxial resonators. Using a specially temperature stabilized coupling a high stop band attenuation can be adjusted very close to the pass band frequency.

Tuning:
The stop band attenuation is dependent on the frequency spacing and the number of S-P filters. The stop band attenuation for four or six S-P filters can be read from the diagram.
The duplexer is tuned to the desired pass band frequencies at the factory. When ordering please specify the pass band frequencies.
The duplexer can also be tuned on site using the supplied instructions.

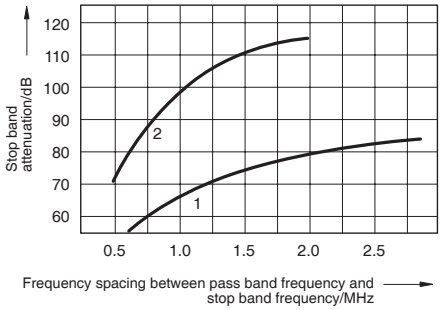
Installation:
The duplexer can be used as a stand alone unit or wall mounted using the supplied brackets. The individual S-P filters can be connected to each other using the supplied straps.

Custom versions:
For special applications more than six S-P filters can be combined.



similar to K654125

Typical attenuation curves
Tuning examples:



Number of resonators	Curve	Insertion loss	Type No.
4	1	1.0 dB	**K654125**
6	2	1.5 dB	**K654126**

Technical Data

Type No.	K654125	K654126
Number of resonators	4	6
Frequency range	380 ... 470 MHz	
Insertion loss	1.0 dB	1.5 dB
VSWR	< 1.4	
Impedance	50 Ω	
Input power	< 200 W	
Effect of temperature	< 1.5 kHz / °C	
Temperature range	-30 ... +60 °C	
Material	Outer conductor: Aluminium Inner conductor: Copper, silver-plated	
Connectors	N female	
Weight	20.5 kg	30.5 kg
Packing size	420 mm x 490 mm x 420 mm	420 mm x 490 mm x 630 mm
Dimensions (w x h x d)	190 mm x max. 350 mm x 760 mm (with tuning rods)	190 mm x max. 350 mm x 1140 mm (with tuning rods)
Attached hardware	S-P filter with interconnecting cables, 2 brackets and 2 straps for each resonator	

Summary of Articles

Multiband Combiners and Transmitter Combiners:

Description	Type No.	Frequency range ... tunable bandwidth - fixed bandwidth (not tunable)	Max. input power	Page
Hybrid Transmitter Combiner, 2 inputs	78410168	380 - 430 MHz	25 W	112
Hybrid Transmitter Combiner, 2 inputs	78410167	380 - 430 MHz	100 W	112
Hybrid Transmitter Combiner, 3 inputs	78410166	380 - 430 MHz	100 W	112
Hybrid Transmitter Combiner, 4 inputs	78410140	380 - 430 MHz	100 W	112
Hybrid Transmitter Combiner, 2 inputs	791644	400 - 470 MHz	25 W	113
Hybrid Transmitter Combiner, 2 inputs	791646	400 - 470 MHz	100 W	113
Hybrid Transmitter Combiner, 3 inputs	791649	400 - 470 MHz	100 W	113
Hybrid Transmitter Combiner, 4 inputs	791652	400 - 470 MHz	100 W	113
Dual-Band Combiner	K64504	68 - 87.5 / 146 - 174 MHz	50 W	114
Dual-Band Combiner	719792	68 - 108 / 146 - 174 MHz	50 W	114
Dual-Band Combiner	721138	68 - 174 / 380 - 470 MHz	50 W	115
Dual-Band Combiner	790244	68 - 174 / 400 - 470 MHz	50 W	115
Dual-Band Combiner	78210369	380 - 400 / 410 - 430 MHz	200 W	116, 117
Dual-Band Combiner	78210379	380 - 400 / 410 - 430 MHz	200 W	116, 117
Dual-Band Combiner	728954	68 - 470 / 870 - 970 MHz	50 W	118
Dual-Band Combiner	78210680	380 - 960 / 1710 - 2700 MHz	700 W	119
Dual-Band Combiner	78210681	380 - 960 / 1710 - 2700 MHz	700 W	119
Dual-Band Combiner	78210682	380 - 960 / 1710 - 2700 MHz	700 W	119
Dual-Band Combiner	78210683	380 - 960 / 1710 - 2700 MHz	700 W	119
Dual-Band Combiner	78210460	50 - 470 / 806 - 2500 MHz	500 W	120, 121
Dual-Band Combiner	78211180	690 - 2180 / 2400 - 2700 MHz	500 W	122, 123
Dual-Band Combiner	78211181	690 - 2180 / 2400 - 2700 MHz	500 W	122, 123
Dual-Band Combiner	78211182	690 - 2180 / 2400 - 2700 MHz	500 W	122, 123
Dual-Band Combiner	78211183	690 - 2180 / 2400 - 2700 MHz	500 W	122, 123
Dual-Band Combiner	78211184	380 - 2180 / 2400 - 2700 MHz	500 W	122, 123
Dual-Band Combiner	78211185	380 - 2180 / 2400 - 2700 MHz	500 W	122, 123
Triple-Band Combiner	78210630	380 - 960 / 1710 - 1880 / 1920 - 2170 MHz	700 / 300 / 300 W	124, 125
Triple-Band Combiner	78210631	380 - 960 / 1710 - 1880 / 1920 - 2170 MHz	700 / 300 / 300 W	124, 125
Triple-Band Combiner	78210632	380 - 960 / 1710 - 1880 / 1920 - 2170 MHz	700 / 300 / 300 W	124, 125
Triple-Band Combiner	78210633	380 - 960 / 1710 - 1880 / 1920 - 2170 MHz	700 / 300 / 300 W	124, 125
Triple-Band Combiner	78210634	380 - 960 / 1710 - 1880 / 1920 - 2170 MHz	700 / 300 / 300 W	124, 125
Triple-Band Combiner	78210635	380 - 960 / 1710 - 1880 / 1920 - 2170 MHz	700 / 300 / 300 W	124, 125
Quad-Band Combiner	78210640	380 - 960 / 1710 - 1880 / 1920 - 2200 / 2500 - 2690 MHz	700 / 300 / 300 / 200 W	126, 127
Quad-Band Combiner	78210641	380 - 960 / 1710 - 1880 / 1920 - 2200 / 2500 - 2690 MHz	700 / 300 / 300 / 200 W	126, 127
Quad-Band Combiner	78210642	380 - 960 / 1710 - 1880 / 1920 - 2200 / 2500 - 2690 MHz	700 / 300 / 300 / 200 W	126, 127
Quad-Band Combiner	78210643	380 - 960 / 1710 - 1880 / 1920 - 2200 / 2500 - 2690 MHz	700 / 300 / 300 / 200 W	126, 127
Quad-Band Combiner	78210644	380 - 960 / 1710 - 1880 / 1920 - 2200 / 2500 - 2690 MHz	700 / 300 / 300 / 200 W	126, 127
Quad-Band Combiner	78210645	380 - 960 / 1710 - 1880 / 1920 - 2200 / 2500 - 2690 MHz	700 / 300 / 300 / 200 W	126, 127
Quad-Band Combiner	78210649	380 - 960 / 1710 - 1880 / 1920 - 2200 / 2500 - 2690 MHz	700 / 300 / 300 / 200 W	128, 129

Multiband Combiner - Frequency combinations

KATHREIN

Dual-Band Combiner, Triple-Band Combiner, Quad-Band Combiner

See KATHREIN catalogue 690 - 6000 MHz

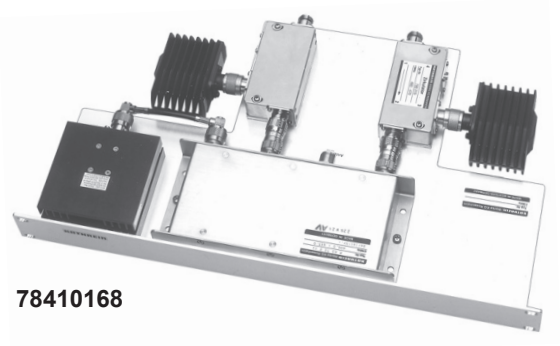
Hybrid Transmitter Combiner 380 - 430 MHz (TETRA, TETRAPOL)

KATHREIN

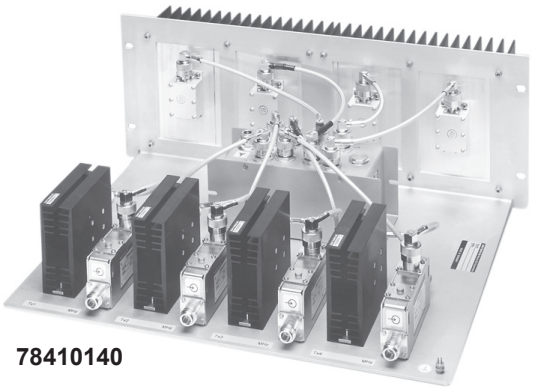
The hybrid transmitter combiner allows two or more transmitters to be combined to a common output.

Special features:
- very small spacing of the transmitting frequencies, down to adjacent channel spacing,
- variable transmitter frequencies,
- small dimensions.

Design:
The hybrid transmitter combiner has two, three, four or five inputs and one output. For combining transmitters a hybrid ring junction a decoupled power splitter is used as hybrid or couplers depending on the number of inputs. In every transmitting path a wide band dual circulator is inserted, which causes very high isolation. This effectively suppresses intermodulation products. The absorbers are dimensioned for a possibly occurring total reflection at the output.

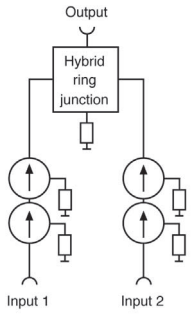


78410168

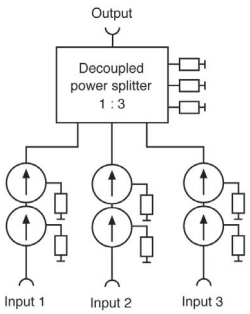


78410140

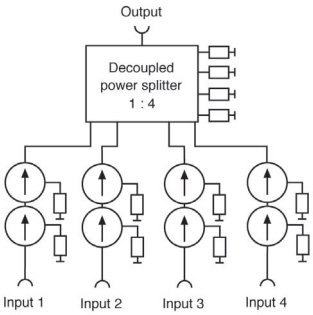
78410168
78410167



78410166



78410140



Technical Data

Type No.	Inputs	Insertion loss	Dimensions 19" drawer		Input power per input	Packing size
			height	plug-in depth		
78410168	2	< 3.9 dB	1 hu* = 44 mm	300 mm	25 W	535 mm x 120 mm x 435 mm
78410167	2	< 3.9 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
78410166	3	< 6.3 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
78410140	4	< 7.3 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
Frequency range			380 - 430 MHz			
Min. frequency spacing			0 MHz			
Isolation			> 70 dB			
Imdedance			50 Ω			
VSWR			< 1.2			
Connectors			N female			
Colour			Front panel: Grey (RAL 7032)			

* hu = height unit

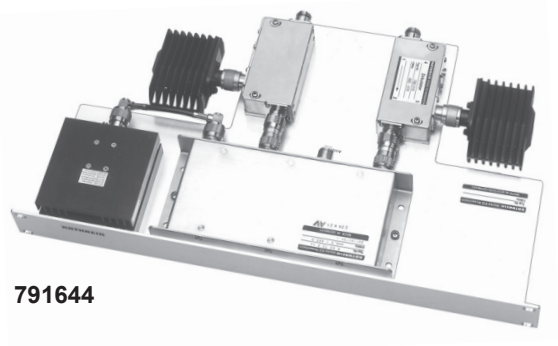
Hybrid Transmitter Combiner 400 - 470 MHz

KATHREIN

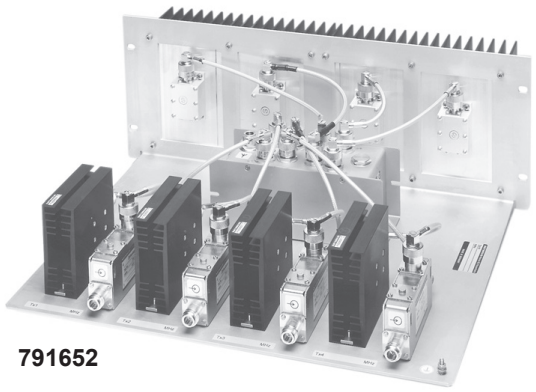
The hybrid transmitter combiner allows two or more transmitters to be combined to a common output.

Special features:
- very small spacing of the transmitting frequencies, down to adjacent channel spacing,
- variable transmitter frequencies,
- small dimensions.

Design:
The hybrid transmitter combiner has two, three, four or five inputs and one output. For combining transmitters a hybrid ring junction a decoupled power splitter is used as hybrid or couplers depending on the number of inputs. In every transmitting path a wide band dual circulator is inserted, which causes very high isolation. This effectively suppresses intermodulation products. The absorbers are dimensioned for a possibly occurring total reflection at the output.

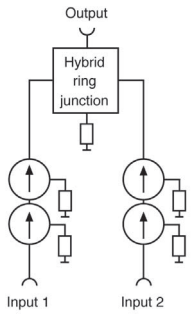


791644

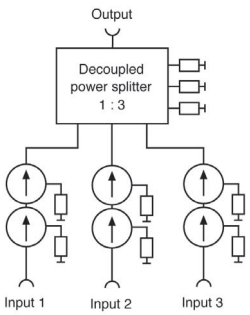


791652

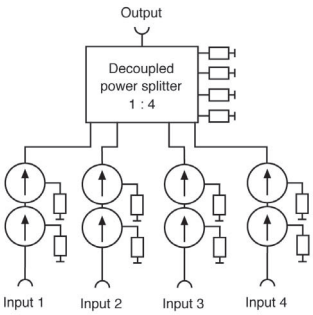
791644
791646



791649



791652



Technical Data

Type No.	Inputs	Insertion loss	Dimensions 19" drawer		Input power per input	Packing size
			height	plug-in depth		
791644	2	< 3.9 dB	1 hu* = 44 mm	300 mm	25 W	535 mm x 120 mm x 435 mm
791646	2	< 3.9 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
791649	3	< 6.3 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
791652	4	< 7.3 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
Frequency range			400 - 470 MHz			
Min. frequency spacing			0 MHz			
Isolation			> 70 dB			
Imdedance			50 Ω			
VSWR			< 1.2			
Connectors			N female			
Colour			Front panel: Grey (RAL 7032)			

* hu = height unit

Dual-Band Combiner
68 - 87.5 MHz / 146 - 174 MHz

KATHREIN

The dual-band combiner allows several transmitters or receivers of different frequency ranges to be combined to one common antenna.

K64504

It can be used:
- to combine transmitters or receivers of different frequency bands to a common feeder cable, to a broad band antenna or a broad band radiating cable,
- to separate a broad band signal to individual frequency bands.

Design and construction:
The dual-band combiners consist of lowpass and high-pass filters with lumped L-C elements.

Technical Data

Type No.	K64504	719792
Frequency range Band 1 Band 2	 68 - 87.5 MHz 146 - 174 MHz	 68 - 108 MHz 146 - 174 MHz
Insertion loss Band 1 Band 2	 < 0.5 dB < 0.5 dB	
Isolation	> 35 dB	> 25 dB
VSWR	< 1.4	
Impedance	50 Ω	
Input power	< 50 W of each input	
Temperature range	-20 ... +50 °C	
Connectors	N female	
Application	Indoor	
Mounting	With 2 screws (max. 4 mm diameter)	
Weight	1 kg	
Packing size	190 x 95 x 100 mm	
Dimensions (w x h x d)	175 x 70 x 80 mm (with connectors)	

Dual-Band Combiner
68 - 174 / 380 - 470 MHz

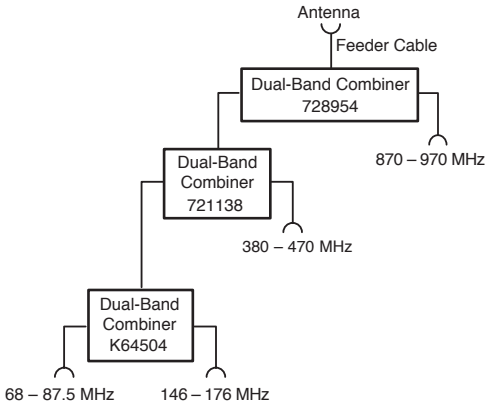
KATHREIN

It can be used:
- to combine several transmitters and receivers in two or three different frequency bands to a common feeder cable, to a broad-band antenna, or to a broad-band radiating cable,
- qand, in the reverse operating mode, to separate several transmission or receiving frequencies into two or three frequency bands.

Design and construction:
The dual-band combiners consist of low pass and high pass filters with lumped L-C elements.

721138

790 44



Example for dual-band combiners in cascade

Technical Data

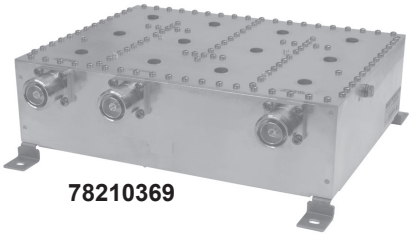
Type No.	721138	790244
Frequency range Band 1 Band 2	 68 - 174 MHz 380 - 470 MHz	 68 - 174 MHz 400 - 470 MHz
Insertion loss Band 1 Band 2	 < 0.5 dB < 0.5 dB	 < 0.5 dB < 0.5 dB
Isolation	> 35 dB	> 45 dB
VSWR	< 1.4	< 1.25
Impedance	50 Ω	
Input power	< 50 W of each input	
Temperature range	-20 ... +50 °C	
Connectors	N female, silver-plated	N female
Application	Indoor	
Mounting	With 2 screws (max. 4 mm diameter)	
Weight	1 kg	0.3 kg
Packing size	190 x 95 x 100 mm	130 x 50 x 130 mm
Dimensions (w x h x d)	175 x 70 x 80 mm (with connectors)	103 x 38 x 68 mm (with connectors)

Dual-Band Combiner

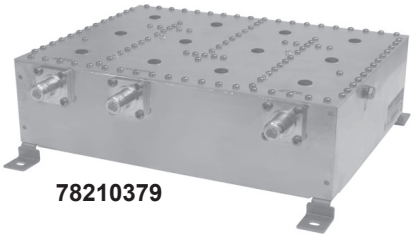
KATHREIN

380 - 400 MHz TETRA/TETRAPOL	**410 - 430 MHz** TETRA/TETRAPOL

- Designed for co-siting purposes
- Enables feeder sharing
- Suitable for indoor applications
- Built-in DC stop between all ports
- 19” drawers available as accessories



78210369



78210379

Technical Data

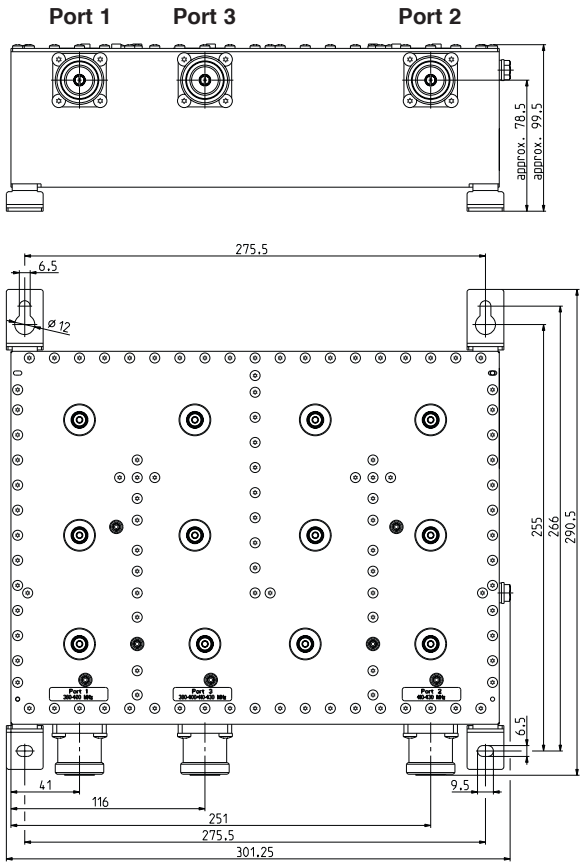
Type No.	**78210369**	**78210379**
Pass band Band 1 Band 2	380 - 400 MHz 410 - 430 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.5 dB, typically 0.2 dB (380 - 400 MHz) < 0.5 dB, typically 0.2 dB (410 - 430 MHz)	
Isolation Port 1 ↔ Port 2	> 60 dB (380 - 400 MHz) > 60 dB (410 - 430 MHz)	
VSWR	< 1.25 (380 - 400 / 410 - 430 MHz)	
Impedance	50 Ω	
Input power Band 1 Band 2	< 200 W (with max. 8 carriers) < 200 W (with max. 8 carriers)	
Intermodulation products	< -150 dBc (3rd order; with 2 x 20 W)	
Temperature range	-20 ... +60 °C	
Connectors	**7-16 female**	**N female**
Application	Indoor	
Special features	Built-in DC stop between all ports	
Mounting	With 4 screws (max. 6 mm diameter)	
Weight	5.4 kg	
Packing size	409 x 378 x 152 mm	
Dimensions (w x h x d)	301.3 x 99.5 x 290.5mm (including connectors and mounting feed)	301.3 x 99.5 x 287.4 mm

Dual-Band Combiner

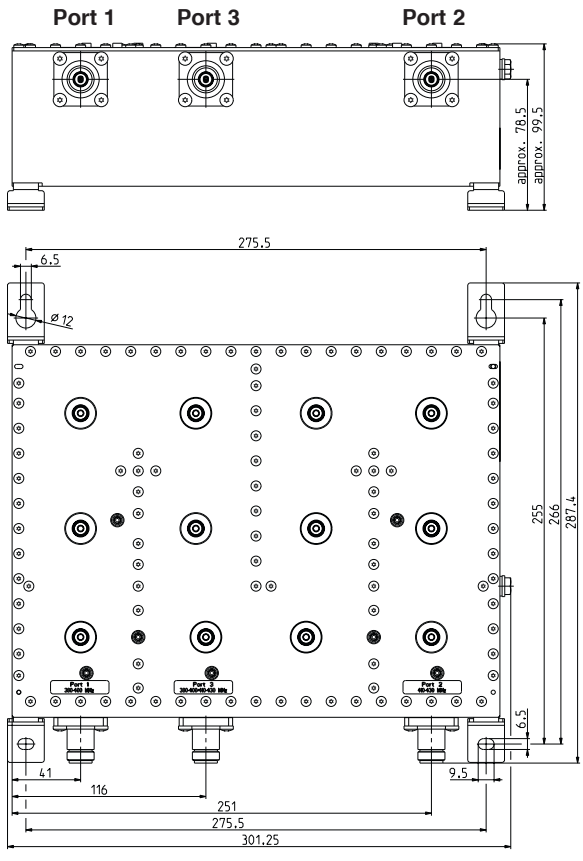
KATHREIN

380 - 400 MHz	410 - 430 MHz
TETRA/TETRAPOL	TETRA/TETRAPOL

78210369



78210379



Typical attenuation curves

Diagram I

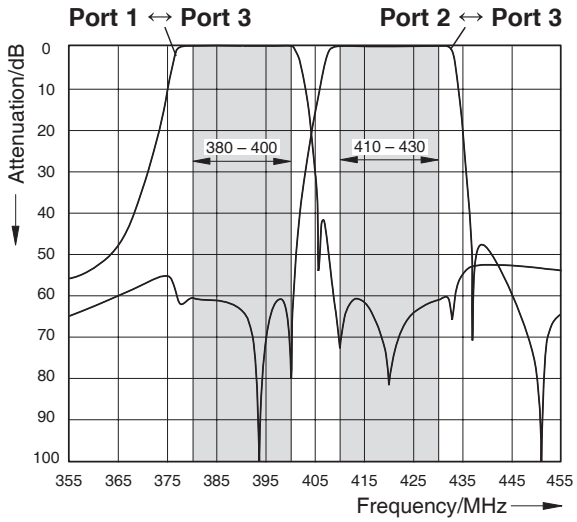
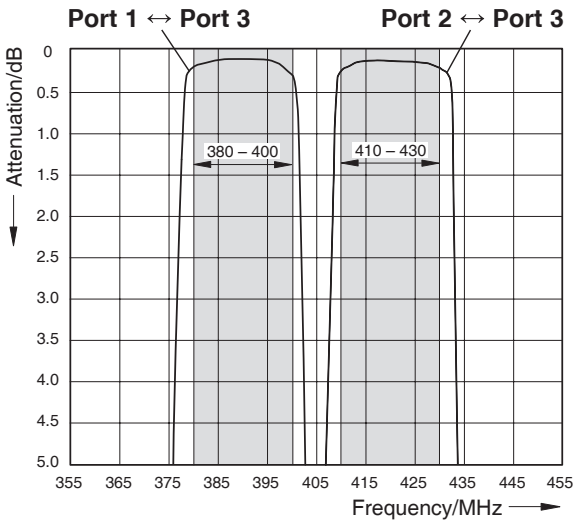


Diagram II

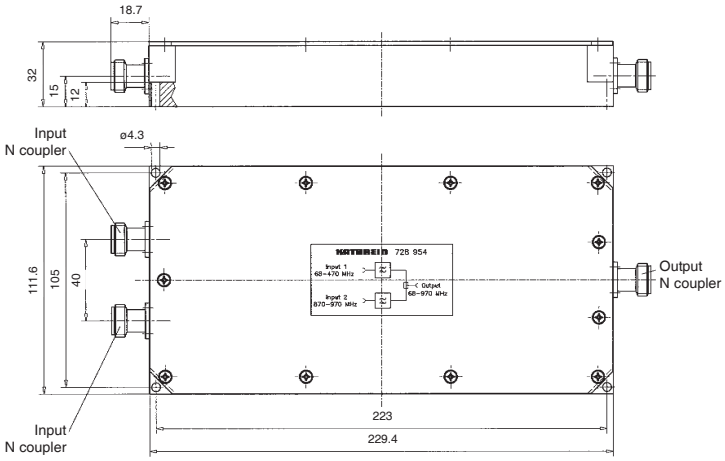


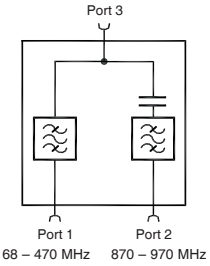
Dual-Band Combiner

KATHREIN

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





Typical attenuation curves

Diagram I

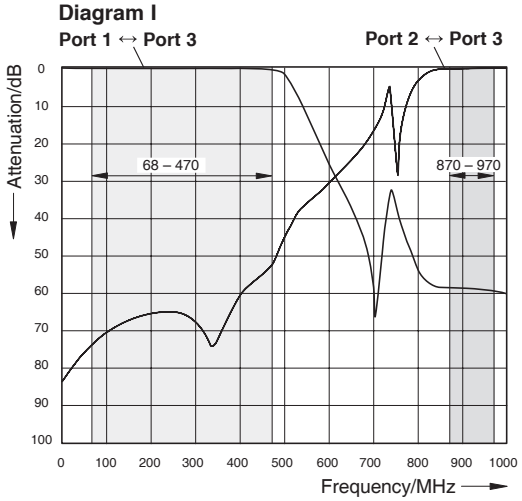
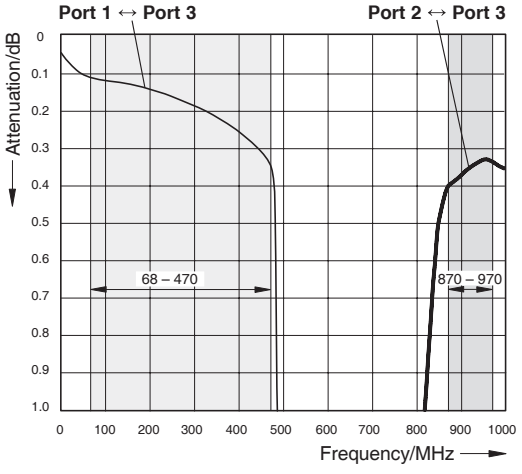


Diagram II



Technical Data

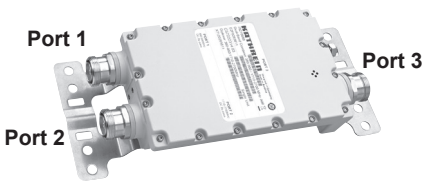
Type No.	728954
Pass band Band 1 Band 2	 68 - 470 MHz 870 - 970 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	 < 0.5 dB (68 - 470 MHz) < 0.5 dB (870 - 970 MHz)
Isolation Port 1 ↔ Port 2	 > 45 dB
VSWR	< 1.2
Impedance	50 Ω
Input power Band 1 Band 2	 < 50 W < 50 W
Temperature range	-20 ... +70 °C
Connectors	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)

Dual-Band Combiner

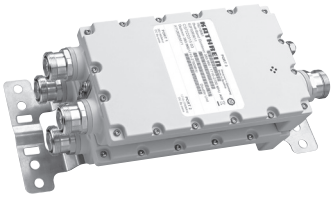
KATHREIN

380 - 960 MHz	1710 - 2700 MHz
TETRA / LTE800 / CDMA850 / GSM900	GSM1800 / UMTS / WiMAX / LTE2600

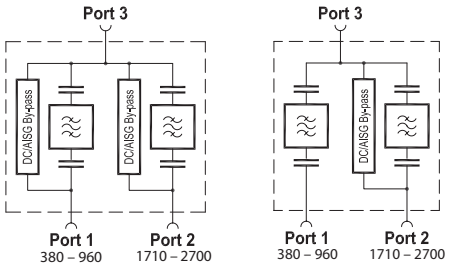
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning 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 kg / Double Unit: 3.9 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 203.46 x 48.8 mm / Double Unit: 117 x 203.46 x 99.3 mm (without connectors, without mounting brackets)	

Typical Attenuation Curves

Diagram I

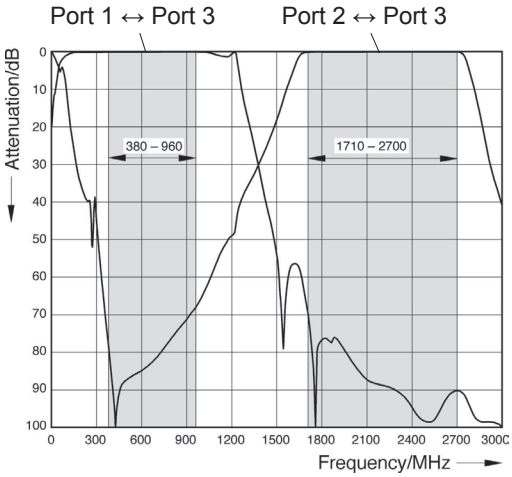
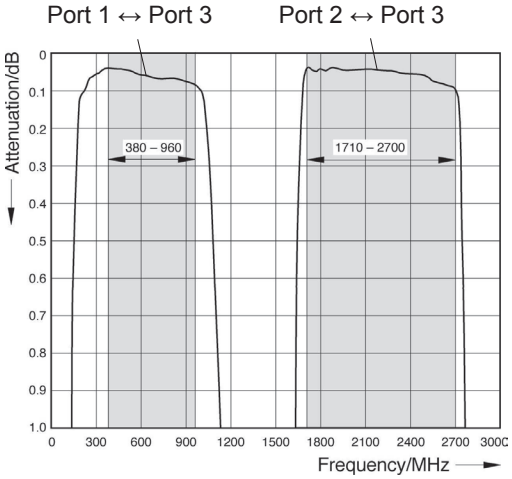


Diagram II



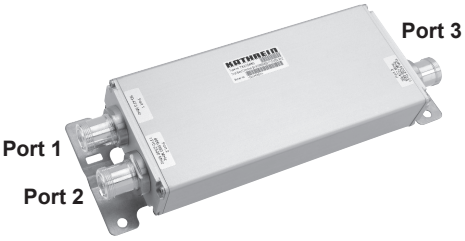
Accessories see data sheet

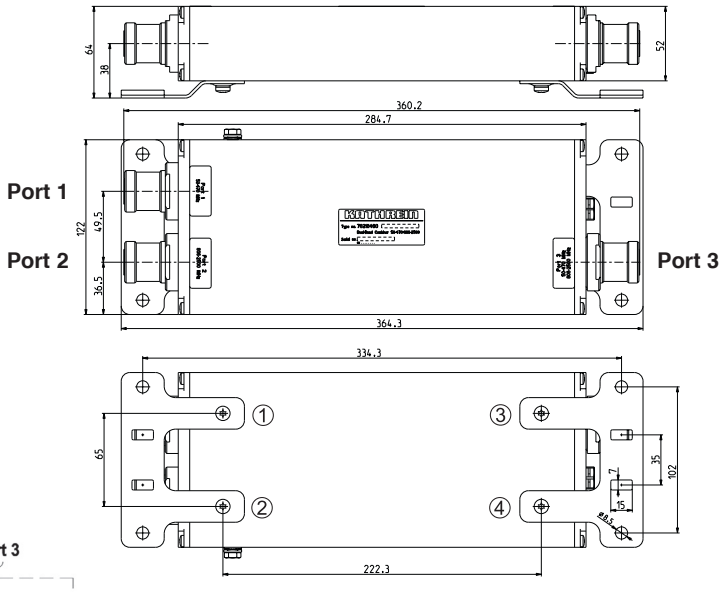
Dual-Band Combiner

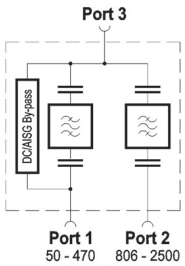
KATHREIN

50 - 470 MHz	806 - 2500 MHz
PMR / TETRA / TETRAPOL	CDMA 800 / GSM 900 / GSM 1800 / UMTS / 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.	78210460
Pass band Band 1 Band 2	 50 - 470 MHz 806 - 2500 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	 < 0.15 dB (50 - 470 MHz) < 0.15 dB (806 - 2500 MHz)
Isolation Port 1 ↔ Port 2	 > 50 dB (50 - 470 / 806 - 2500 MHz)
VSWR	< 1.25 (50 - 470 / 806 - 960 / 1710 - 2500 MHz)
Impedance	50 Ω
Input power	Band 1 < 500 W / Band 2 < 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 transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	 **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 64 x 364.3 mm (including mounting brackets)

Dual-Band Combiner

KATHREIN

50 - 470 MHz PMR / TETRA / TETRAPOL	806 - 2500 MHz CDMA 800 / GSM 900 / GSM 1800 / UMTS / WLAN

Typical Attenuation Curves

782 10460

Diagram I

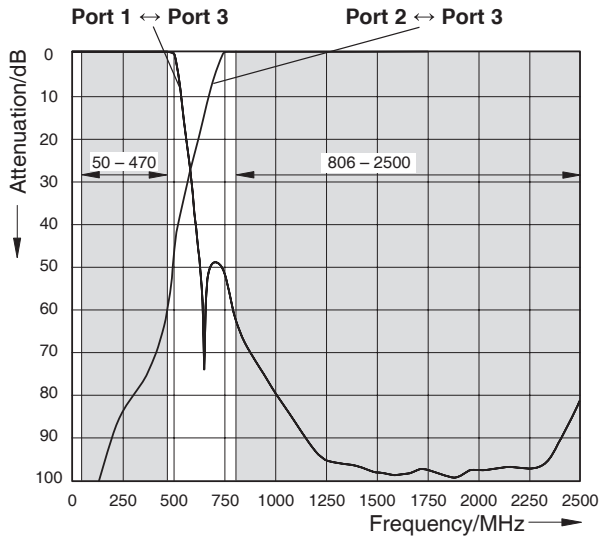
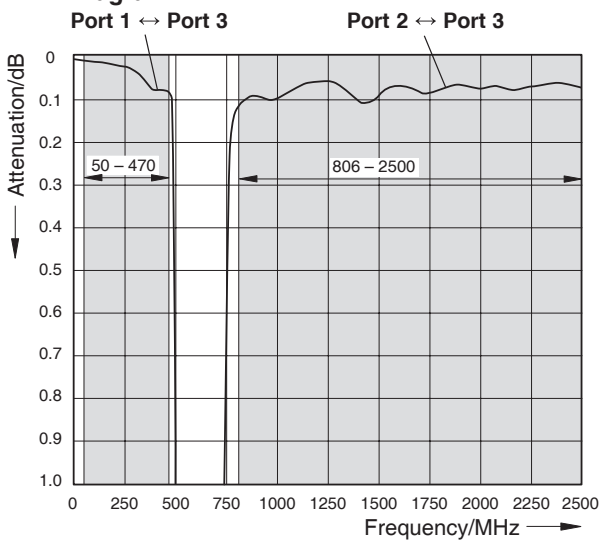


Diagram II



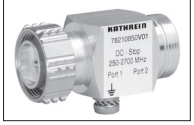
Accessories (order separately)

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
78210850V01	DC stop
78410367	50-Ohm load

Clamp Set

DC stop



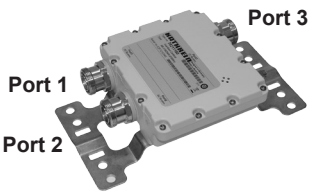
50-Ohm load

Dual-Band Combiner

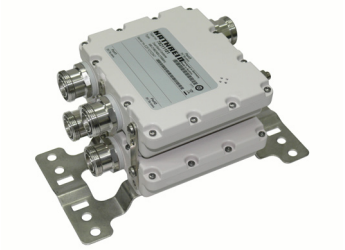
KATHREIN

380 (690) - 2180 MHz	2400 - 2700 MHz
TETRA / LTE 800 / CDMA 850 / GSM 900 / GSM 1800 / UMTS 2100	WiMAX / LTE 2600

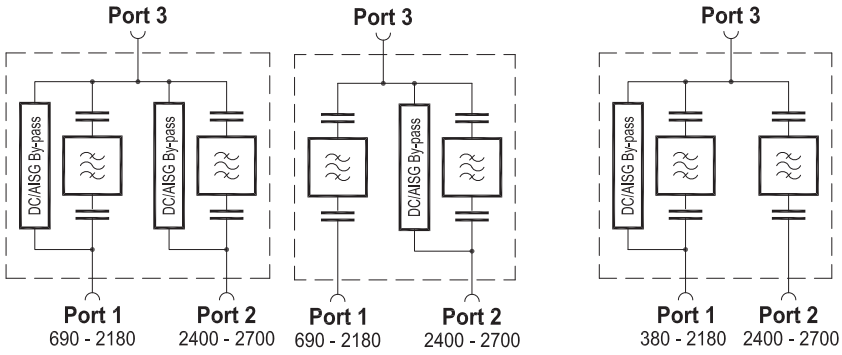
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**



78211180, 78211182, 78211184
Single Unit



78211181, 78211183, 78211185
Double Unit



Technical Data

Type No.	78211180 Single Unit	78211182 Single Unit	78211184 Single Unit
	78211181 Double Unit	78211183 Double Unit	78211185 Double Unit
Pass band Band 1 Band 2	690 - 2180 MHz 2400 - 2700 MHz		380 - 2180 MHz 2400 - 2700 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.2 dB (690 – 2180 MHz) typ. 0.1 dB < 0.15 dB (2400 – 2700 MHz) typ. 0.1 dB		< 0.2 dB (380 - 2180 MHz) typ. 0.1 dB < 0.15 dB (2400 - 2700 MHz) typ. 0.1 dB
Isolation Port 1 ↔ Port 2	> 50 dB (690 - 2180 MHz), > 48 dB (2400 - 2700 MHz)		> 50 dB (380 - 2180 MHz), > 48 dB (2400 - 2700 MHz)
VSWR	< 1.22 (690 - 2180 MHz) < 1.2 (2400 - 2700 MHz)		< 1.22 (1500 - 2180 MHz) / < 1.27 (380 - 1500 MHz) < 1.2 (2400 - 2700 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**
Lightning protection	3 kA, 10/350 µs pulse		Without lightning protection
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	Single Unit: 1.5 kg / Double Unit: 2.8 kg		
Packing size	Single Unit: 266 x 196 x 130 mm / Double Unit: 266 x 196 x 180 mm		
Dimensions (w x h x d)	Single Unit: 141 x 119 x 48 mm / Double Unit: 141 x 119 x 98.5 mm (without connectors, without mounting brackets)		

Dual-Band Combiner

KATHREIN

380 (690) - 2180 MHz TETRA / LTE 800 / CDMA 850 / GSM 900 / GSM 1800 / UMTS 2100	2400 - 2700 MHz WiMAX / LTE 2600

Typical Attenuation Curves

Diagram 1
78211180
78211181
78211182
78211183

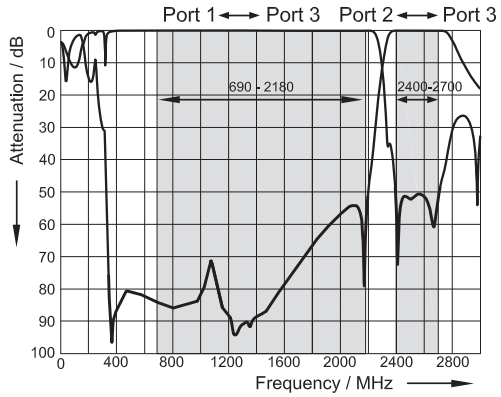


Diagram 1
78211184
78211185

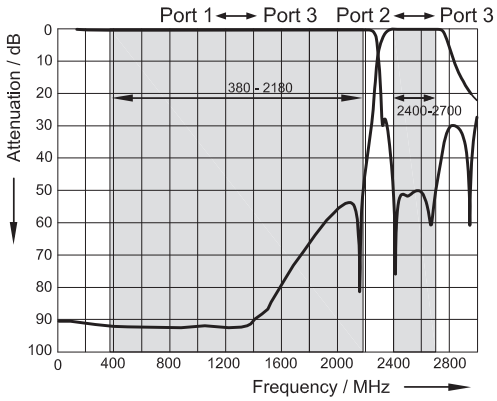


Diagram 2
78211180
78211181
78211182
78211183

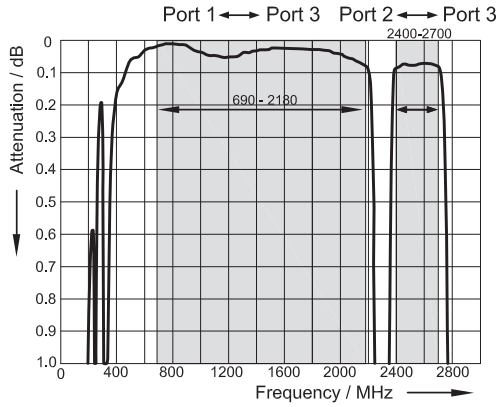
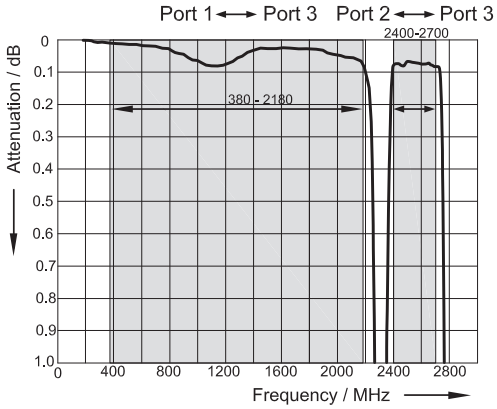


Diagram 2
78211184
78211185



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
78210850V01	DC stop
78410367	50-Ohm load

Clamp Set

DC stop

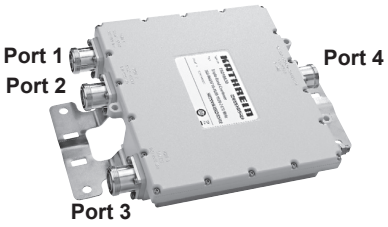
50-Ohm load

Triple-Band Combiner

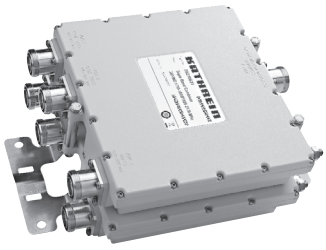
KATHREIN

380 - 960 MHz	1710 - 1880 MHz	1920 - 2170 MHz
TETRA / LTE 800 / CDMA 850 / GSM 900	GSM 1800	UMTS 2100

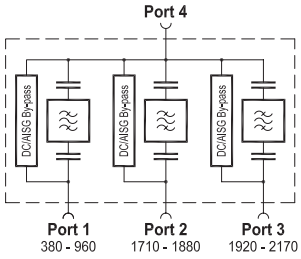
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory

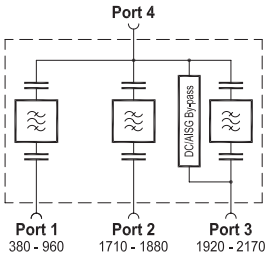


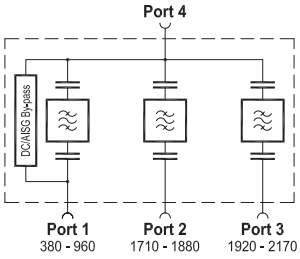
78210630, 78210632, 78210634
Single Unit



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

380 - 960 MHz TETRA / LTE 800 / CDMA 850 / GSM 900	1710 - 1880 MHz GSM 1800	1920 - 2170 MHz UMTS 2100

Typical attenuation curves

Diagram I

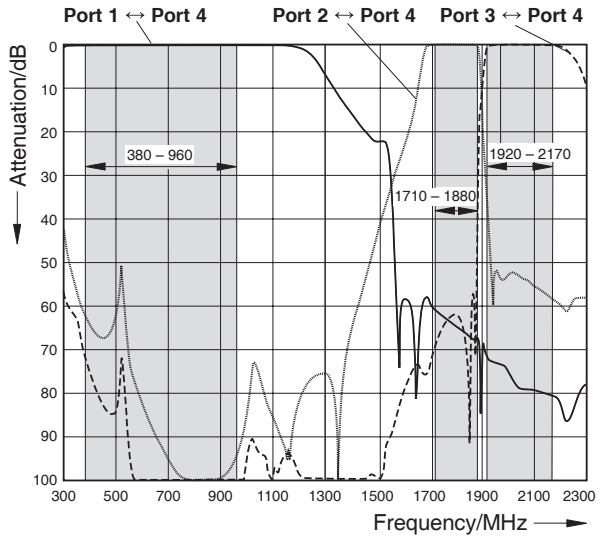
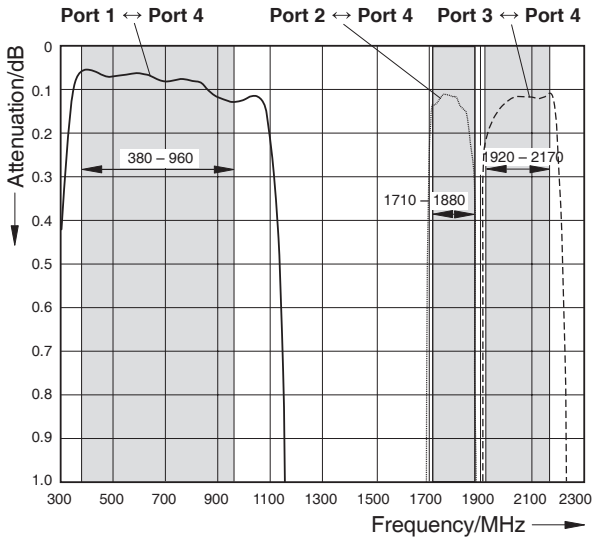


Diagram II



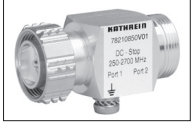
Accessories (order separately)

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
78210850V01	DC stop
78410367	50-Ohm load

Clamp Set

DC stop



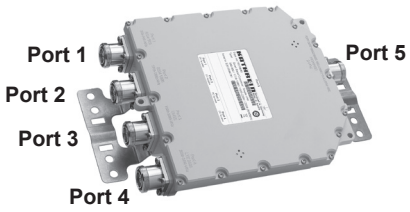
50-Ohm load

Quad-Band Combiner

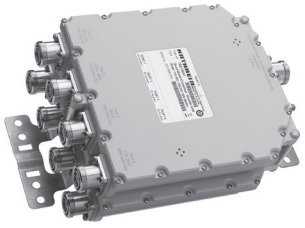
KATHREIN

380 - 960 MHz TETRA / LTE 800 / CDMA 850 / GSM 900	1710 - 1880 MHz GSM 1800	1920 - 2200 MHz UMTS 2100	2500 - 2690 MHz LTE 2600

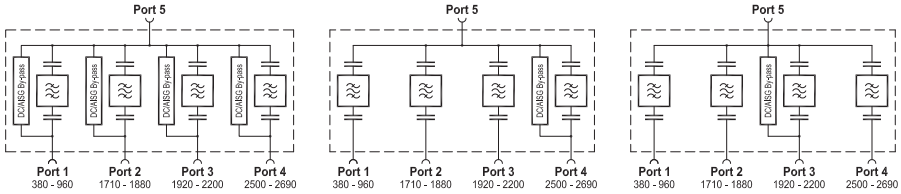
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory



78210640, 78210642, 78210644
Single Unit



78210641, 78210643, 78210645
Double Unit



Technical Data

Type No.	78210640 Single Unit	78210642 Single Unit	78210644 Single Unit
	78210641 Double Unit	78210643 Double Unit	78210645 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)**	**Stop** **Stop** **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		

Quad-Band Combiner

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380 - 960 MHz TETRA / LTE 800 / CDMA 850 / GSM 900	1710 - 1880 MHz GSM 1800	1920 - 2200 MHz UMTS 2100	2500 - 2690 MHz LTE 2600

Typical Attenuation Curves

Diagram I

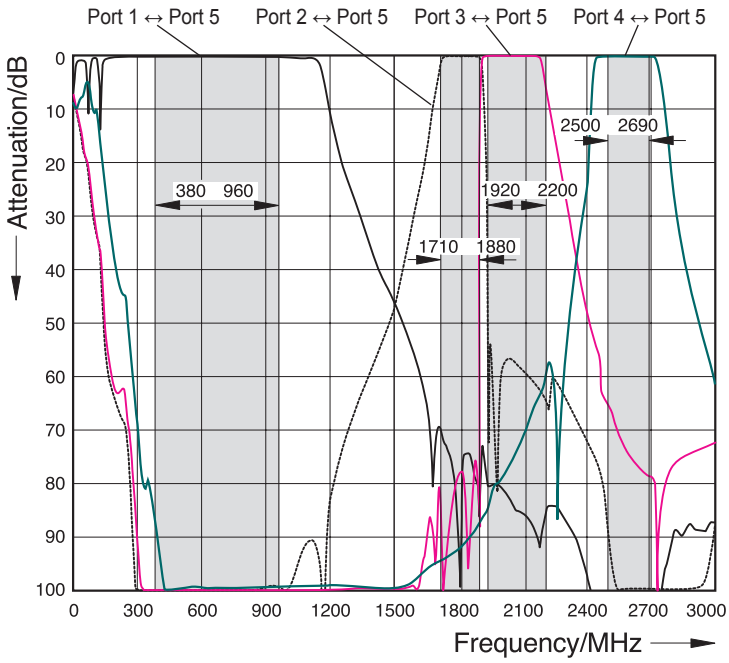
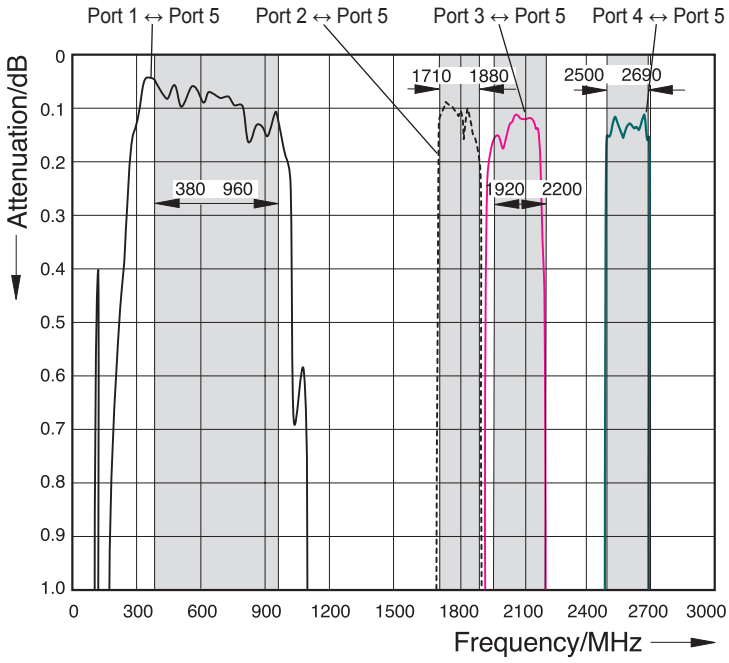


Diagram II



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
78210850V01	DC stop
78410367	50-Ohm load

DC stop

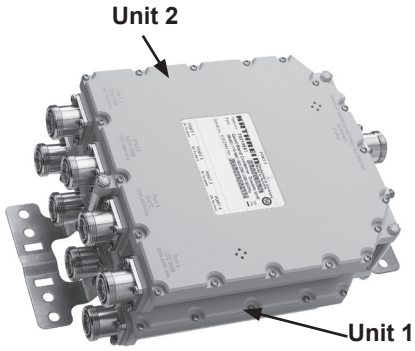
50-Ohm load

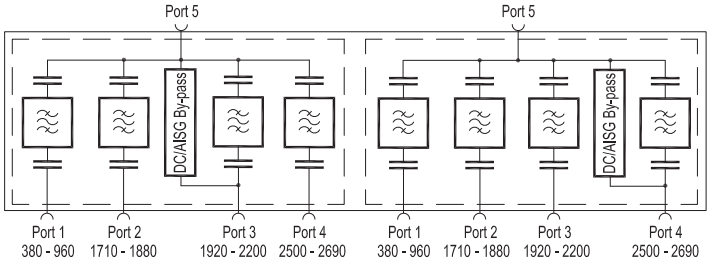
Quad-Band Combiner

KATHREIN

380 - 960 MHz TETRA / LTE 800 / CDMA 850 / GSM 900	1710 - 1880 MHz GSM 1800	1920 - 2200 MHz UMTS 2100	2500 - 2690 MHz LTE 2600

- Designed to support separate DC/AISG supply for 2100 MHz and 2600 MHz band DTMA via 2 feeder cables (see application example)
- 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
- Built-in lightning protection





Technical Data

Type No.	**78210649** 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	**Unit 1** **Stop** **Stop** **By-pass (max. 2500 mA)** **Stop**	**Unit 2** **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	7.5 kg	
Packing size	392 x 292 x 189 mm	
Dimensions (w x h x d)	215 x 228 x 106 mm (without connectors, without mounting brackets)	

Quad-Band Combiner

KATHREIN

380 - 960 MHz TETRA / LTE 800 / CDMA 850 / GSM 900	1710 - 1880 MHz GSM 1800	1920 - 2200 MHz UMTS 2100	2500 - 2690 MHz LTE 2600

Typical Attenuation Curves

Diagram I

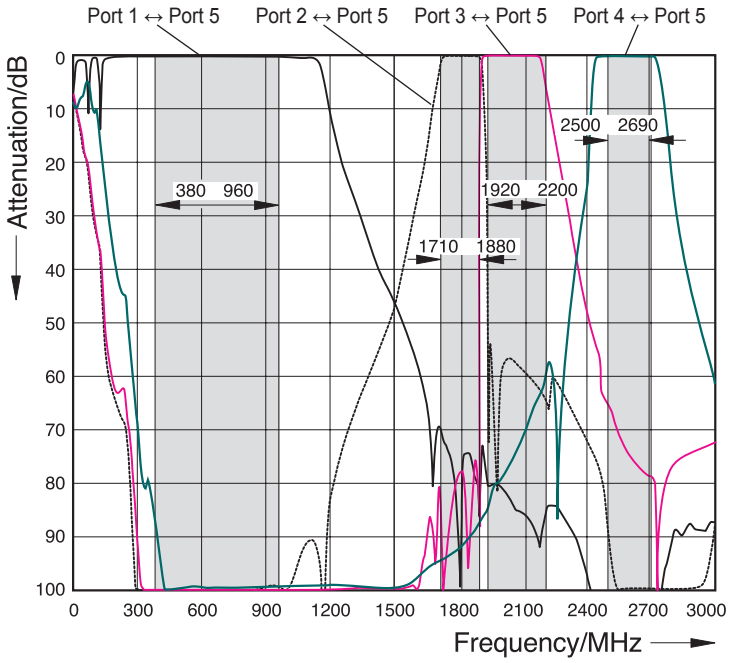
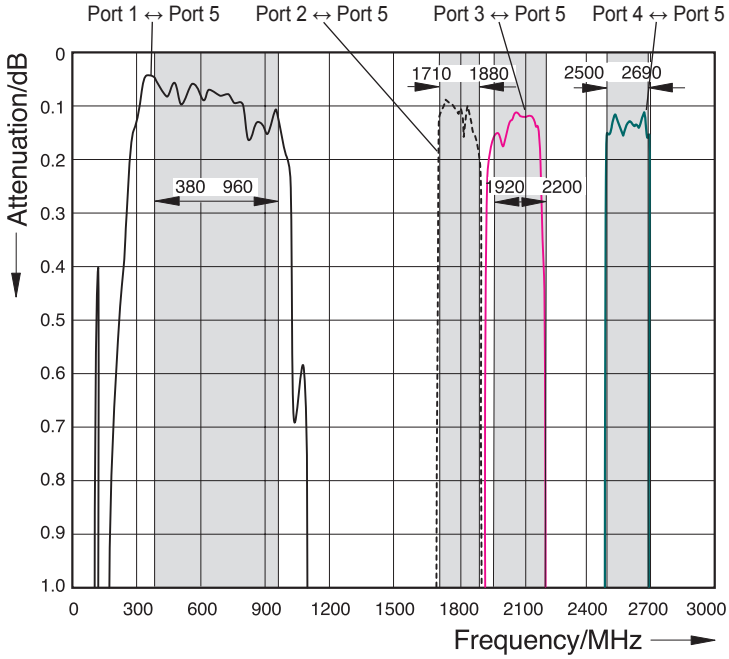


Diagram II



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
78210850V01	DC stop
78410367	50-Ohm load

DC stop

50-Ohm load

Summary of Articles

System Components:

Description	Type No.	Frequency range	Max. input power	Page
3-dB Coupler	K627041	68 - 108 MHz	1000 W	133
Hybrid Ring Junction	K627341	68 - 87.5 MHz	100 W	134
Circulator	793276	68 - 88 MHz	50 W	135
3-dB Coupler	K627021	140 - 180 MHz	800 W	138
Hybrid Ring Junction	K627321	146 - 174 MHz	100 W	139
Circulator	793277	146 - 174 MHz	100 W	140
Circulator	780060	146 - 174 MHz	100 W	141
3-dB Coupler	K637021	340 - 512 MHz	500 W	142
3-dB Coupler	K637027	340 - 512 MHz	500 W	142
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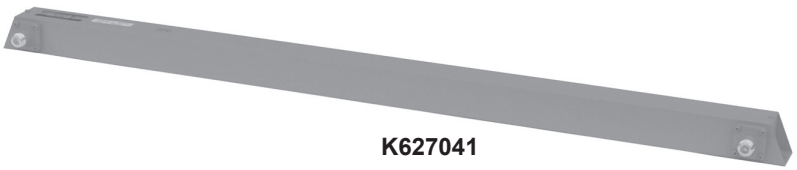
6-dB Coupler	792777	380 - 470 MHz	500 W	143
7-dB Coupler	792331	380 - 470 MHz	500 W	143
10-dB Coupler	720297	380 - 470 MHz	500 W	143
Hybrid Ring Junction, TETRA, TETRAPOL	730092	380 - 430 MHz	100 W	144
Hybrid Ring Junction	K6373211	400 - 470 MHz	100 W	145
Decoupled Power Splitter 1 : 3	78210231	380 - 430 MHz	100 W	146
Decoupled Power Splitter 1 : 4	78210189	380 - 430 MHz	100 W	146
Decoupled Power Splitter 1 : 3	724348	400 - 470 MHz	100 W	147
Decoupled Power Splitter 1 : 4	725871	400 - 470 MHz	100 W	147
Circulator	78410175	380 - 430 MHz	200 W	148
Circulator	790215	400 - 470 MHz	100 W	148
DC-Stop	721062	68 - 87.5 / 146 - 174 / 380 - 470 MHz	10 W	136
DC-Stop	78210850V01	250 - 2700 MHz	750 W	137
Attenuator 3 dB	78410235	0 - 4000 MHz	2 W	149
Attenuator 6 dB	78410236	0 - 4000 MHz	2 W	149
Attenuator 10 dB	78410237	0 - 4000 MHz	2 W	149
Attenuator 20 dB	78410238	0 - 4000 MHz	2 W	149
Attenuator 3 dB	791918	0 - 4000 MHz	15 W	149
Attenuator 6 dB	791919	0 - 4000 MHz	12 W	149
Attenuator 10 dB	791920	0 - 4000 MHz	10 W	149
Attenuator 20 dB	791921	0 - 4000 MHz	10 W	149
50-Ω Load (N male)	K6226611	0 - 2700 MHz	0.5 W	150
50-Ω Load (7-16 male)	78410367	0 - 4000 MHz	1.5 W	150
50-Ω Load (7-16 female)	78410470	0 - 4000 MHz	1.5 W	150
50-Ω Load (N male)	K6226111	0 - 2700 MHz	2 W	150
50-Ω Load (N female)	K6226401	0 - 2700 MHz	10 W	150
50-Ω Load (N male)	K6226411	0 - 2700 MHz	10 W	150
50-Ω Load (N female)	K6226201	0 - 2700 MHz	25 W	151
50-Ω Load (N male)	K6226211	0 - 2700 MHz	25 W	151
50-Ω Load (7-16 female)	K6226207	0 - 2700 MHz	25 W	151
50-Ω Load (7-16 male)	K6226217	0 - 2700 MHz	25 W	151
50-Ω Load (N female)	K6226301	0 - 2700 MHz	50 W	151
50-Ω Load (N male)	K6226311	0 - 2700 MHz	50 W	151
50-Ω Load (7-16 female)	K6226307	0 - 2700 MHz	50 W	151
50-Ω Load (7-16 male)	K6226317	0 - 2700 MHz	50 W	151
50-Ω Load (N female)	K6226501	0 - 1000 MHz	100 W	151
50-Ω Load (N male)	K6226511	0 - 1000 MHz	100 W	151
50-Ω Load (7-16 female)	K6226507	0 - 1000 MHz	100 W	151

3-dB Coupler (90° Hybrid)
68 - 108 MHz

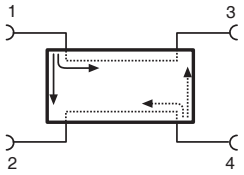
KATHREIN

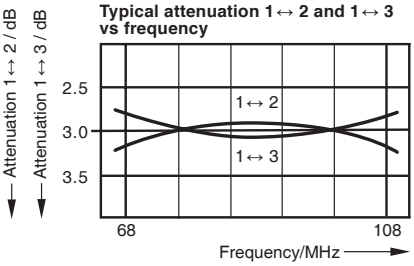
The 3-dB coupler can be used:
- as decoupled power splitter with a ratio of 1:1,
- for the decoupled combining of two transmitters with arbitrarily low frequency spacing (at 3-dB loss),
- for the decoupled combining of two receivers with arbitrarily low frequency spacing,
- for the decoupled combining of two transmitter/receiver units, whose integrated duplexers are within the same frequency range,
- as a frequency independent 90° phase shifter,
- as a component to form combiners.



K627041

Design and 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 is to be planned for according to the mismatch of ports 2 and 3.





Decoupled combining can be achieved via the diagonally opposite ports 2 and 3 respectively 1 and 4.

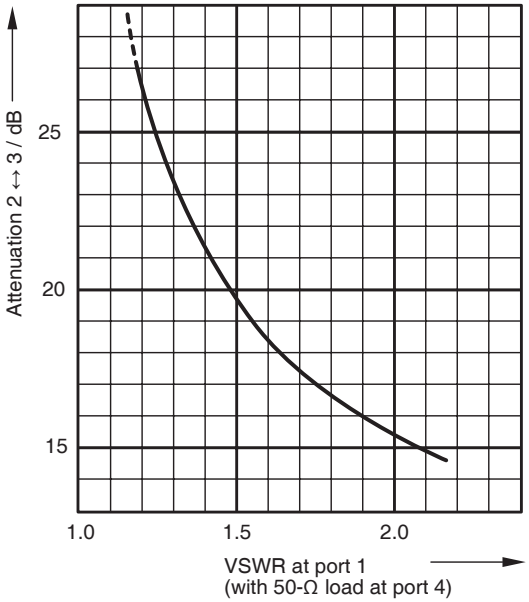
Any open ports must be terminated with suitable loads.

Technical Data

Type No.	K627041
Frequency range	68 - 108 MHz
Attenuation 1 ↔ 2 / 1 ↔ 3	3 ±0.4 dB
Attenuation 2 ↔ 3	See diagram
Directivity	> 32 dB
VSWR	< 1.06
Impedance	50 Ω
Max. power	1 kW
Connectors	N female silver-plated
Material	Brass, silver-plated
Colour	Grey (RAL 7032)
Installation	With 2 screws (max. 6 mm diameter)
Weight	2.3 kg
Packing size	931 mm x 126 mm x 54 mm
Dimensions (w x h x d)	886 mm x 40 mm x 95 mm (incl. connectors)

Note: VSWR and attenuation are measured when the remaining ports are terminated with 50-Ω loads.

Attenuation 2 ↔ 3 vs VSWR at port 1

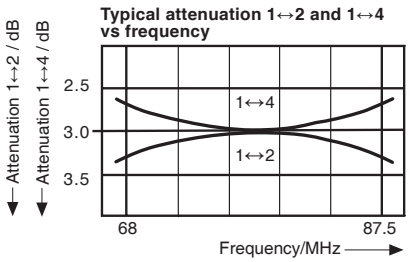


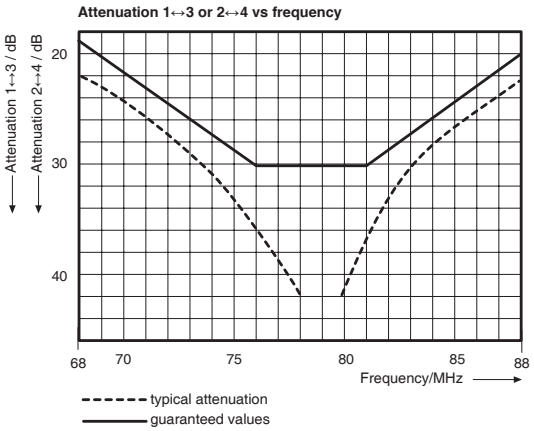
Hybrid Ring Junction (180° Hybrid)
68 - 87.5 MHz

KATHREIN

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 port 1 and 3 or 2 and 4.



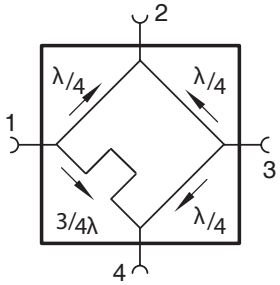


The remaining ports are terminated with 50-Ω loads.

Technical Data

Type No.	K627341
Frequency range	68 - 87.5 MHz
Attenuation 1 ↔ 2 bzw. 1 ↔ 4	3.2 ±0.4 dB
Attenuation 1 ↔ 3 bzw. 2 ↔ 4	See diagrams
VSWR	< 1.3
Impedance	50 Ω
Input power	< 100 W per Input
Connector	N female
Material	Housing: Aluminium
Installation	With 2 screws (M4)
Weight	650 g
Packing size	230 mm x 35 mm x 130 mm
Dimensions (w x h x d)	225 mm x 32 mm x 117 mm (with connectors)

Note: VSWR and attenuation are measured when the remaining ports are terminated with 50-Ω loads.



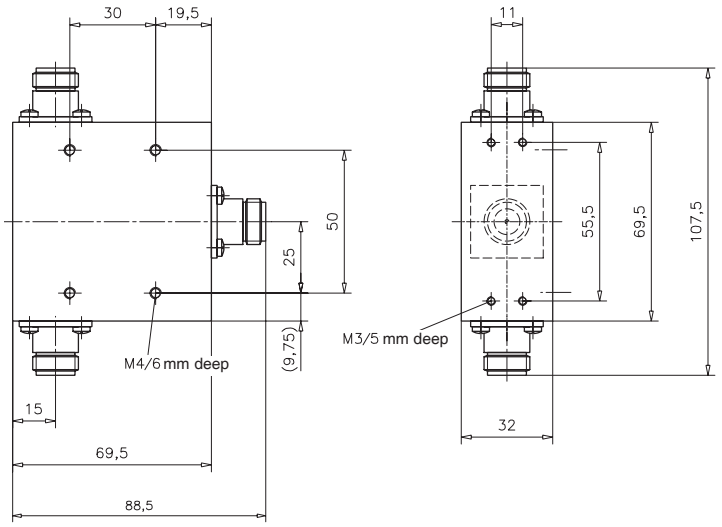
Circulator
68 - 88 MHz

KATHREIN

The circulator can be used:
- to increase the coupling attenuation between transmitters, to reduce intermodulation products,
- to prevent adverse effects of unmatched load impedance on amplifier performance.

Function:
The circulator is a non-reciprocal component with low insertion loss in the forward direction (1 → 2) and high attenuation in the reverse direction (2 → 1). The impedance at the input (1) of the circulator is constant and independent of the impedance of the components following. The reflected power at output (2) is passed to the absorber port (3), which must be terminated with an absorber.

Dimensioning of the absorber:
The absorber at port (3) must be dimensioned to be able to absorb the maximum power reflected at output (2).



Technical Data

Type No.	793276
Frequency range	68 - 88 MHz
Insertion loss 1 → 2	< 0.45 dB
Isolation 2 → 1	> 20 dB
VSWR 1, 2, 3	< 1.22
Impedance	50 Ω
Input power	< 50 W
Temperature range	-10 ... +55 °C
Connectors	N female
Weight	660 g
Packing size	150 mm x 115 mm x 105 mm
Dimensions (w x h x d)	105 mm x 87 mm x 32 mm (with connectors)

DC-Stop
68 ... 470 MHz

KATHREIN

The DC-Stop is used to block DC voltage in coaxial cables where the specified RF frequencies are passed.

Special features:
- galvanic DC isolation of the inner and outer conductors of a coaxial cable,
- at the input and output of the DC-Stop the inner and outer conductor is DC connected. This avoids DC voltage differences between inner and outer conductors,
- protection against electric shock hazard because of plastic housing construction.

Design and construction:
The DC-Stop consists of broad band transformers and high voltage capacitors.

Technical Data

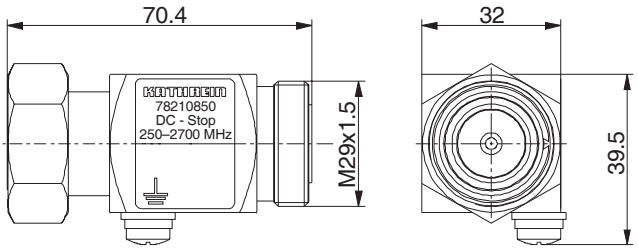
Type No.	721062
Frequency range	68 - 87.5 MHz 146 - 174 MHz 380 - 470 MHz
Insertion loss	< 0.8 dB (68 - 87.5 MHz) < 1.0 dB (146 - 174 MHz) < 1.5 dB (380 - 470 MHz)
VSWR	< 1.4
Impedance	50 Ω
Input power	< 10 W
DC test voltage	4 kV
Connectors	Mounting clamps for coaxial cable RG 213/U, RG 214U
Material	Housing: Polyester
Installation	With 4 screws (max. 4 mm diameter)
Weight	350 g
Packing size	190 mm x 100 mm x 65 mm
Dimensions (w x h x d)	180 mm x 75 mm x 55 mm

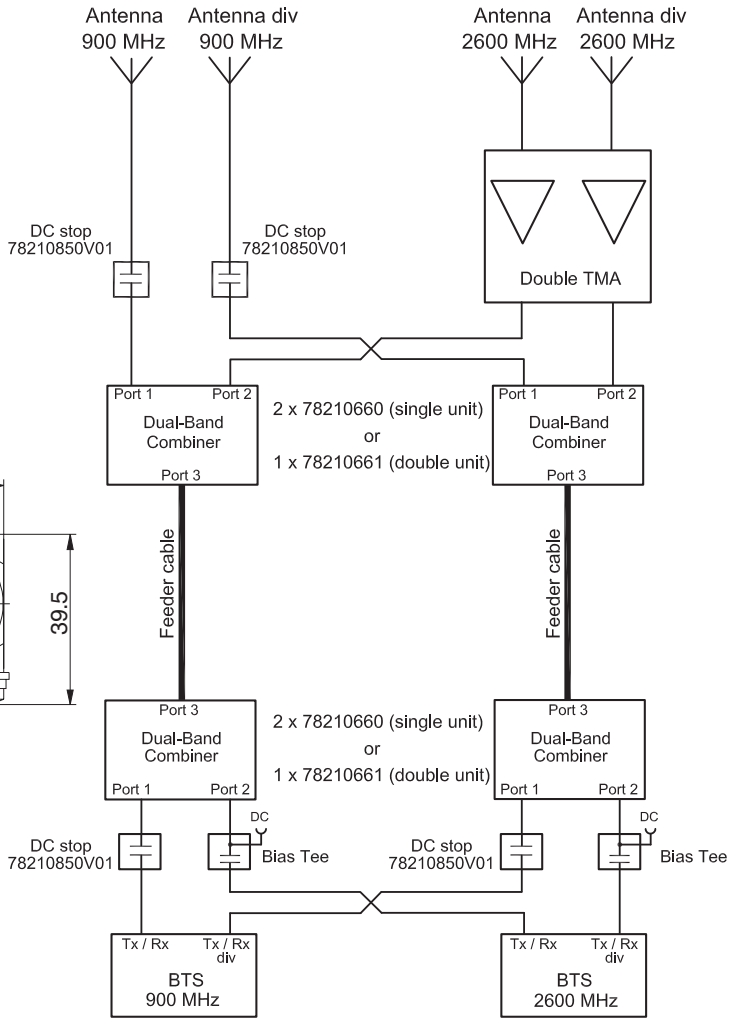
DC Stop
250 - 2700 MHz

KATHREIN

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.

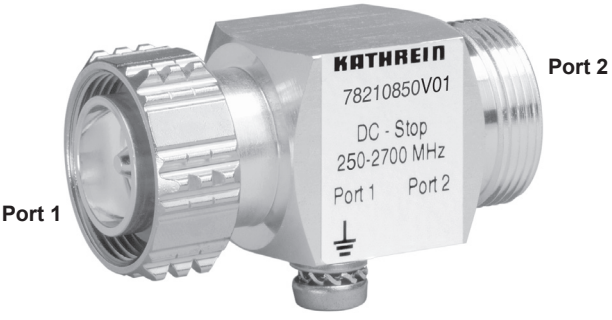
- Low RF signal insertion loss
- High DC signal isolation from port 1 to port 2 and vice versa
- Isolation of AISG signals
- Suitable for indoor or outdoor applications





Technical Data

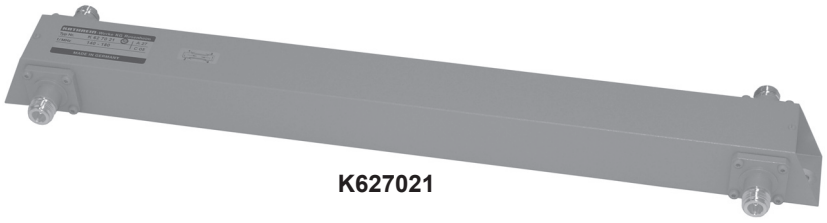
Type No.	78210850V01
Frequency range	250 - 2700 MHz
Insertion loss Port 1 ↔ Port 2	 < 0.1 dB (250 - 2700 MHz)
Isolation Port 1 ↔ Port 2	 DC Stop > 23 dB (AISG 2.176 MHz)
VSWR	< 1.5 (250 - 380 MHz) < 1.25 (380 - 690 MHz) < 1.1 (690 - 2700 MHz)
Impedance	50 Ω
Input power	< 750 W (250 - 2700 MHz)
Intermodulation 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)



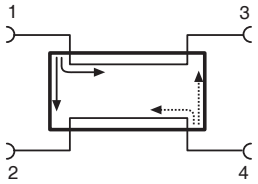
3-dB Coupler (90° Hybrid)
140 - 180 MHz

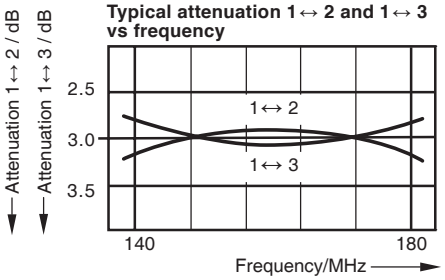
KATHREIN

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.



K627021





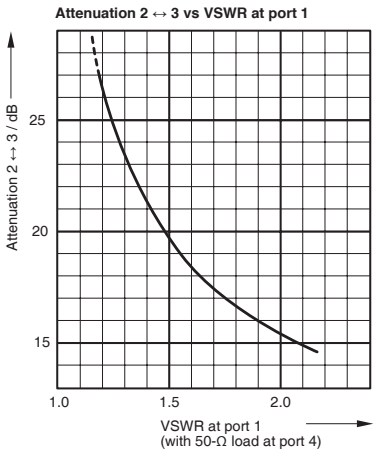
Function:
The 3-dB coupler has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 3. Port 4 is decoupled and without power if ports 2 and 3 are ideally matched. In practice an absorber of suitable power at port 4 is 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.

Customized versions:
On request couplers with a coupling attenuation of between 3 dB and 10 dB are available.

Technical Data

Type No.	K627021
Frequency range	140 - 180 MHz
Attenuation 1 ↔ 2 / 1 ↔ 3	3 ±0.4 dB
Attenuation 2 ↔ 3	See diagram
Directivity	> 35 dB
VSWR	< 1.06
Impedance	50 Ω
Input power	< 800 W total power
Connectors	N female silver-plated
Material	Brass, silver-plated
Colour	Grey (RAL 7032)
Installation	With 2 screws (max. 5 mm dia.)
Weight	1.4 kg
Packing size	520 x 47 x 115 mm
Dimensions (w x h x d)	496 x 40 x 95 mm (with connectors)

Note: VSWR and attenuation are measured when the remaining ports are terminated with 50-Ω loads.

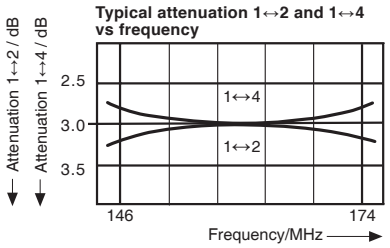


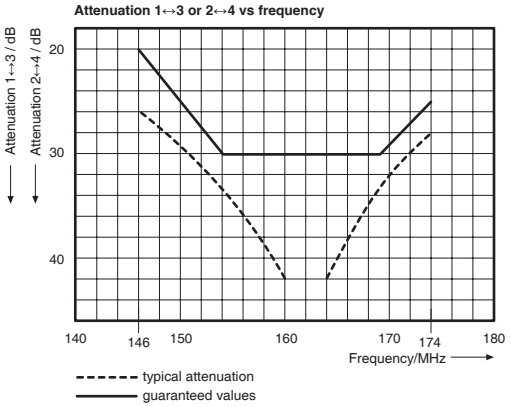
Hybrid Ring Junction (180° Hybrid) 146 - 174 MHz

KATHREIN

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 port 1 and 3 or 2 and 4.



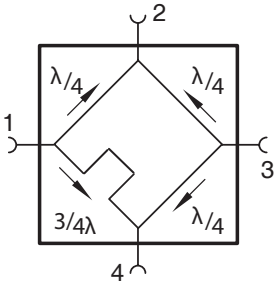


The remaining ports are terminated with 50-Ω loads.

Technical Data

Type No.	K627321
Frequency range	146 - 174 MHz
Attenuation 1 ↔ 2 bzw. 1 ↔ 4	3 ±0.4 dB
Attenuation 1 ↔ 3 bzw. 2 ↔ 4	See diagrams
VSWR*	< 1.2
Impedance	50 Ω
Input power	< 100 W per Input
Connector	N female
Material	Housing: Aluminium
Installation	With 2 screws (M4)
Weight	550 g
Packing size	230 mm x 35 mm x 130 mm
Dimensions (w x h x d)	225 mm x 32 mm x 117 mm (with connectors)

Note: VSWR and attenuation are measured when the remaining ports are terminated with 50-Ω loads.



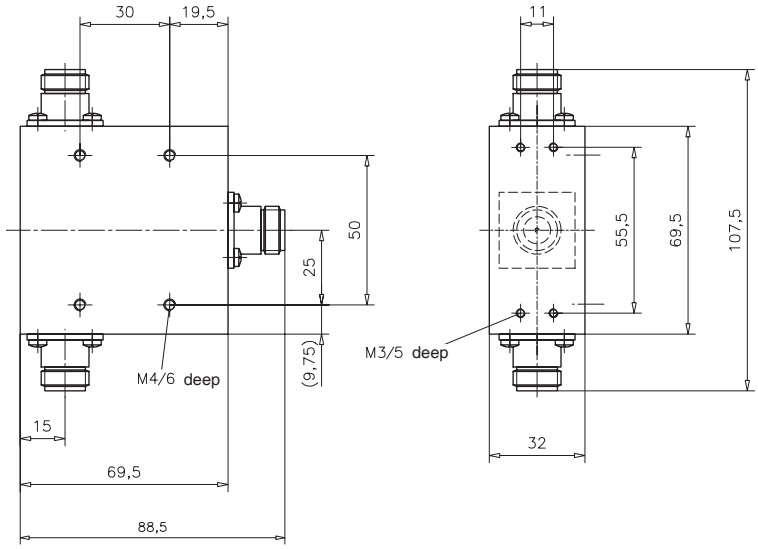
Circulator
146 - 174 MHz

KATHREIN

The circulator can be used:
- to increase the coupling attenuation between transmitters, to reduce intermodulation products,
- to prevent adverse effects of unmatched load impedance on amplifier performance.

Function:
The circulator is a nonreciprocal component with low insertion loss in the forward direction (1 → 2) and high attenuation in the reverse direction (2 → 1). The impedance at the input (1) of the circulator is constant and independent of the impedance of the components following. The reflected power at output (2) is passed to the absorber port (3), which must be terminated with an absorber.

Dimensioning of the absorber:
The absorber at port (3) must be dimensioned to be able to absorb the maximum power reflected at output (2).



Technical Data

Type No.	793277
Frequency range	146 - 174 MHz
Insertion loss 1 → 2	< 0.5
Isolation 2 → 1	> 20 dB
VSWR 1, 2, 3	< 1.22
Impedance	50 Ω
Input power	< 100 W
Temperature range	-10 ... +55 °C
Connectors	N female
Weight	660 g
Packing size	150 mm x 115 mm x 105 mm
Dimensions (w x h x d)	105 mm x 87 mm x 32 mm (with connectors)

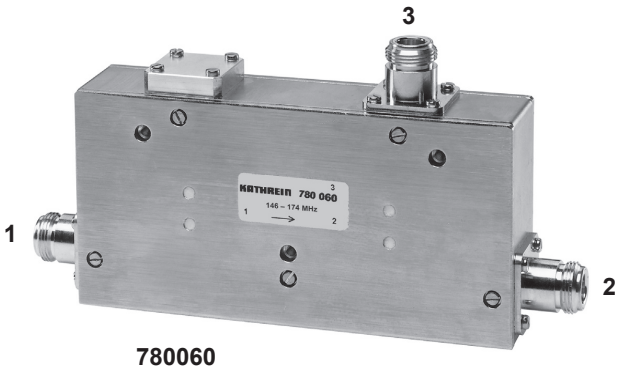
Circulator
146 - 174 MHz

KATHREIN

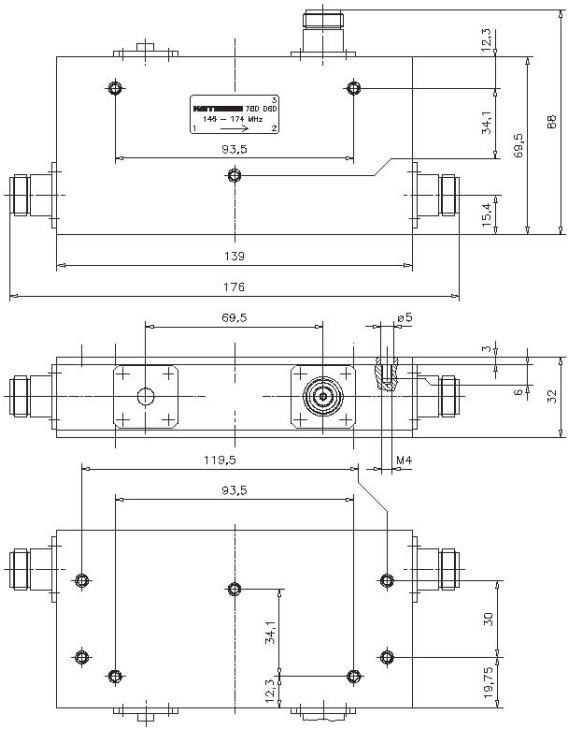
The circulator can be used:
- to increase the coupling attenuation between transmitters, to reduce intermodulation products,
- to prevent adverse effects of unmatched load impedance on amplifier performance.

Function:
The circulator is a nonreciprocal component with low insertion loss in the forward direction (1 → 2) and high attenuation in the reverse direction (2 → 1). The impedance at the input (1) of the circulator is constant and independent of the impedance of the components following. The reflected power at output (2) is passed to the absorber port (3), which must be terminated with an absorber.

Dimensioning of the absorber:
The absorber at port (3) must be dimensioned to be able to absorb the maximum power reflected at output (2).



780060



Technical Data

Type No.	780060
Frequency range	146 - 174 MHz
Insertion loss 1 → 2	< 1.0 dB (typ. 0.6 dB)
Isolation 2 → 1	> 40 dB
VSWR 1, 2, 3	< 1.25
Impedance	50 Ω
Input power	< 100 W
Temperature range	0 ... +60 °C
Connectors	N female
Weight	1.3 g
Packing size	205 mm x 115 mm x 105 mm
Dimensions (w x h x d)	175 mm x 87 mm x 32 mm (with connectors)

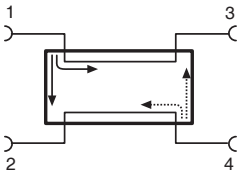
3-dB Coupler (90° Hybrid)
340 - 512 MHz

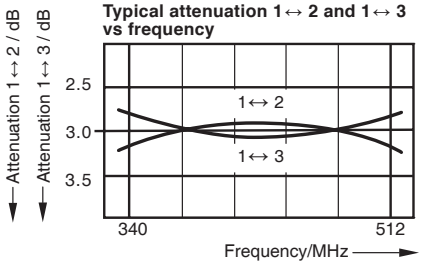
KATHREIN

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.

K637021

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.

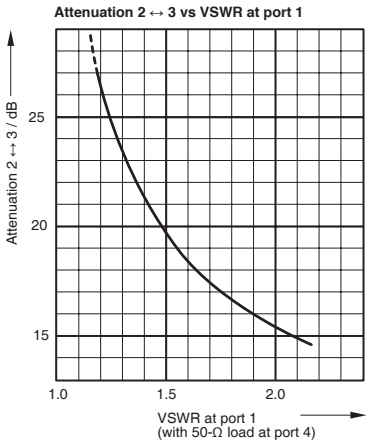




Customized versions:
On request couplers with a coupling attenuation of between 3 dB and 10 dB are available.

Technical Data

Type No.	K637021	K637027
Connectors	N female silver-plated	7-16 female silver-plated
Frequency range	340 - 512 MHz	
Attenuation 1 → 2 / 1 → 3	3 ± 0.4 dB	
Attenuation 2 → 3	See diagram	
Directivity	> 34 dB	
VSWR	< 1.06	
Impedance	50 Ω	
Input power	< 500 W total power	
Material	Brass, silver-plated	
Colour	Grey (RAL 7032)	
Installation	With 2 screws (max. 5 mm diameter)	
Weight	0.9 kg	
Packing size	275 mm x 47 mm x 115 mm	
Dimensions (w x h x d)	252 mm x 40 mm x 95 mm (with connectors)	252 mm x 40 mm x 84 mm (with connectors)



4.7-dB, 6-dB, 7-dB, 10-dB Coupler (90° Hybrid) KATHREIN
380 - 470 MHz

The **4.7-dB coupler** is used as a decoupled splitter for power splitting purposes at a 1 : 2 ratio.
An effective power entering into e.g. port 1 is divided between the ports 2 and 3 at a ratio of 1 : 2. Thus 1/3 of the input power (attenuation: 4.7 dB) is available at port 2 and 2/3 of the input power is available at port 3.

The **6-dB coupler** is used as a decoupled splitter for power splitting purposes at a 1 : 3 ratio. An effective power entering into e.g. port 1 is divided between the ports 2 and 3 at a ratio of 1 : 3.
Thus 1/4 of the input power (attenuation: 6 dB) is available at port 2 and 3/4 of the input power is available at port 3.

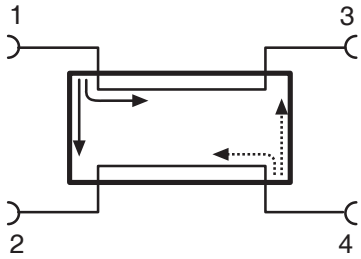
The **7-dB coupler** is used as a decoupled splitter for power splitting purposes at a 1 : 4 ratio. An effective power entering into e.g. port 1 is divided between the ports 2 and 3 at a ratio of 1 : 4.
Thus 1/5 of the input power (attenuation: 7 dB) is available at port 2 and 4/5 of the input power is available at port 3.

The **10-dB coupler** is used as a decoupled splitter for power splitting purposes at a 1 : 9 ratio. An effective power entering at e.g. port 1 is divided between the ports 2 and 3 at a ratio of 1 : 9.
Thus 1/10 of the input power (attenuation: 10 dB) is available at port 2 and 9/10 of the input power is available at port 3.

Port 4 is decoupled and remains free of power if the 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 respectively 1 and 4.

719782
792777
792331
720297



Technical Data

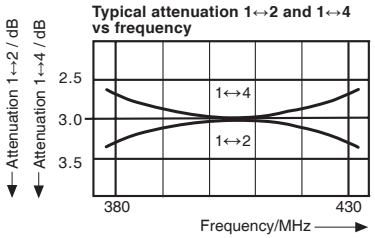
Type No.	719782	792777	792331	720297
Version	4.7-dB coupler	6-dB coupler	7-dB coupler	10-dB coupler
Frequency range	380 - 470 MHz			
Attenuation 1 → 3 (4 → 2)	1.8 ±0.3 dB	1.25 ±0.2 dB	1.0 ±0.2 dB	0.5 ±0.2 dB
Attenuation 1 → 2 (4 → 3)	4.7 ±0.5 dB	6.0 ±0.5 dB	7.0 ±0.5 dB	10 ±0.5 dB
Directivity	> 30 dB	> 30 dB	> 30 dB	> 27 dB
VSWR	< 1.1			
Impedance	50 Ω			
Input power	< 500 W			
Connectors	N female, silver-plated			
Material	Brass, silver-plated			
Colour	Grey (RAL 7032)			
Installation	With 2 screws (max. 5 mm diameter)			
Weight	1.0 kg			
Packing size	275 mm x 47 mm x 115 mm			
Dimensions N female (w x h x d)	252 mm x 40 mm x 95 mm (with connectors)			

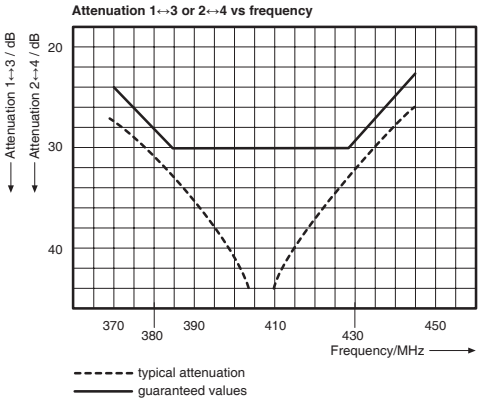
Hybrid Ring Junction (180° Hybrid)
380 - 430 MHz
TETRA, TETRAPOL

KATHREIN

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 intgrated 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 port 1 and 3 or 2 and 4.



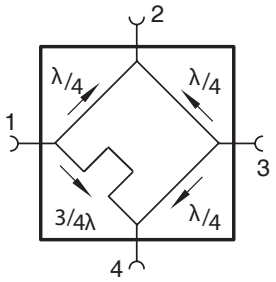


The remaining ports are terminated with 50-Ω loads.

Technical Data

Type No.	730092
Frequency range	380 - 430 MHz
Attenuation 1 → 2 bzw. 1 → 4	3 ±0.4 dB
Attenuation 1 → 3 bzw. 2 → 4	See diagrams
VSWR*	< 1.2
Impedance	50 Ω
Input power	< 100 W per Input
Connector	N female
Material	Housing: Aluminium
Installation	With 2 screws (M4)
Weight	500 g
Packing size	230 mm x 35 mm x 130 mm
Dimensions (w x h x d)	225 mm x 32 mm x 117 mm (with connectors)

Note: VSWR and attenuation are measured when the remaining ports are terminated with 50-Ω loads.

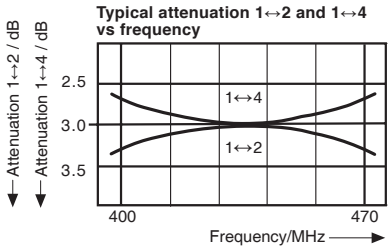


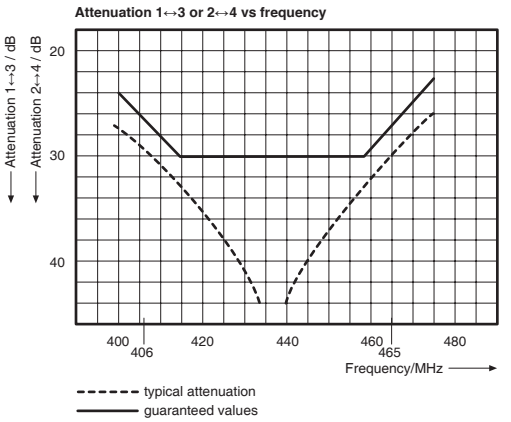
Hybrid Ring Junction (180° Hybrid) 400 - 470 MHz

KATHREIN

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 port 1 and 3 or 2 and 4.



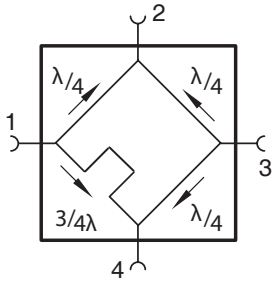


The remaining ports are terminated with 50-Ω loads.

Technical Data

Type No.	K6373211
Frequency range	400 - 470 MHz
Attenuation 1 → 2 bzw. 1 → 4	3 ±0.4 dB
Attenuation 1 → 3 bzw. 2 → 4	See diagrams
VSWR*	< 1.2
Impedance	50 Ω
Input power	< 100 W per Input
Connector	N female
Material	Housing: Aluminium
Installation	With 2 screws (M4)
Weight	500 g
Packing size	230 mm x 35 mm x 130 mm
Dimensions (w x h x d)	225 mm x 32 mm x 117 mm (with connectors)

Note: VSWR and attenuation are measured when the remaining ports are terminated with 50-Ω loads.



Decoupled Power Splitter
380 - 430 MHz
TETRA, TETRAPOL

KATHREIN

The decoupled power splitter can be used:
- for power distribution. For example: From one common antenna to several receivers of arbitrarily low frequency spacing,
- for power distribution. For example: From one transmitter to several outputs,
- for decoupled combining of several transmitters with arbitrarily low frequency spacing (loss: 4.7 dB resp. 6 dB),
- for decoupled combining of several transmitting/receiving units, whose integrated duplexers are within the same frequency range.

78210189

Function:
The decoupled power splitter has 3 or 4 inputs, one output, as well as 3 or 4 absorber ports. The inputs are only decoupled when the absorber ports are terminated with 50-Ω loads of suitable power.

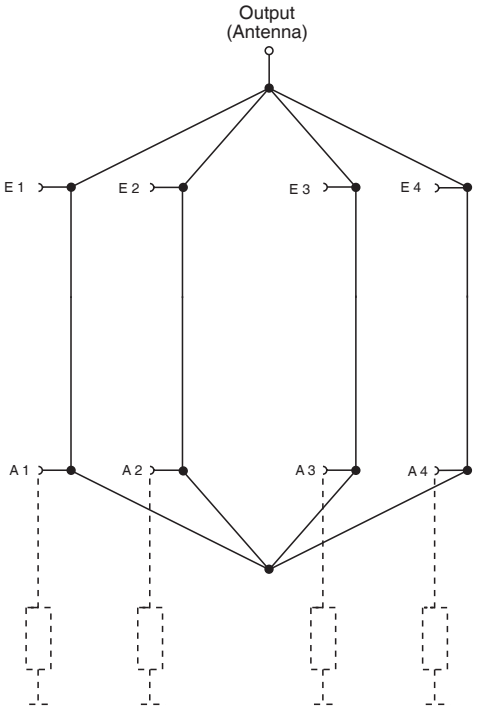
The absorbers of the 3:1-power splitter have to be dimensioned so that at least 2/3 of the power fed into the inputs can be absorbed. Example: If a power of 50 W is fed into every input, the absorbers have to absorb 33 W each.

The absorbers of the 4:1 power splitter have to be dimensioned so that at least 3/4 of the power fed into the inputs can be absorbed. Example: If a power of 50 W is fed into every input, the absorbers have to absorb 37 W each.

Technical Data

Type No.	78210231	78210189
Power ratio	1 : 3	1 : 4
Frequency range	380 - 430 MHz	
Power dividing loss (incl. insertion loss)	< 5.5 dB	< 6.5 dB
Isolation between inputs	> 25 dB	> 30 dB
Impedance	50 Ω	
VSWR	< 1.2	
Input power	< 100 W per Input	
Connectors	N female	
Material	Housing: Aluminium	
Installation	With 2 screws (max. 4 mm diameter)	
Weight	1.0 kg	1.5 kg
Packing size	220 mm x 90 mm x 110 mm	
Dimensions (w x h x d)	190 mm x 80 mm x 94 mm (with connectors)	

1 : 4 power splitter 782 10189



Connectors E 1 ... E 4: Inputs, decoupled
Connectors A 1 ... A 4: External 50-Ω absorbers

Decoupled Power Splitter
400 - 470 MHz

KATHREIN

The decoupled power splitter can be used:
- for power distribution. For example: From one common antenna to several receivers of arbitrarily low frequency spacing,
- for power distribution. For example: From one transmitter to several outputs,
- for decoupled combining of several transmitters with arbitrarily low frequency spacing (loss: 4.7 dB resp. 6 dB),
- for decoupled combining of several transmitting/receiving units, whose integrated duplexers are within the same frequency range.

Function:
The decoupled power splitter has 3 or 4 inputs, one output, as well as 3 or 4 absorber ports. The inputs are only decoupled when the absorber ports are terminated with 50-Ω loads of suitable power.

The absorbers of the 3:1-power splitter have to be dimensioned so that at least 2/3 of the power fed into the inputs can be absorbed. Example: If a power of 50 W is fed into every input, the absorbers have to absorb 33 W each.

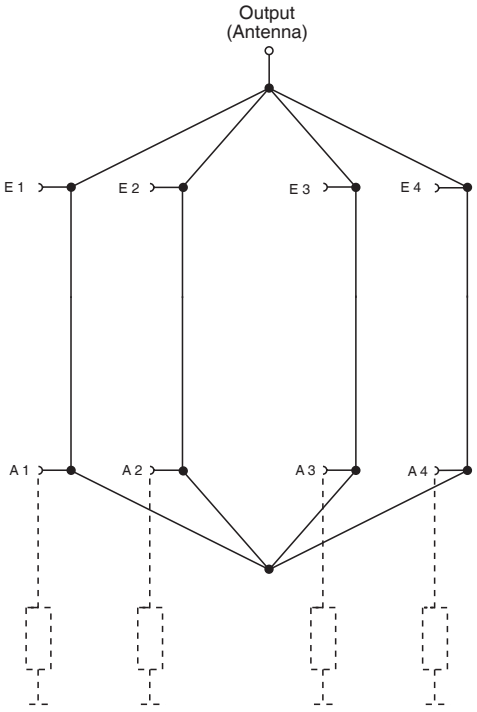
The absorbers of the 4:1 power splitter have to be dimensioned so that at least 3/4 of the power fed into the inputs can be absorbed. Example: If a power of 50 W is fed into every input, the absorbers have to absorb 37 W each.

725871

Technical Data

Type No.	724348	725871
Power ratio	1 : 3	1 : 4
Frequency range	400 - 470 MHz	
Power dividing loss (incl. insertion loss)	< 5.5 dB	< 6.5 dB
Isolation between inputs	> 25 dB	> 30 dB
Impedance	50 Ω	
VSWR	< 1.2	
Input power	< 100 W per input	
Connectors	N female	
Material	Housing: Aluminium	
Installation	With 2 screws (max. 4 mm diameter)	
Weight	1.0 kg	1.5 kg
Packing size	220 mm x 90 mm x 110 mm	
Dimensions (w x h x d)	190 mm x 80 mm x 94 mm (with connectors)	

1 : 4 power splitter 725 871



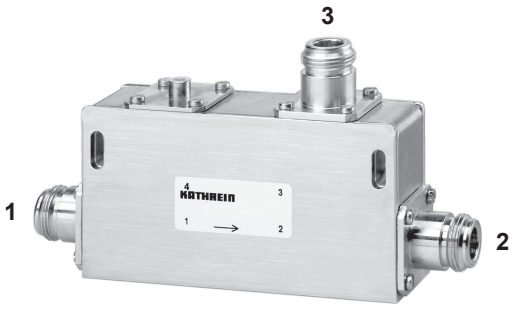
Connectors E 1 ... E 4: Inputs, decoupled
Connectors A 1 ... A 4: External 50-Ω absorbers

Circulator
380 - 430 MHz (TETRA, TETRAPOL)
400 - 470 MHz

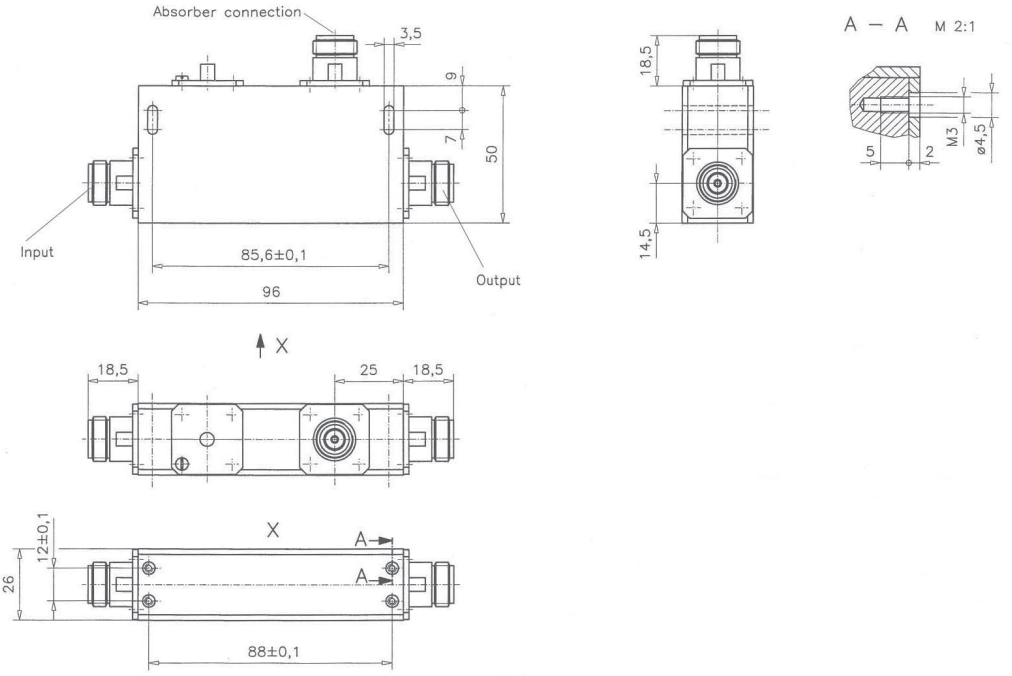
KATHREIN

The circulator can be used:
- to increase the coupling attenuation between transmitters, to reduce intermodulation products,
- to prevent adverse effects of unmatched load impedance on amplifier performance.

Function:
Circulators are nonreciprocal components with low insertion loss in the forward direction (1 → 2) and high attenuation in the reverse direction (2 → 1). The impedance at the input (1) of the circulator is constant and independent of the impedance of the components following, since the reflected power is passed to the absorber port (3).



78410175
790215



Technical Data

Type No.	78410175	790215
Frequency range	380 - 430 MHz	400 - 470 MHz
Insertion loss 1 → 2	< 0.5 dB (typ. 0.4 dB)	< 0.5 dB (typ. 0.3 dB)
Isolation 2 → 1	> 45 dB	> 50 dB
VSWR 1, 2, 3	< 1.19	< 1.22
Imdedance	50 Ω	
Input power	< 200 W	< 100 W
Temperature range	-10 ... +55 °C	
Connectors	N female	
Mounting	With 2 screws (M3)	
Weight	635 g	
Packing size	160 mm x 90 mm x 40 mm	
Dimensions (w x h x d)	96 mm x 50 mm x 26 mm (without connector)	

Attenuator
2 - 15 W
0 - 4000 MHz

KATHREIN

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	791 21
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			

50-Ohm Load
0 ... 4000 MHz
0.5 ... 100 W

KATHREIN

- 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

K6226611

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

78410367

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

K6226111

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	40 x 82 x 77 mm (including connector)	40 x 82 x 85 mm (including connector)

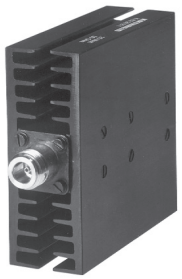
K6226401

50-Ohm Load
0 ... 4000 MHz
0.5 ... 100 W

KATHREIN

25 Watt *

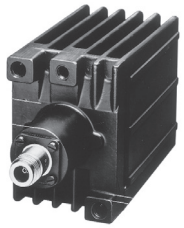
Type No.	K6226201	K6226211	K6226207	K6226217
Connector	N female	N male	7-16 female	7-16 male
Frequency range	0 - 2700 MHz			
VSWR 0 - 1000 MHz 1000 - 2000 MHz 2000 - 2700 MHz	< 1.08 < 1.15 < 1.20			
Application	Indoor			
Weight	Approx. 0.5 kg			
Packing size	50 x 100 x 135 mm			
Dimensions	35 x 94 x 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)



K6226201

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	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)



K6226301

100 Watt *

Type No.	K6226501	K6226511	K6226507
Connector	N female	N male	7-16 female
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	67 x 90 x 130 mm (incl. connector)	67 x 90 x 138 mm (incl. connector)	67 x 90 x 134 mm (incl. connector)

K6226501

* 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 10474, should be used if intermodulation requirements are of high priority.

Summary of Articles

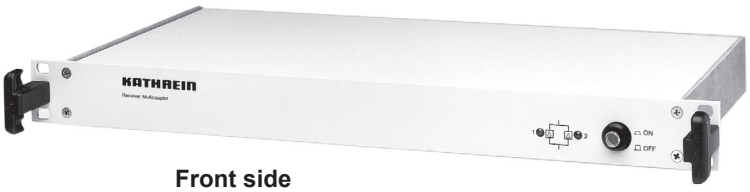
System Components:

Description	Type No.	Frequency range	Gain	Outputs	Page
Receiver Multicoupler	780232	146 - 174 MHz	3 dB	8	154
Receiver Multicoupler	727621	380 - 470 MHz	3 dB	8	155

Receiver Multicoupler
146 - 174 MHz

KATHREIN

This receiver multicoupler makes it possible to operate up to 8 receivers simultaneously on one common antenna. It is especially suitable for use at base stations where there is only limited mast space for the receiving antennas.
The low noise level and the excellent intermodulation characteristics of the receiver multicoupler ensure a high dynamic range.



Front side

Rear side

The receiver multicoupler consists of:
- a low noise amplifier,
- a power splitter,
- a voltage supply.

The RF signals are amplified at the input of the receiver multicoupler by an actively redundant low noise amplifier. This means that the receiver multicoupler will still remain operational even if one of the parallel connected amplifier modules fails. In this case, however, the gain will decrease by about 6 dB.
Each amplifier module has its own voltage supply which is so designed that the modules can be operated simultaneously with both alternating current (230 V ~) and direct current (11 ... 48 V =).

Technical Data

Type No.	**780232**
Number of inputs	1
Number of outputs	8
Frequency range	146 - 174 MHz
Gain	3.0 dB (+1.5 / -1.5 dB)
Noise figure	< 4.0 dB (+0.5 dB)
3rd order intercept point	> 23 dBm (typ. 25 dBm)
Isolation	> 25 dB (typ. 30 dB) between any two outputs
VSWR Input Output	< 1.4 < 1.4
Impedance	50 Ω
Power supply	230 V ~ (+10 / -15 %), 50 ... 60 Hz and/or 11 ... 48 V =, floating
Power consumption	< 9 W (230 V ~, 50 Hz) < 20 W (11 ... 48 V =)
Temperature range	-20 ... +55 °C
Connectors	N female
Colour	Front panel: Grey (RAL 7032)
Attached hardware	Power cable and 4 pin DC connector
Weight	3.9 kg
Packing size	560 mm x 105 mm x 385 mm
Dimensions (w x h x d)	483 mm x 44 mm x 280 mm, 19” drawer

Note: Not used outputs have to be terminated using a 50-Ω load in order to comply with the specifications.

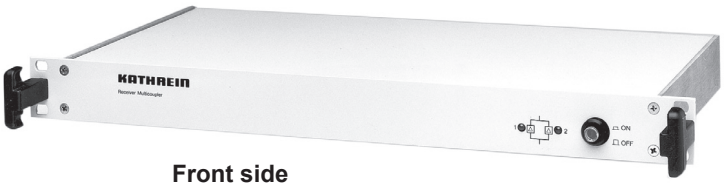
Receiver Multicoupler
380 - 470 MHz

KATHREIN

This receiver multicoupler makes it possible to operate up to 8 receivers simultaneously on one common antenna. It is especially suitable for use at base stations where there is only limited mast space for the receiving antennas.
The low noise level and the excellent intermodulation characteristics of the receiver multicoupler ensure a high dynamic range.

The receiver multicoupler consists of:
- a low-noise amplifier,
- a power splitter,
- a voltage supply.

The HF signals are amplified at the input of the receiver multicoupler by an actively redundant lownoise amplifier. This means that the receiver multicoupler will still remain operational even if one of the parallel connected amplifier modules fails. In this case, however, the amplification will decrease by about 6 dB.
Each amplifier module has its own voltage supply which is so designed that the modules can be operated simultaneously with both alternating current (230 V) and direct current (+11 ... +48 DC).



Front side

Rear side

Technical Data

Type No.	727621
Number of inputs	1
Number of outputs	8
Frequency range	380 - 470 MHz Special tuning is possible in the range of 350 to 550 MHz
Gain	3.0 dB +1.5 / -1.5 dB
Noise figure	< 3.5 dB +0.5 / -1 dB
3rd order intercept point	> 16 dBm (typ. 19 dBm)
Isolation	> 25 dB (typ. 30 dB) between any two outputs
VSWR Input Output	< 1.4 < 1.4
Impedance	50 Ω
Power supply	230 V +10 / -15 %, 50 ... 60 Hz and/or +11 ... +48 VDC, minus grounded
Power consumption	< 9 W (230 V, 50 Hz) < 20 W (+11 ... +48 VDC)
Temperature range	-20 ... +50 °C
Connectors	N female
Colour	Front panel: Grey (RAL 7032)
Attached hardware	Power cable and 4 pin DC connector
Weight	4.0 kg
Packing size	560 mm x 105 mm x 385 mm
Dimensions (w x h x d)	483 mm x 44 mm x 280 mm, 19” drawer

Note: Not used outputs have to be terminated using a 50-Ω load in order to comply with the specifications.

Besides our standard versions we also manufacture many custom versions and combiner systems, which we adapt to your requirements or special operating conditions.

Combiner Systems
Example

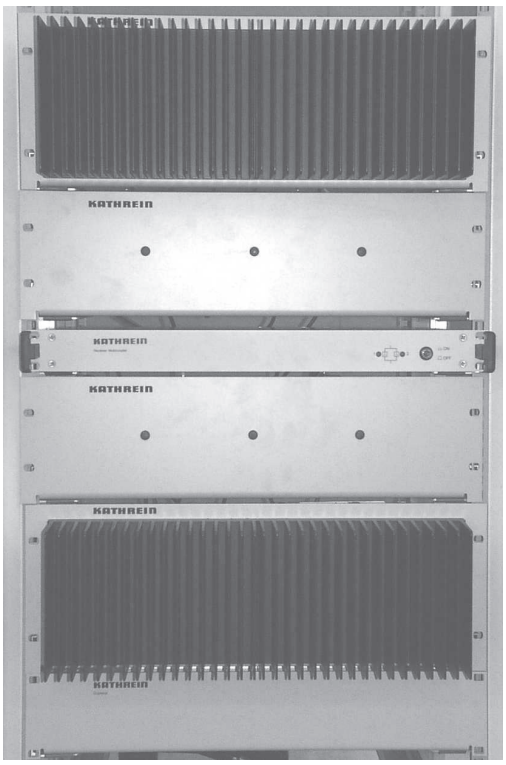
KATHREIN

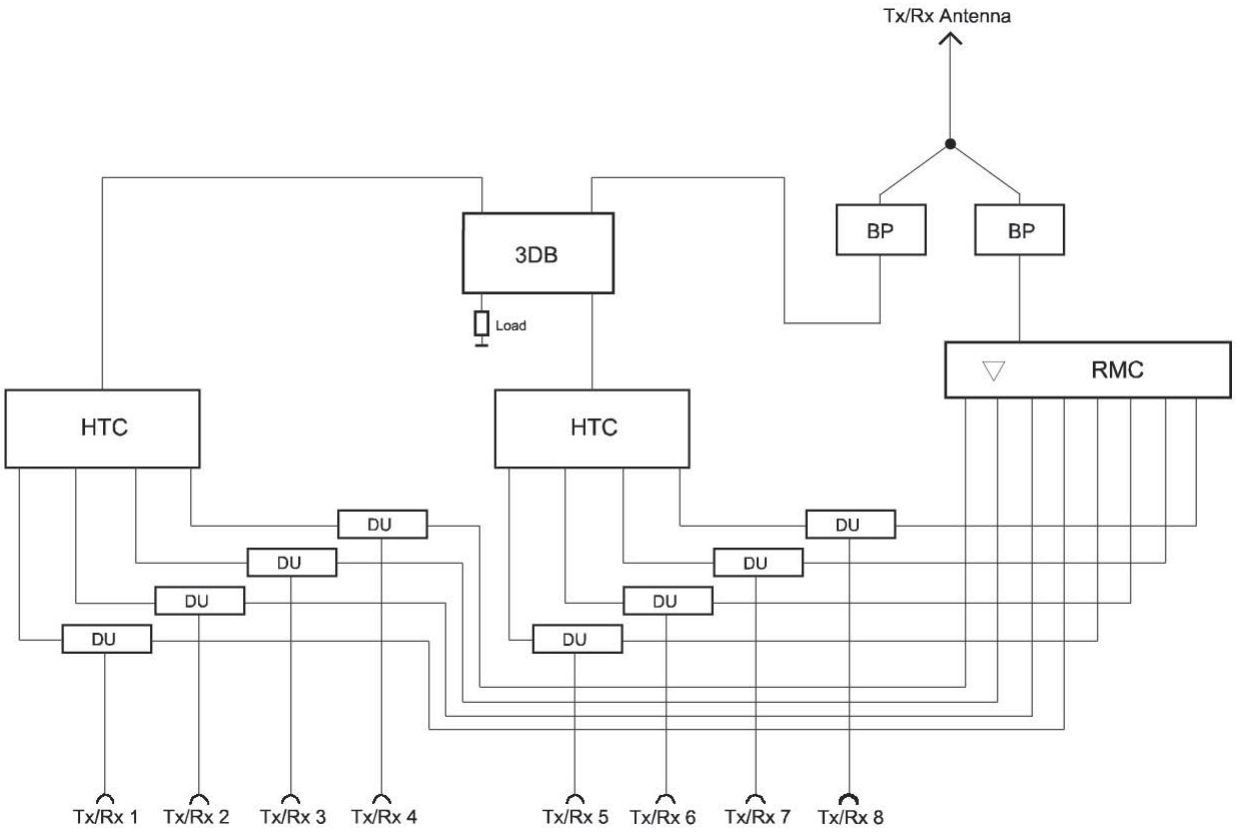
Combiner system for a police mobile communication TETRA network

Frequency range 380 - 385 / 390 - 395 MHz

For combining eight transceivers with TETRA frequencies onto one common antenna.

3DB = 3-dB coupler
BP = Band-pass filter
HTC = Hybrid transmitter combiner
RMC = Receiver multicoupler
DU = Duplexer
Tx/Rx = Transceiver unit





Combiner Systems
Example

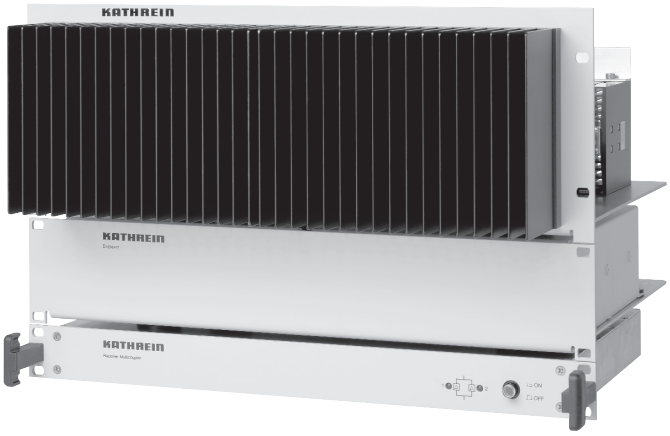
KATHREIN

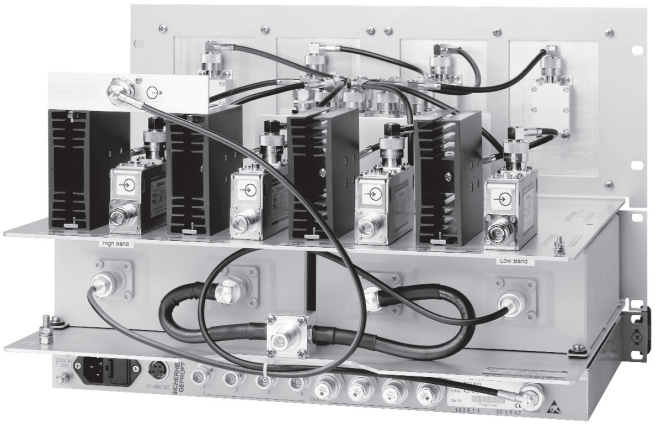
Service radio for governmental and emergency

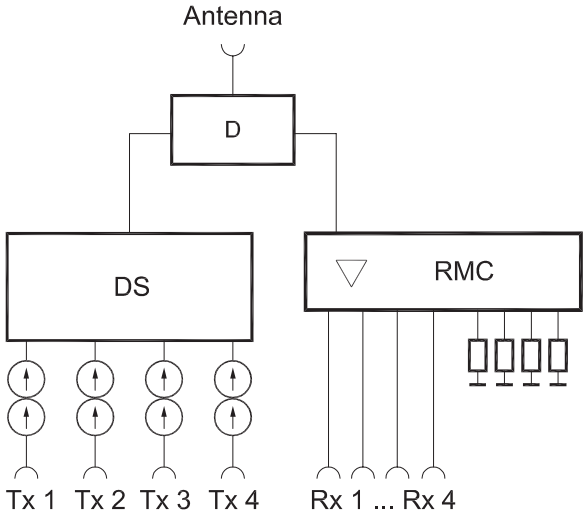
Frequency range 450 - 465 MHz

For combining of 4 transmitters and 4 receivers each to one common Tx/Rx-antenna.

D = Duplexer
DS = Decoupled power splitter
RMC = Receiver multicoupler
↑ = Isolator
Tx = Transmitter
Rx = Receiver







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. 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.

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. Wind loads are calculated according to DIN 1055-4.

The antennas may be used at locations where the anticipated peak wind velocity or gust wind speed lies within the maximum wind speed listed in the datasheet. We warrant the mechanical safety and electrical functionality under such conditions. The wind speeds are defined in accordance with the DIN, EN or TIA standards. This warranty makes allowance for the partial safety factors specified in those standards.

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.Site planning and installation must be carried out by qualified and experienced staff. All relevant national safety regulations must be upheld and respected. Incorrect site planning, faulty installation, as well as interfering surroundings on site, may lead to deviations in the electrical parameters compared to those specified in the respective data sheets.

Subsidiaries/Affiliates

An actual list of Kathrein's International Representatives can be found on our homepage:
www.kathrein.com

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99812556/1215/VMPT | Technical data subject to change.