68 – 470 MHz
Filters, Combiners, Amplifiers for Mobile Communications

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Antennen · Electronic

Quality leads the way

ISO 9001 Certificate

“Quality leads the way“ is our company motto - and this best describes the product philosophy of KATHREIN-Werke KG.

Kathrein’s **quality assurance system** is certified in accordance with ISO 9001. It covers not only development, production and marketing, but also other areas, such as administration and the correct delivery of products to our customers.

Our customers are invited to benefit from Kathrein’s **expertise** and to discuss any special requirements with us.

Use our know-how!

Target Groups:

This catalogue is aimed at
- System suppliers of mobile communication networks
- Manufacturers of mobile radio equipment
- Operators of various mobile communication networks
- Authorities and organisations concerned with safety issues
- Community offices, authorities, organisations and private companies

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Filters

68 – 87.5 MHz
146 – 174 MHz
380 – 470 MHz

Duplexers

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

Multiband Combiners and Transmitter Combiners

Filter Transmitter Combiners
Hybrid Transmitter Combiners
Multiband 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

Active Multicouplers

68 – 87.5 MHz
146 – 174 MHz
380 – 470 MHz

Combiner Systems

Summary of Types

The articles are listed by type number in numerical order

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Filters

68 – 87.5 MHz
146 – 174 MHz
380 – 470 MHz

Summary of Articles

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Filters:

Description	Type No.	Frequency range ... tunable bandwidth – fixed bandwidth (not tunable)	Max. input power	Page
3-cavity Band-pass Filter	791 374	74 – 78 MHz	50 W	8
3-cavity Band-pass Filter	792 047	84 – 88 MHz	50 W	8
2-cavity Band-pass Filter	K 64 12 41	68 ... 87.5 MHz	50 W	10
3-cavity Band-pass Filter	K 64 13 41	68 ... 87.5 MHz	50 W	10
Band-pass Filter	K 64 21 45 1	68 ... 87.5 MHz	200 W	12
1-cavity Band-stop Filter	K 64 31 41	68 ... 87.5 MHz	300 W	14
1-cavity Band-stop Filter	K 64 31 47	68 ... 87.5 MHz	300 W	14
2-cavity Band-stop Filter	K 64 32 41	68 ... 87.5 MHz	300 W	14
2-cavity Band-stop Filter	K 64 32 47	68 ... 87.5 MHz	300 W	14
3-cavity Band-stop Filter	K 64 33 41	68 ... 87.5 MHz	300 W	14
3-cavity Band-stop Filter	K 64 33 47	68 ... 87.5 MHz	300 W	14
S-P Filter	K 64 21 46 1	68 ... 87.5 MHz	200 W	16
S-P Filter	K 64 21 47 1	68 ... 87.5 MHz	200 W	16
S-P Filter	721 751	68 ... 87.5 MHz	100 W	18
S-P Filter	721 752	68 ... 87.5 MHz	100 W	18
S-P Filter	721 753	68 ... 87.5 MHz	100 W	18
S-P Filter	721 754	68 ... 87.5 MHz	100 W	18
S-P Filter	721 784	68 ... 87.5 MHz	100 W	20
S-P Filter	721 687	68 ... 87.5 MHz	100 W	20
S-P Filter	724 579	68 ... 87.5 MHz	100 W	20
S-P Filter	724 580	68 ... 87.5 MHz	100 W	20
Low-pass Filter	726 941	68 – 87.5 MHz	40 W	22
3-cavity Band-pass Filter	791 730	150 ... 169 MHz	50 W	24
2-cavity Band-pass Filter	K 64 00 21	146 ... 174 MHz	50 W	26
2-cavity Band-pass Filter	790 965	146 ... 174 MHz	75 W	28
3-cavity Band-pass Filter	790 964	146 ... 174 MHz	100 W	28
Band-pass Filter	K 64 21 25 1	146 ... 174 MHz	200 W	30
1-cavity Band-stop Filter	K 64 31 21	146 ... 174 MHz	300 W	32
1-cavity Band-stop Filter	K 64 31 27	146 ... 174 MHz	300 W	32
2-cavity Band-stop Filter	K 64 32 21	146 ... 174 MHz	300 W	32
2-cavity Band-stop Filter	K 64 32 27	146 ... 174 MHz	300 W	32
3-cavity Band-stop Filter	K 64 33 21	146 ... 174 MHz	300 W	32
3-cavity Band-stop Filter	K 64 33 27	146 ... 174 MHz	300 W	32
S-P Filter	792 119	146 ... 174 MHz	15 W	34
S-P Filter	728 024	146 ... 174 MHz	200 W	34
S-P Filter	K 64 21 26 1	146 ... 174 MHz	200 W	34
S-P Filter	721 755	146 ... 174 MHz	100 W	36
S-P Filter	721 756	146 ... 174 MHz	100 W	36
S-P Filter	721 757	146 ... 174 MHz	100 W	36
S-P Filter	721 758	146 ... 174 MHz	100 W	36
S-P Filter	721 785	146 ... 174 MHz	100 W	38
S-P Filter	722 916	146 ... 174 MHz	100 W	38
S-P Filter	721 786	146 ... 174 MHz	100 W	38
S-P Filter	722 917	146 ... 174 MHz	100 W	38
Low-pass Filter	729 870	146 – 174 MHz	40 W	40
2-cavity Band-pass Filter	K 65 00 21	380 ... 470 MHz	50 W	42
2-cavity Band-pass Filter	790 967	380 ... 470 MHz	50 W	44
3-cavity Band-pass Filter	790 966	380 ... 470 MHz	50 W	44
Band-pass Filter	K 65 21 25 1	380 ... 470 MHz	200 W	46
1-cavity Band-stop Filter	K 65 31 21	380 ... 470 MHz	300 W	48
1-cavity Band-stop Filter	K 65 31 27	380 ... 470 MHz	300 W	48
2-cavity Band-stop Filter	K 65 32 21	380 ... 470 MHz	300 W	48
2-cavity Band-stop Filter	K 65 32 27	380 ... 470 MHz	300 W	48
3-cavity Band-stop Filter	K 65 33 21	380 ... 470 MHz	300 W	48
3-cavity Band-stop Filter	K 65 33 27	380 ... 470 MHz	300 W	48
S-P Filter	K 65 21 26 1	380 ... 470 MHz	200 W	50
S-P Filter	721 759	380 ... 470 MHz	100 W	52
S-P Filter	721 760	380 ... 470 MHz	100 W	52
S-P Filter	721 761	380 ... 470 MHz	100 W	52
S-P Filter	721 762	380 ... 470 MHz	100 W	52
S-P Filter	723 594	380 ... 470 MHz	100 W	54
S-P Filter	723 790	380 ... 470 MHz	100 W	54
S-P Filter	721 767	380 ... 470 MHz	100 W	54
S-P Filter	724 581	380 ... 470 MHz	100 W	54
Low-pass Filter	725 168	400 – 470 MHz	50 W	56

Band-pass Filter
74 ... 88 MHz

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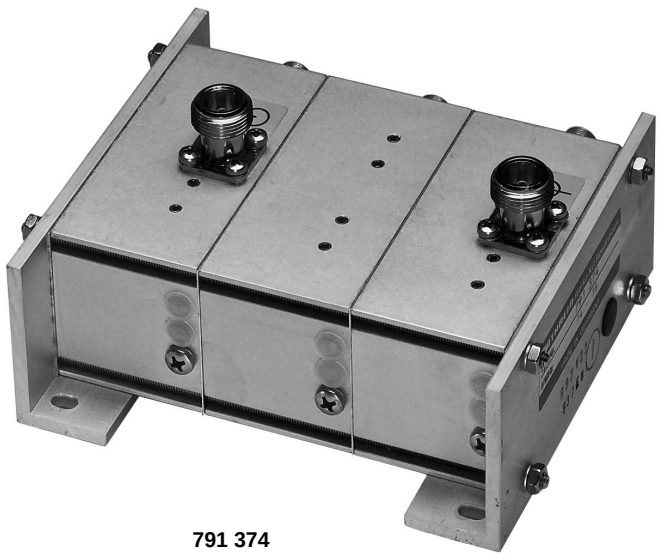
The band-pass filter is suitable for use as a receiving or transmitting filter for **one or several** receivers, or **one** transmitter.

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 consists of three capacitively coupled helix resonators.

Filter characteristics:
Broad pass band with low insertion loss and high stop band attenuation outside of the pass band.



791 374

Technical Data

Type No.	791 374	792 047
Pass band	74 – 78 MHz	84 – 88 MHz
Insertion loss	< 0.7 dB	
Pass band bandwidth	4.0 MHz	
VSWR	< 1.2 (at pass band)	
Impedance	50 Ω	
Input power	< 50 W	
Temperature range	–20 … +50 °C	
Connectors	N female	
Material	Aluminium / copper, silver-plated	
Installation	With 4 screws (max. 4 mm diameter)	
Weight	0.9 kg	
Packing size	188 mm x 80 mm x 153 mm	
Dimensions (w x h x d)	140 mm x 68 mm x 130 mm (with connectors)	

Band-pass Filter
74 ... 88 MHz
Typical attenuation curves

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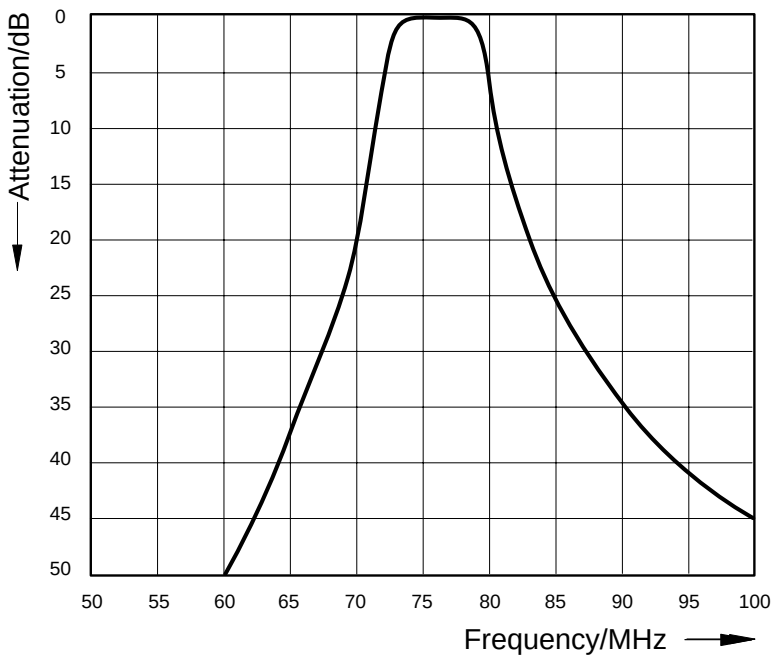
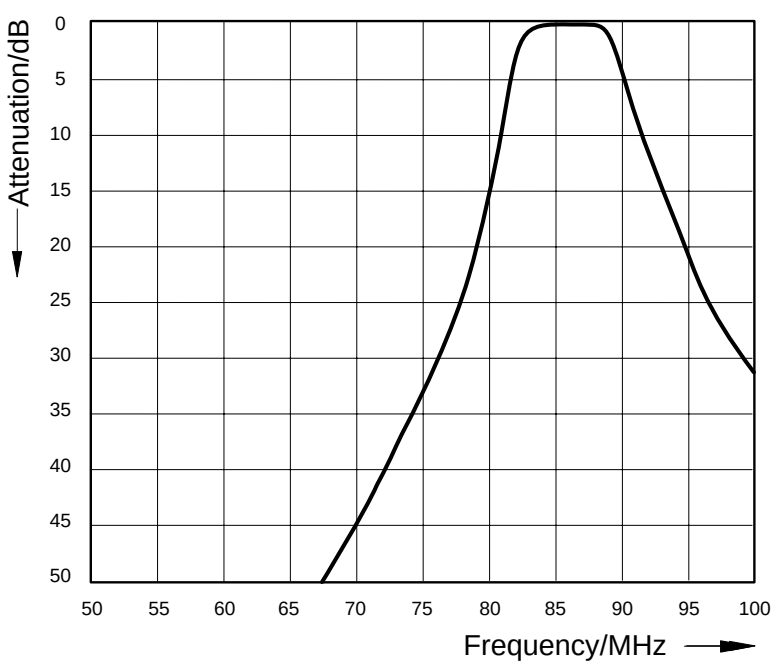
791 374



792 047



Band-pass Filter
68 … 87.5 MHz

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

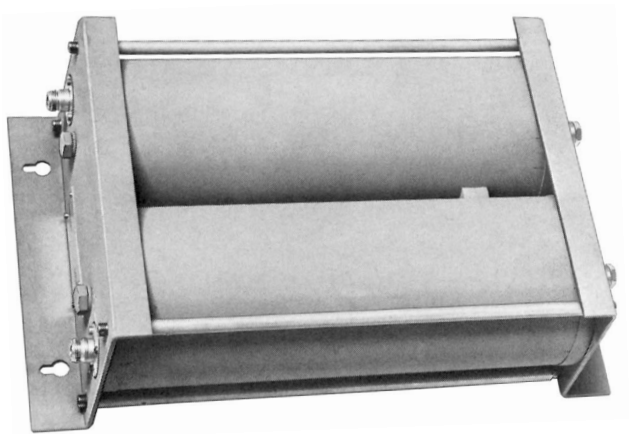
It can be used:
- to improve the input selectivity of receivers and amplifiers,
- to increase the isolation of transmitters, whose respective antennas are mounted close together,
- to suppress noise side bands and inter-modulation products,
- as a combiner component.

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.

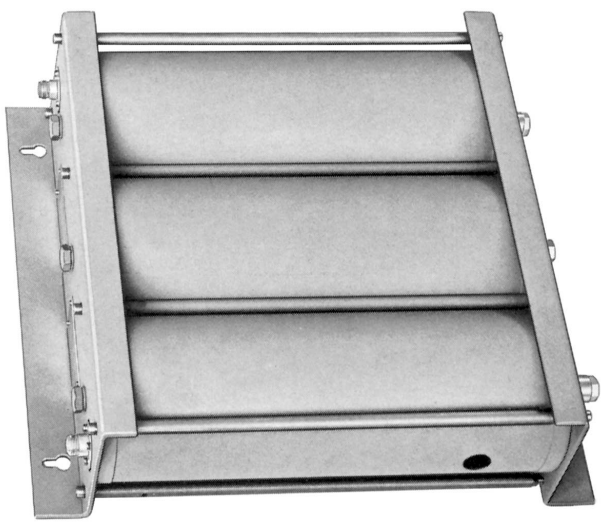
Filter characteristics:
Narrow pass band with low insertion loss, high stop band attenuation, variable filter response corresponding to the desired stop band attenuation.

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.



K 64 12 41



K 64 13 41

Technical Data

Type No.	**K 64 12 41** **2-cavity band-pass filter**		**K 64 13 41** **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

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Tuning examples:

2-cavity band-pass filter
K 64 12 41

Diagram I:

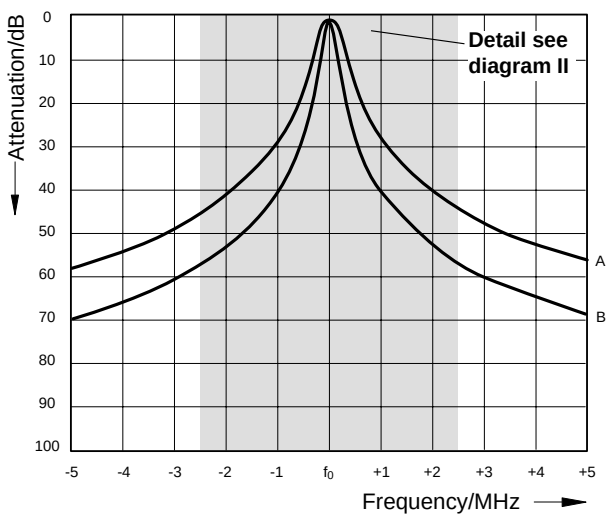


Diagram II:

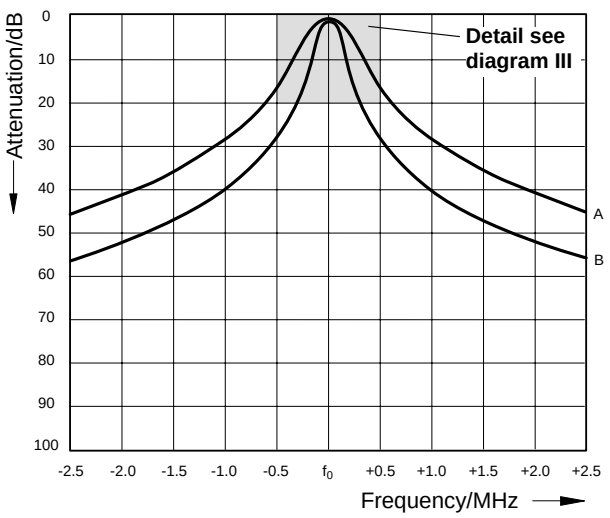
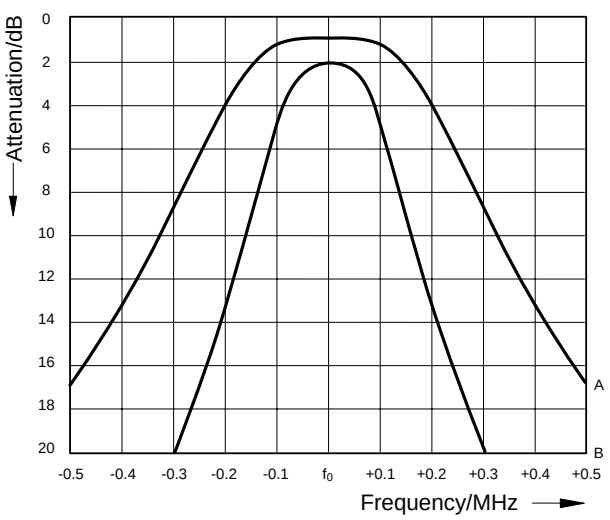


Diagram III:



3-cavity band-pass filter
K 64 13 41

Diagram I:

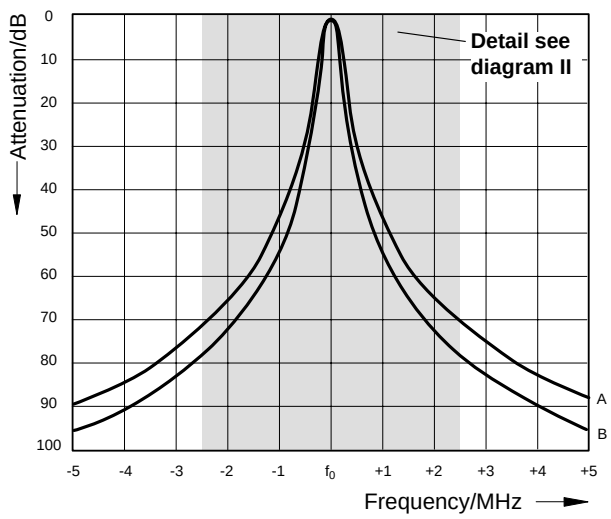


Diagram II:

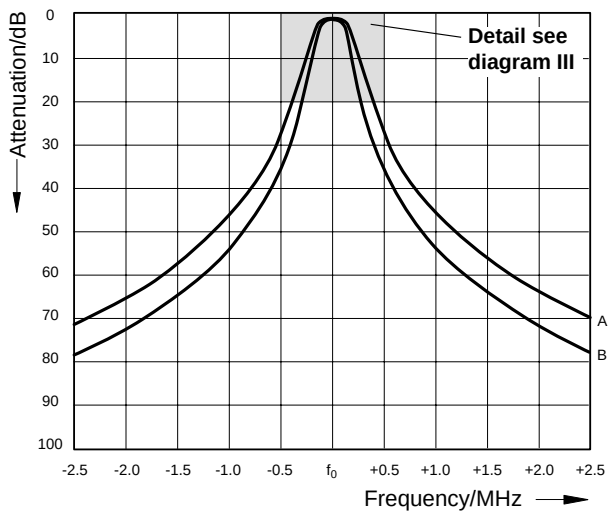
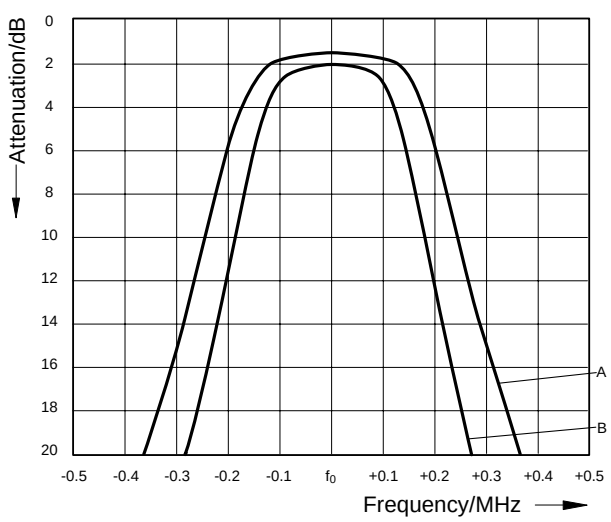


Diagram III:



Band-pass Filter
68 … 87.5 MHz

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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 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.

K 64 21 45 1

Technical Data

Type No.	**K 64 21 45 1**			
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

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Tuning examples:

Diagram I:

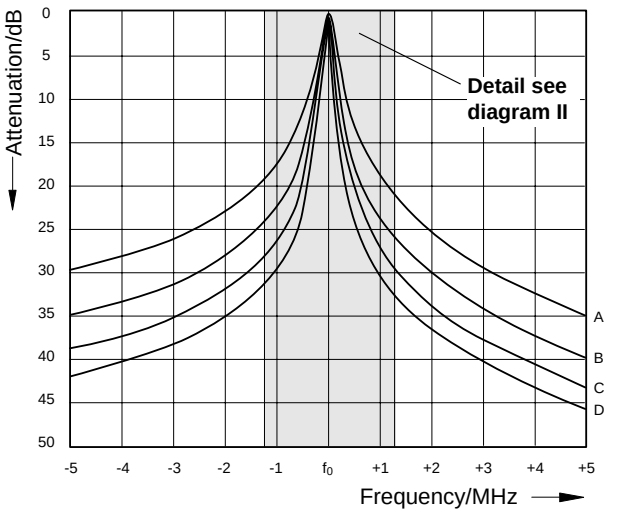


Diagram II:

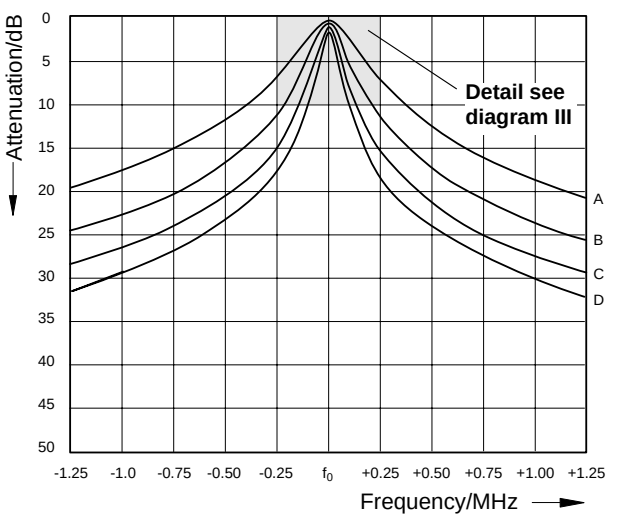
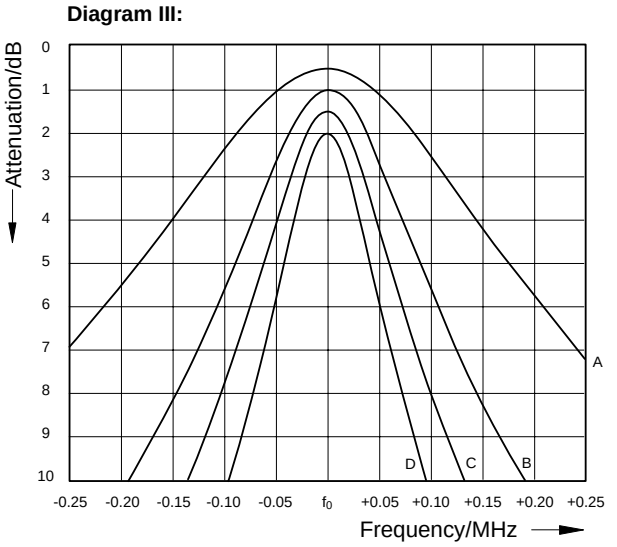


Diagram III:



Band-stop Filter
68 … 87.5 MHz

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The band-stop filter is used:
– to attenuate interfering signals,
– to increase the isolation between transmitter and receiver.

Design and construction:
The band-stop filter consists of capacitively shortened λ/4 coaxial resonators. The resonators of the multi cavity band-stop filters are interconnected by cables of λ/4 length. The stop band frequency and the stop band attenuation are tunable.

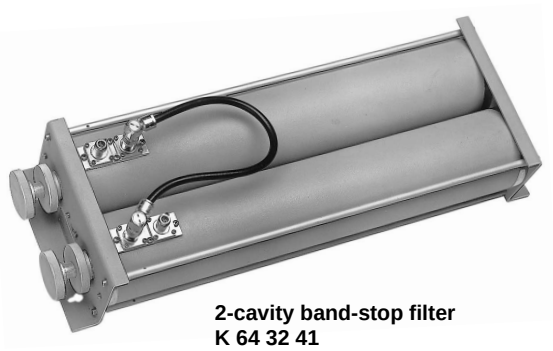
Filter characteristics:
Narrow stop band with high stop band attenuation, low insertion loss outside of the stop band.

Tuning:
The band-stop filter is tuned to the desired stop band frequency at the factory.
When ordering please specify stop band frequency.

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

The resonators of the 2-cavity or 3-cavity band-stop filters can be tuned independently. In this way, 2 or 3 different interfering signals can be suppressed or one single interfering signal can be especially attenuated.

1-cavity band-stop filter
K 64 31 41



2-cavity band-stop filter
K 64 32 41

3-cavity band-stop filter
K 64 33 47

Technical Data

Type No. N female / 7-16 female	K 64 31 41 / K 64 31 47	K 64 32 41 / K 64 32 47	K 64 33 41 / K 64 33 47
Version	1-cavity band-stop filter	2-cavity band-stop filter	3-cavity band-stop filter
Frequency range	68 … 87.5 MHz		
Impedance	50 Ω		
Input power	< 300 W (at insertion loss < 1 dB)		
Temperature range	–30 … +60 °C		
Temperature coefficient	< 18 x 10^{-6} / °C		
Material	Brass, silver-plated		
Colour	Grey (RAL 7032)		
Installation	With 4 screws (max. 6 mm diameter)		
Weight	8.3 kg	16.6 kg	25.0 kg
Packing size	207 mm x 207 mm x 865 mm	285 mm x 210 mm x 840 mm	445 mm x 210 mm x 840 mm
Dimensions (w x h x d)	120 mm x 148 mm x 710 mm	240 mm x 148 mm x 710 mm	360 mm x 148 mm x 710 mm

Band-stop Filter
68 … 87.5 MHz
Typical attenuation curves

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Tuning examples:

1-cavity band-stop filter

Diagram I:

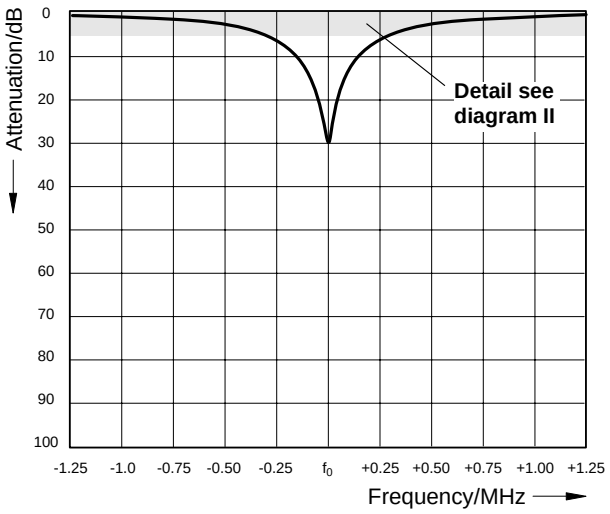
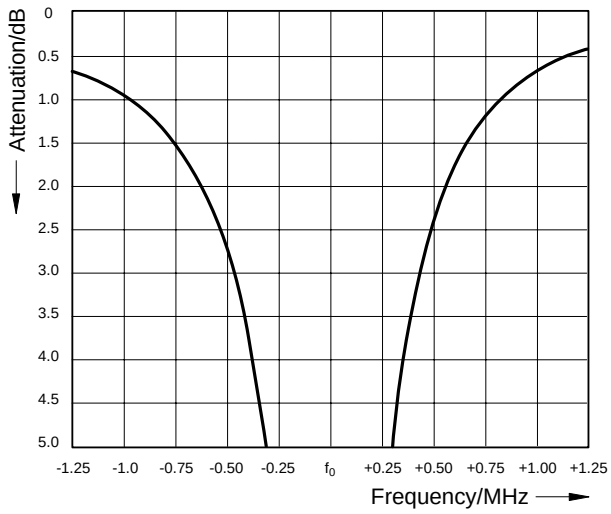


Diagram II:



2-cavity band-stop filter

Diagram I:

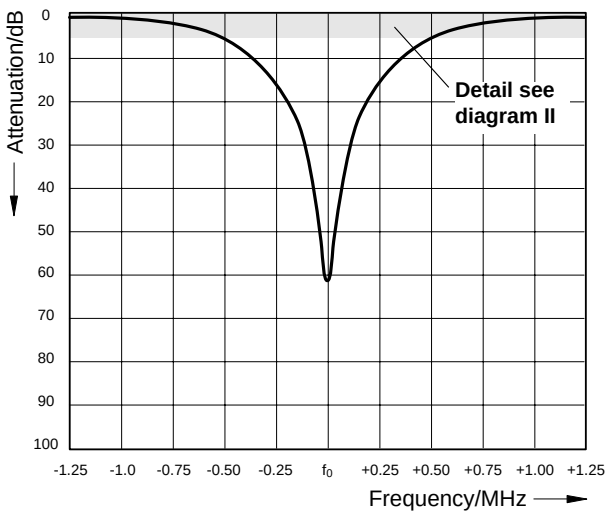
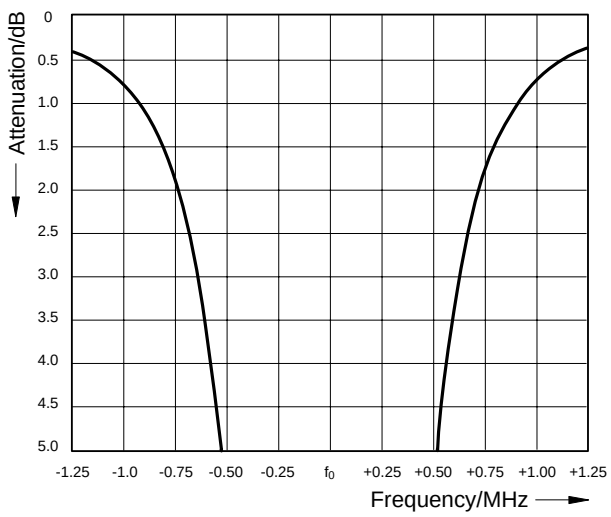


Diagram II:



3-cavity band-stop filter

Diagram I:

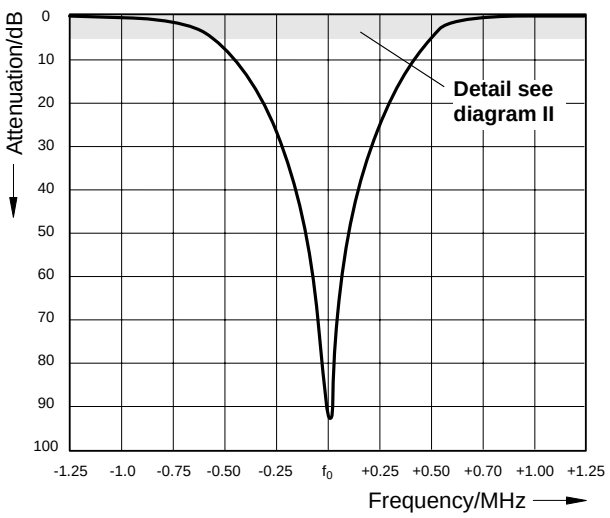
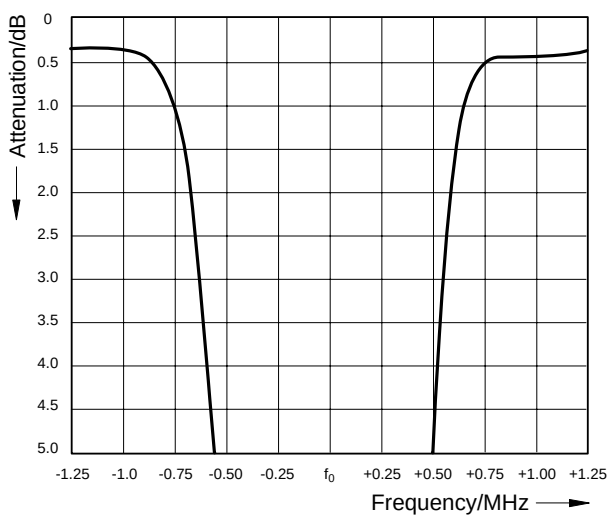


Diagram II:



S-P Filter
68 … 87.5 MHz

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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.

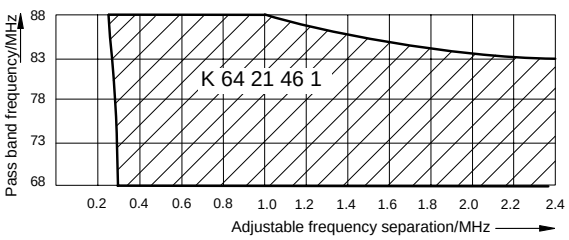
If the stop band attenuation of the individual filters exceeds 10 dB, approximately the following applies:
additional stop band attenuation =
(n – 1) x 5 dB;
n = number of individual filters.
For special applications S-P filters can also be interconnected with band-pass filters.

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.

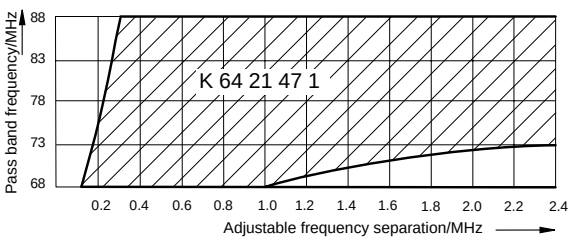
The S-P filter can also be tuned on site using the supplied instructions.

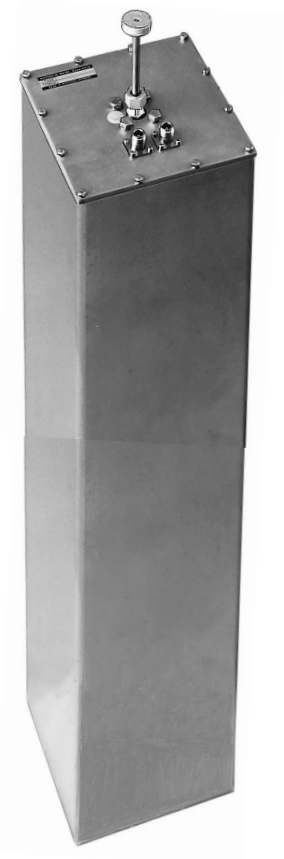
Customized versions
For special applications S-P filters for even lower frequency spacing or lower insertion loss are available.

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



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





K 64 21 46 1
K 64 21 47 1

Technical Data

Type No.	K 64 21 46 1	K 64 21 47 1
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 wall 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

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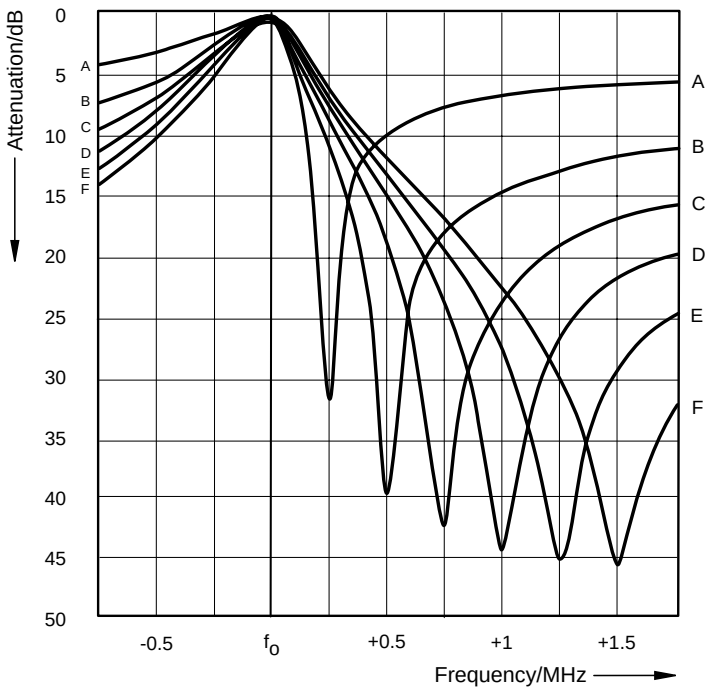
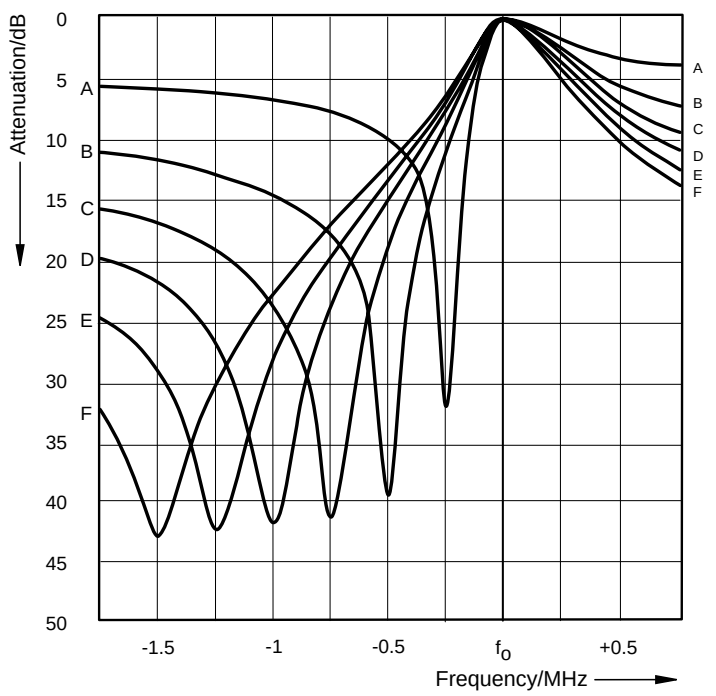
Tuning examples:

K 64 21 46 1



K 64 21 47 1



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

S-P Filter
68 … 87.5 MHz

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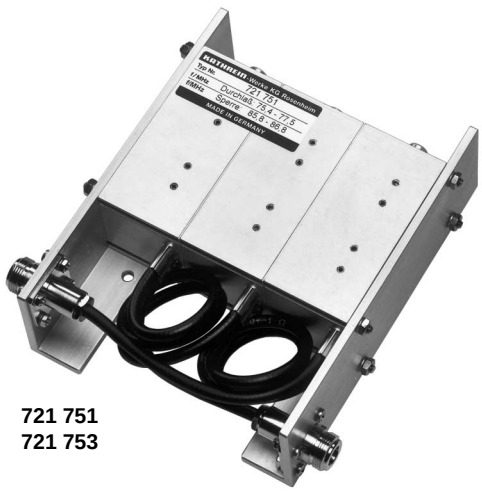
The S-P filter (Stop-Pass filter) is suitable for attenuating interfering frequencies, close to the operational frequency band. It is designed for operation with **one** transmitter respectively with **one or several** receivers.

It can be used:
– in the transmission path for suppressing side band noise and for attenuating intermodulation products at the receiving frequencies,
– in the receiving path for attenuating transmitting frequencies,
– as a duplexer component.

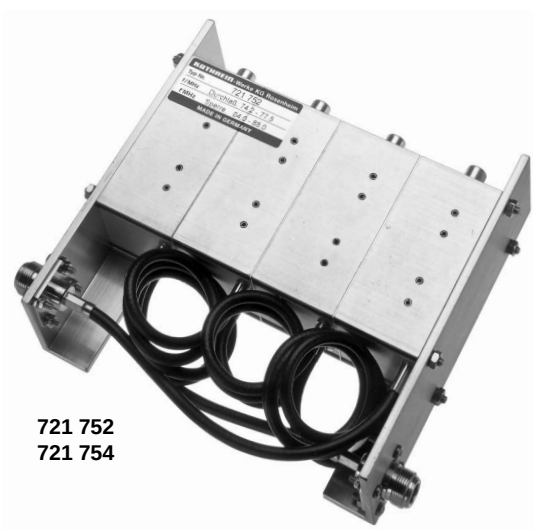
Design and construction:
The S-P filter consists of three or four S-P resonators, interconnected by cables of defined electrical length.

Filter characteristics:
721 751 / 721 752: Broad pass band with low insertion loss in the low band, high stop band attenuation at the stop band frequencies in the high band.
721 753 / 721 754: Broad pass band with low insertion loss in the high band, high stop band attenuation at the stop band frequencies in the low band.

Tuning:
The S-P filter can only be tuned at the factory because of its special design. Special requests such as: Special band spacing, switching band-widths or attenuation can be taken into account. When ordering please specify the desired high **and** low band frequencies.



721 751
721 753



721 752
721 754

Technical Data

Type No.	**721 751** (Pass band: Low band; Stop band: High band) **721 753** (Pass band: High band; Stop band: Low band)					**721 752** (Pass band: Low band; Stop band: High band) **721 754** (Pass band: High band; Stop band: Low band)				
Number of resonators	3					4				
Frequency range	68 … 87.5 MHz									
	Tuning examples									
Band spacing	**3 MHz**	**6 MHz**	**9.8 MHz**			**2 MHz**	**6 MHz**	**9.8 MHz**		
Switching bandwidth	**0.1 MHz**	**0.5 MHz**	**1.0 MHz**	**1.5 MHz**	**2.5 MHz**	**0.1 MHz**	**1.0 MHz**	**2.5 MHz**	**3.3 MHz**	**4.0 MHz**
Insertion loss	< 1.2 dB	< 0.6 dB	< 0.6 dB	< 0.6 dB	< 0.8 dB	< 1.5 dB	< 0.8 dB	< 0.8 dB	< 0.8 dB	< 1.2 dB
Stop band attenuation	> 60 dB	> 65 dB	> 70 dB	> 65 dB	> 60 dB	> 60 dB	> 70 dB	> 75 dB	> 65 dB	> 60 dB
VSWR	< 1.4 (at operating frequency)									
Impedance	50 Ω									
Input power	< 100 W (–30 … +55 °C) / < 50 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	1.0 kg					1.2 kg				
Packing size	235 mm x 61 mm x 165 mm									
Dimensions (w x h x d)	155 mm x 50 mm x 160 mm (with connectors)					195 mm x 50 mm x 160 mm (with connectors)				

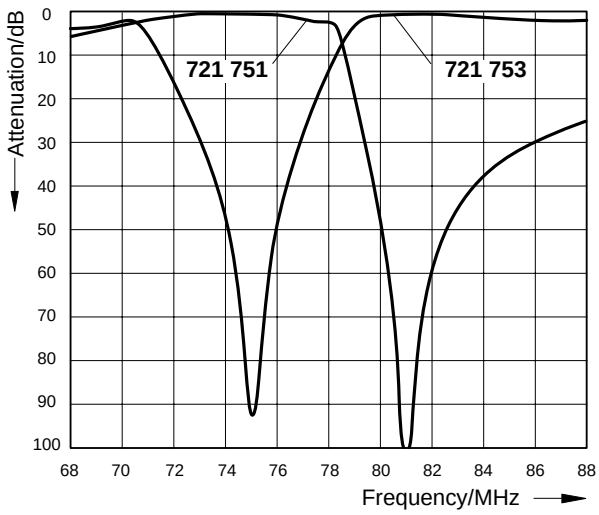
S-P Filter
68 … 87.5 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

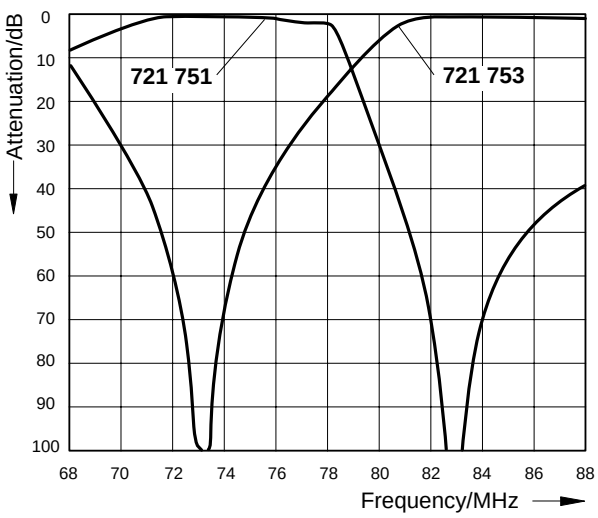
Tuning examples:

721 751 / 721 753

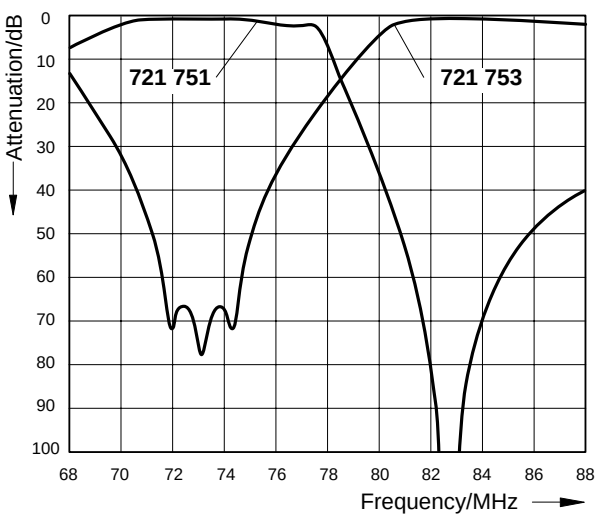
Band spacing: 6.0 MHz
Switching bandwidth: 0.5 MHz



Band spacing: 9.8 MHz
Switching bandwidth: 1.0 MHz

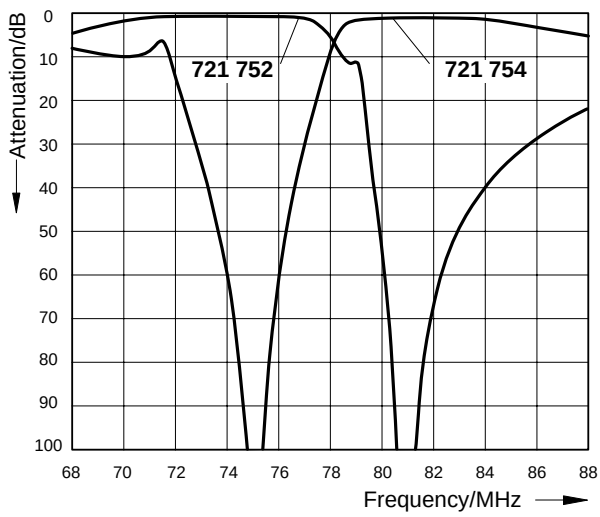


Band spacing: 9.8 MHz
Switching bandwidth: 2.5 MHz

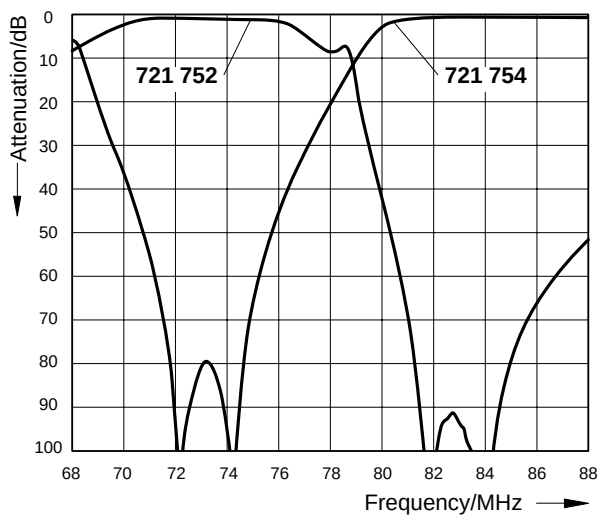


721 752 / 721 754

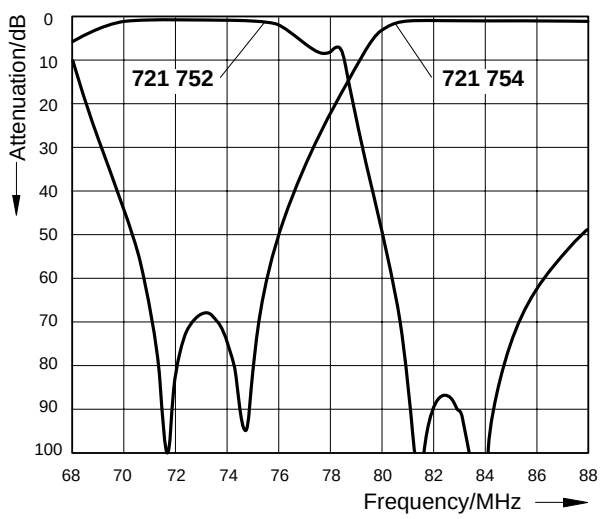
Band spacing: 6.0 MHz
Switching bandwidth: 1.0 MHz



Band spacing: 9.8 MHz
Switching bandwidth: 2.5 MHz



Band spacing: 9.8 MHz
Switching bandwidth: 4.0 MHz



S-P Filter
68 … 87.5 MHz

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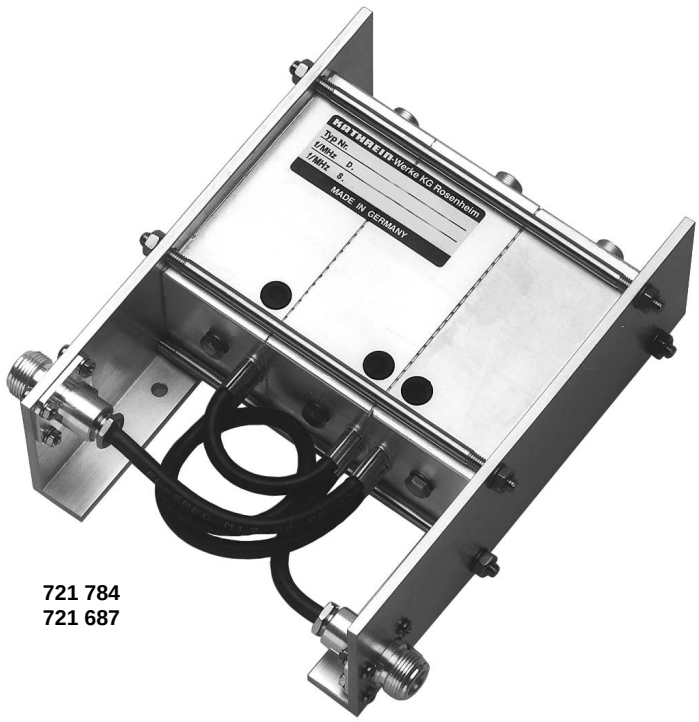
The S-P filter (Stop-Pass filter) is suitable for attenuating interfering frequencies, close to the operational frequency band. It is designed for operation with **one or several** transmitters respectively with **one or several** receivers.

It can be used:
– in the transmission path for suppressing side band noise and for attenuating intermodulation products at the receiving frequencies,
– in the receiving path for attenuating transmitting frequencies,
– as a duplexer component.

Design and construction:
The S-P filter consists of three or four S-P resonators, interconnected by cables of defined electrical length.

Filter characteristics:
721 784 / 724 579: Broad pass band with low insertion loss in the low band, high stop band attenuation at the stop band frequencies in the high band.
721 687 / 724 580: Broad pass band with low insertion loss in the high band, high stop band attenuation at the stop band frequencies in the low band.

Tuning:
The S-P filter can only be tuned at the factory because of its special design. Special requests such as: Special band spacing, switching band-widths or attenuation can be taken into account. When ordering please specify the desired high **and** low band frequencies.



721 784
721 687

Technical Data

Type No.	**721 784** (Pass band: Low band; Stop band: High band) **721 687** (Pass band: High band; Stop band: Low band)					**724 579** (Pass band: Low band; Stop band: High band) **724 580** (Pass band: High band; Stop band: Low band)				
Number of resonators	3					4				
Frequency range	68 … 87.5 MHz									
	Tuning examples									
Band spacing	**3 MHz**	**6 MHz**	**9.8 MHz**			**2 MHz**	**6 MHz**	**9.8 MHz**		
Switching bandwidth	**0.1 MHz**	**0.5 MHz**	**1.0 MHz**	**1.5 MHz**	**2.5 MHz**	**0.1 MHz**	**1.0 MHz**	**2.5 MHz**	**3.3 MHz**	**4.0 MHz**
Insertion loss	< 1.2 dB	< 0.6 dB	< 0.6 dB	< 0.6 dB	< 0.8 dB	< 1.5 dB	< 0.8 dB	< 0.8 dB	< 0.8 dB	< 1.2 dB
Stop band attenuation	> 60 dB	> 65 dB	> 70 dB	> 65 dB	> 60 dB	> 60 dB	> 70 dB	> 75 dB	> 65 dB	> 60 dB
VSWR	< 1.4 (at operating frequency)									
Impedance	50 Ω									
Input power	< 100 W (–30 … +55 °C) / < 50 W (+55 … +70 °C)									
Temperature range	–30 … +70 °C									
Connectors	N female, silver-plated									
Material	S-P resonators: Brass, silver-plated / copper, silver-plated; cable: RG 223/U									
Installation	With 4 screws (max. 4 mm diameter)									
Weight	1.5 kg					1.75 kg				
Packing size	245 mm x 71 mm x 210 mm									
Dimensions (w x h x d)	155 mm x 60 mm x 175 mm (with connectors)					195 mm x 60 mm x 175 mm (with connectors)				

S-P Filter
68 … 87.5 MHz
Typical attenuation curves

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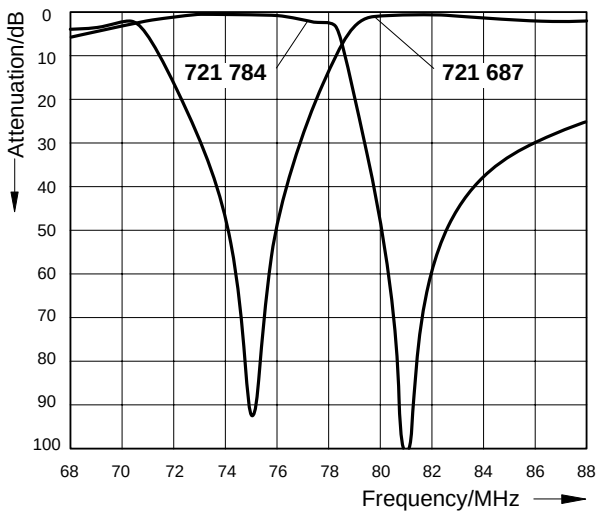
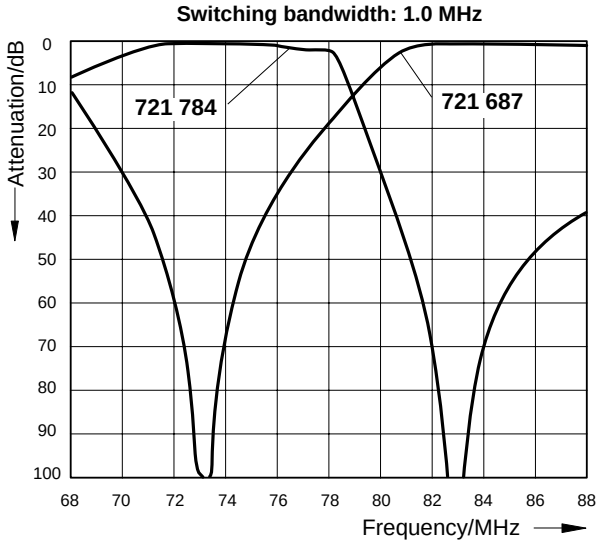
Tuning examples:

721 784 / 721 687

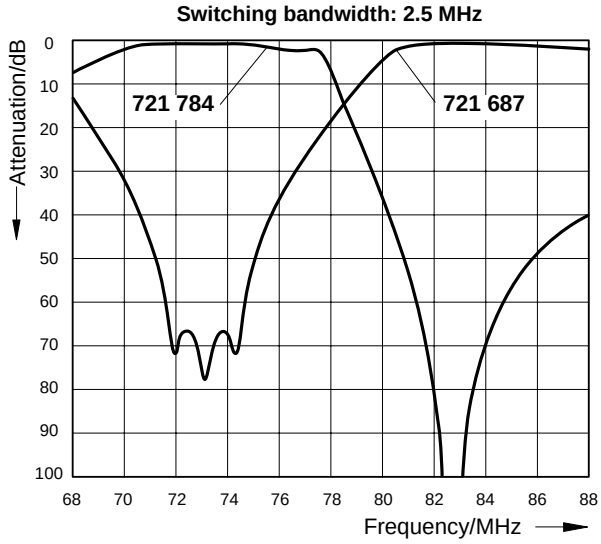
Band spacing: 6.0 MHz
Switching bandwidth: 0.5 MHz



Band spacing: 9.8 MHz
Switching bandwidth: 1.0 MHz

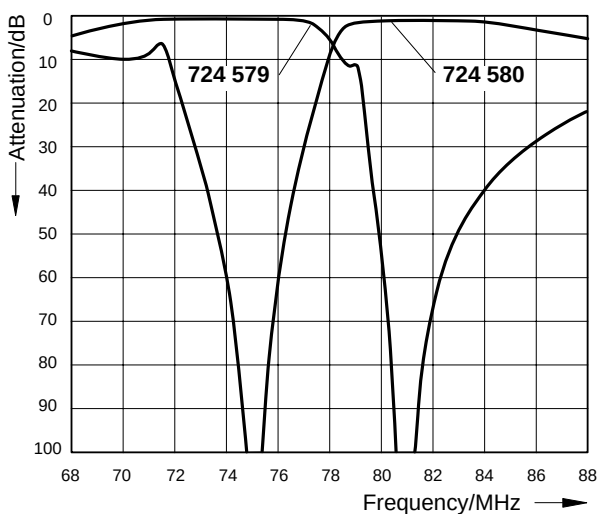


Band spacing: 9.8 MHz
Switching bandwidth: 2.5 MHz

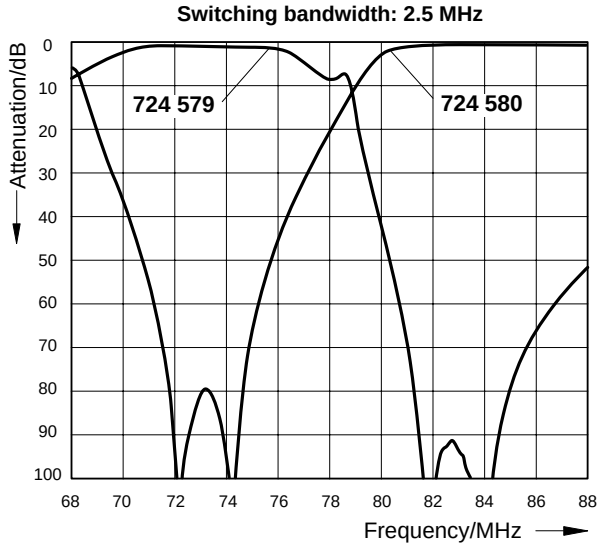


724 579 / 724 580

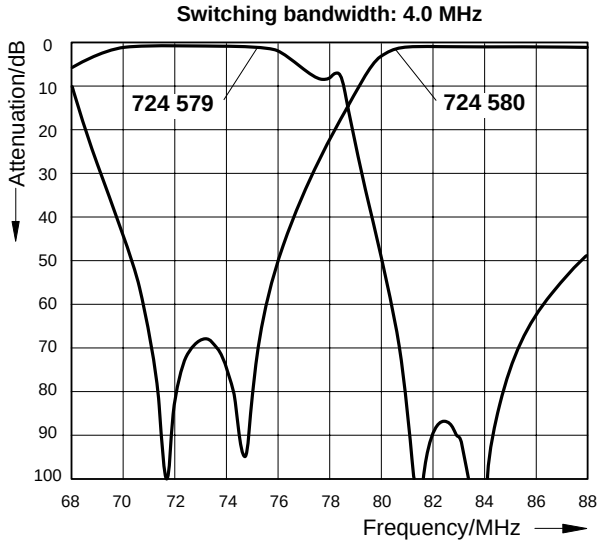
Band spacing: 6.0 MHz
Switching bandwidth: 1.0 MHz



Band spacing: 9.8 MHz
Switching bandwidth: 2.5 MHz



Band spacing: 9.8 MHz
Switching bandwidth: 4.0 MHz



Low-pass Filter
68 – 87.5 MHz

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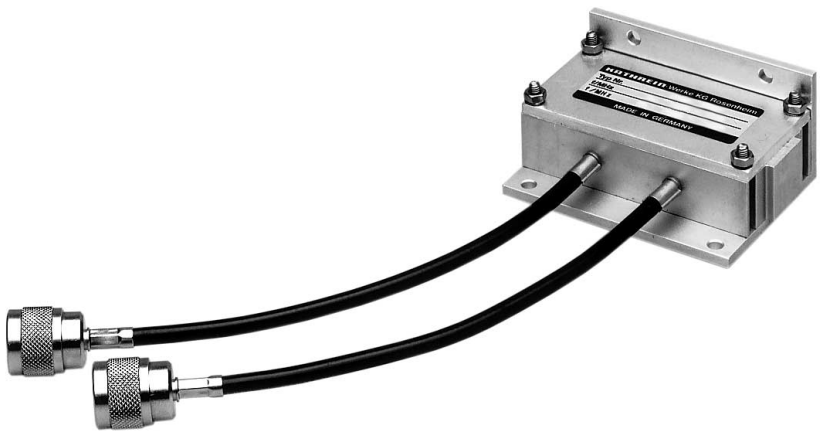
The low-pass filter is suitable for use as a receiving or transmitting filter.

It can be used:
– to suppress harmonics in the transmitting path,
– to suppress interfering signals in the receiving path.

Design and construction:
The low-pass filter consists of lumped L-C elements.

Filter characteristics:
Broad pass band with low insertion loss, high stop band attenuation in the stop band.

Installation:
The right angle mounting plate allows horizontal as well as vertical installation.



Technical Data

Type No.	726 941
Pass band	68 – 87.5 MHz
Insertion loss	< 0.5 dB (68 – 87.5 MHz)
Stop band attenuation	> 55 dB (136 – 154 MHz) > 65 dB (154 – 1110 MHz)
VSWR	< 1.4 (68 – 87.5 MHz)
Impedance	50 Ω
Input power	< 40 W
Temperature range	–30 … +60 °C
Connectors	N male at a 250 mm long cable
Material	Housing: Aluminium Cabel: RG 223/U
Installation	With 2 screws (max. 4 mm diameter)
Weight	0.3 kg
Packing size	190 mm x 65 mm x 110 mm
Dimensions (w x h x d)	88 mm x 40 mm x 64 mm (without connectors)

Low-pass Filter
68 – 87.5 MHz
Typical attenuation curves

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Diagram I:

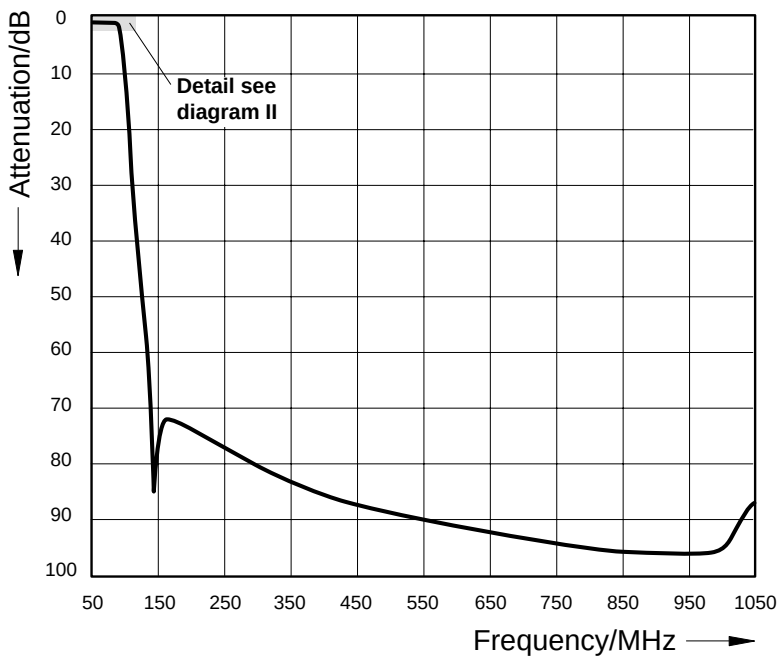
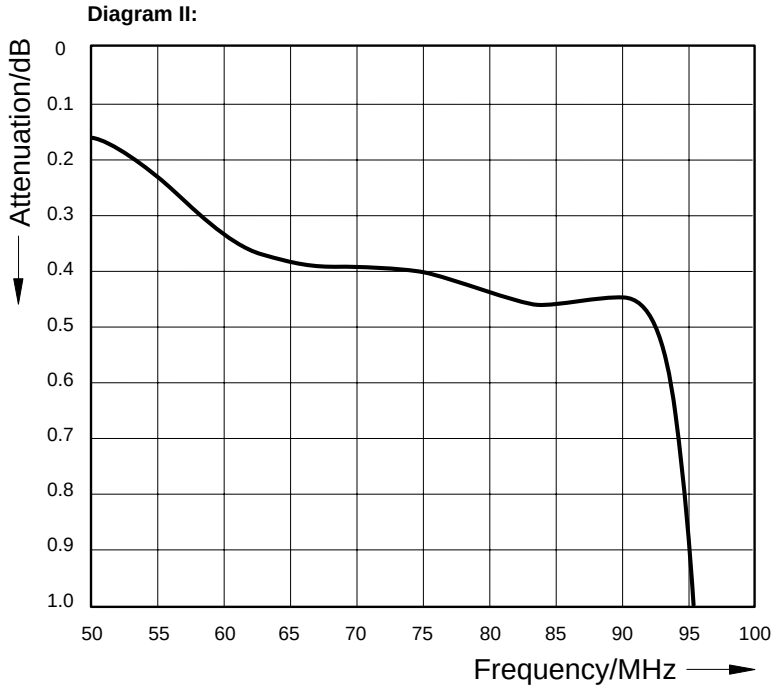


Diagram II:



Band-pass Filter
150 ... 169 MHz

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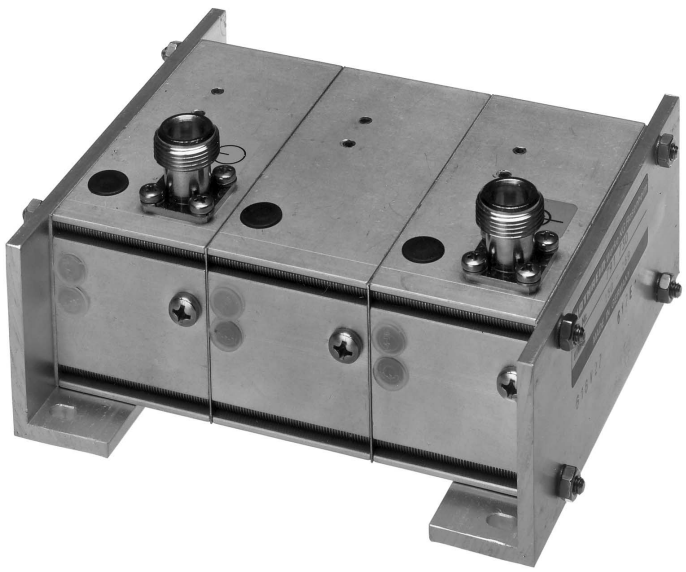
The band-pass filter is suitable for use as a receiving or transmitting filter for **one or several** receivers, or **one** transmitter.

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 three inductively coupled helix resonators.

Filter characteristics:
Broad pass band with low insertion loss and high stop band attenuation outside of the pass band.

Tuning:
The band-pass filter is factory-tuned to the desired pass-band center frequency f_o with a bandwidth of f_o ±2.0 MHz and an insertion loss of < 1.0 dB.
When ordering please specify the desired center frequency f_o.



Technical Data

Type No.	791 730
Number of resonators	3
Frequency range	150 ... 169 MHz
Insertion loss at f_o ±2 MHz	< 1.0 dB
VSWR at f_o ±2 MHz	< 1.3 dB
Impedance	50 Ω
Input power	< 50 W
Temperature range	–20 … +50 °C
Connectors	N female
Material	Aluminium / copper, silver-plated
Installation	With 4 screws (max. 4 mm diameter)
Weight	0.85 kg
Packing size	188 mm x 80 mm x 153 mm
Dimensions (w x h x d)	115 mm x 69 mm x 140 mm (with connectors)

Band-pass Filter
150 ... 169 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

Tuning example:

Diagram I:

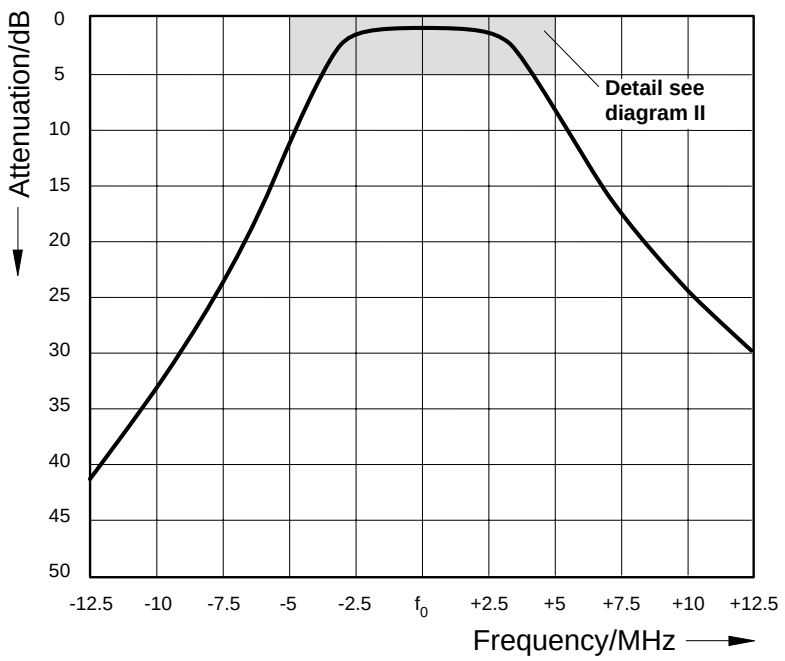
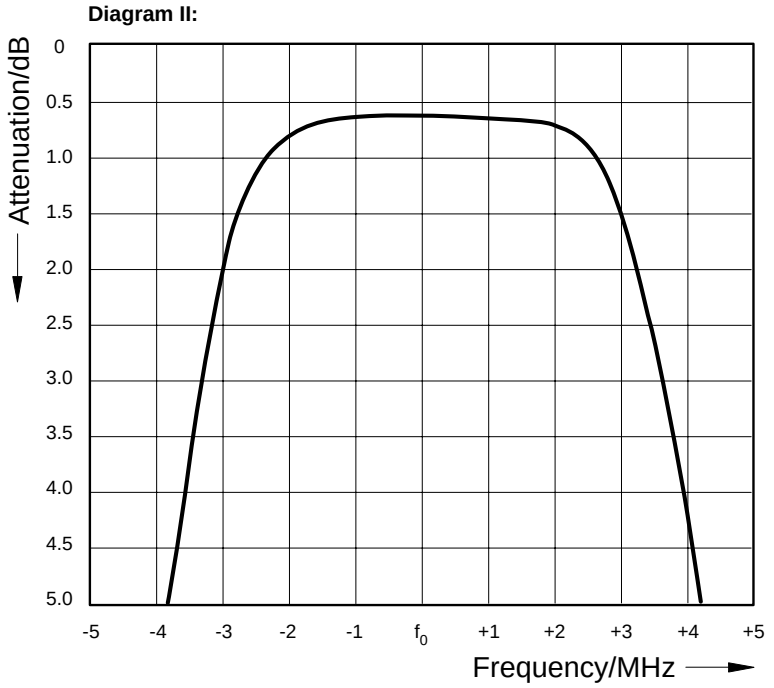


Diagram II:



Band-pass Filter
146 … 174 MHz

KATHREIN
Antennen · Electronic

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 inter-modulation products,
– as a combiner component.

Design and construction:
The band-pass filter consists of two capacitively coupled resonators.

Filter characteristics:
Narrow pass band with low insertion loss and high stop band attenuation.

Tuning:
The band-pass filter is tuned to the desired pass band frequency f_0 at the factory.
Please specify desired pass band frequency when ordering.
The band-pass filter can also be tuned on site using the supplied instructions.

Technical Data

Type No.	K 64 00 21
Frequency range	146 … 174 MHz
Insertion loss at f_0	< 1 dB
VSWR	< 1.2 (at operating frequency)
Impedance	50 Ω
Input power	< 50 W
Temperature range	–30 … +60 °C
Connectors	N female
Material	Brass, silver-plated
Colour	Grey (RAL 7032)
Installation	With 4 screws (max. 5 mm diameter)
Weight	1 kg
Packing size	315 mm x 90 mm x 95 mm
Dimensions (w x h x d)	276 mm x 67 mm x 83 mm (with connectors)

Band-pass Filter
146 … 174 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

Tuning example:

Diagram I:

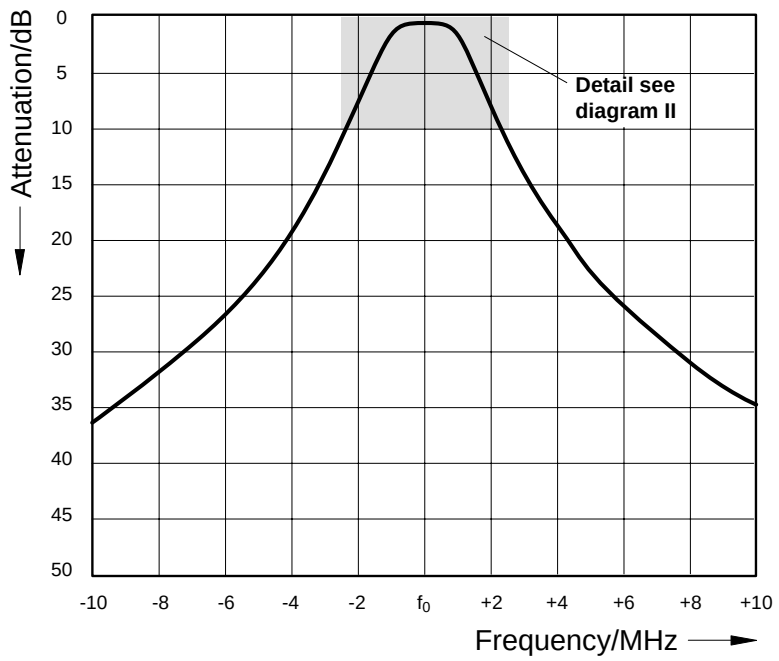
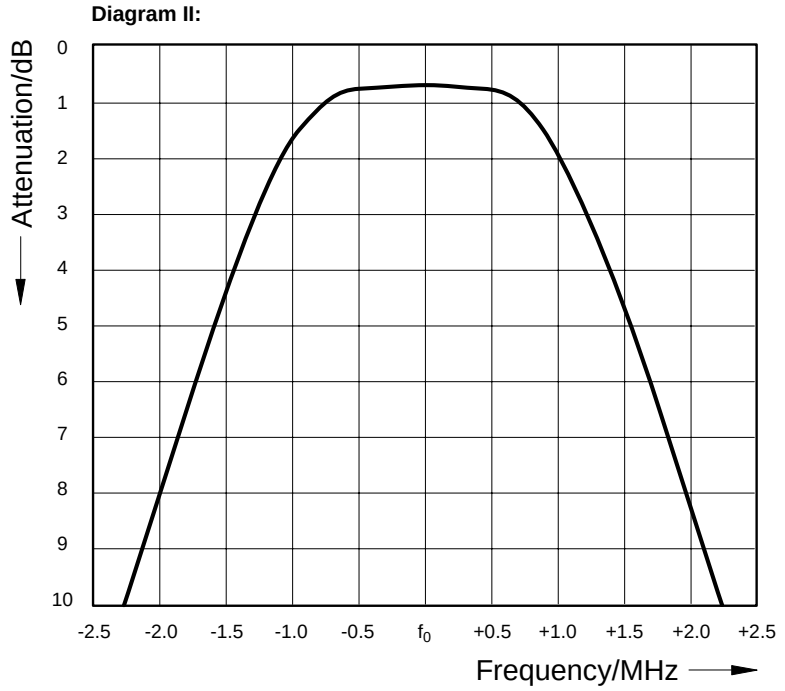


Diagram II:



Band-pass Filter
146 … 174 MHz

KATHREIN
Antennen · Electronic

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

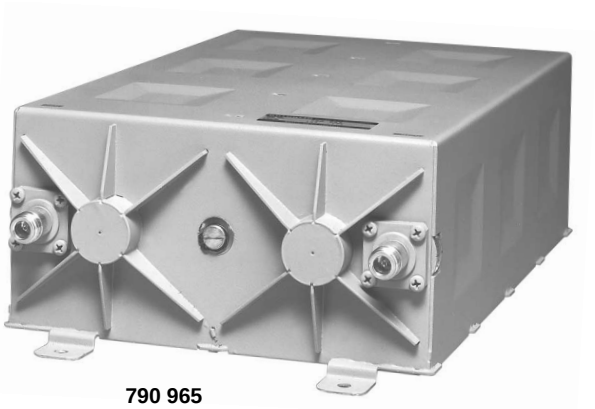
It can be used:
- to improve the input selectivity of receivers and amplifiers,
- to increase the isolation of transmitters, whose respective antennas are mounted close together,
- to suppress noise side bands and inter-modulation products,
- as a combiner component.

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.

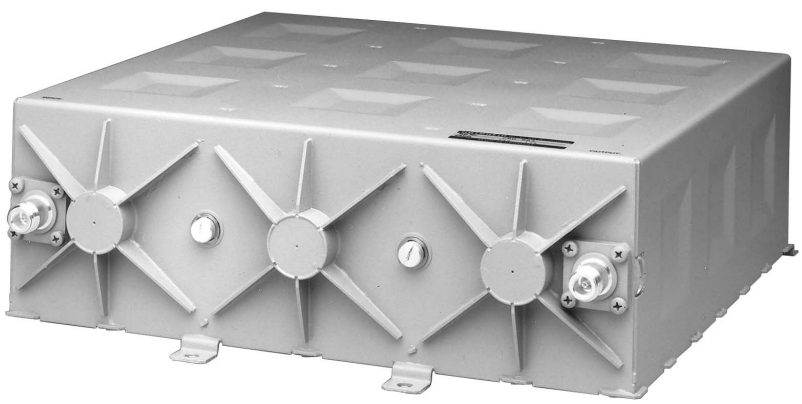
Filter characteristics:
Narrow pass band with low insertion loss, high stop band attenuation, variable filter response corresponding to the desired stop band attenuation.

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.



790 965



790 964

Technical Data

Type No.	**790 965** **2-cavity band-pass filter**			**790 964** **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
Antennen · Electronic

Tuning examples:

2-cavity band-pass filter 790 965

Diagram I:

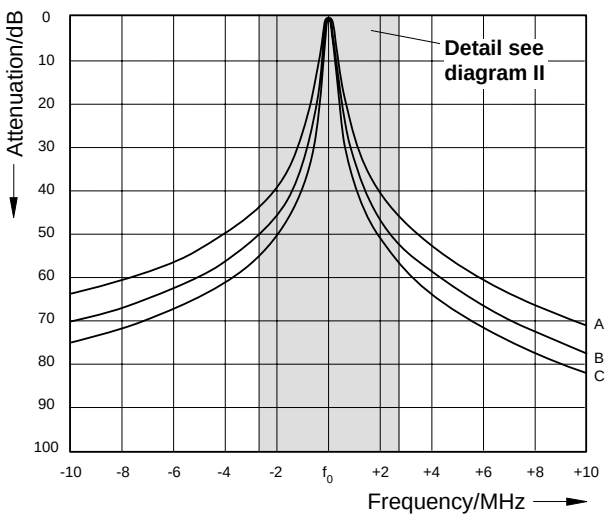


Diagram II:

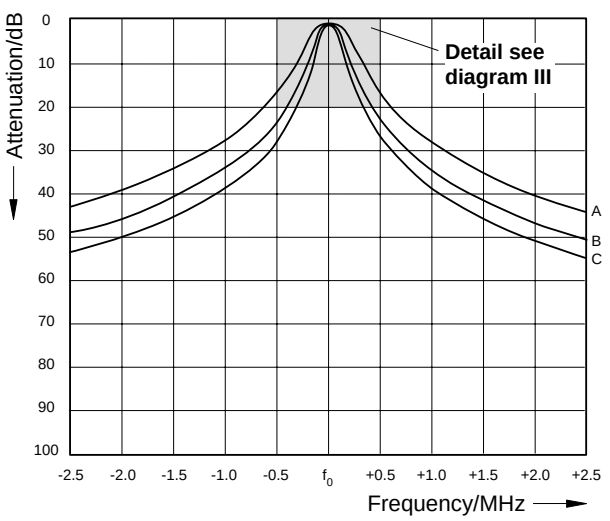
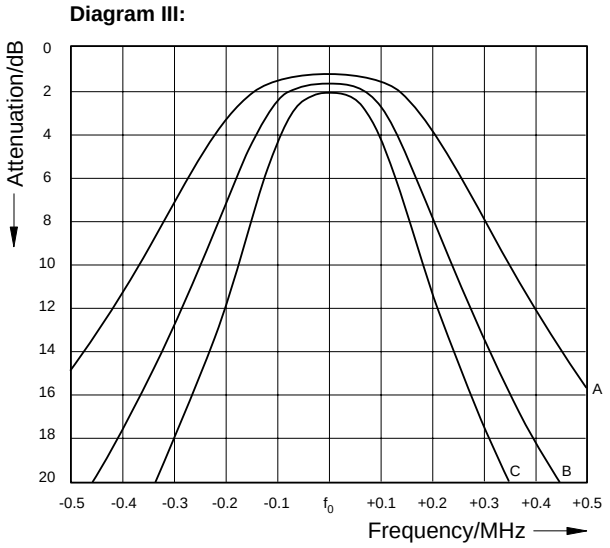


Diagram III:



3-cavity band-pass filter 790 964

Diagram I:

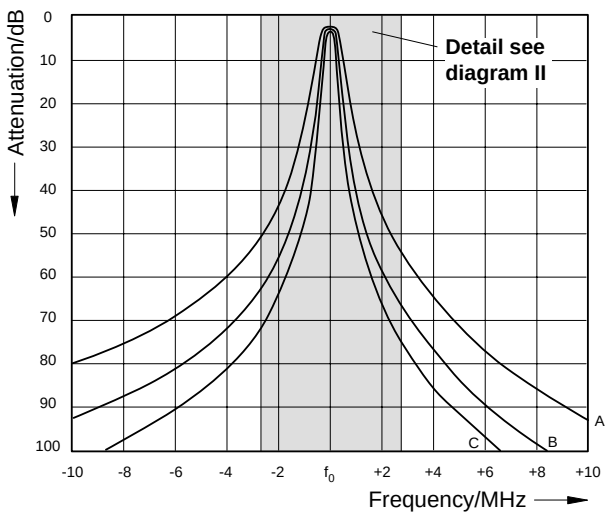


Diagram II:

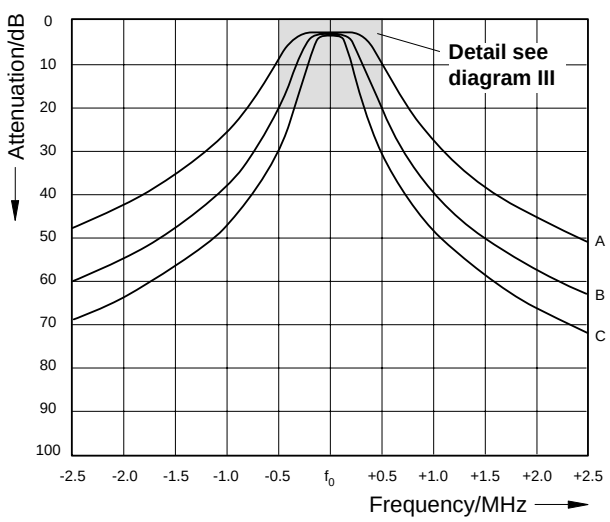
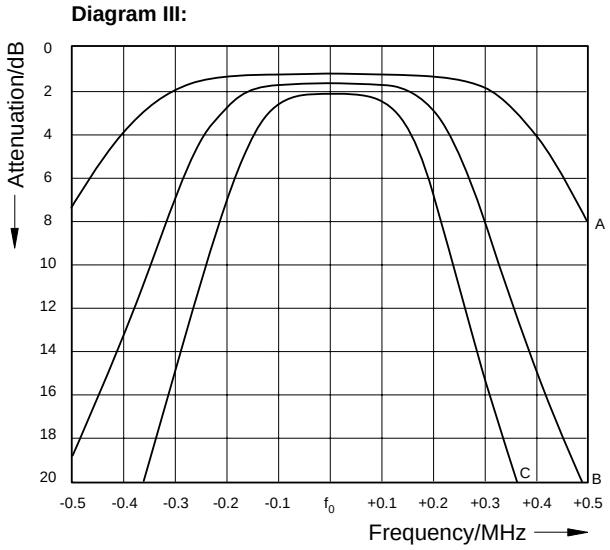


Diagram III:



Band-pass Filter
146 … 174 MHz

KATHREIN
Antennen · Electronic

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 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.

Technical Data

Type No.	**K 64 21 25 1**			
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
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Tuning examples:

Diagram I:

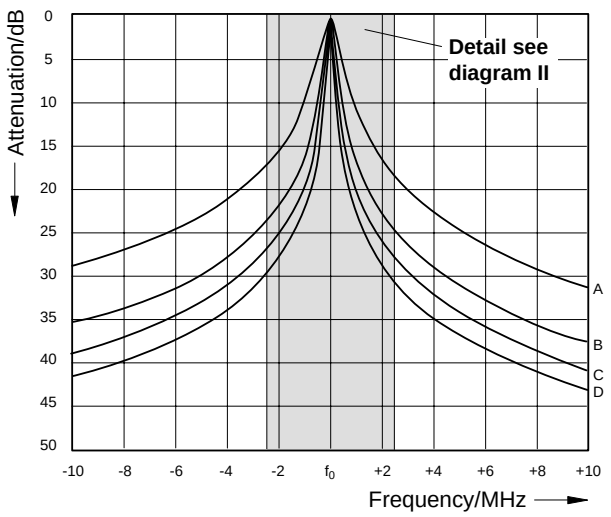


Diagram II:

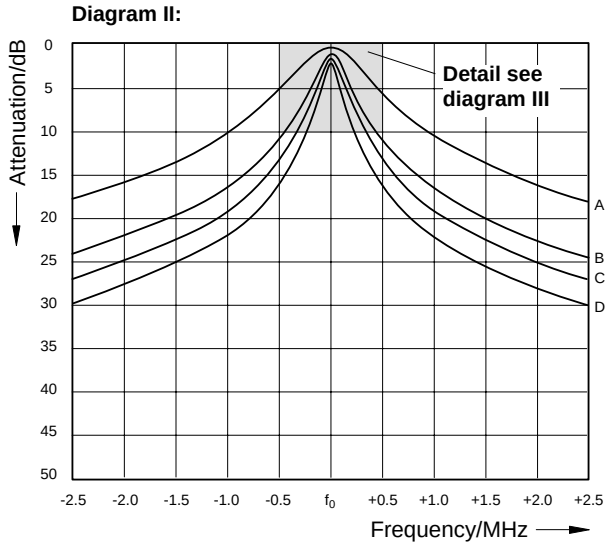
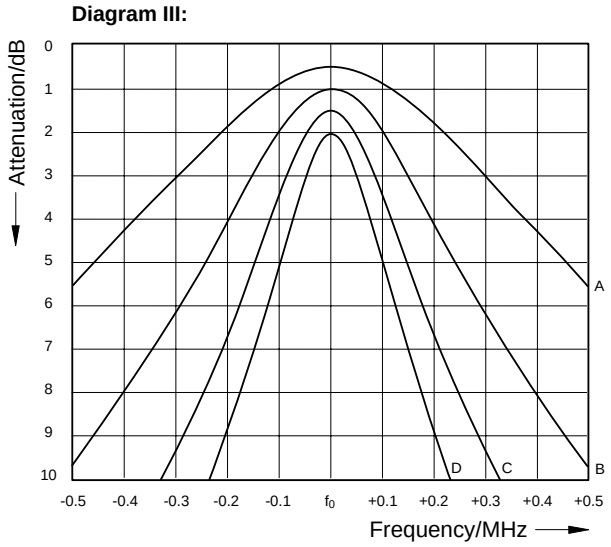


Diagram III:



Band-stop Filter
146 … 174 MHz

KATHREIN
Antennen · Electronic

The band-stop filter is used:
– to attenuate interfering signals,
– to increase the coupling isolation between transmitter and receiver.

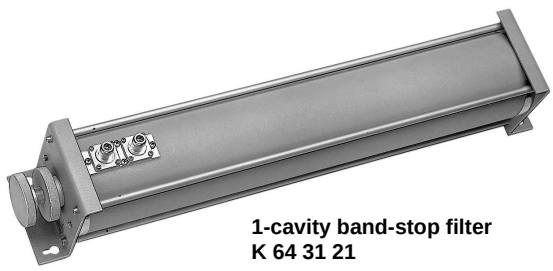
Design and construction:
The band-stop filter consists of capacitively shortened λ/4 coaxial resonators.
The resonators of the multi cavity band-stop filters are interconnected by cables of λ/4 length. The stop band frequency and the stop band attenuation are tunable.

Filter characteristics:
Narrow stop band with high stop band attenuation, low insertion loss outside the stop band.

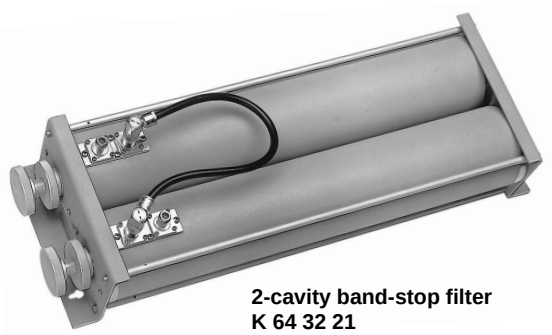
Tuning:
The band-stop filter is tuned to the desired stop band frequency at the factory.
When ordering please specify stop band frequency.

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

The resonators of the 2-cavity or 3-cavity band-stop filters can be tuned independently. In this way, 2 or 3 different interfering signals can be suppressed or one single interfering signal can be especially attenuated.



1-cavity band-stop filter
K 64 31 21



2-cavity band-stop filter
K 64 32 21

3-cavity band-stop filter
K 64 33 27

Technical Data

Type No. N female / 7-16 female	K 64 31 21 / K 64 31 27	K 64 32 21 / K 64 32 27	K 64 33 21 / K 64 33 27
Version	1-cavity band-stop filter	2-cavity band-stop filter	3-cavity band-stop filter
Frequency range	146 … 174 MHz		
Impedance	50 Ω		
Input power	< 300 W (at insertion loss < 1 dB)		
Temperature range	–30 … +60 °C		
Temperature coefficient	< 18 x 10^{-6} / °C		
Material	Brass, silver-plated		
Colour	Grey (RAL 7032)		
Montage	With 4 screws (max. 6 mm diameter)		
Weight	5.2 kg	10.4 kg	15.5 kg
Packing size	207 mm x 207 mm x 575 mm	330 mm x 205 mm x 550 mm	435 mm x 205 mm x 505 mm
Dimensions (w x h x d)	120 mm x 148 mm x 420 mm	240 mm x 148 mm x 420 mm	360 mm x 148 mm x 420 mm

Band-stop Filter
146 … 174 MHz
Typical attenuation curves

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Tuning examples:

1-cavity band-stop filter

Diagram I:

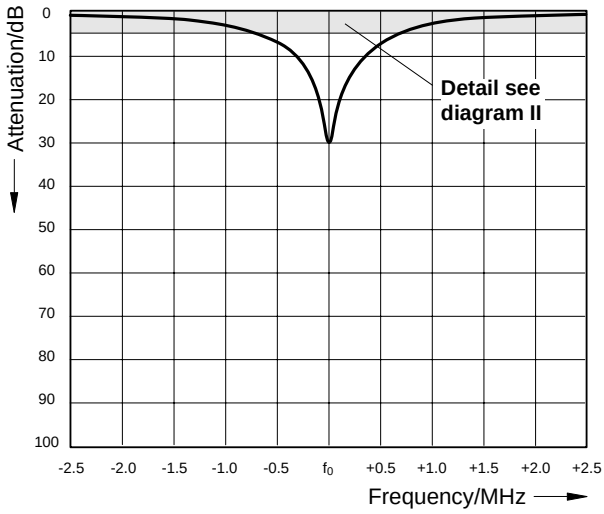
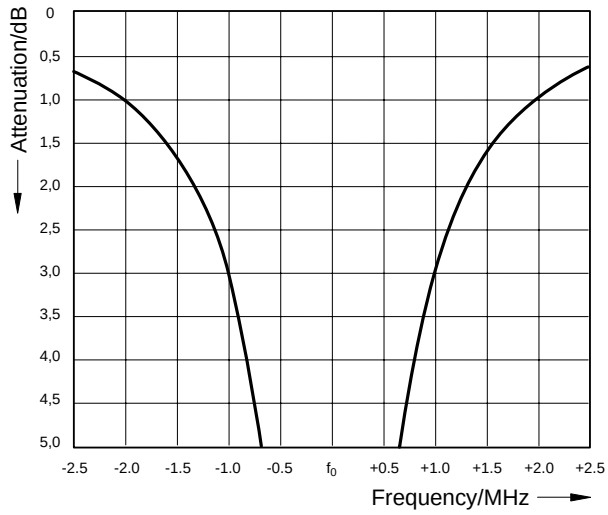


Diagram II:



2-cavity band-stop filter

Diagram I:

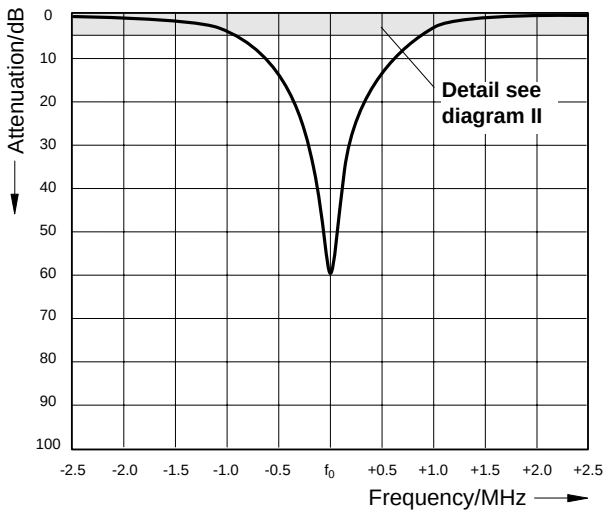
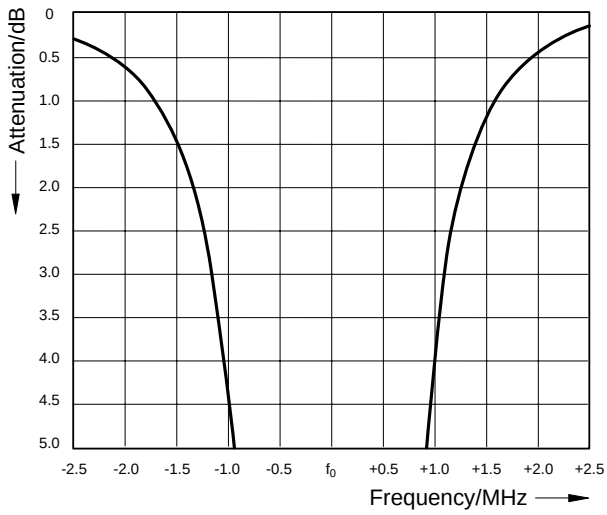


Diagram II:



3-cavity band-stop filter

Diagram I:

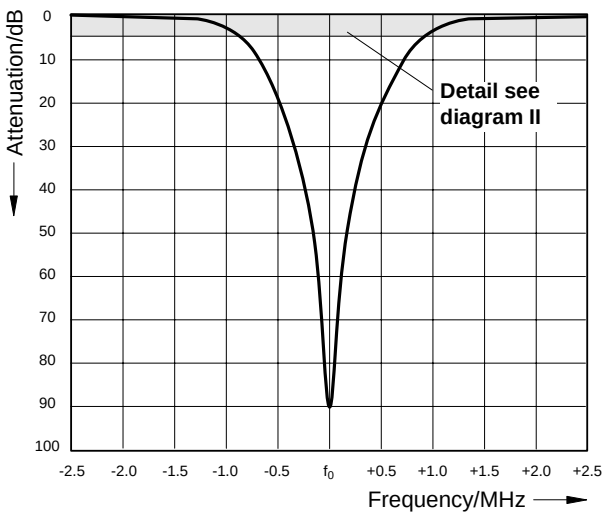
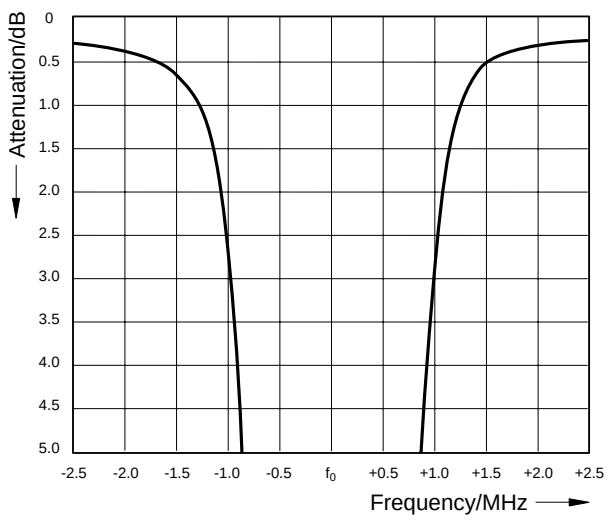


Diagram II:



S-P Filter
146 … 174 MHz

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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.

K 64 21 26 1
728 024
792 119

Technical Data

Type No.	792 119	728 024	K 64 21 26 1
Frequency range	146 … 174 MHz		
Frequency spacing			
Pass band / stop band frequency	60 – 100 kHz	80 – 150 kHz [1] 150 – 300 kHz [2] > 300 kHz [3]	> 300 kHz
Insertion loss	< 1.0 dB	< 0.7 dB	0.5 ±0.15 dB
VSWR	< 1.5 (at operating frequency)		
Impedance	50 Ω		
Input power	< 15 W	< 15 W [1] < 100 W [2] < 200 W [3]	< 200 W
Temperature range	0 … +35 °C	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

KATHREIN
Antennen · Electronic

Tuning examples:

792 119

Diagram I:

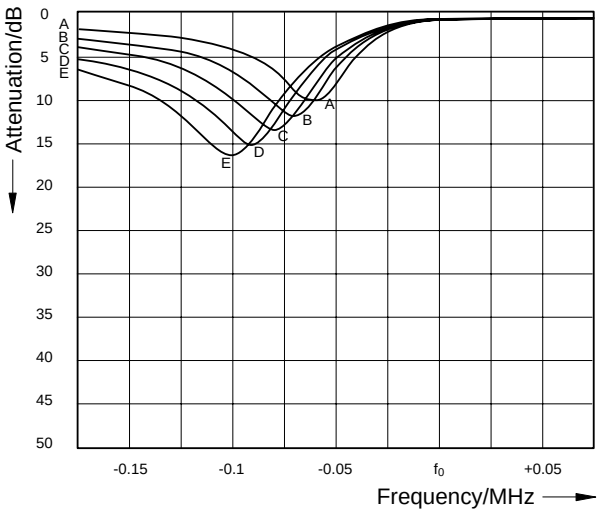
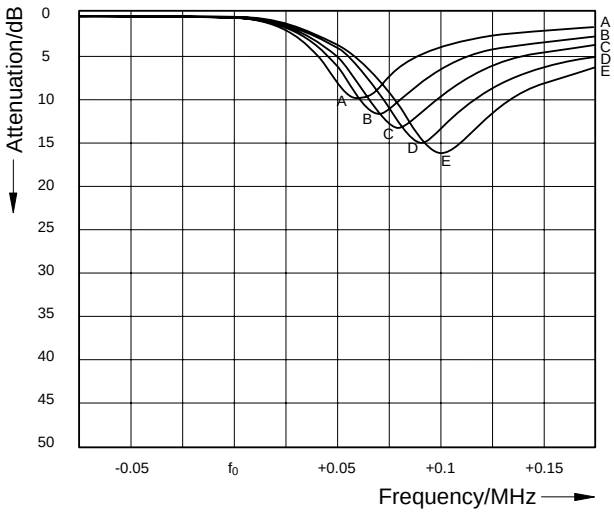


Diagram II:



728 024

Diagram I:

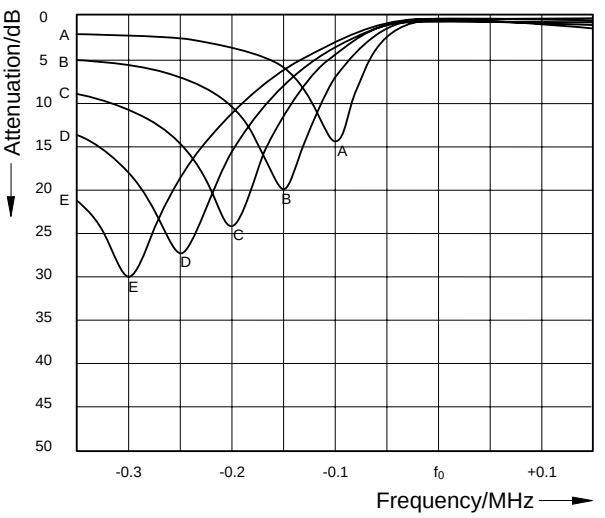
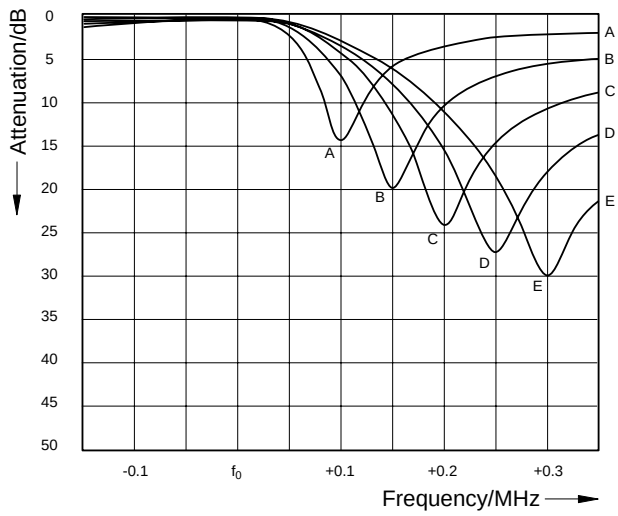


Diagram II:



K 64 21 26 1

Diagram I:

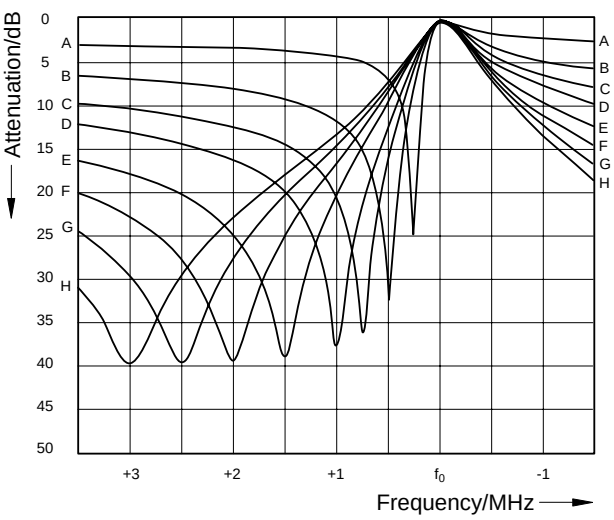
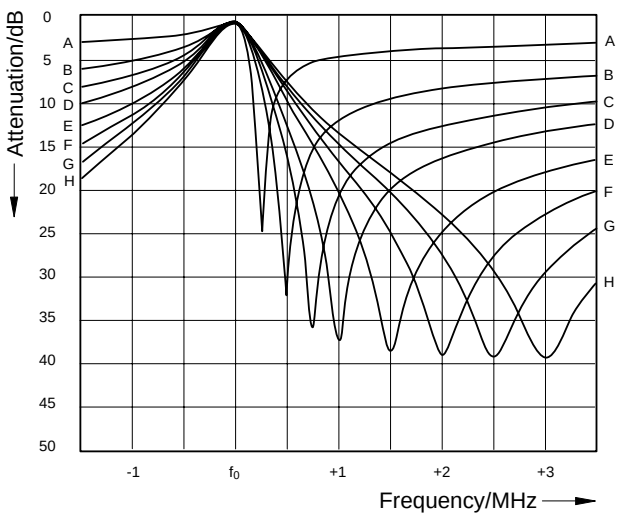


Diagram II:



S-P Filter
146 … 174 MHz

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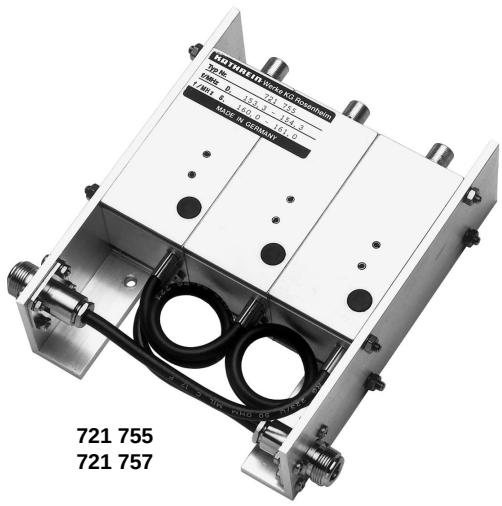
The S-P filter (Stop-Pass filter) is suitable for attenuating interfering frequencies, close to the operational frequency band. It is designed for operation with **one** transmitter respectively with **one or several** receivers.

It can be used:
– in the transmission path for suppressing side band noise and for attenuating intermodulation products at the receiving frequencies,
– in the receiving path for attenuating transmitting frequencies,
– as a duplexer component.

Design and construction:
The S-P filter consists of three or four S-P resonators, interconnected by cables of defined electrical length.

Filter characteristics:
721 755 / 721 756: Broad pass band with low insertion loss in the low band, high stop band attenuation at the stop band frequencies in the high band.
721 757 / 721 758: Broad pass band with low insertion loss in the high band, high stop band attenuation at the stop band frequencies in the low band.

Tuning:
The S-P filter can only be tuned at the factory because of its special design. Special requests such as: Special band spacing, switching band-widths or attenuation can be taken into account. When ordering please specify the desired high **and** low band frequencies.



721 755
721 757

Technical Data

Type No.	**721 755** (Pass band: Low band/Stop band: High band) **721 757** (Pass band: High band/Stop band: Low band)					**721 756** (Pass-band: Low band/Stop band: High band) **721 758** (Pass-band: High band/Stop band: Low band)				
Number of resonators	3					4				
Frequency range	146 … 174 MHz									
	Tuning examples									
Band 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	< 1.2 dB	< 1.0 dB	< 1.0 dB	< 1.2 dB	< 1.0 dB	< 1.2 dB	< 1.2 dB	< 1.3 dB	< 2.0 dB	< 1.3 dB
Stop band attenuation	> 60 dB	> 70 dB	> 60 dB	> 55 dB	> 60 dB	> 65 dB	> 70 dB	> 60 dB	> 55 dB	> 60 dB
VSWR	< 1.4 (at operating frequency)									
Impedance	50 Ω									
Input power	< 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	1.0 kg					1.2 kg				
Packing size	235 mm x 61 mm x 165 mm									
Dimensions (w x h x d)	155 mm x 50 mm x 160 mm (with connectors)					195 mm x 50 mm x 160 mm (with connectors)				

S-P Filter
146 … 174 MHz
Typical attenuation curves

KATHREIN
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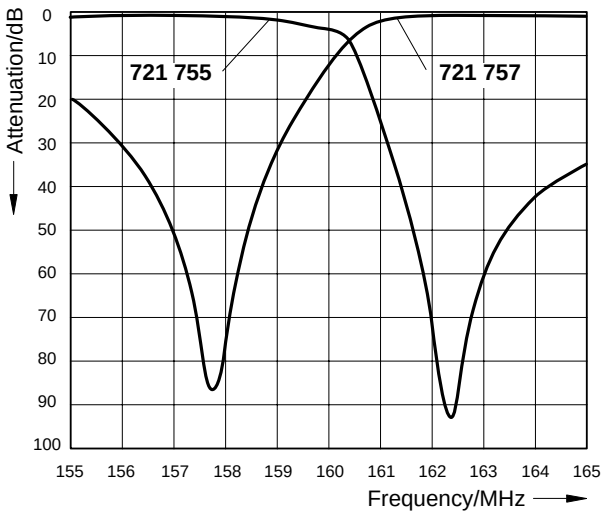
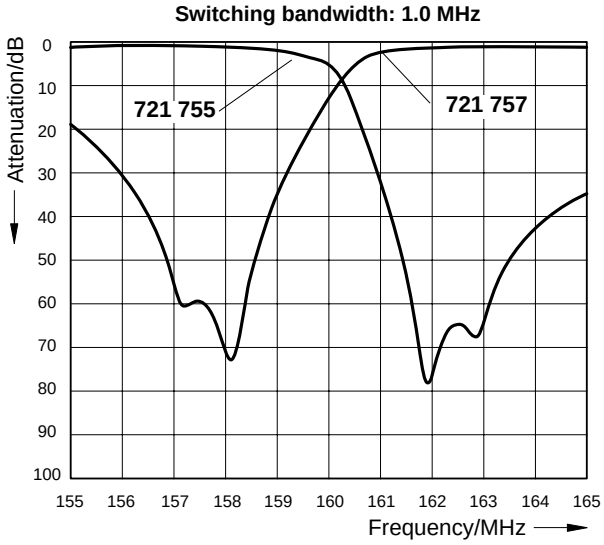
Tuning examples:

721 755 / 721 757

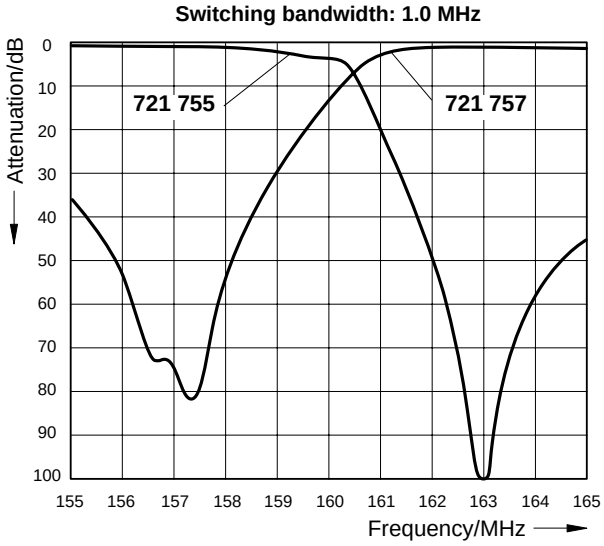
Band spacing: 4.6 MHz
Switching bandwidth: 0.1 MHz



Band spacing: 4.6 MHz
Switching bandwidth: 1.0 MHz

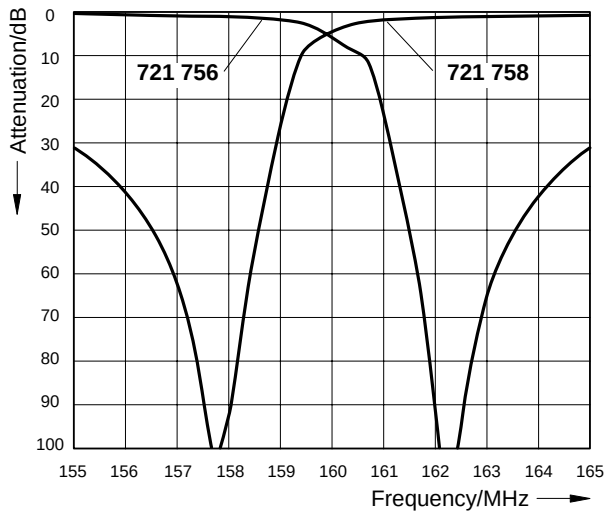


Band spacing: 6.0 MHz
Switching bandwidth: 1.0 MHz

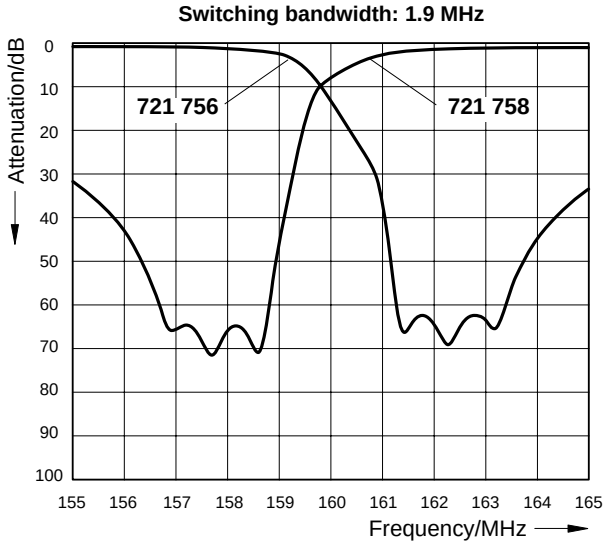


721 756 / 721 758

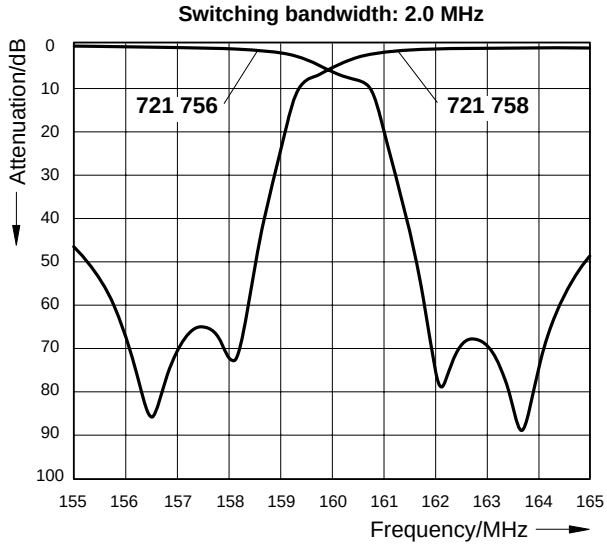
Band spacing: 4.6 MHz
Switching bandwidth: 0.5 MHz



Band spacing: 4.6 MHz
Switching bandwidth: 1.9 MHz



Band spacing: 6.0 MHz
Switching bandwidth: 2.0 MHz



S-P Filter
146 … 174 MHz

KATHREIN
Antennen · Electronic

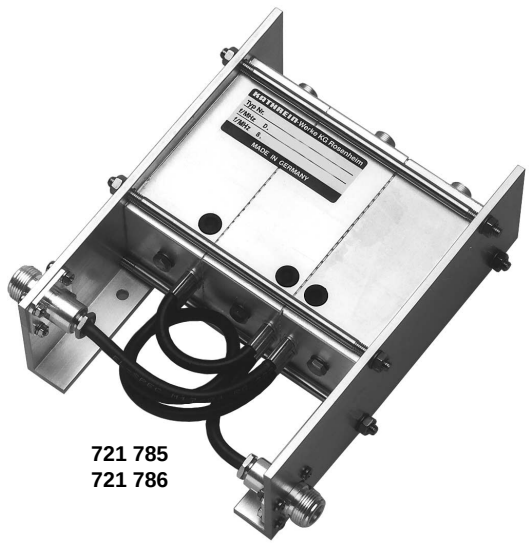
The S-P filter (Stop-Pass filter) is suitable for attenuating interfering frequencies, close to the operational frequency band. It is designed for operation with **one or several** transmitters respectively with **one or several** receivers.

It can be used:
– in the transmission path for suppressing side band noise and for attenuating intermodulation products at the receiving frequencies,
– in the receiving path for attenuating transmitting frequencies,
– as a duplexer component.

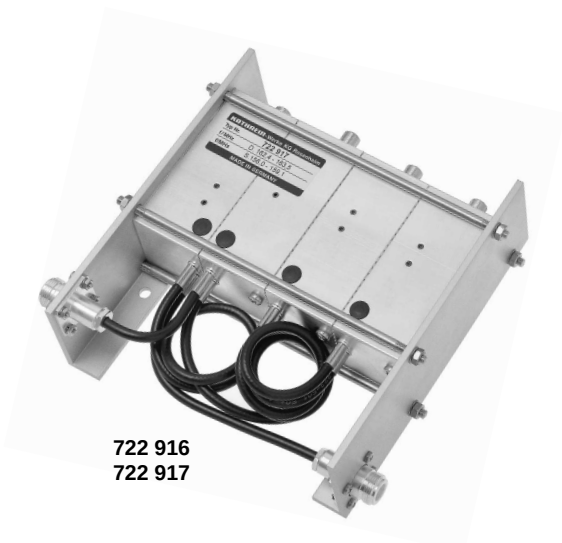
Design and construction:
The S-P filter consists of three or four S-P resonators, interconnected by cables of defined electrical length.

Filter characteristics:
721 785 / 722 916: Broad pass band with low insertion loss in the low band, high stop band attenuation at the stop band frequencies in the high band.
721 786 / 722 917: Broad pass band with low insertion loss in the high band, high stop band attenuation at the stop band frequencies in the low band.

Tuning:
The S-P filter can only be tuned at the factory because of its special design. Special requests such as: Special band spacing, switching bandwidths or attenuation can be taken into account. When ordering please specify the desired high **and** low band frequencies.



721 785
721 786



722 916
722 917

Technical Data

Type No.	**721 785** (Pass band: Low band/Stop band: High band) **721 786** (Pass band: High band/Stop band: Low band)					**722 916** (Pass band: Low band/Stop band: High band) **722 917** (Pass band: High band/Stop band: Low band)				
Number of resonators	3					4				
Frequency range	146 … 174 MHz									
	Tuning examples									
Band 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	< 1.2 dB	< 1.0 dB	< 1.0 dB	< 1.2 dB	< 1.0 dB	< 1.2 dB	< 1.2 dB	< 1.3 dB	< 2.0 dB	< 1.3 dB
Stop band attenuation	> 60 dB	> 70 dB	> 60 dB	> 55 dB	> 60 dB	> 65 dB	> 70 dB	> 60 dB	> 55 dB	> 60 dB
VSWR	< 1.4 (at operating frequency)									
Impedance	50 Ω									
Input power	< 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 / copper silver-plated; cable: RG 223/U									
Installation	With 4 screws (max. 5 mm diameter)									
Weight	1.5 kg					1.75 kg				
Packing size	245 mm x 71 mm x 210 mm									
Dimensions (w x h x d)	155 mm x 60 mm x 175 mm (with connectors)					195 mm x 60 mm x 175 mm (with connectors)				

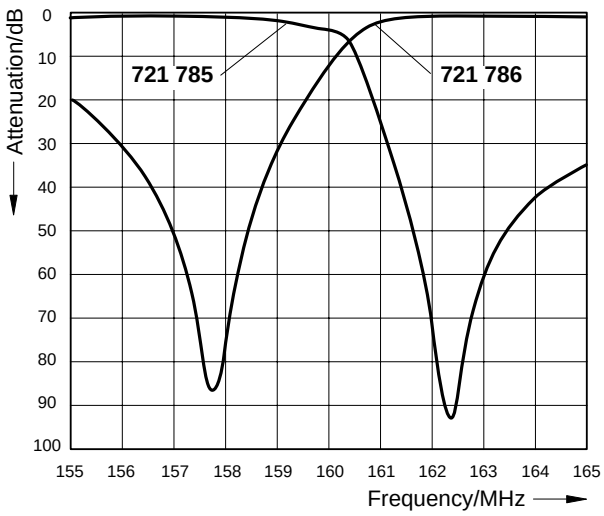
S-P Filter
146 … 174 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

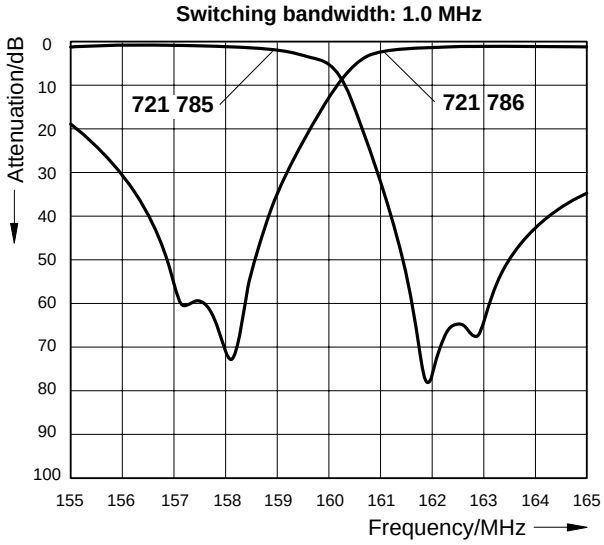
Tuning examples:

721 785 / 721 786

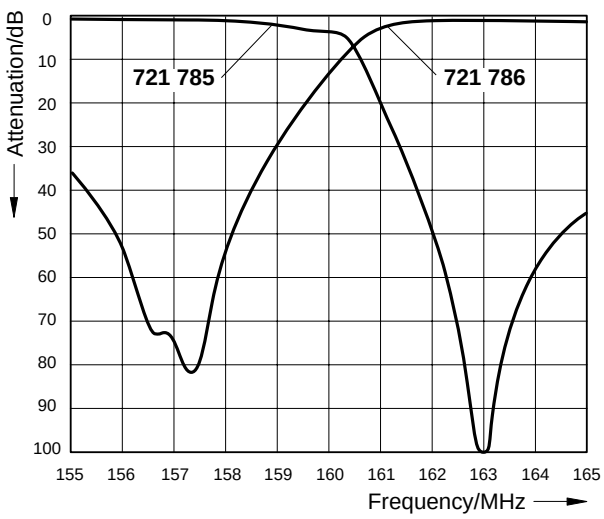
Band spacing: 4.6 MHz
Switching bandwidth: 0.1 MHz



Band spacing: 4.6 MHz
Switching bandwidth: 1.0 MHz

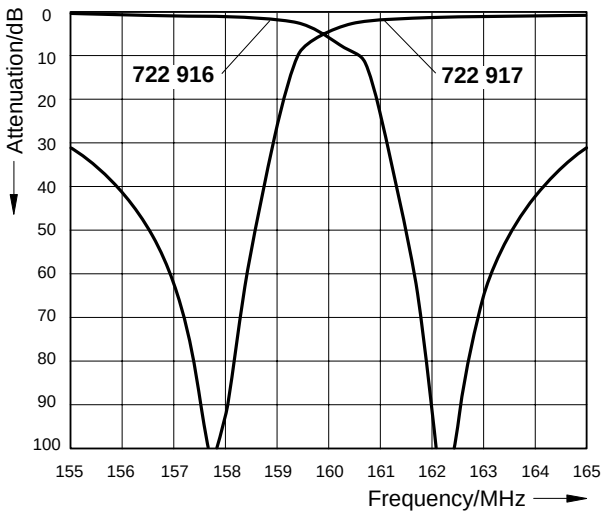


Band spacing: 6.0 MHz
Switching bandwidth: 1.0 MHz

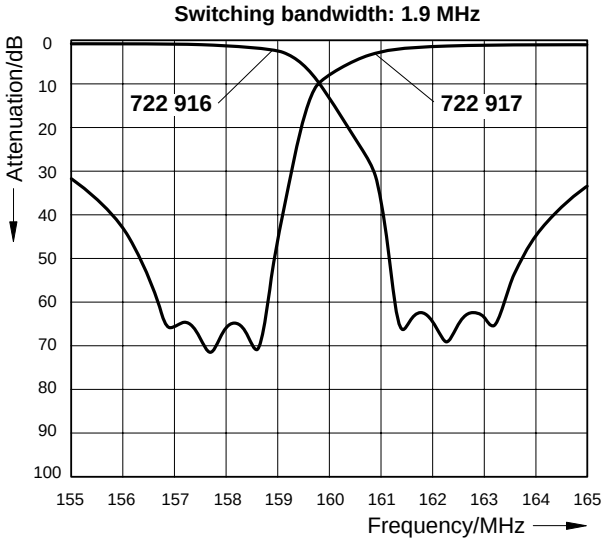


722 916 / 722 917

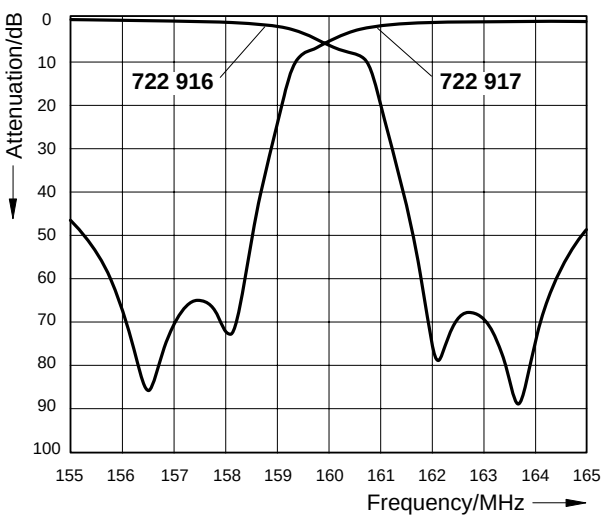
Band spacing: 4.6 MHz
Switching bandwidth: 0.5 MHz



Band spacing: 4.6 MHz
Switching bandwidth: 1.9 MHz



Band spacing: 6.0 MHz
Switching bandwidth: 2.0 MHz



Low-pass Filter
146 – 174 MHz

KATHREIN
Antennen · Electronic

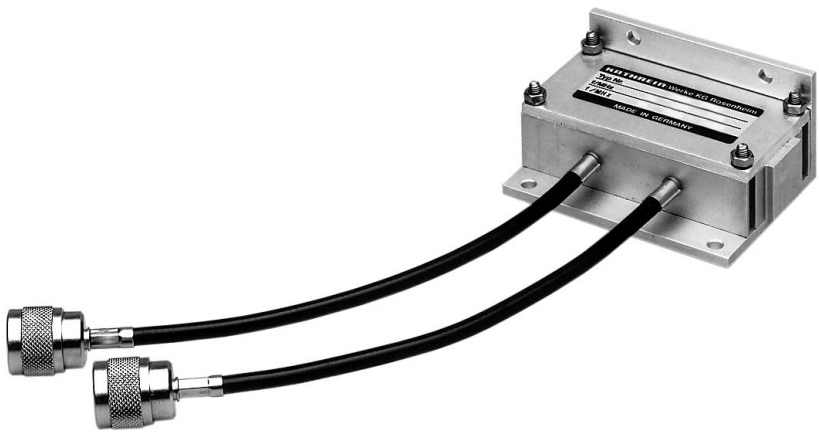
The low-pass filter is suitable for use as a receiving or transmitting filter.

It can be used:
– to suppress harmonics in the transmitting path,
– to suppress interfering signals in the receiving path.

Design and construction:
The low pass filter consists of lumped L-C elements.

Filter characteristics:
Broad pass band with low insertion loss, high stop band attenuation in the stop band.

Installation:
The right angle mounting plate allows horizontal as well as vertical installation.



Technical Data

Type No.	729 870
Pass band	146 – 174 MHz
Insertion loss	< 0.5 dB (146 – 174 MHz)
Stop band	292 – 1050 MHz
Stop band attenuation	> 60 dB (292 – 1050 MHz)
VSWR	< 1.4 (146 – 174 MHz)
Impedance	50 Ω
Input power	< 40 W
Temperature range	–30 … +60 °C
Connectors	N male at a 250 mm long cable
Material	Housing: Aluminium Cabel: RG 223/U
Installation	With 2 screws (max. 4 mm diameter)
Weight	0.3 kg
Packing size	190 mm x 65 mm x 110 mm
Dimensions (w x h x d)	88 mm x 40 mm x 64 mm (without connectors)

Low-pass Filter
146 – 174 MHz
Typical attenuation curves

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Diagram I:

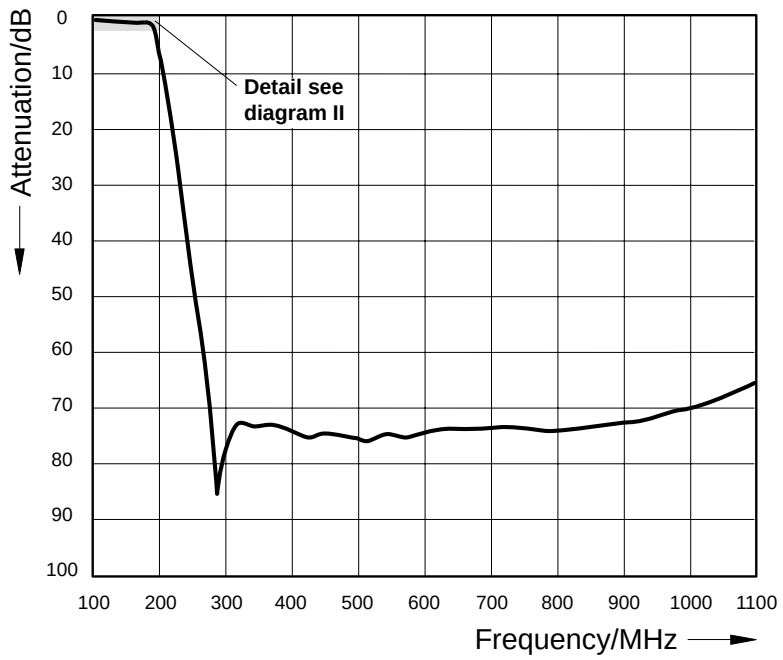
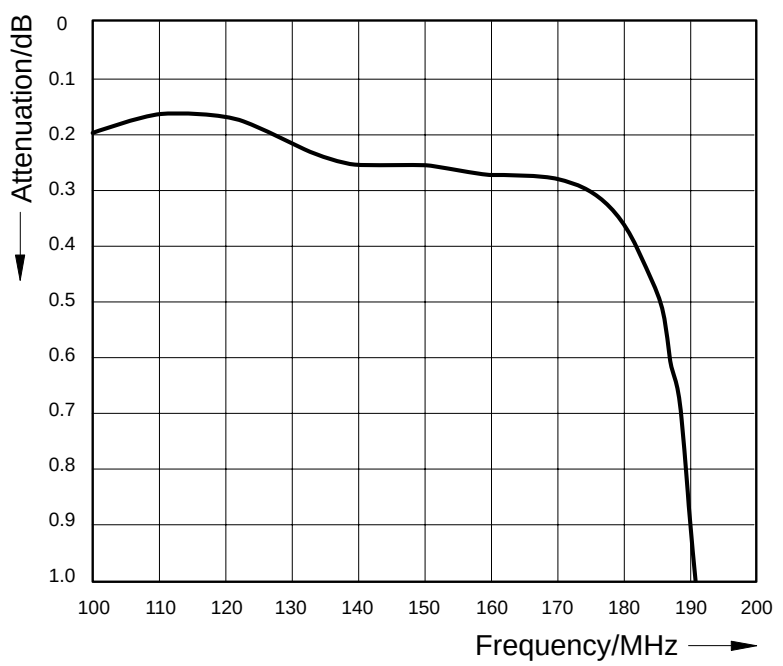


Diagram II:



Band-pass Filter
380 … 470 MHz

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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 capacitively coupled resonators.

Filter characteristics:
Narrow pass band range with low insertion loss, high stop band attenuation.

Tuning:
The band-pass filter is tuned to the desired pass band frequency at the factory. Please specify desired pass band frequency when ordering. The band-pass filter can also be tuned on site using the supplied instructions.

Technical Data

Type No.	K 65 00 21
Frequency range	380 … 470 MHz
Insertion loss	< 1.2 dB
VSWR	< 1.2
Impedance	50 Ω
Input power	< 50 W
Temperature range	–30 … +60 °C
Connectors	N female
Material	Brass, silver-plated
Colour	Grey (RAL 7032)
Installation	With 2 screws (max. 5 mm diameter)
Weight	0.6 kg
Packing size	315 mm x 90 mm x 95 mm
Dimensions (w x h x d)	158 mm x 40 mm x 83 mm (without connectors and tuning bolts)

Band-pass Filter
380 … 470 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

Tuning example:

Diagram I:

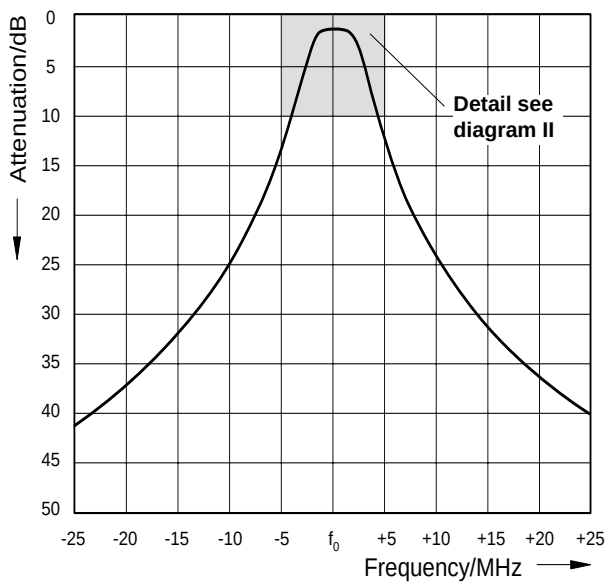
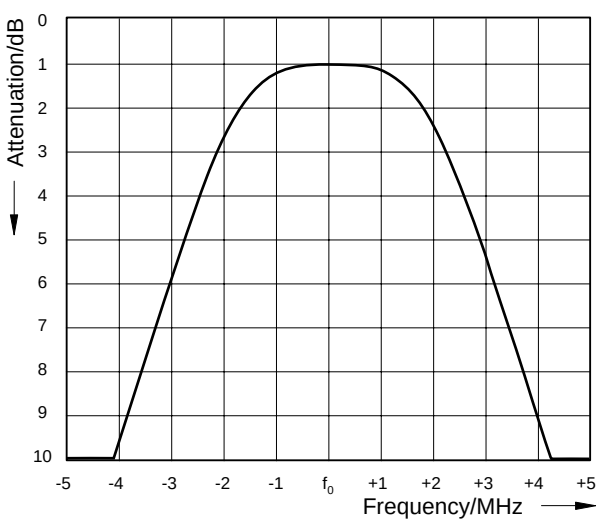


Diagram II:



Band-pass Filter
380 … 470 MHz

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

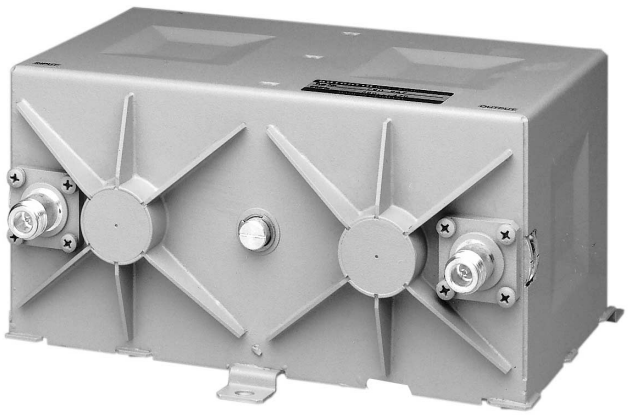
It can be used:
- to improve the input selectivity of receivers and amplifiers,
- to increase the isolation of transmitters, whose respective antennas are mounted close together,
- to suppress noise sidebands and intermodulation products,
- as a component to form combiners.

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.

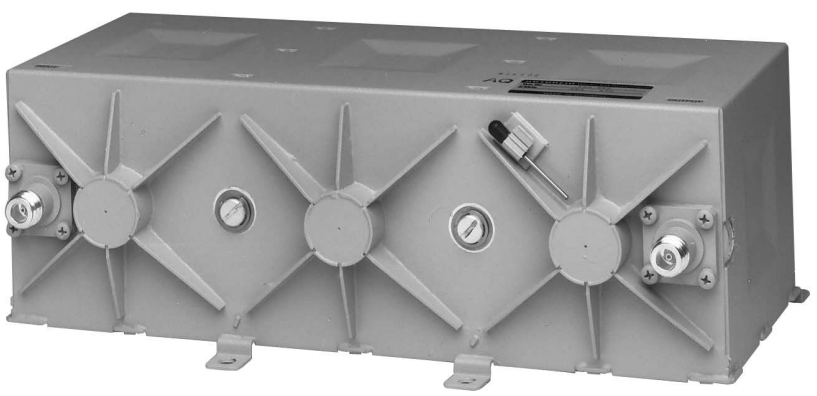
Filter characteristics:
Narrow pass band range with low insertion loss, high stop band attenuation, variable filter response corresponding to the desired stop band attenuation.

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.



790 967



790 966

Technical Data

Type No.	**790 967** **2-cavity band-pass filter**			**790 966** **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 pass band 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
Antennen · Electronic

Tuning example:

2-cavity band-pass filter 790 967

Diagram I:

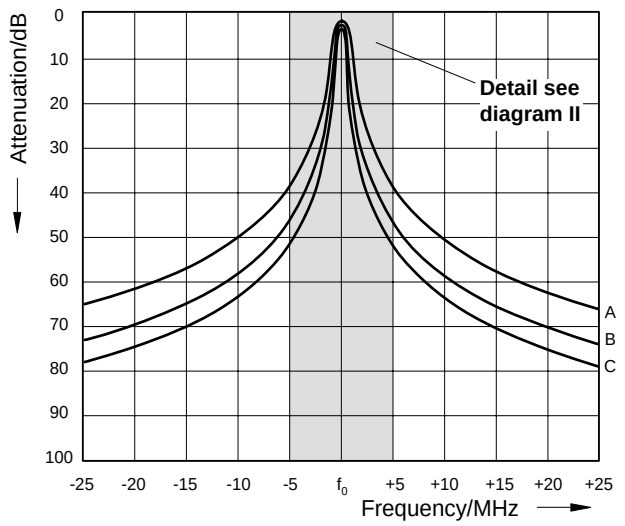


Diagram II:

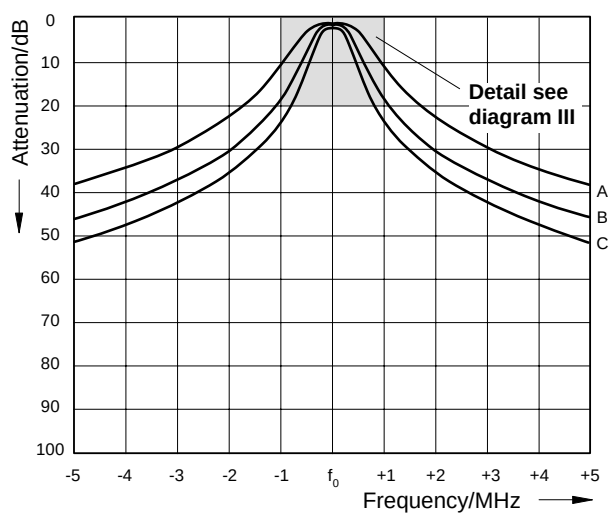
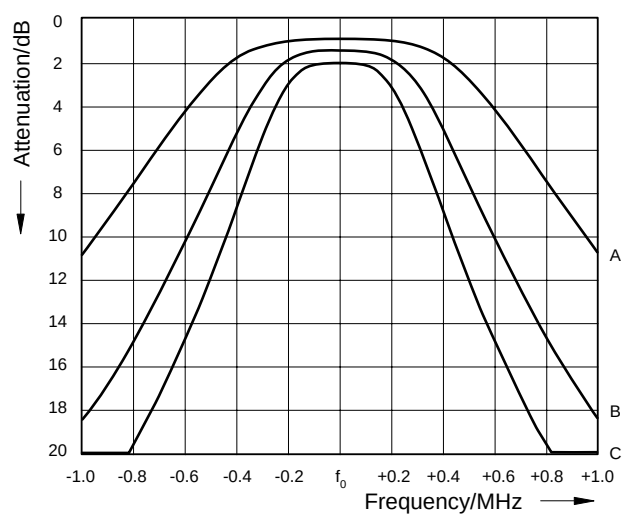


Diagram III:



3-cavity band-pass filter 790 966

Diagram I:

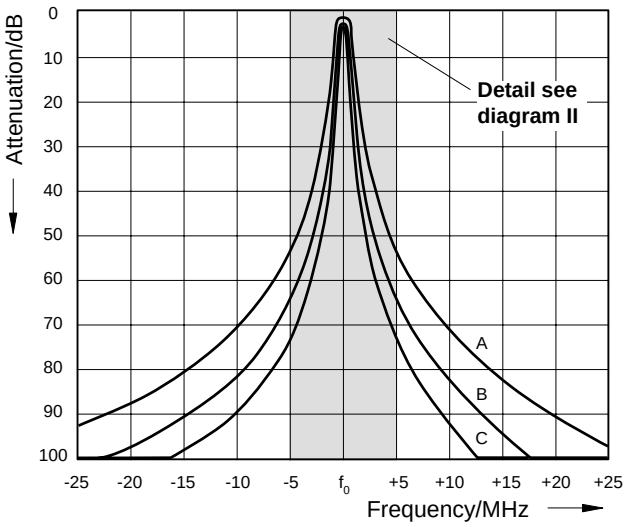


Diagram II:

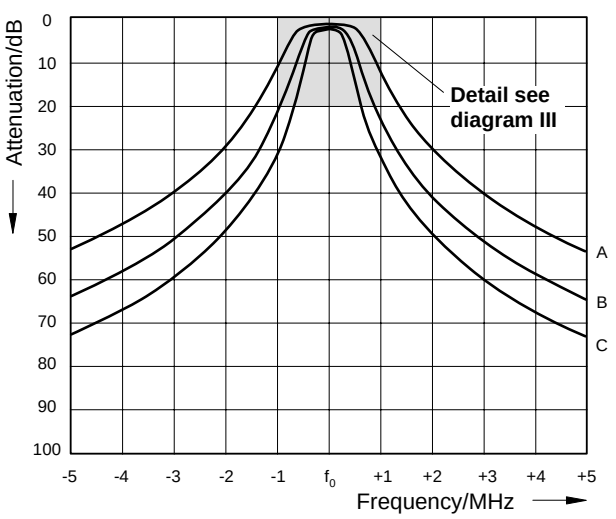
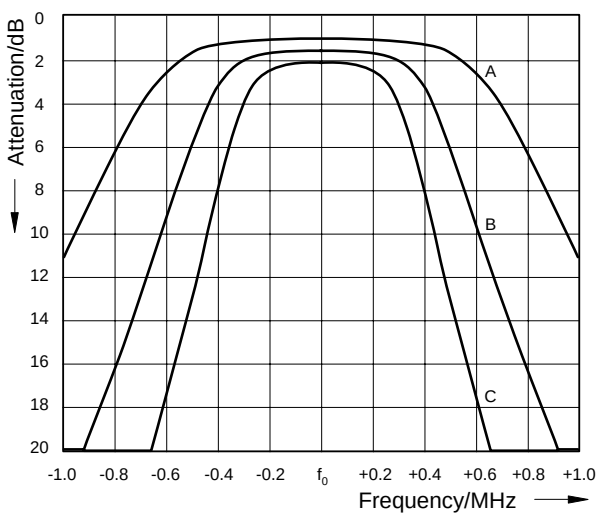


Diagram III:



Band-pass Filter
380 … 470 MHz

KATHREIN
Antennen · Electronic

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 inter-modulation 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.	**K 65 21 25 1**			
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

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Tuning example:

Diagram I:

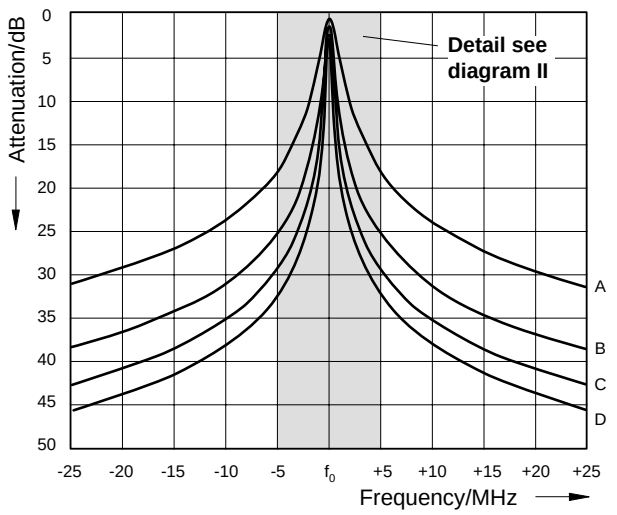


Diagram II:

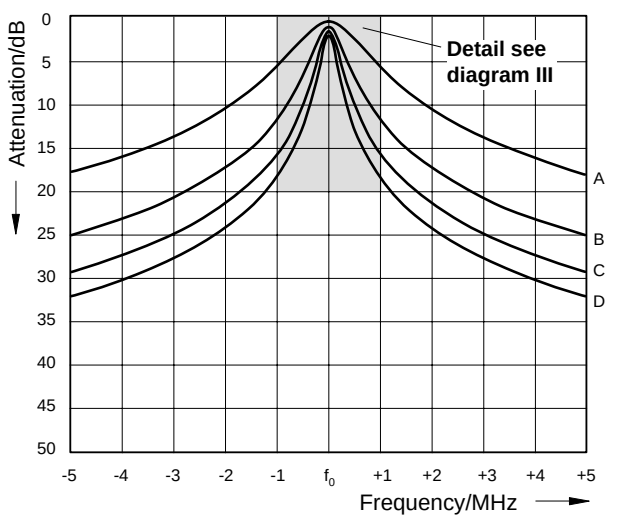
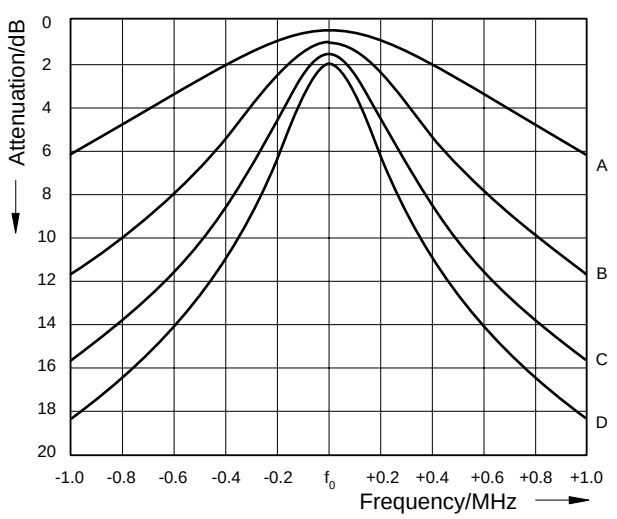


Diagram III:



Band-stop Filter
380 … 470 MHz

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The band-stop filter is used:
– to attenuate interfering signals,
– to increase the coupling attenuation between transmitter and receiver.

Design and construction:
The band-stop filter consists of capacitively shortened λ/4 coaxial resonators. The resonators of the 2- and 3-cavity band-stop filter are interconnected by cables of λ/4 length.

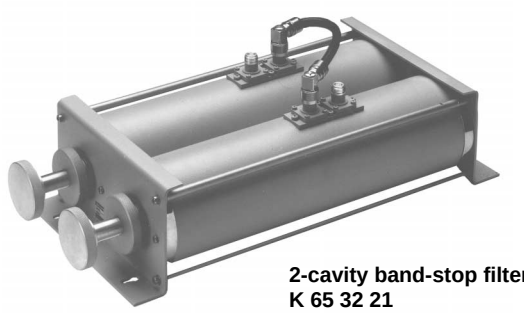
Filter characteristics:
Narrow stop band range with high stop band attenuation, low insertion loss outside the stop band range.

Tuning:
The band-stop filter is tuned to the desired stop band frequency at the factory. When ordering please specify stop band frequency.

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

The resonators of the 2-cavity or 3-cavity band-stop filters can be tuned independently. In this way, 2 or 3 different interfering signals can be suppressed or one single interfering signal can be especially attenuated.

1-cavity band-stop filter
K 65 31 21



2-cavity band-stop filter
K 65 32 21

3-cavity band-stop filter
K 65 33 21

Technical Data

Type No. **N female** **7-16 female**	**K 65 31 21** **K 65 31 27**	**K 65 32 21** **K 65 32 27**	**K 65 33 21** **K 65 33 27**
Version	1-cavity band-stop filter	2-cavity band-stop filter	3-cavity band-stop filter
Frequency range	380 … 470 MHz		
Impedance	50 Ω		
Input power	< 300 W (insertion loss < 1 dB)		
Temperature range	–30 … +60 °C		
Temperature coefficient	18 x 10^{-6} / °C		
Material	Brass, silver-plated		
Colour	Grey (RAL 7032)		
Installation	With 4 screws (max. 6 mm diameter)		
Weight	5.6 kg	11.2 kg	17.0 kg
Packing size by mm	585 x 170 x 170	585 x 170 x 285	585 x 170 x 405
Dimensions by mm (w x h x d)	426 x 130 x 122	426 x 130 x 240	426 x 130 x 360

Band-stop Filter
380 … 470 MHz
Typical attenuation curves

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Tuning example:

1-cavity band-stop filter

Diagram I:

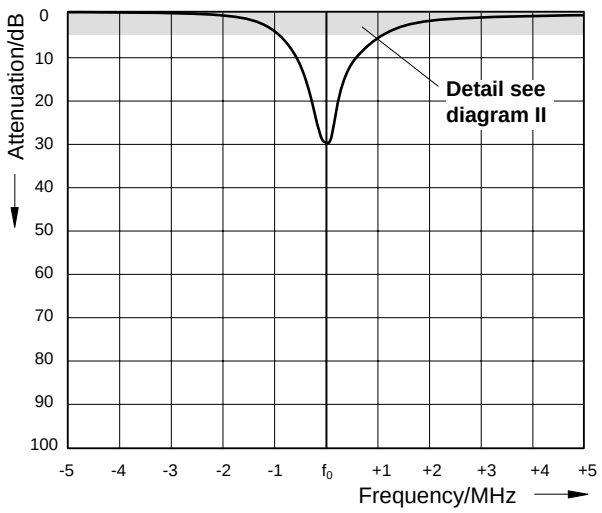
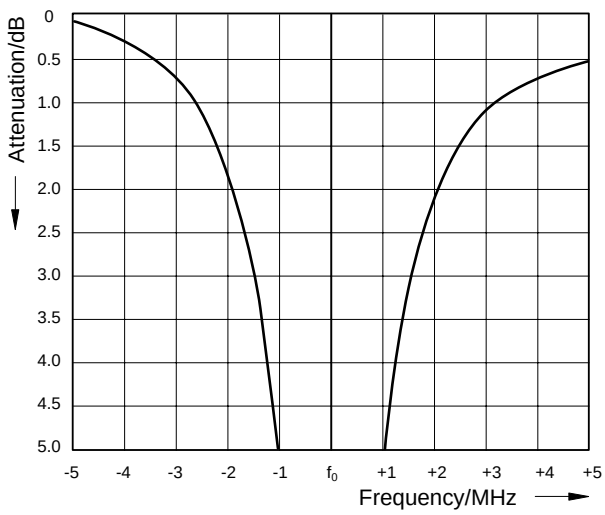


Diagram II:



2-cavity band-stop filter

Diagram I:

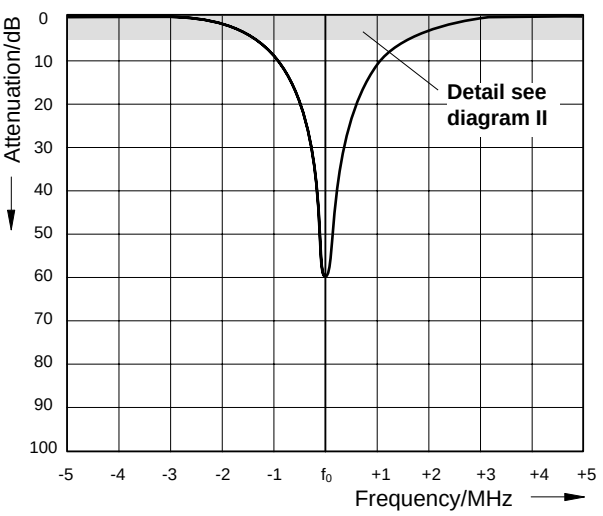
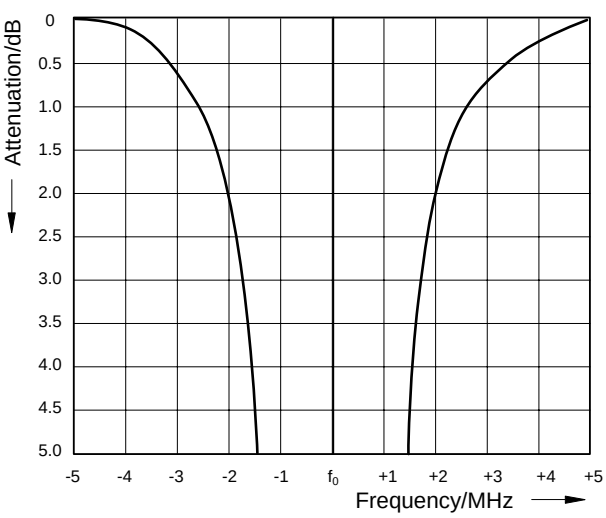


Diagram II:



3-cavity band-stop filter

Diagram I:

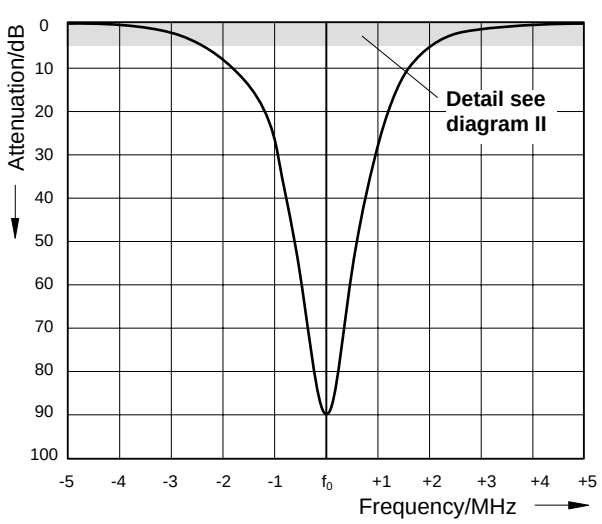
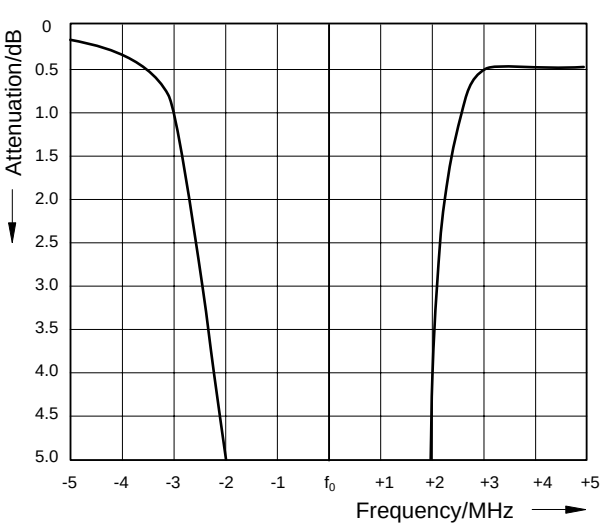


Diagram II:



S-P Filter
380 … 470 MHz

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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 frequecies,
– 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 range 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.

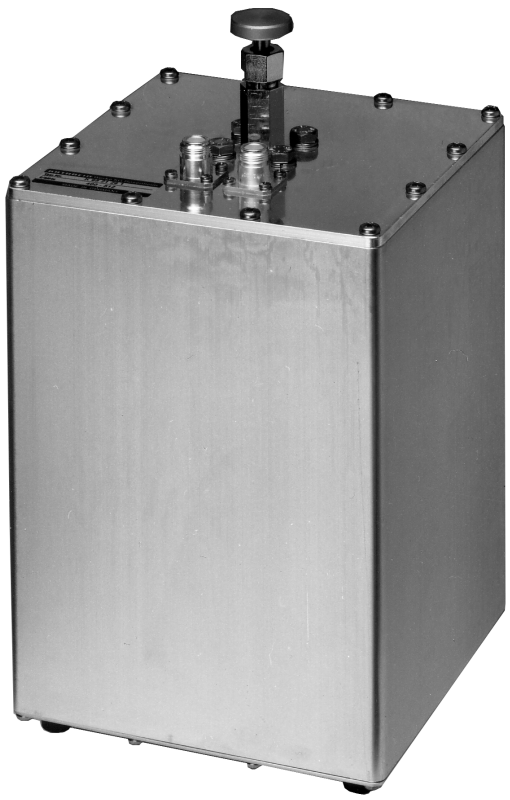
Insertion loss of the filter combination = Sum insertion loss of the individual filters + cable attenuation of the interconnecting cables (about 0.1 dB per cable). Stop band attenuation of the filter combination = Sum stop band attenuation of the individual filters + additional stop band attenuation.

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.



Technical Data

Type No.	K 65 21 26 1
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 wall mounting
Attached 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

KATHREIN
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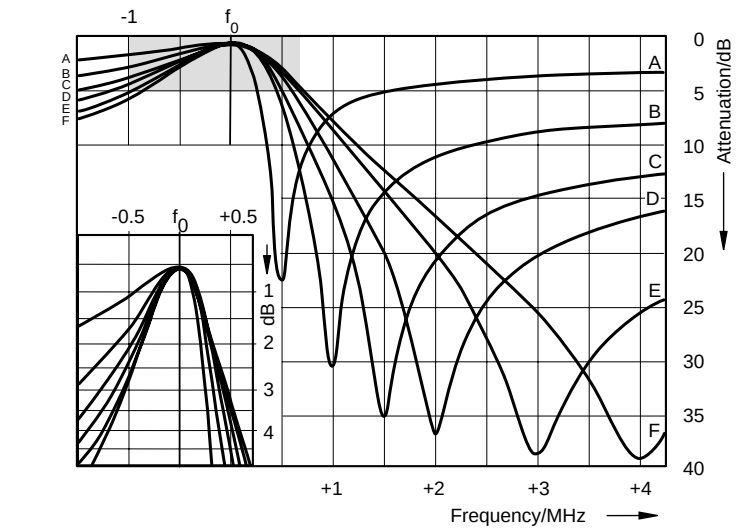
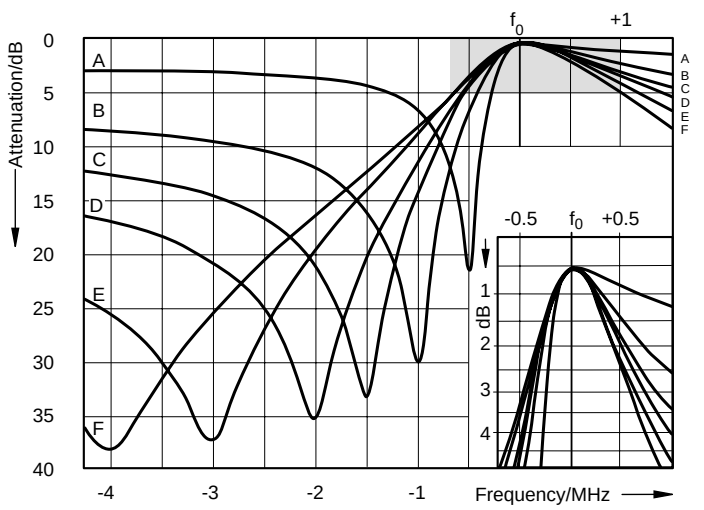
Tuning example:





Curve	Frequency spacing pass band frequency / stop band frequency
A	0.5 MHz
B	1.0 MHz
C	1.5 MHz
D	2.0 MHz
E	3.0 MHz
F	4.0 MHz

S-P Filter
380 … 470 MHz

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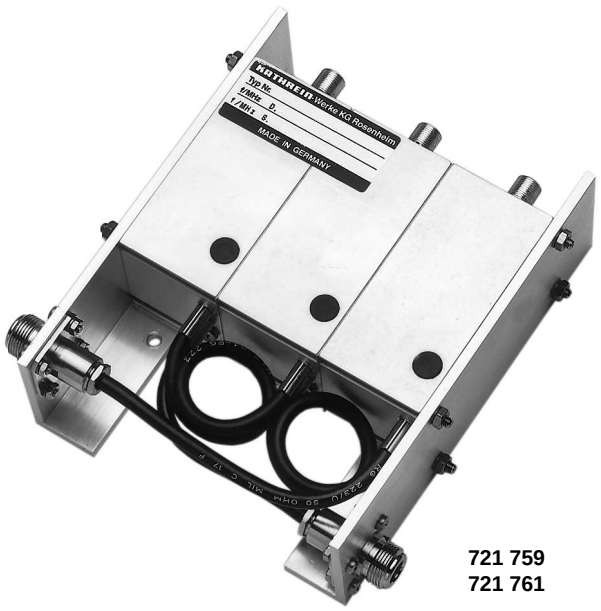
The S-P filter (Stop-Pass filter) is suitable for attenuating interfering frequencies, close to the operational frequency band. It is designed for operation with **one** transmitting channel or several receiving channels.

It can be used:
– in the transmission path for suppressing sideband noise and for attenuating intermodulation products at the receiving frequencies,
– in the receiving path for attenuating transmitting frequencies,
– as a duplexer component.

Design and construction:
The S-P filter consists of three or four S-P resonators, interconnected by cables of defined electrical length.

Filter characteristics:
721 759 / 721 760: Broad pass band range with low insertion loss in the low band, high stop band attenuation at the stop band frequencies in the high band.
721 761 / 721 762: Broad pass band range with low insertion loss in the high band, high stop band attenuation at the stop band frequencies in the low band.

Tuning:
The S-P filter can only be tuned at the factory because of its special design. Special requests such as: Special band spacing, switching bandwidths or attenuation can be taken into account. When ordering please specify the desired high **and** low band frequencies.



721 759
721 761

Technical Data

Type No.	**721 759** (Pass band: low band/Stop band: high band) **721 761** (Pass band: high band/Stop band: low band)					**721 760** (Pass band: low band/Stop band: high band) **721 762** (Pass band: high band/Stop band: low band)					
Number of resonators	3					4					
Frequency range	380 … 470 MHz										
Band 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	< 1.2 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	< 1.6 dB
Stop band attenuation	> 55 dB	> 55 dB	> 70 dB	> 65 dB	> 60 dB	> 70 dB	> 60 dB	> 75 dB	> 70 dB	> 65 dB	> 55 dB
VSWR	< 1.4										
Impedance	50 Ω										
Input power	< 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	1.0 kg					1.2 kg					
Packing size	175 mm x 60 mm x 200 mm					175 mm x 60 mm x 200 mm					
Dimensions (w x h x d)	136 mm x 50 mm x 160 mm (with connectors)					171 mm x 50 mm x 160 mm (with connectors)					

S-P Filter
380 … 470 MHz
Typical attenuation curves

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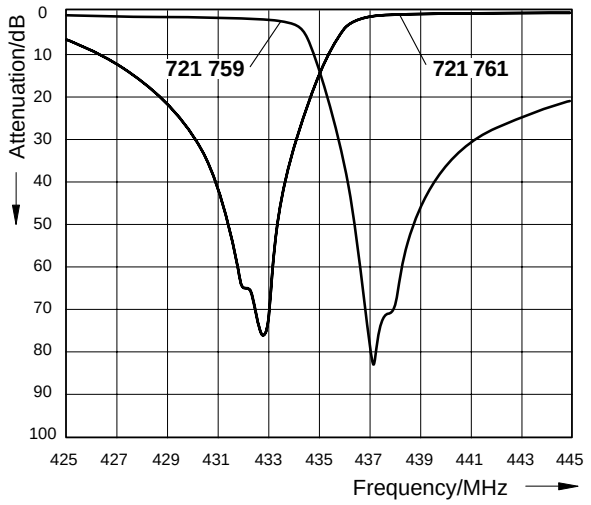
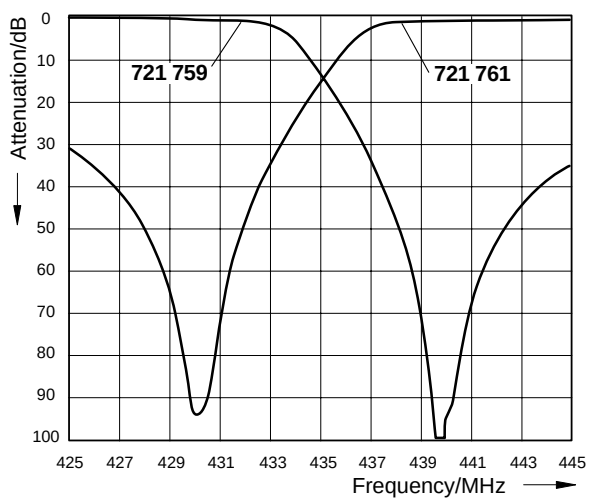
Tuning examples:

721 759 / 721 761

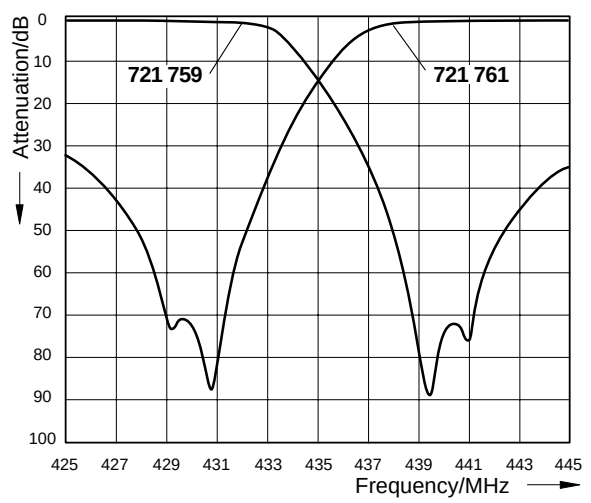
Band spacing: 5 MHz
Switching bandwidth: 0.5 MHz



Band spacing: 10 MHz
Switching bandwidth: 1.0 MHz

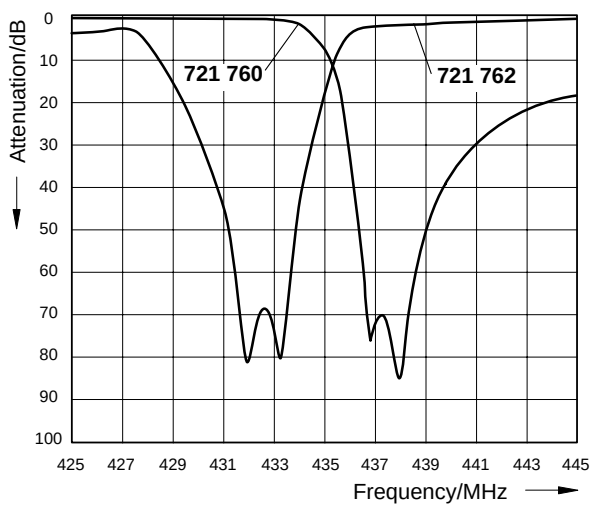


Band spacing: 10 MHz
Switching bandwidth: 2.0 MHz

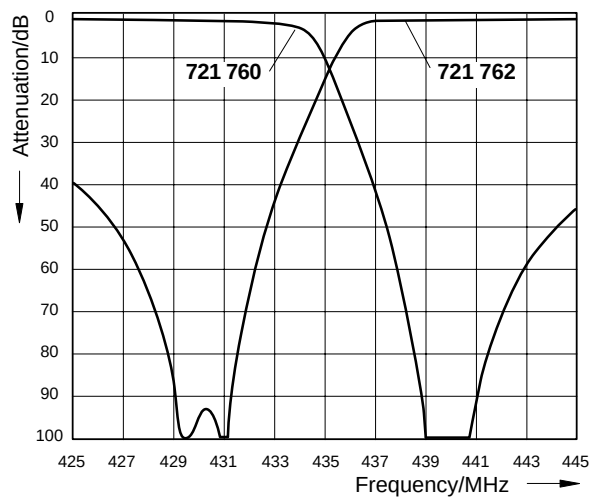


721 760 / 721 762

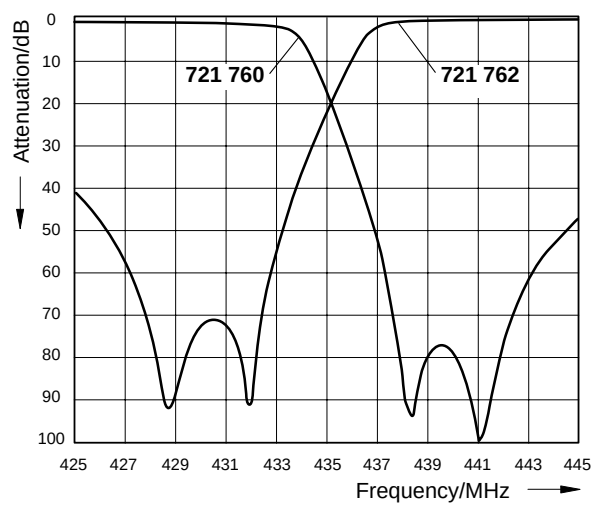
Band spacing: 5 MHz
Switching bandwidth: 1.0 MHz



Band spacing: 10 MHz
Switching bandwidth: 2.0 MHz



Band spacing: 10 MHz
Switching bandwidth: 4.0 MHz



S-P Filter
380 … 470 MHz

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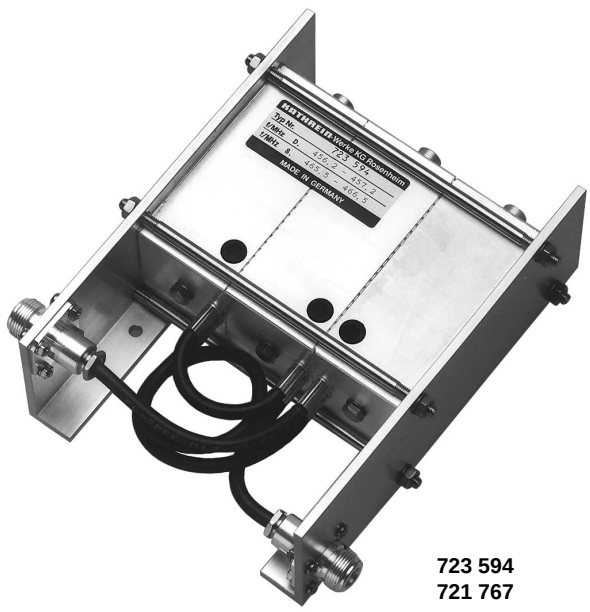
The S-P filter (Stop-Pass filter) is suitable for attenuating interfering frequencies, close to the operational frequency band. It is designed for operation with **several** transmitting and receiving channels.

It can be used:
– in the transmission path for suppressing sideband noise and for attenuating intermodulation products at the receiving frequencies,
– in the receiving path for attenuating transmitting frequencies,
– as a duplexer component.

Design and construction:
The S-P filter consists of three or four S-P resonators, interconnected by cables of defined electrical length.

Filter characteristics:
723 594 / 723 790: Broad pass band range with low insertion loss in the low band, high stop band attenuation at the stop band frequencies in the high band.
721 767 / 724 581: Broad pass band range with low insertion loss in the high band, high stop band attenuation at the stop band frequencies in the low band.

Tuning:
The S-P filter can only be tuned at the factory because of its special design.
Special requests such as: Special band spacing, switching bandwidths or attenuation can be taken into account. When ordering please specify the desired high **and** low band frequencies.



723 594
721 767

Technical Data

Type No.	**723 594** (Pass band: low band/Stop band: high band) **721 767** (Pass band: high band/Stop band: low band)					**723 790** (Pass band: low band/Stop band: high band) **724 581** (Pass band: high band/Stop band: low band)					
Number of resonators	3					4					
Frequency range	380 … 470 MHz										
Band 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	< 1.2 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	< 1.6
Stop band attenuation	> 55 dB	> 55 dB	> 70 dB	> 65 dB	> 60 dB	> 70 dB	> 60 dB	> 75 dB	> 70 dB	> 65 dB	> 55 dB
VSWR	< 1.4										
Impedance	50 Ω										
Input power	< 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	1.3 kg					1.8 kg					
Packing size	250 mm x 85 mm x 195 mm										
Dimensions (w x h x d)	155 mm x 60 mm x 175 mm (with connectors)					196 mm x 60 mm x 175 mm (with connectors)					

S-P Filter
380 … 470 MHz
Typical attenuation curves

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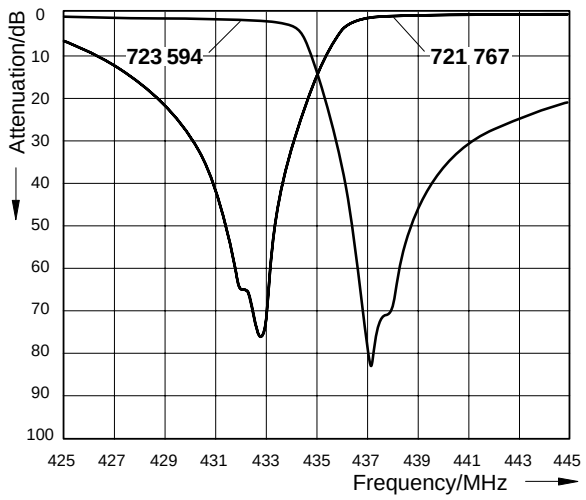
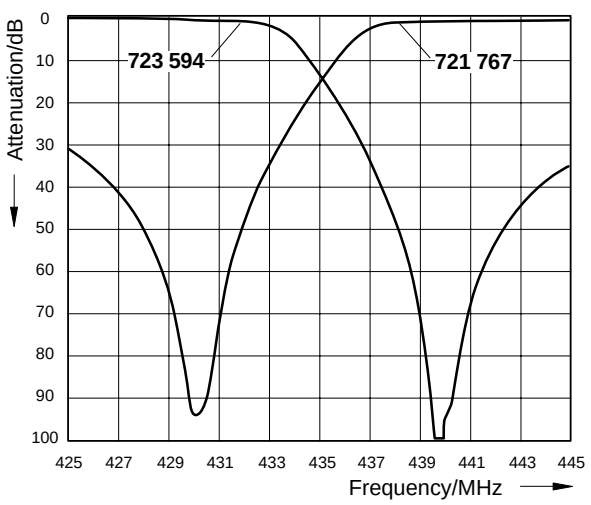
Tuning examples:

723 594 / 721 767

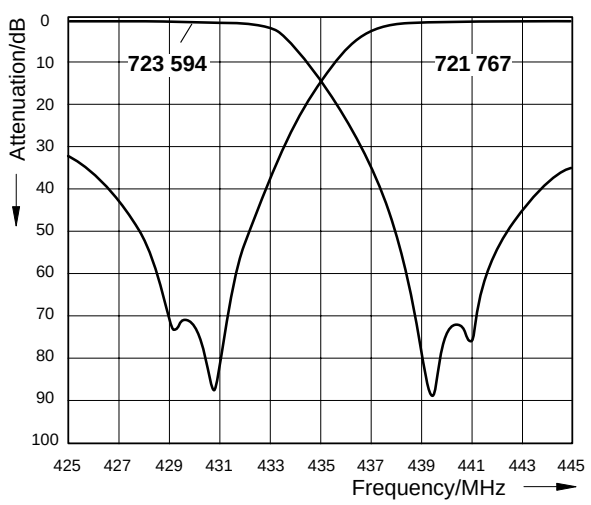
Band spacing: 5 MHz
Switching bandwidth: 0.5 MHz



Band spacing: 10 MHz
Switching bandwidth: 1.0 MHz

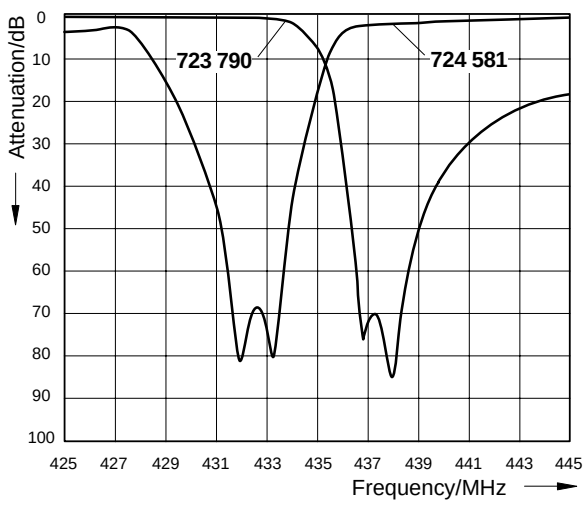


Band spacing: 10 MHz
Switching bandwidth: 2.0 MHz

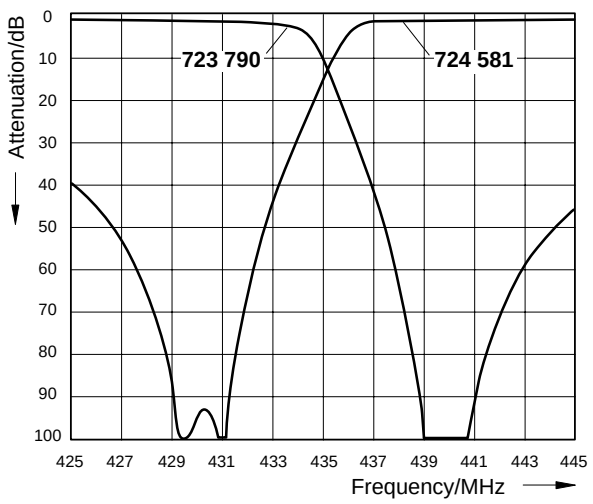


723 790 / 724 581

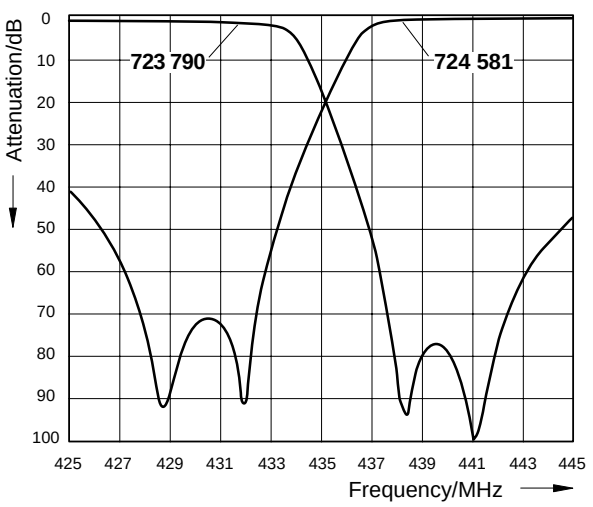
Band spacing: 5 MHz
Switching bandwidth: 1.0 MHz



Band spacing: 10 MHz
Switching bandwidth: 2.0 MHz



Band spacing: 10 MHz
Switching bandwidth: 4.0 MHz



Low-pass Filter
400 – 470 MHz

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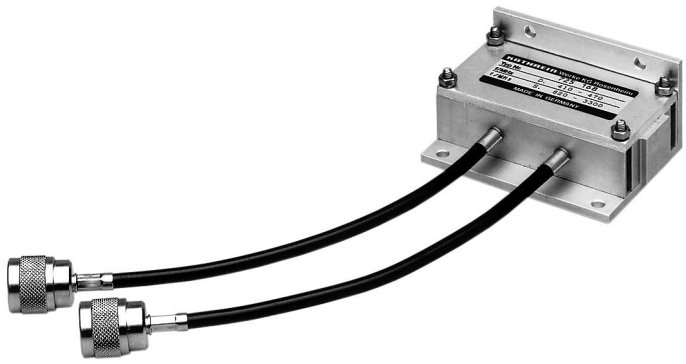
The low-pass filter is suited as receiving or transmitting filter.

It can be used:
– to suppress harmonics in the transmitting path,
– to suppress interfering signals in the receiving path.

Design and construction:
The low-pass filter consists of lumped L-C elements.

Filter characteristics:
Broad pass band range with low insertion loss, high stop band attenuation in the stop band.

Installation:
The right angle mounting plate allows horizontal as well as vertical installation.



Technical Data

Type No.	725 168
Pass band	400 – 470 MHz
Insertion loss	< 0.55 dB (400 – 470 MHz)
Stop band attenuation	> 45 dB (800 – 3300 MHz)
VSWR	< 1.4 (400 – 470 MHz)
Impedance	50 Ω
Input power	< 50 W (–30 ... +50°C) < 20 W (+50 ... +60 °C)
Temperature range	–30 … +60 °C
Connectors	N male at a 220 mm long cable
Material	Housing: Aluminium Cable: RG 223/U
Installation	With 2 screws (max. 4 mm diameter)
Weight	0.3 kg
Packing size	190 mm x 65 mm x 110 mm
Dimensions (w x h x d)	88 mm x 64 mm x 40 mm (without connectors)

Low-pass Filter
400 – 470 MHz
Typical attenuation curves

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Diagram I:

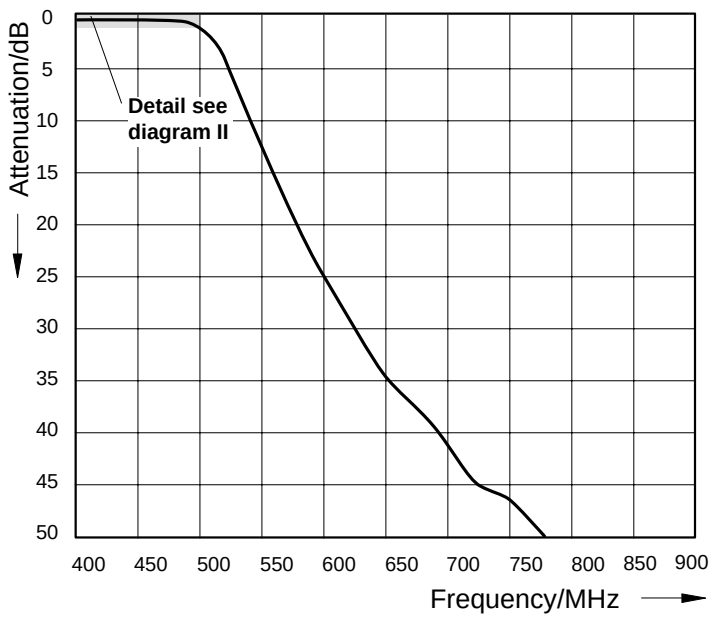
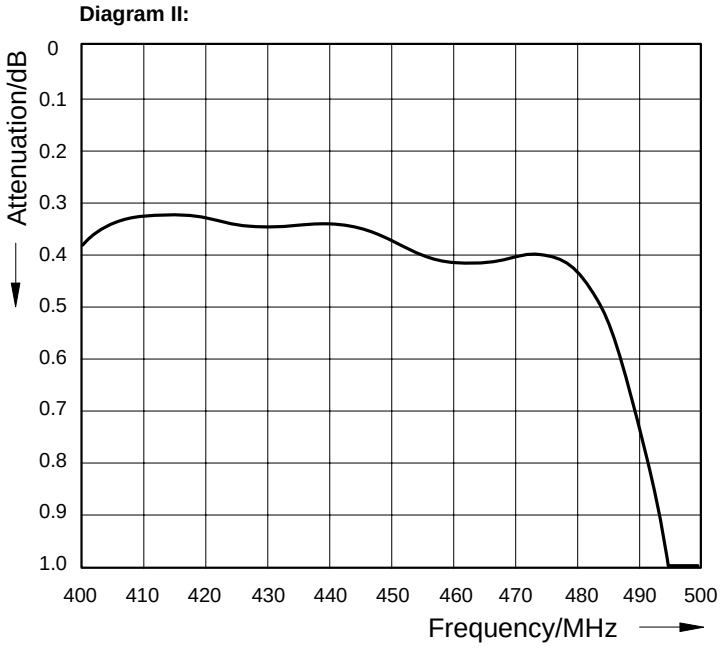


Diagram II:



Duplexers

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

Duplexers:

Description	Type No.	Frequency range ... tunable bandwidth – fixed bandwidth (not tunable)	Max. input power	Page
Duplexer	793 356	68 ... 87.5 MHz	15 W	62
Duplexer	718 987	68 ... 87.5 MHz	100 W	64
Duplexer	719 069	68 ... 87.5 MHz	100 W	64
Duplexer	720 209	68 ... 87.5 MHz	100 W	66
Duplexer	719 084	68 ... 87.5 MHz	100 W	66
Duplexer	K 64 41 43	68 ... 87.5 MHz	200 W	68
Duplexer	K 64 41 44	68 ... 87.5 MHz	200 W	68
Duplexer	793 357	146 ... 174 MHz	15 W	70
Duplexer	719 628	146 ... 174 MHz	100 W	72
Duplexer	718 388	146 ... 174 MHz	100 W	72
Duplexer	720 642	146 ... 174 MHz	100 W	74
Duplexer	720 877	146 ... 174 MHz	100 W	74
Duplexer	792 978	146 ... 164 MHz	300 W	76
Duplexer	792 979	156 ... 174 MHz	100 W	76
Duplexer	K 64 41 23	146 ... 174 MHz	200 W	78
Duplexer	K 64 41 24	146 ... 174 MHz	200 W	78
Duplexer	791 255	380 ... 470 MHz	15 W	80
Duplexer	719 785	380 ... 470 MHz	100 W	82
Duplexer	718 290	380 ... 470 MHz	100 W	82
Duplexer	718 313	380 ... 470 MHz	100 W	84
Duplexer	719 237	380 ... 470 MHz	100 W	84
Duplexer (TETRA, TETRAPOL)	782 10361	380 – 395 MHz	200 W	86
Duplexer (TETRA, TETRAPOL)	782 10362	382 – 397 MHz	200 W	86
Duplexer (TETRA, TETRAPOL)	782 10363	385 – 400 MHz	200 W	86
Duplexer (TETRA, TETRAPOL)	782 10371	380 – 395 MHz	200 W	86
Duplexer (TETRA, TETRAPOL)	782 10372	382 – 397 MHz	200 W	86
Duplexer (TETRA, TETRAPOL)	782 10373	385 – 400 MHz	200 W	86
Duplexer (TETRA, TETRAPOL)	782 10364	410 – 425 MHz	200 W	88
Duplexer (TETRA, TETRAPOL)	782 10365	415 – 430 MHz	200 W	88
Duplexer (TETRA, TETRAPOL)	782 10374	410 – 425 MHz	200 W	88
Duplexer (TETRA, TETRAPOL)	782 10375	415 – 430 MHz	200 W	88
Duplexer (TETRA, TETRAPOL)	782 10366	450 – 465 MHz	200 W	90
Duplexer (TETRA, TETRAPOL)	782 10367	455 – 470 MHz	200 W	90
Duplexer (TETRA, TETRAPOL)	782 10376	450 – 465 MHz	200 W	90
Duplexer (TETRA, TETRAPOL)	782 10377	455 – 470 MHz	200 W	90
Duplexer (4 Resonators)	K 65 41 25	380 ... 470 MHz	200 W	92
Duplexer (6 Resonators)	K 65 41 26	380 ... 470 MHz	200 W	92

Duplexer
68 … 87.5 MHz

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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 4-cavity S-P filter (Stop-Pass filter) for the low band and a 4-cavity S-P filter for the high band.
The S-P filters are designed to allow the transmitter to operate in the low band or in the high band.

Tuning:
The duplexer is tunable within the specified frequency range.
When ordering please note the desired low **and** high band frequencies.
The duplexer can be tuned on site using the instructions available on request.

Technical Data

Type No.	793 356
Frequency range	68 … 87.5 MHz
Duplex spacing	9.8 MHz
Switching bandwidth	< 1.0 MHz
Insertion loss [1)]	< 1.2 dB (at 1 MHz switching bandwidth)
Isolation [2)]	> 65 dB (at 1 MHz switching bandwidth)
VSWR	< 1.4 (at operating frequency)
Impedance	50 Ω
Input power [3)]	< 15 W
Temperature range	–20 … +50 °C
Connectors	SMB male, angled
Material	Brass, silver-plated
Installation	With 3 screws (max. 3 mm diameter)
Weight	0.25 kg
Packing size	150 mm x 30 mm x 120 mm
Dimensions (w x h x d)	144 mm x 20 mm x 114 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
Typical attenuation curves

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Tuning example:

Duplex spacing: 9.8 MHz

Diagram I:

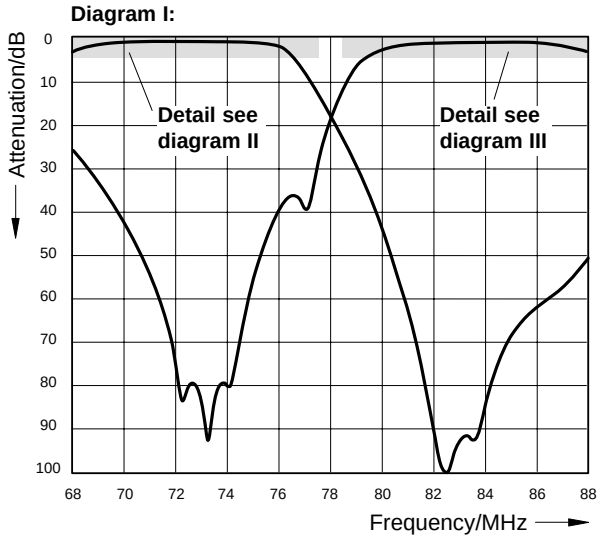


Diagram II: (Low band ↔ antenna)

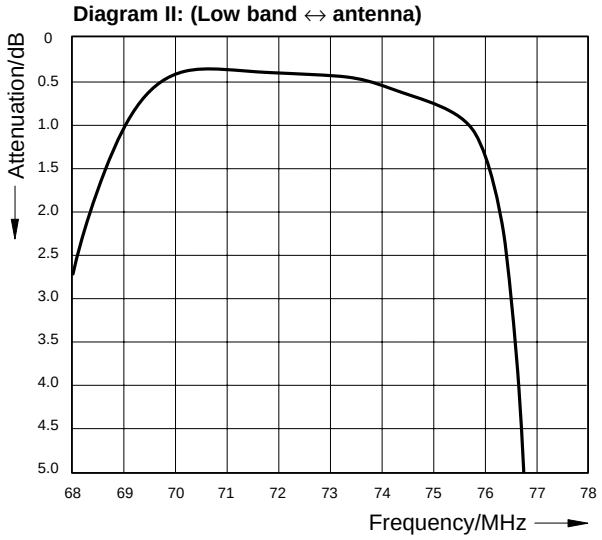
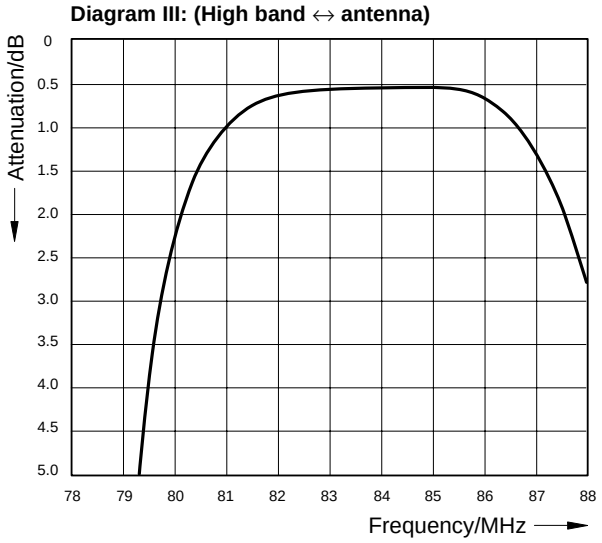


Diagram III: (High band ↔ antenna)



Duplexer
68 … 87.5 MHz

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

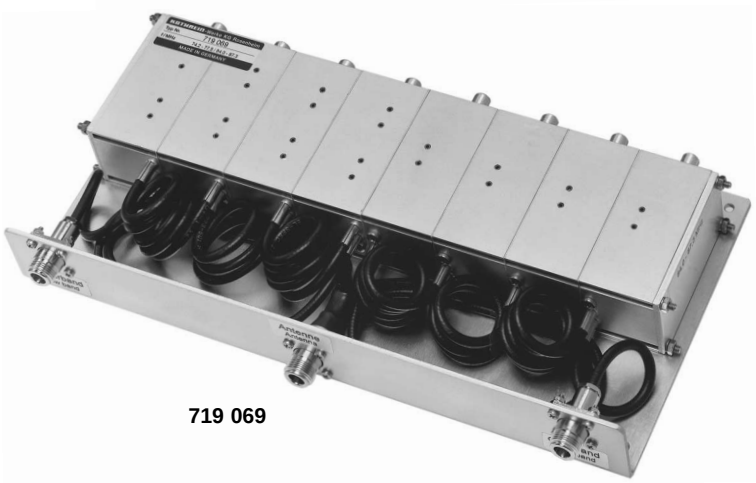
Design and construction:
The duplexer consists of a 3-cavity or 4-cavity S-P filter (Stop-Pass filter) for the low band and a 3-cavity or 4-cavity S-P filter for the high band. The two S-P filters are interconnected to a common antenna output using cables of defined electrical lengths.

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.

718 987



719 069

Technical Data

Type No.	**718 987**					**719 069**				
Number of resonators	3 + 3					4 + 4				
Frequency range	68 … 87.5 MHz									
	Tuning examples									
Duplex spacing	**3 MHz**	**6 MHz**	**9.8 MHz**			**2 MHz**	**6 MHz**	**9.8 MHz**		
Switching bandwidth	**0.1 MHz**	**0.5 MHz**	**1.0 MHz**	**1.5 MHz**	**2.5 MHz**	**0.1 MHz ***	**1.0 MHz**	**2.5 MHz**	**3.3 MHz**	**4.0 MHz**
Insertion loss [1]	< 1.5 dB	< 0.8 dB	< 0.8 dB	< 0.8 dB	< 1.0 dB	< 1.8 dB	< 1.0 dB	< 1.0 dB	< 1.0 dB	< 1.2 dB
Isolation [2]	> 65 dB	> 70 dB	> 75 dB	> 70 dB	> 65 dB	> 65 dB	> 75 dB	> 80 dB	> 70 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	2.15 kg					2.75 kg				
Packing size	275 mm x 60 mm x 245 mm					362 mm x 60 mm x 245 mm				
Dimensions (w x h x d)	263 mm x 50 mm x 190 mm (with connectors)					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

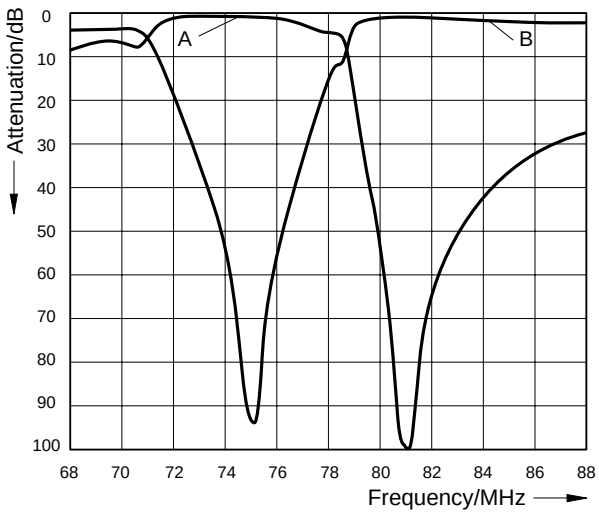
Duplexer
68 … 87.5 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

Tuning examples:

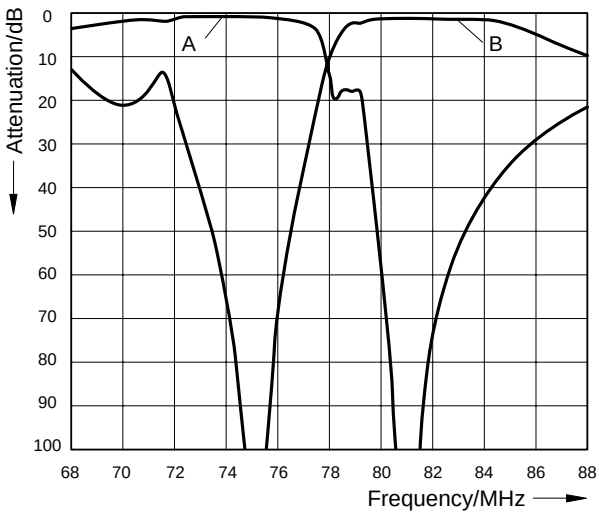
Duplexer 718 987

Duplex spacing: 6.0 MHz
Switching bandwidth: 0.5 MHz

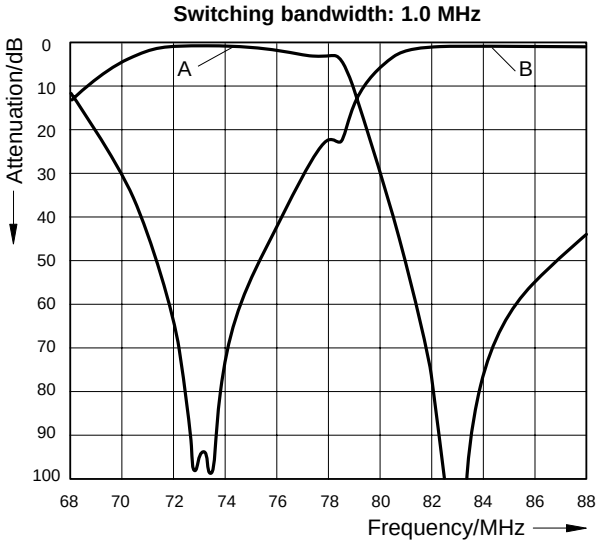


Duplexer 719 069

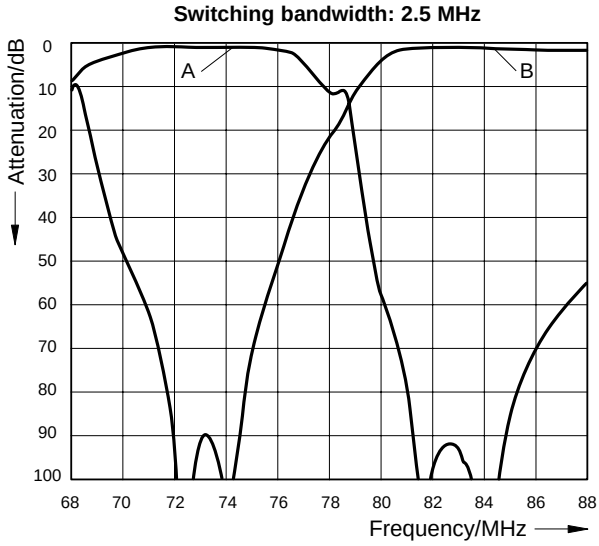
Duplex spacing: 6.0 MHz
Switching bandwidth: 1.0 MHz



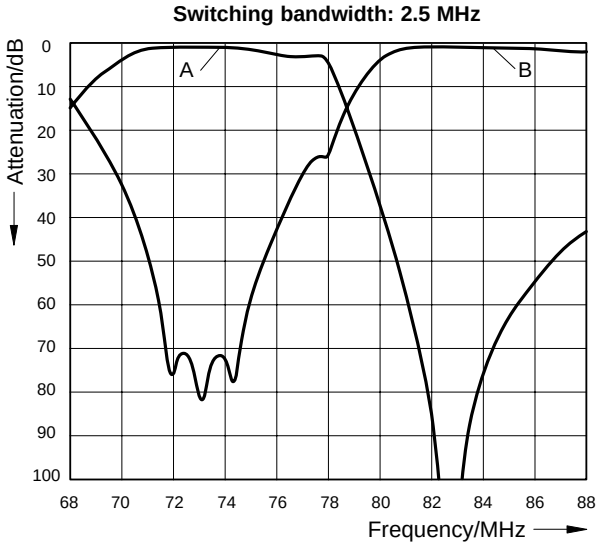
Duplex spacing: 9.8 MHz
Switching bandwidth: 1.0 MHz



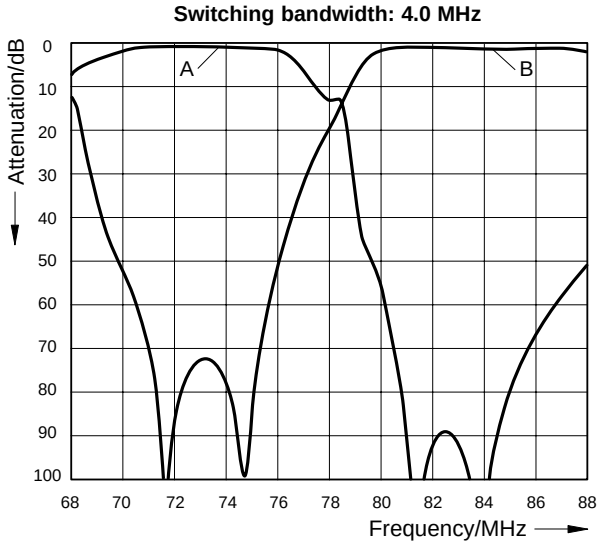
Duplex spacing: 9.8 MHz
Switching bandwidth: 2.5 MHz



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
Antennen · Electronic

The duplexer is suited to combine **one or several** transmitters with **one or several** receivers to a common antenna.
It can also be used to combine two transmitters to a common transmitting antenna.

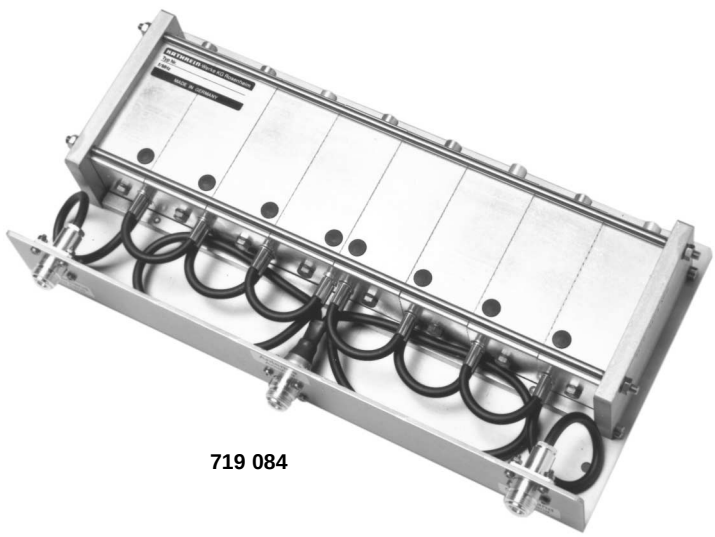
Design and construction:
The duplexer consists of a 3-cavity or 4-cavity S-P filter (Stop-Pass filter) for the low band and a 3-cavity or 4-cavity S-P filter for the high band. The two S-P filters are interconnected to a common antenna output using cables of defined electrical lengths.

The S-P filters are designed to allow the transmitters to be operated in either the low band or the high band or in both bands together.

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.

720 209



719 084

Technical Data

Type No.	**720 209**					**719 084**				
Number of resonators	3 + 3					4 + 4				
Frequency range	68 … 87.5 MHz									
	Tuning examples									
Duplex spacing	**3 MHz**	**6 MHz**	**9.8 MHz**			**2 MHz**	**6 MHz**	**9.8 MHz**		
Switching bandwidth	**0.1 MHz**	**0.5 MHz**	**1.0 MHz**	**1.5 MHz**	**2.5 MHz**	**0.1 MHz ***	**1.0 MHz**	**2.5 MHz**	**3.3 MHz**	**4.0 MHz**
Insertion loss [1]	< 1.5 dB	< 0.8 dB	< 0.8 dB	< 0.8 dB	< 1.0 dB	< 1.8 dB	< 1.0 dB	< 1.0 dB	< 1.0 dB	< 1.2 dB
Isolation [2]	> 65 dB	> 70 dB	> 75 dB	> 70 dB	> 65 dB	> 65 dB	> 75 dB	> 80 dB	> 70 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, silver-plated									
Material	S-P resonators: Brass, silver-plated / copper, silver-plated; cable: RG 223/U									
Installation	With 4 screws (max. 5 mm diameter)									
Weight	3.0 kg					3.5 kg				
Packing size	275 mm x 60 mm x 245 mm					355 mm x 60 mm x 245 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 low band or high band respectively the summ of the input powers low band and high band.

Duplexer
68 … 87.5 MHz
Typical attenuation curves

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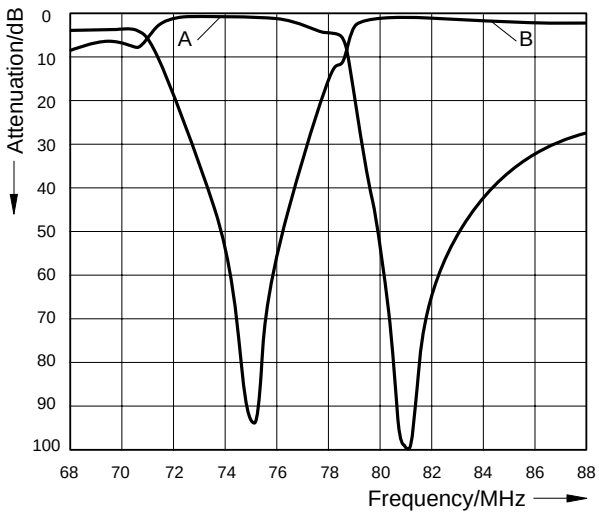
Tuning examples:

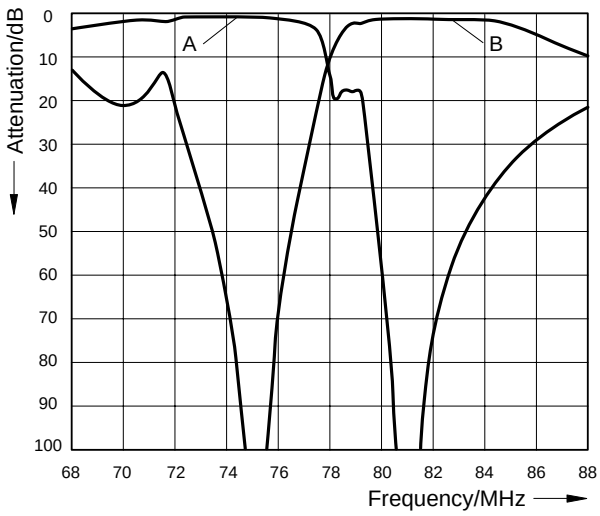
Duplexer 720 209

Duplex spacing: 6.0 MHz
Switching bandwidth: 0.5 MHz

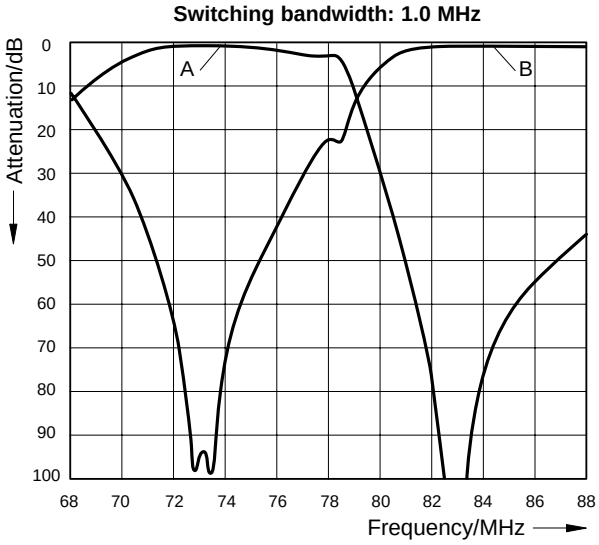


Duplexer 719 084

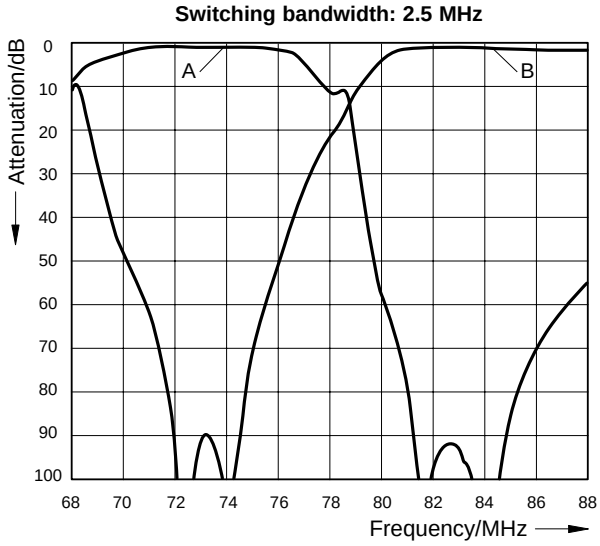
Duplex spacing: 6.0 MHz
Switching bandwidth: 1.0 MHz



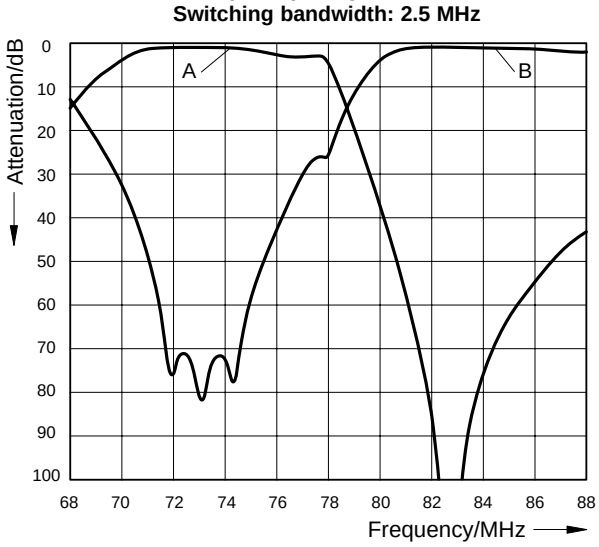
Duplex spacing: 9.8 MHz
Switching bandwidth: 1.0 MHz



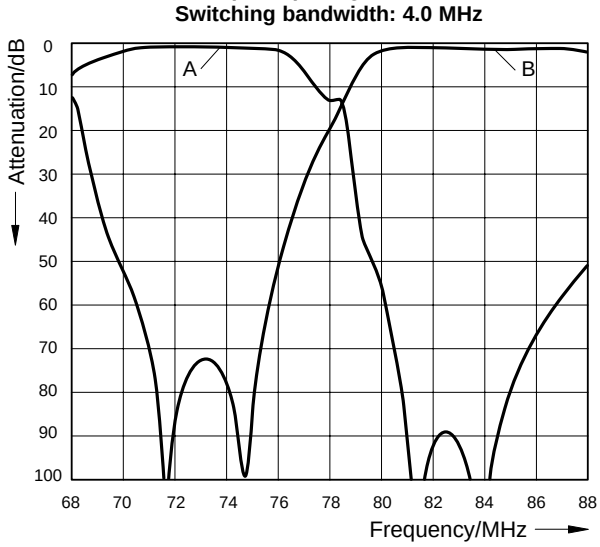
Duplex spacing: 9.8 MHz
Switching bandwidth: 2.5 MHz



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
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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.

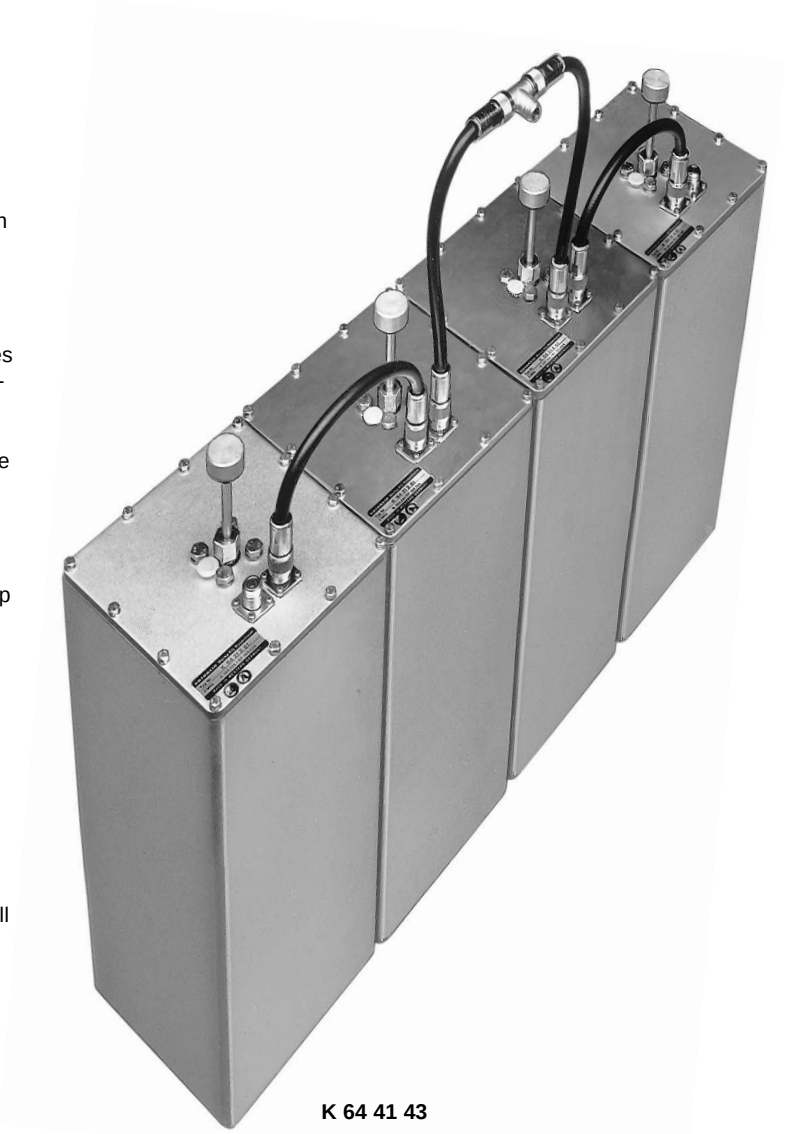
Tuning:
The stop band attenuation is dependent on the frequency spacing and the number of S-P filters. The stop band attenuation for four or six S-P filters can be read from the diagram.

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.



K 64 41 43

Technical Data

Type No.	K 64 41 43	K 64 41 44
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	

Duplexer
68 … 68.5 MHz
Typical attenuation curves

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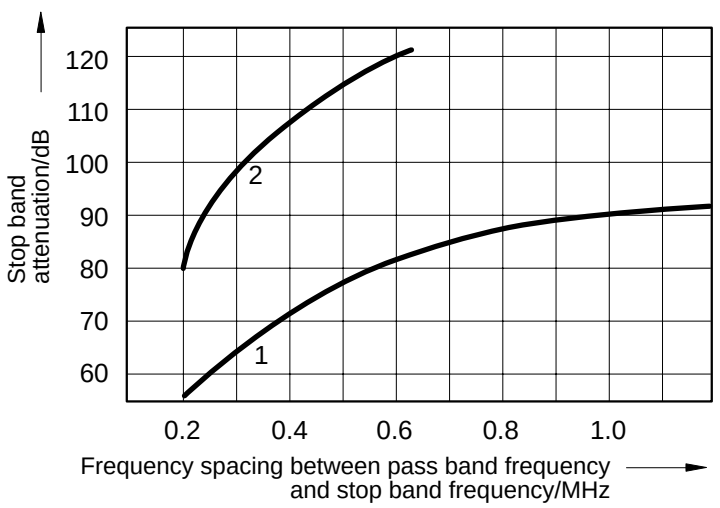
Number of resonators	Curve	Insertion loss	Type No.
4	1	1.0 dB	**K 64 41 43**
6	2	1.5 dB	**K 64 41 44**



Duplexer
146 … 174 MHz

KATHREIN
Antennen · Electronic

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 4-cavity S-P filter (Stop-Pass filter) for the low band and a 4-cavity S-P filter for the high band. The S-P filters are designed to allow the transmitter to operate in the low band or in the high band.

Tuning:
The duplexer is tunable within the specified frequency range.
When ordering please note the desired low **and** high band frequencies.
The duplexer can be tuned on site using the instructions available on request.

Technical Data

Type No.	793 357
Frequency range	146 … 174 MHz
Duplex spacing	4.6 MHz
Switching bandwidth	< 1.0 MHz
Insertion loss [1)]	< 2.0 dB (at 1 MHz switching bandwidth)
Isolation [2)]	> 65 dB (at 1 MHz switching bandwidth)
VSWR	< 1.4 (at operating frequency)
Impedance	50 Ω
Input power [3)]	< 15 W
Temperature range	–20 … +50 °C
Connectors	SMB male, angled
Material	Brass, silver-plated
Installation	With 3 screws (max. 3 mm diameter)
Weight	0.25 kg
Packing size	150 mm x 30 mm x 120 mm
Dimensions (w x h x d)	144 mm x 20 mm x 114 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

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Tuning example:

Duplex spacing: 10 MHz

Diagram I:

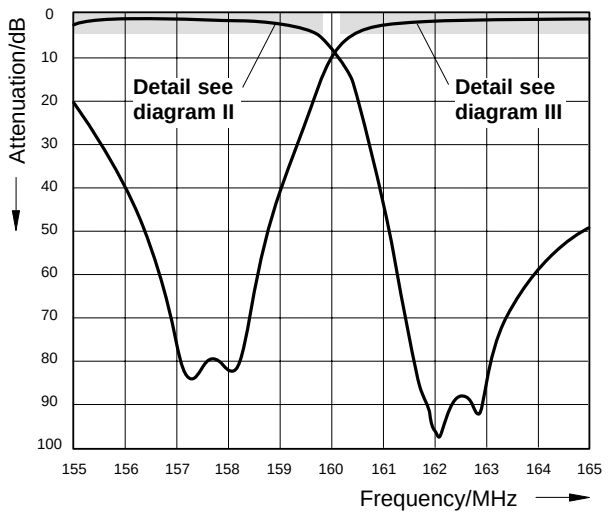


Diagram II: (Low band ↔ antenna)

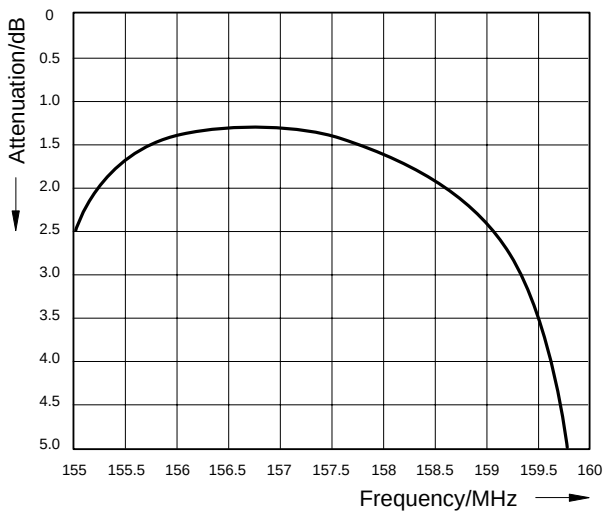
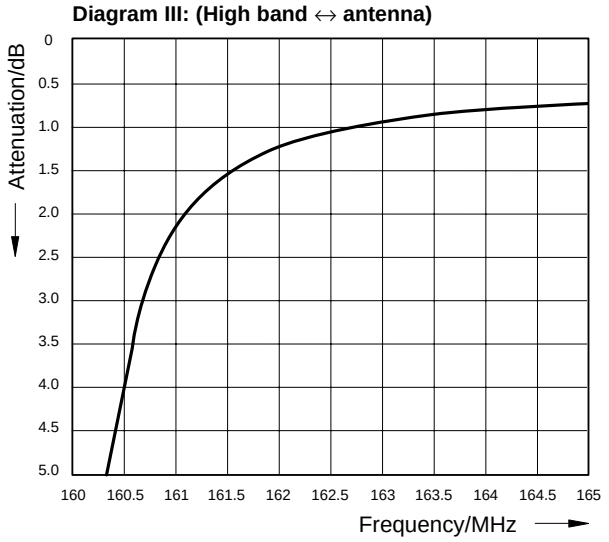


Diagram III: (High band ↔ antenna)



Duplexer
146 … 174 MHz

KATHREIN
Antennen · Electronic

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

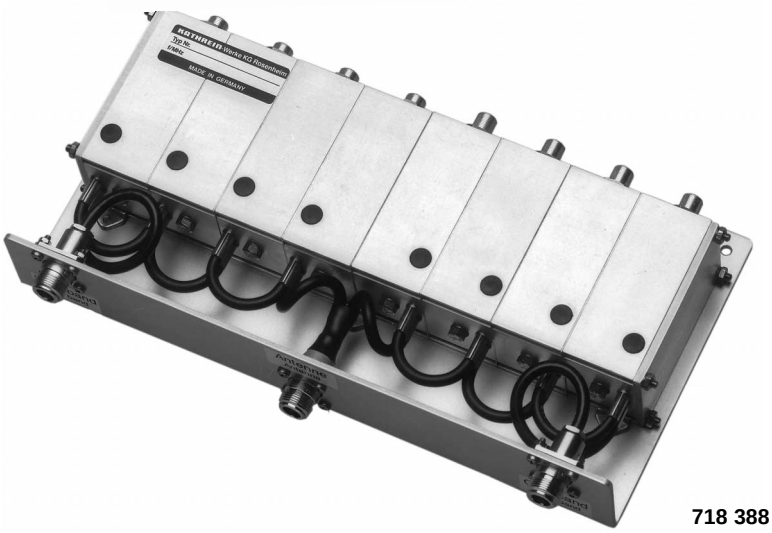
Design and construction:
The duplexer consists of a 3-cavity or 4-cavity S-P filter (Stop-Pass filter) for the low band and a 3-cavity or 4-cavity S-P filter for the high band. The two S-P filters are interconnected to a common antenna output using cables of defined electrical lengths.

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.

719 628



718 388

Technical Data

Type No.	**719 628**					**718 388**				
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

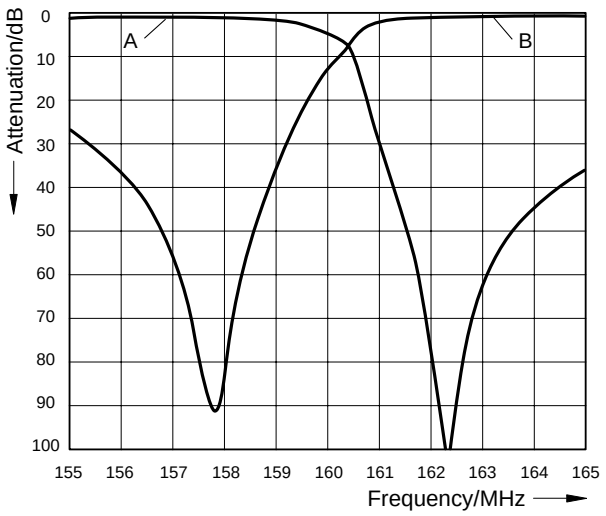
Duplexer
146 … 174 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

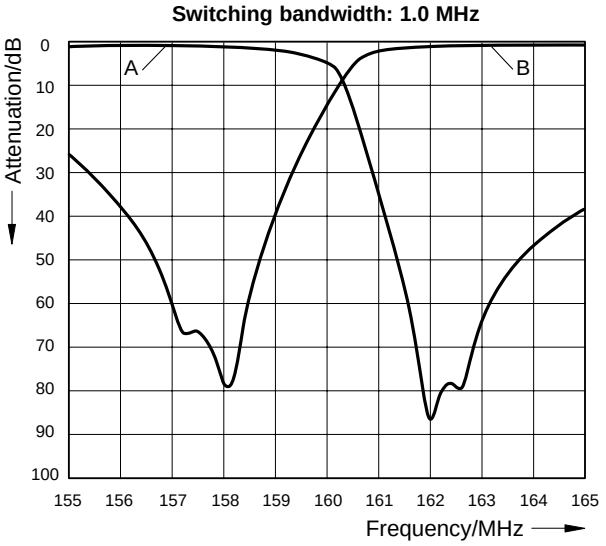
Tuning examples:

Duplexer 719 628

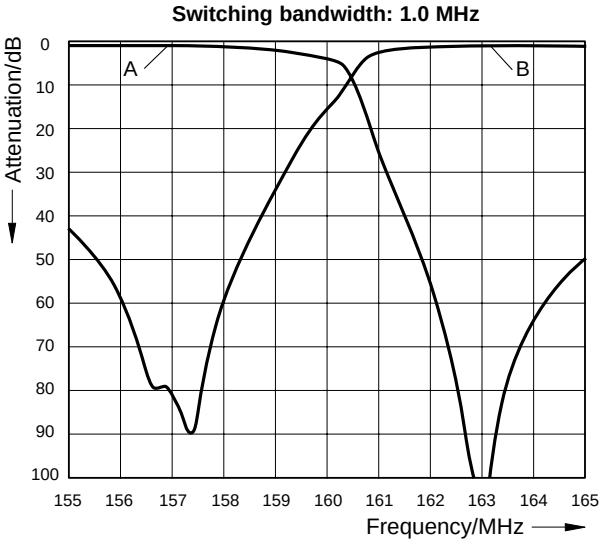
Duplex spacing: 4.6 MHz
Switching bandwidth: 0.1 MHz



Duplex spacing: 4.6 MHz
Switching bandwidth: 1.0 MHz

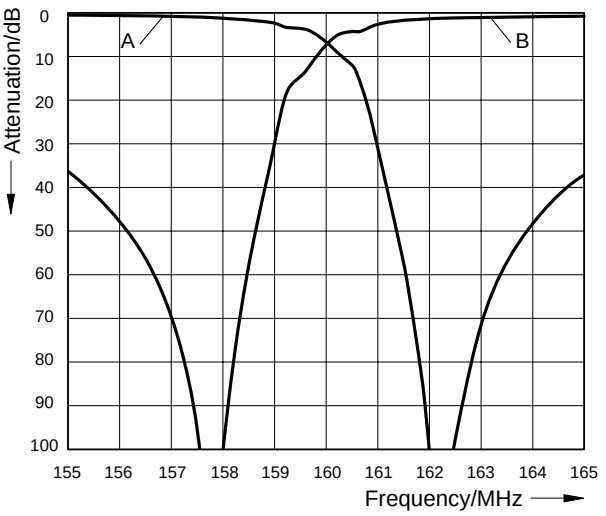


Duplex spacing: 6.0 MHz
Switching bandwidth: 1.0 MHz

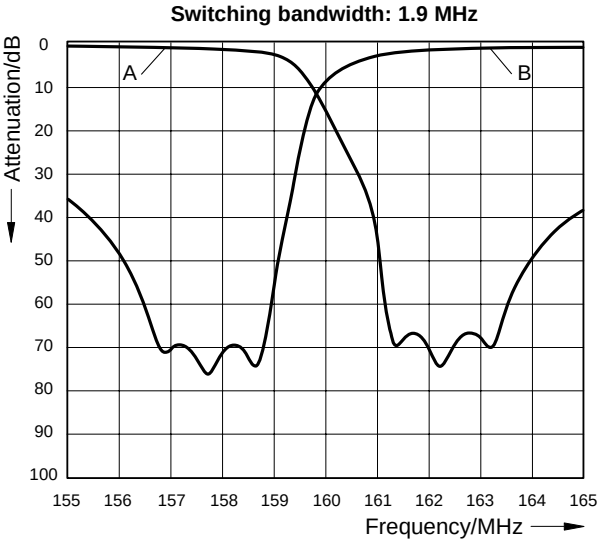


Duplexer 718 388

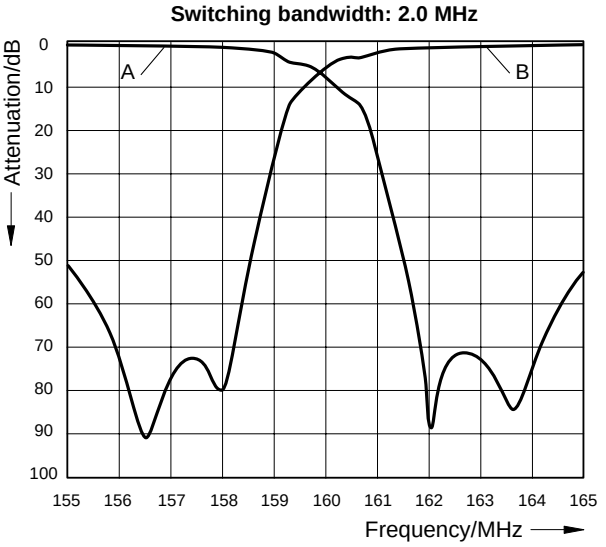
Duplex spacing: 4.6 MHz
Switching bandwidth: 0.5 MHz



Duplex spacing: 4.6 MHz
Switching bandwidth: 1.9 MHz



Duplex spacing: 6.0 MHz
Switching bandwidth: 2.0 MHz



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

Duplexer
146 … 174 MHz

KATHREIN
Antennen · Electronic

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

It can also be used to combine two transmitters to a common transmitting 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 transmitters to be operated in either the low band or the high band or in both bands together.

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.

720 642

720 877

Technical Data

Type No.	**720 642**					**720 877**				
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, silver-plated									
Material	S-P resonators: Brass, silver-plated / copper, silver-plated; cable: RG 223/U									
Installation	With 4 screws (max. 5 mm diameter)									
Weight	3.0 kg					3.5 kg				
Packing size	450 mm x 130 mm x 330 mm					530 mm x 130 mm x 330 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 low band *or* high band respectively the summ of the input powers low band *and* high band.

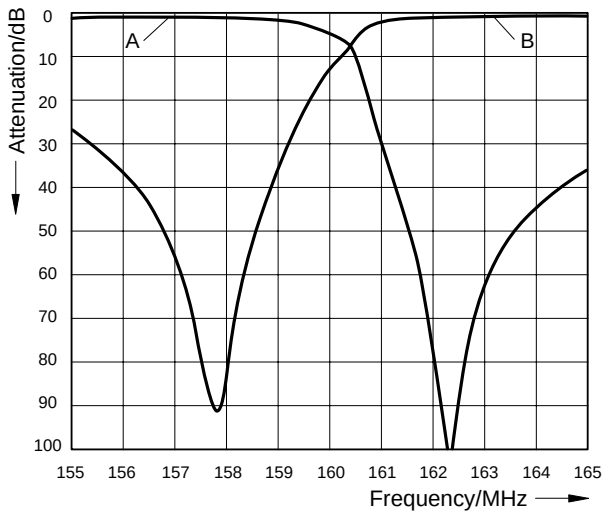
Duplexer
146 … 174 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

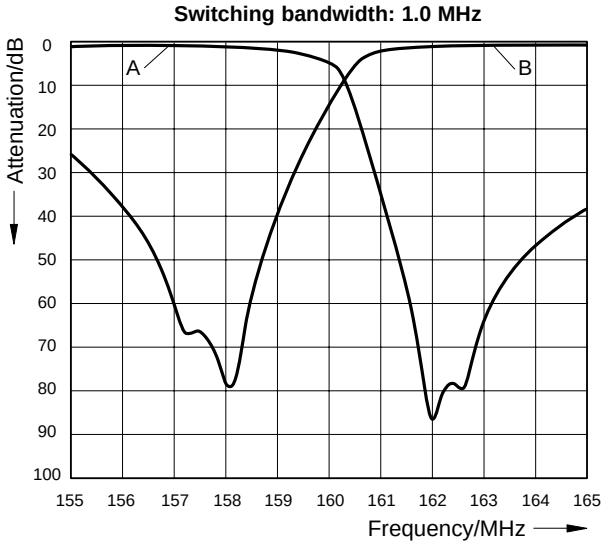
Tuning examples:

Duplexer 720 642

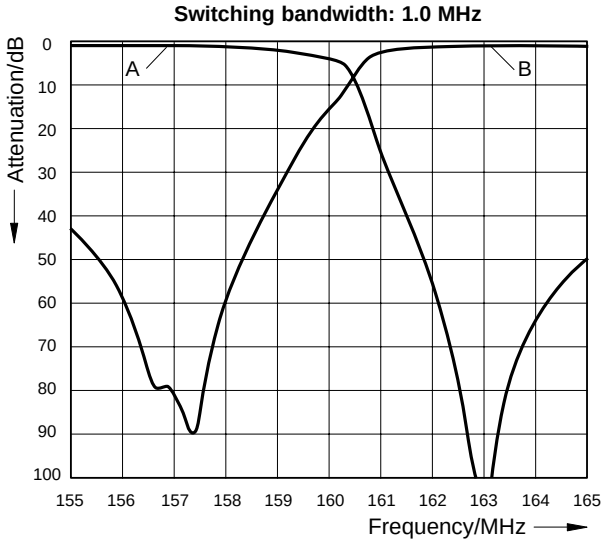
Duplex spacing: 4.6 MHz
Switching bandwidth: 0.1 MHz



Duplex spacing: 4.6 MHz
Switching bandwidth: 1.0 MHz

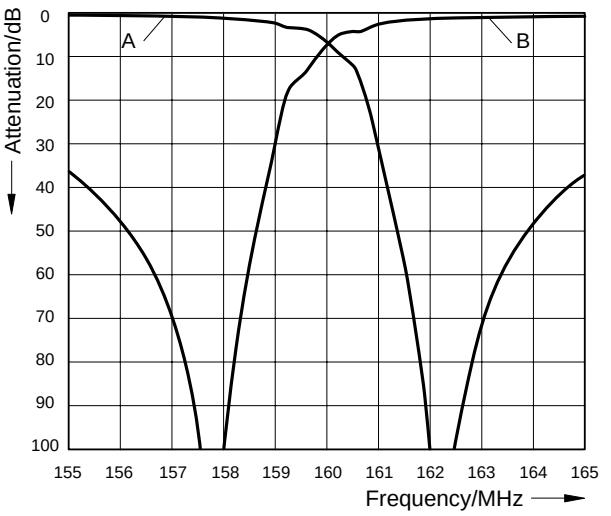


Duplex spacing: 6.0 MHz
Switching bandwidth: 1.0 MHz

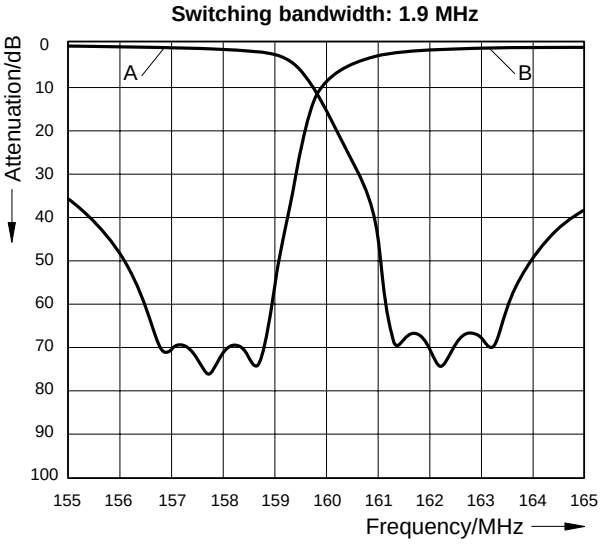


Duplexer 720 877

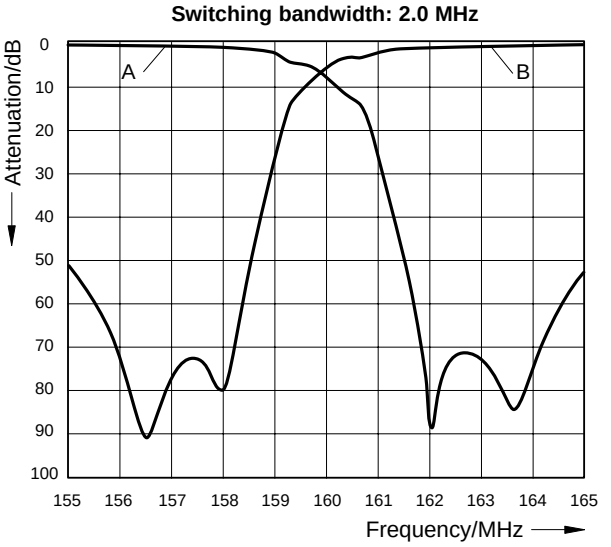
Duplex spacing: 4.6 MHz
Switching bandwidth: 0.5 MHz



Duplex spacing: 4.6 MHz
Switching bandwidth: 1.9 MHz



Duplex spacing: 6.0 MHz
Switching bandwidth: 2.0 MHz



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

Duplexer
146 ... 174 MHz

KATHREIN
Antennen · Electronic

The duplexer is suited to combine **one or several** transmitters with **one or several** receivers to a common antenna. It can also be used to combine two transmitters to a common transmitting 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 S-P filters are designed to allow the transmitters to be operated in either the low band or the high band or in both bands together.

Tuning:
The duplexer is tuned to the desired pass band frequencies 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.

792 978
792 979

Technical Data

Type No.	**792 978: Frequency range 146 ... 164 MHz** **792 979: Frequency range 156 ... 174 MHz**			
	Tuning examples			
Duplex spacing	**4.6 MHz**		**1.5 MHz**	
Switching bandwidth	**< 1.5 MHz**	**< 0.05 MHz**	**< 0.5 MHz**	**< 0.05 MHz**
Insertion loss	< 1.0 dB	< 0.7 dB	< 2.0 dB	< 1.5 dB
Isolation	> 80 dB	> 90 dB	> 60 dB	> 65 dB
VSWR	< 1.4 (at operating frequency)			
Impedance	50 Ω			
Input power [1)]	< 300 W		< 100 W	
Temperature range	–20 … +50 °C			
Material	Duplexer: Brass, silver-plated and varnished (RAL 7032) Drawer: Aluminium Front panel: Aluminium, varnished, grey (RAL 7032)			
Connectors	N female, silver-plated			
Weight	6.7 kg			
Packing size	540 mm x 192 mm x 520 mm		540 mm x 192 mm x 520 mm	
Dimensions	19″ drawer with 2 height units with a plug-in depth of 380 mm			

[1)] Input power low band *or* high band or the summ of the input powers low band *and* high band.

Duplexer
146 ... 174 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

Tuning example:

792 979
Duplex spacing: 4.6 MHz
Switching bandwidth: 1.5 MHz

Diagram I:

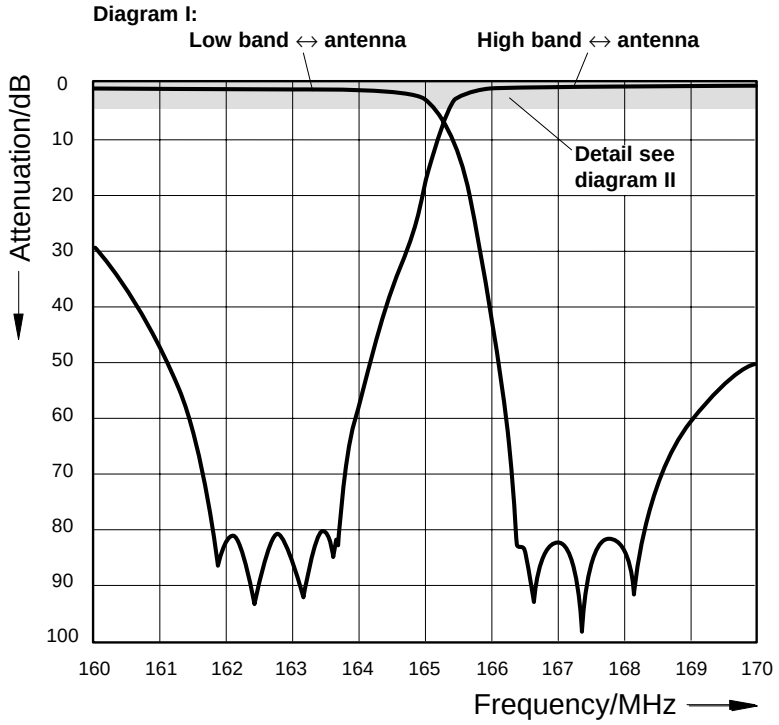
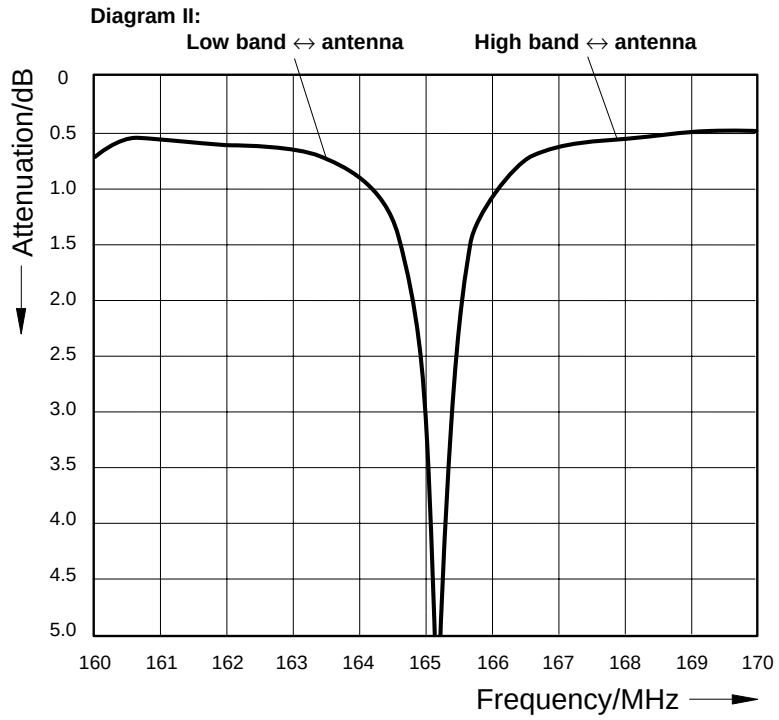


Diagram II:



Duplexer
146 … 174 MHz

KATHREIN
Antennen · Electronic

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.

K 64 41 23

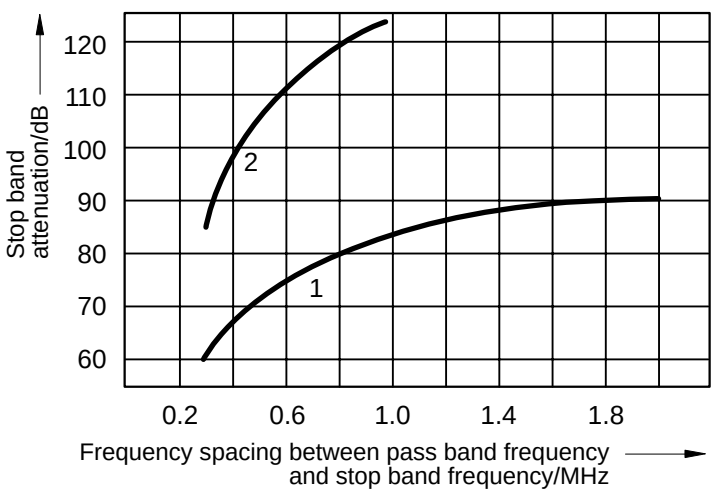
Technical Data

Type No.	K 64 41 23	K 64 41 24
Number of resonators	4	6
Frequency range	146 … 174 MHz	
Insertion loss	1.0 ±0.2 dB	1.5 dB ±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 865 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
Typical attenuation curves

KATHREIN
Antennen · Electronic

Number of resonators	Curve	Insertion loss	Type No.
4	1	1.0 dB	**K 64 41 23**
6	2	1.5 dB	**K 64 41 24**



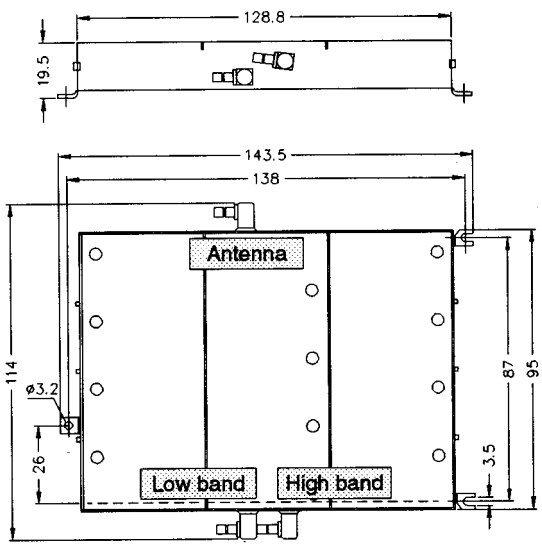
Duplexer
380 … 470 MHz

KATHREIN
Antennen · Electronic

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

Tuning:
The duplexer is tuneable within the specified frequency range.
When ordering please note the desired low **and** high band frequencies.
The duplexer can be tuned on site using the instructions available on request.



Technical Data

Type No.	791 255			
Number of resonators	4 + 4			
Frequency range	380 … 470 MHz			
Duplex spacing	10 MHz		8 MHz	
Switching bandwidth	< 1.0 MHz	< 0.5 MHz	< 1.0 MHz	< 0.5 MHz
Insertion loss [1]	< 1.8 dB	< 1.6 dB	< 2.3 dB	< 2.0 dB
Isolation [2]	> 65 dB	> 65 dB	> 60 dB	> 65 dB
VSWR	< 1.4			
Impedance	50 Ω			
Input power [3]	< 15 W		< 10 W	
Temperature range	–20 … +50 °C			
Connectors	SMB male, angled			
Material	Brass, silver-plated			
Installation	With 3 screws (max. 3 mm diameter)			
Weight	0.25 kg			
Packing size	150 mm x 30 mm x 120 mm			
Dimensions (w x h x d)	144 mm x 20 mm x 114 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
Antennen · Electronic

Tuning examples:

Duplex spacing: 10 MHz

Diagram I:

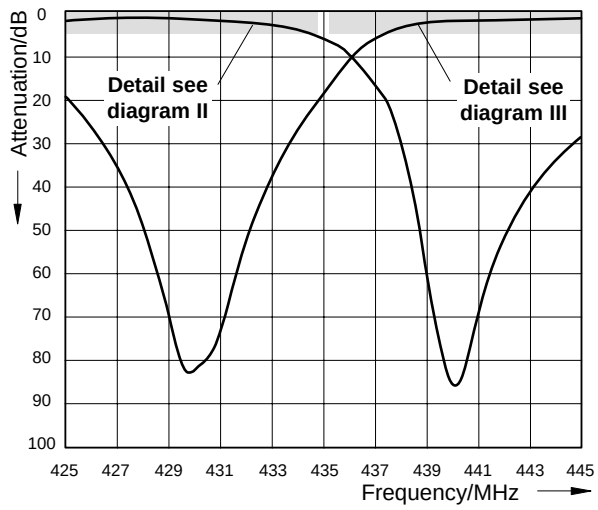


Diagram II: (Low band → Antenna)

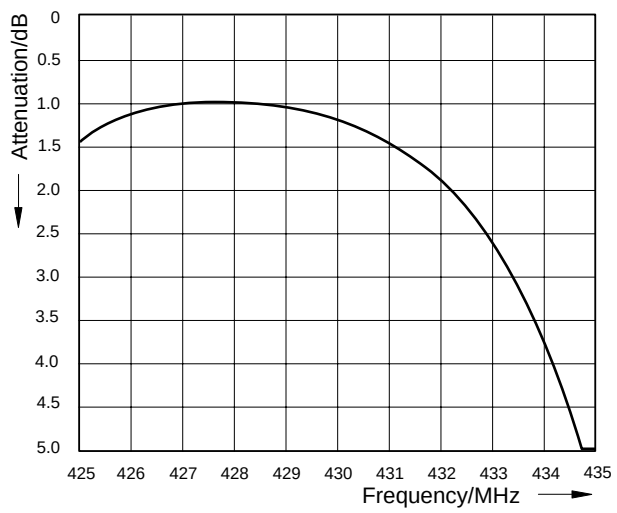
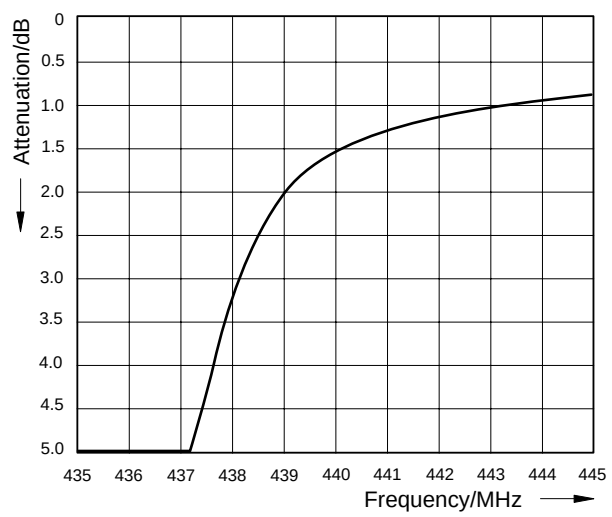


Diagram III: (High band → Antenna)



Duplexer
380 … 470 MHz

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Antennen · Electronic

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

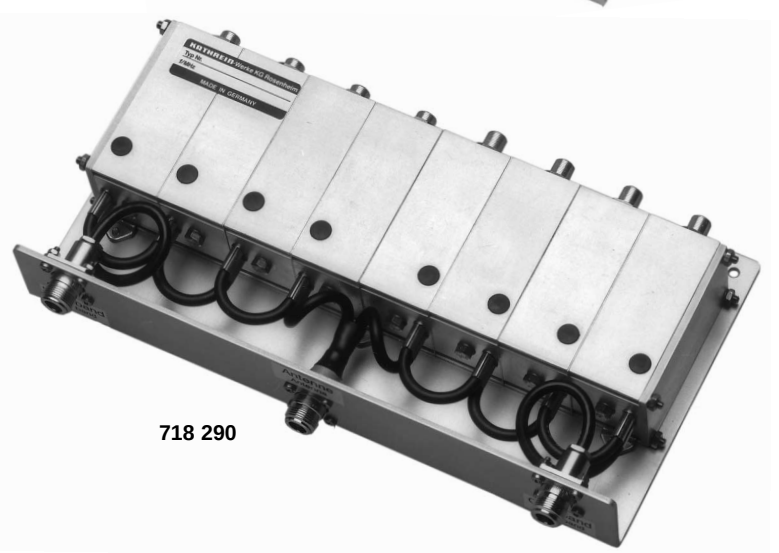
Design and construction:
The duplexer consists of a 3-cavity or 4-cavity S-P filter (Stop-Pass filter) for the low band and a 3-cavity or 4-cavity S-P filter for the high band. The two S-P filters are interconnected to a common antenna output using cables of defined electrical lengths.

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.

719 785



718 290

Technical Data

Type No.	719 785					718 290					
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

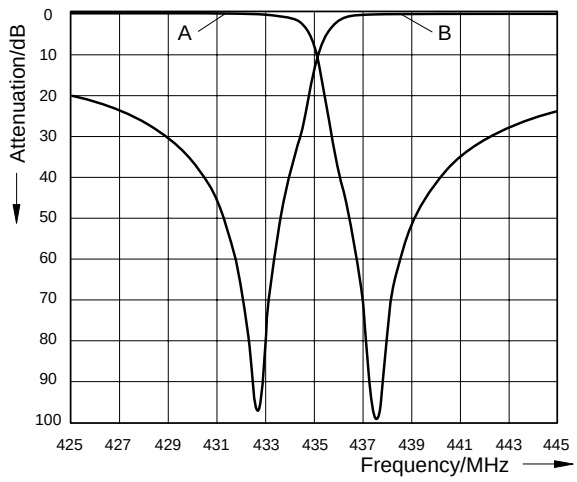
Duplexer
380 … 470 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

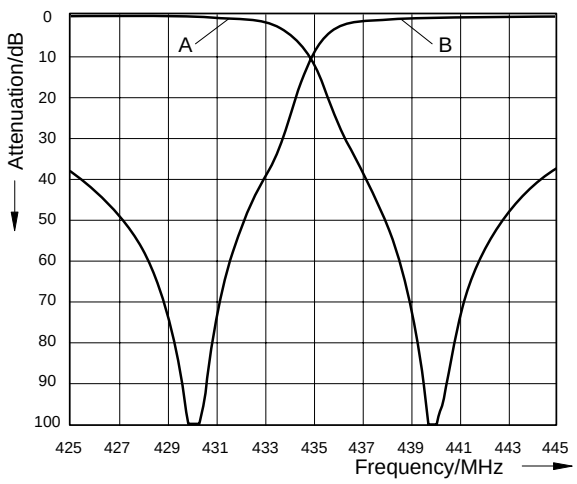
Tuning examples:

Duplexer 719 785

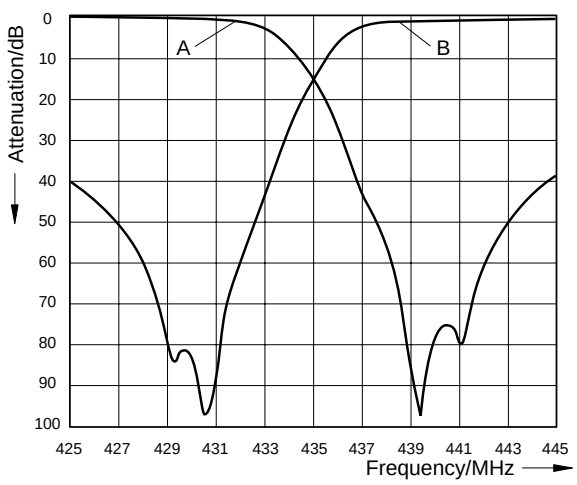
Duplex spacing : 5 MHz
Switching bandwidth: 0.5 MHz



Duplex spacing : 10 MHz
Switching bandwidth: 1.0 MHz

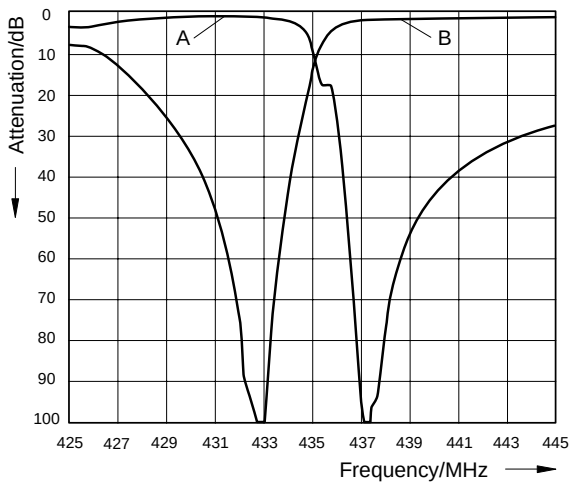


Duplex spacing : 10 MHz
Switching bandwidth: 2.0 MHz

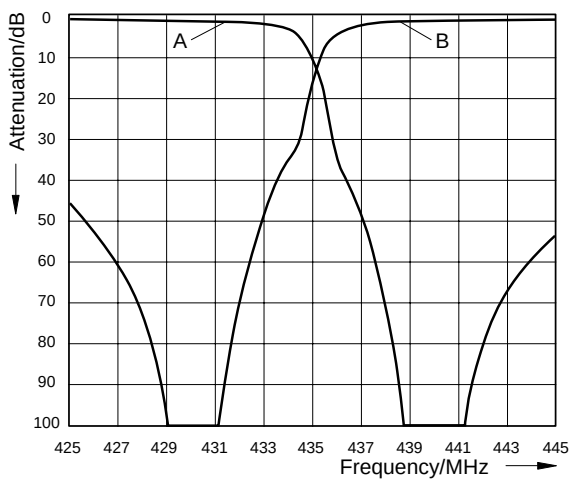


Duplexer 718 290

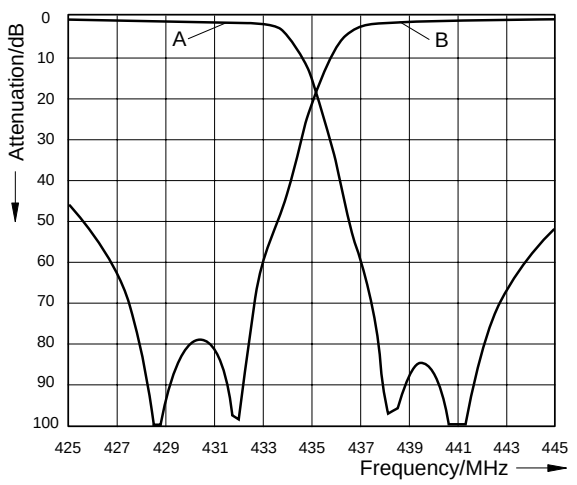
Duplex spacing : 5 MHz
Switching bandwidth: 1.0 MHz



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
Antennen · Electronic

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

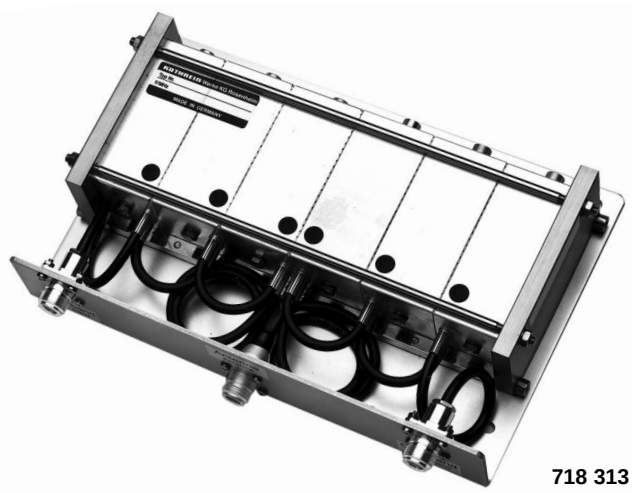
It can also be used to combine two transmitters to a common antenna.

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.

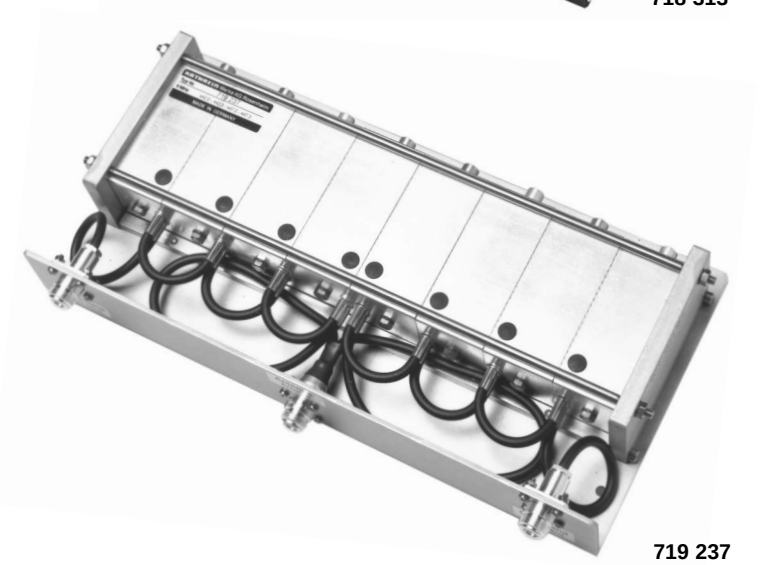
The S-P filters are designed to allow the transmitter to be operated in the low band or the high band.

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.



718 313



719 237

Technical Data

Type No.	718 313					719 237					
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.

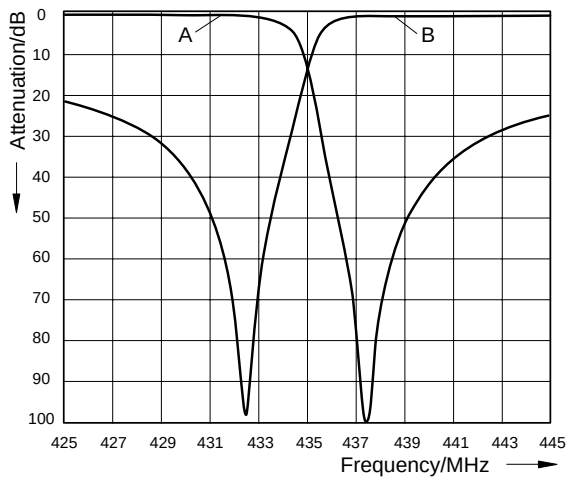
Duplexer
380 … 470 MHz
Typical attenuation curves

KATHREIN
Antennen · Electronic

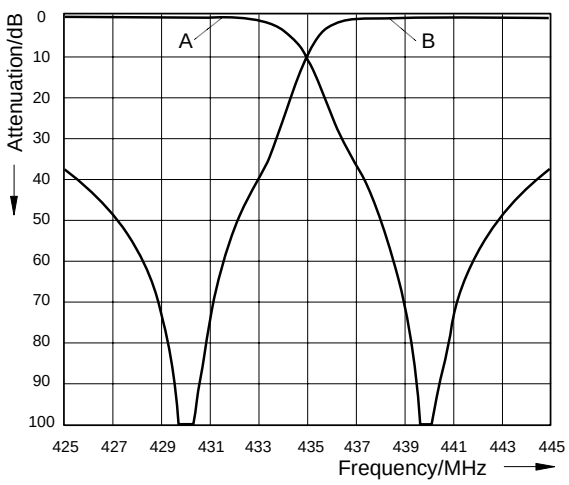
Tuning examples:

Duplexer 718 313

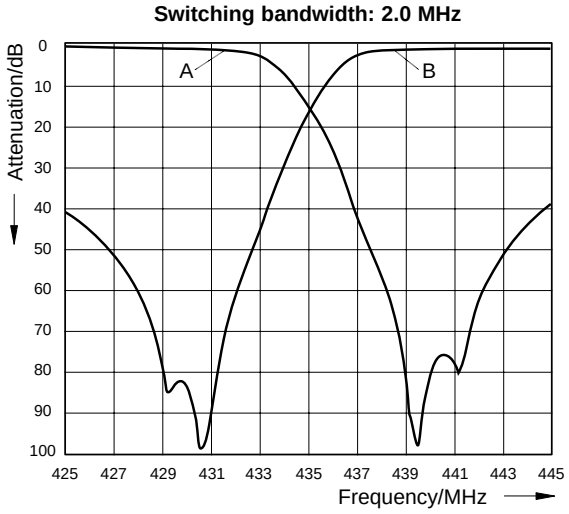
Duplex spacing : 5 MHz
Switching bandwidth: 0.5 MHz



Duplex spacing : 10 MHz
Switching bandwidth: 1.0 MHz

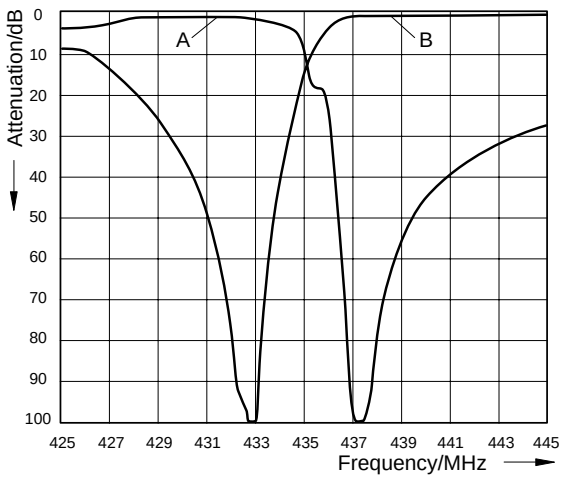


Duplex spacing : 10 MHz
Switching bandwidth: 2.0 MHz

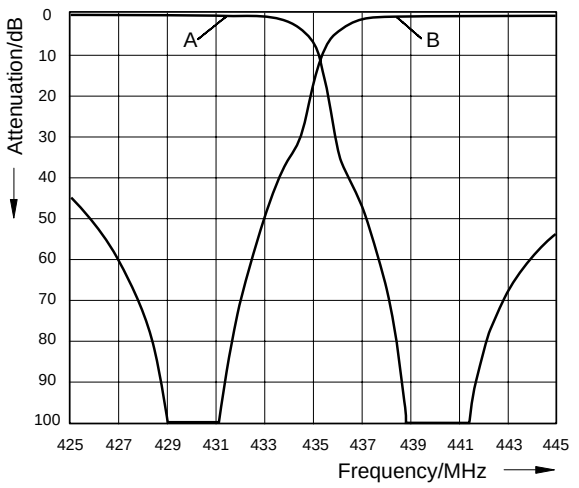


Duplexer 719 237

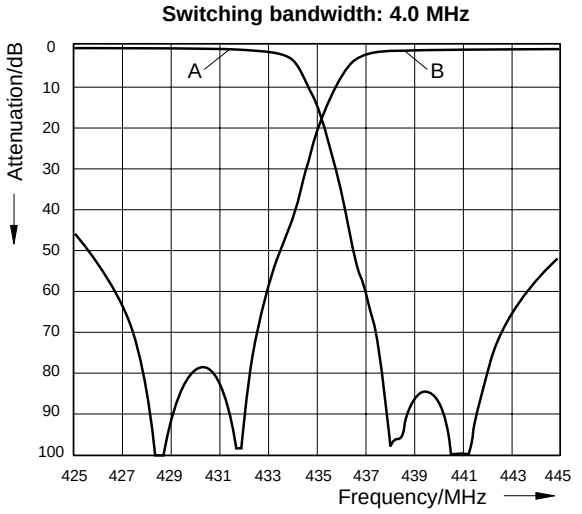
Duplex spacing : 5 MHz
Switching bandwidth: 1.0 MHz



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)

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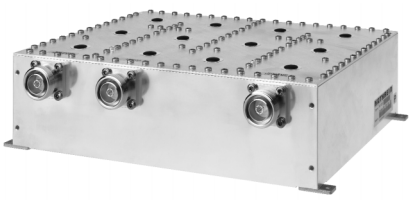
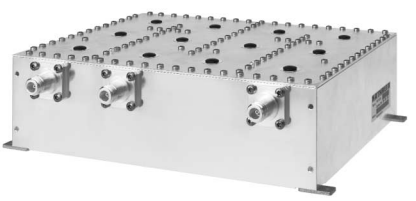
The Duplexer is designed to combine/split TETRA or TETRAPOL Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

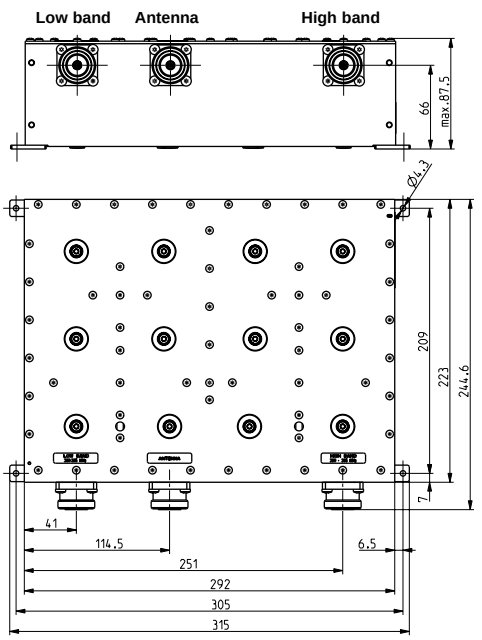
- Suitable for indoor applications
- Built-in DC stop
- 19˝ drawers available as accessories

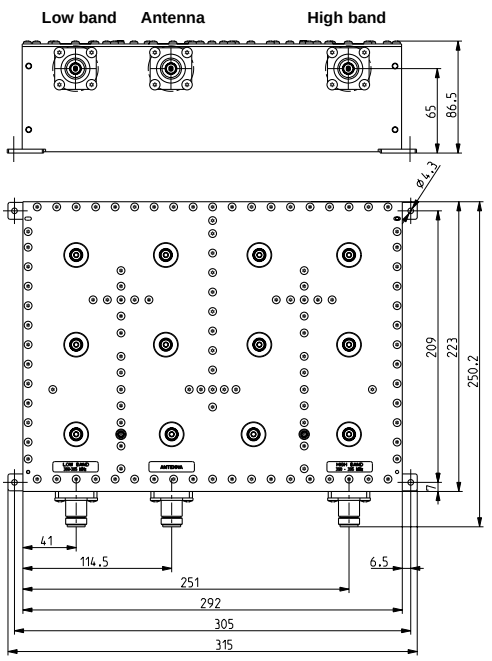
782 10361
782 10362
782 10363



782 10371
782 10372
782 10373







Technical Data

Type No. 7-16 female / N female	782 10361 782 10371	782 10362 782 10372	782 10363 782 10373
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)
Impedance	50 Ω		
Input power	< 200 W (low band *or* high band)		
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. 4 mm diameter)		
Weight	5.5 kg		
Packing size	409 x 378 x 152 mm		
Dimensions (w x h x d)	782 10361, 782 10362, 782 10363: 315 x 87.5 x 244.6 mm (including connectors and mounting feet) 782 10371, 782 10372, 782 10373: 315 x 86.5 x 250.2 mm (including connectors and mounting feet)		

Duplexer

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

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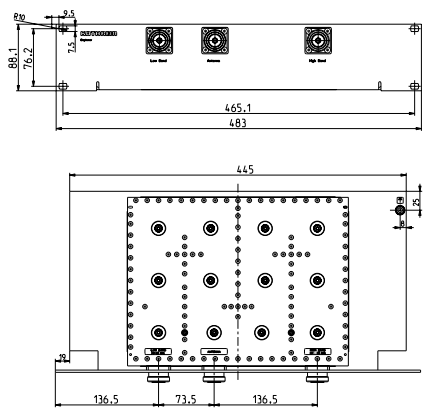
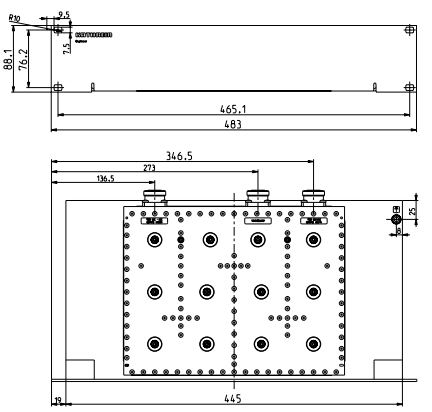
Accessories (order separately)

Type No.	**782 10370** **19˝ drawer**	**782 10380** **19˝ drawer**
Application	Suitable for duplexers 782 10361, 782 10362, 782 10363, 782 10371, 782 10372, 782 10373 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**	
Mounting example		

Typical Attenuation Curves

782 10361 / 782 10371

Diagram I

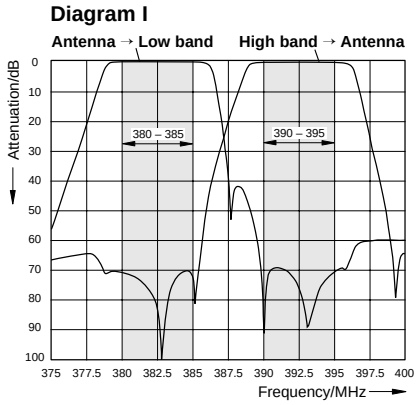
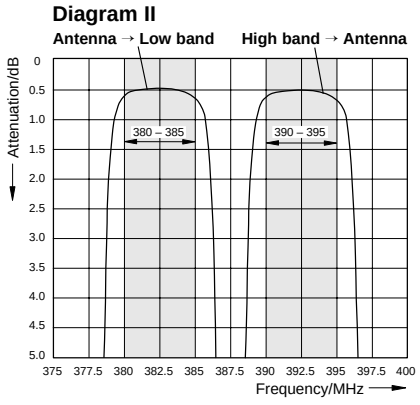


Diagram II



782 10362 / 782 10372

Diagram I

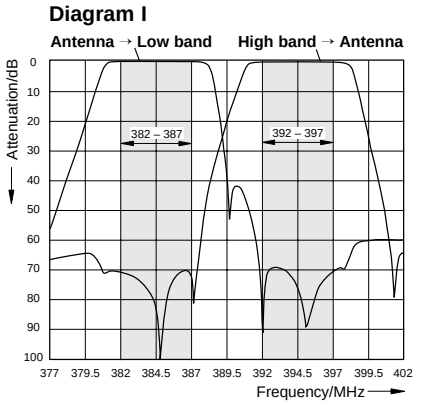
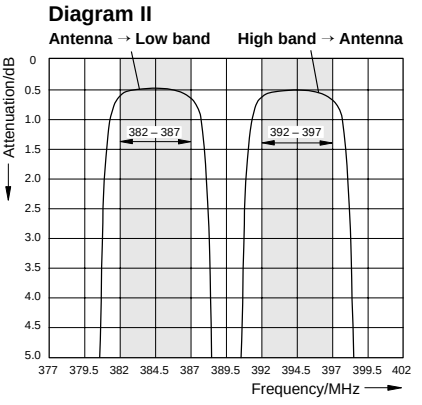


Diagram II



782 10363 / 782 10373

Diagram I

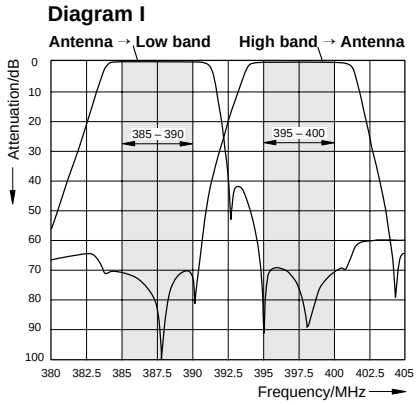
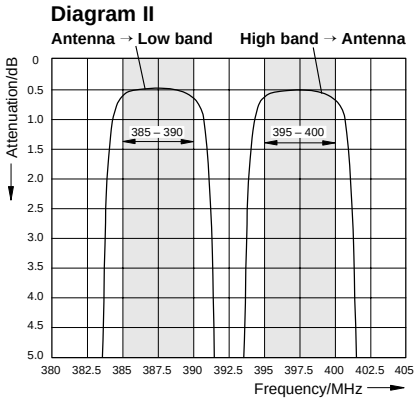


Diagram II



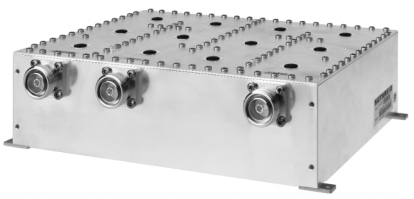
Duplexer
410 – 415 / 420 – 425 MHz (TETRA, TETRAPOL)
415 – 420 / 425 – 430 MHz (TETRA, TETRAPOL)

KATHREIN
Antennen · Electronic

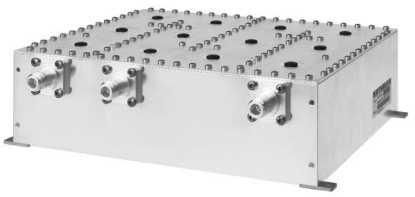
The Duplexer is designed to combine/split TETRA or TETRAPOL Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

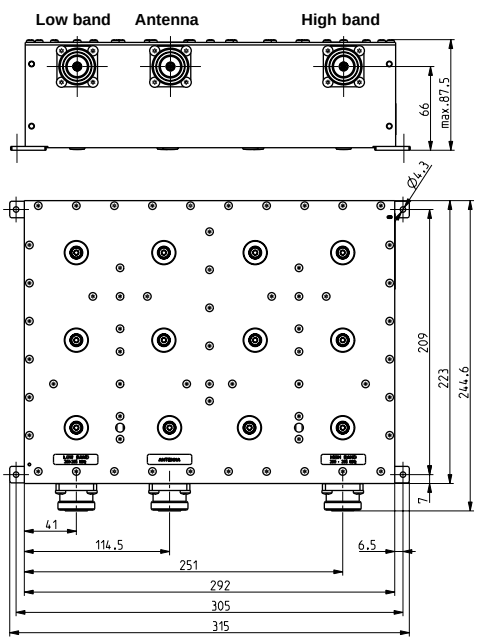
- Suitable for indoor applications
- Built-in DC stop
- 19˝ drawers available as accessories

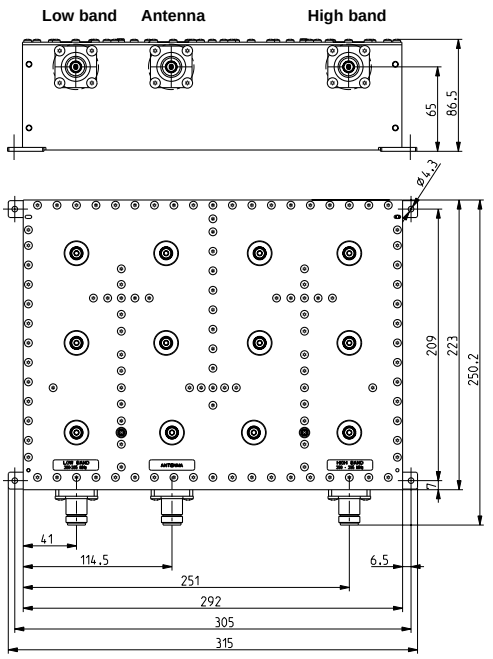
782 10364
782 10365



782 10374
782 10375







Technical Data

Type No. 7-16 female / N female	782 10364 / 782 10374	782 10365 / 782 10375
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)	
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. 4 mm diameter)	
Weight	5.5 kg	
Packing size	409 x 378 x 152 mm	
Dimensions (w x h x d)	782 10364 / 782 10365: 315 x 87.5 x 244.6 mm (including connectors and mounting feet) 782 10374 / 782 10375: 315 x 86.5 x 250.2 mm (including connectors and mounting feet)	

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

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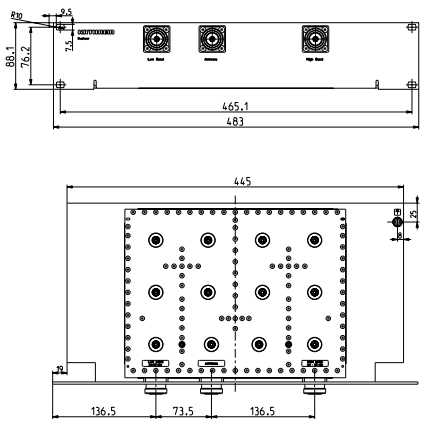
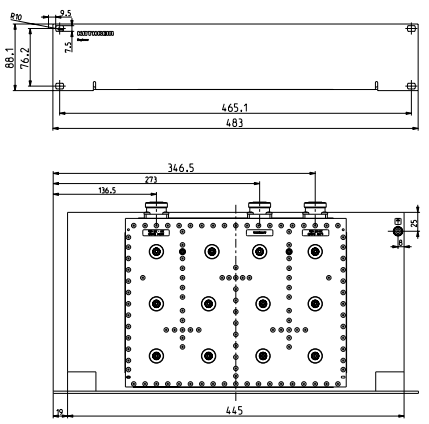
Antennen · Electronic

Accessories (order separately)

Type No.	**782 10370** **19˝ drawer**	**782 10380** **19˝ drawer**
Application	Suitable for duplexers 782 10364, 782 10365, 782 10374, 782 10375 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**	
Mounting example		

Typical Attenuation Curves

782 10364 / 782 10374

Diagram I

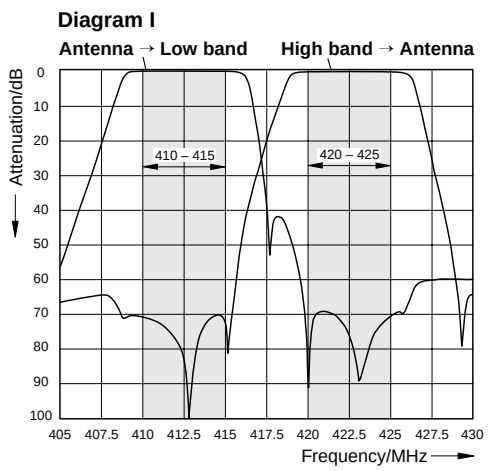
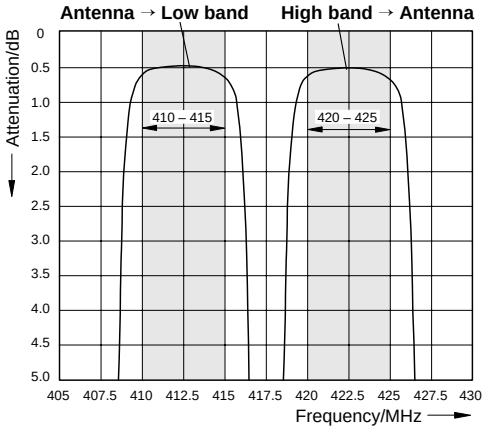


Diagram II



782 10365 / 782 10375

Diagram I

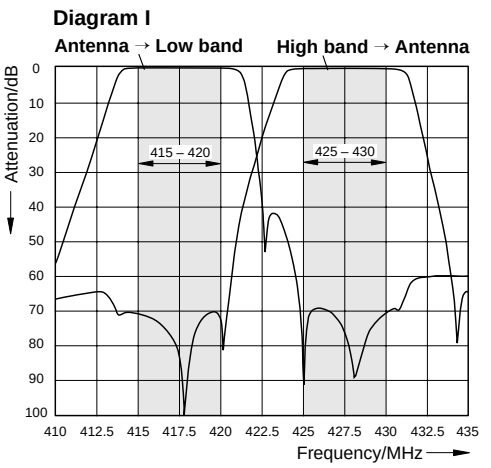
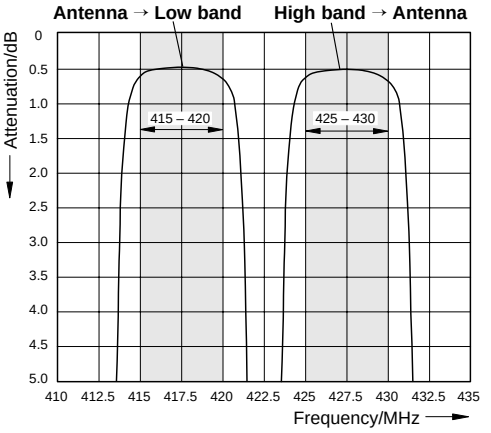


Diagram II



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

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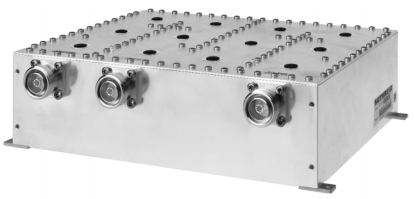
Antennen · Electronic

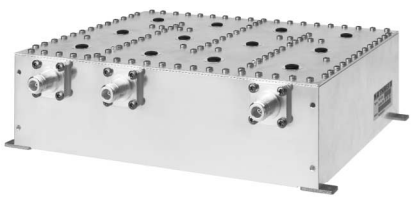
The Duplexer is designed to combine/split TETRA or TETRAPOL Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

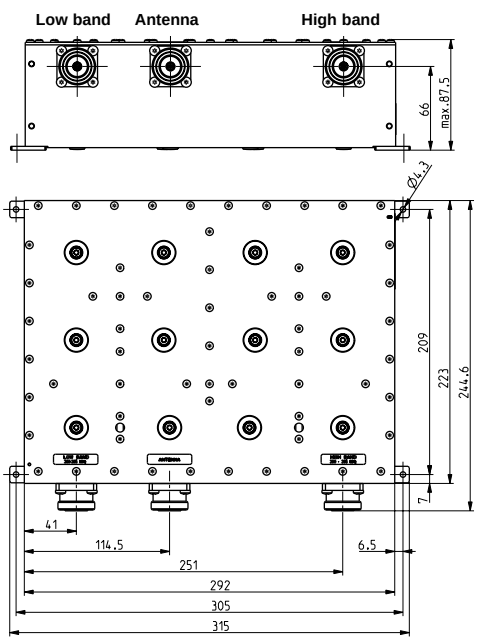
- Suitable for indoor applications
- Built-in DC stop
- 19˝ drawers available as accessories

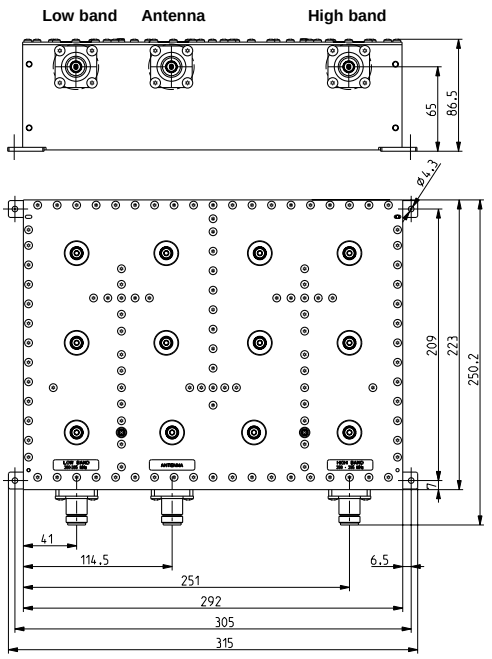
782 10366
782 10367



782 10376
782 10377







Technical Data

Type No. 7-16 female / N female	782 10366 / 782 10376	782 10367 / 782 10377
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)	
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. 4 mm diameter)	
Weight	5.5 kg	
Packing size	409 x 378 x 152 mm	
Dimensions (w x h x d)	782 10366 / 782 10367: 315 x 87.5 x 244.6 mm (including connectors and mounting feet) 782 10376 / 782 10377: 315 x 86.5 x 250.2 mm (including connectors and mounting feet)	

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

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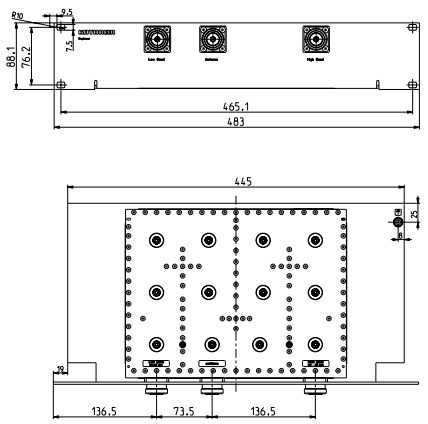
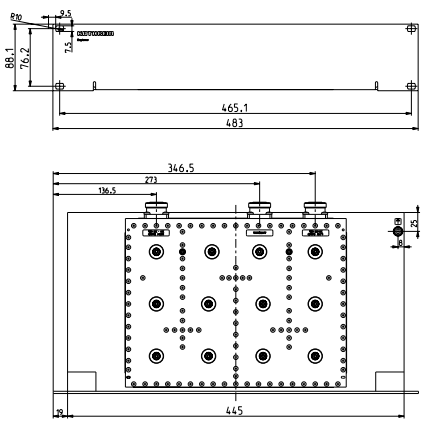
Accessories (order separately)

Type No.	**782 10370** **19˝ drawer**	**782 10380** **19˝ drawer**
Application	Suitable for duplexers 782 10366, 782 10367, 782 10376, 782 10377 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**	
Mounting example		

Typical Attenuation Curves

782 10366 / 782 10376

Diagram I

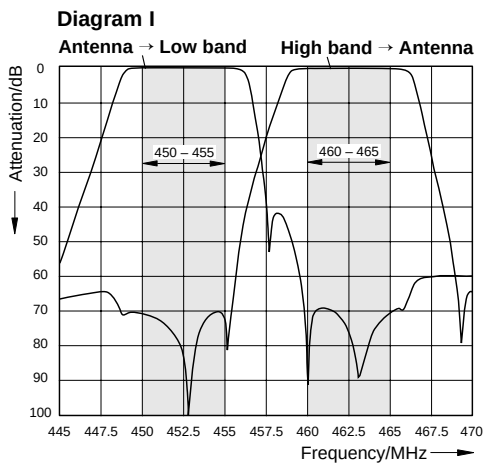
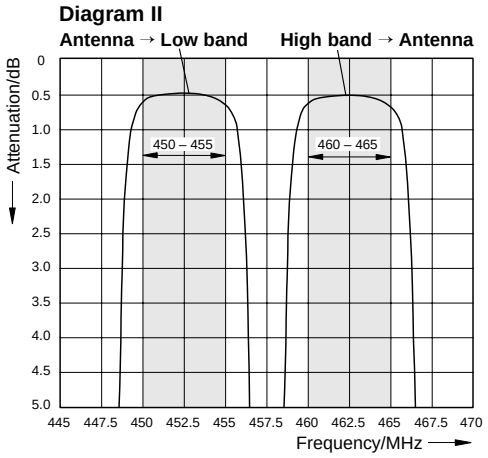


Diagram II



782 10367 / 782 10377

Diagram I

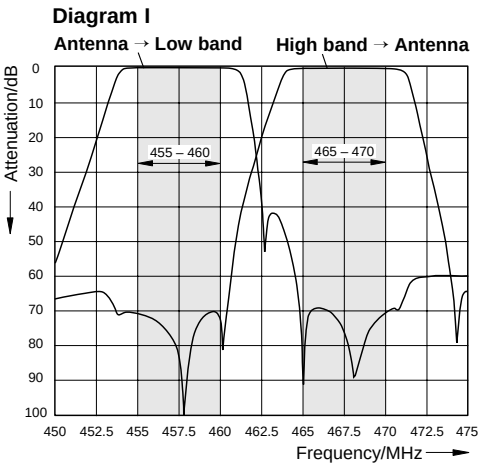
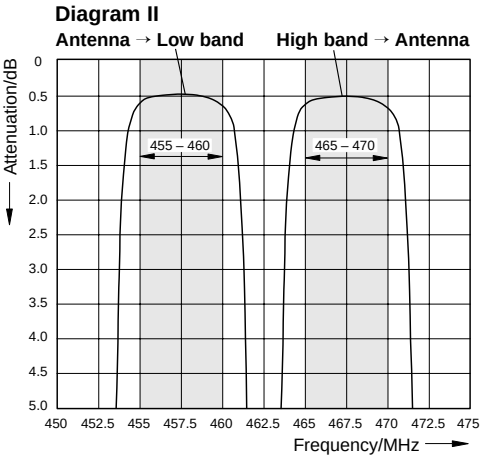


Diagram II



Duplexer
380 … 470 MHz

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Antennen · Electronic

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.

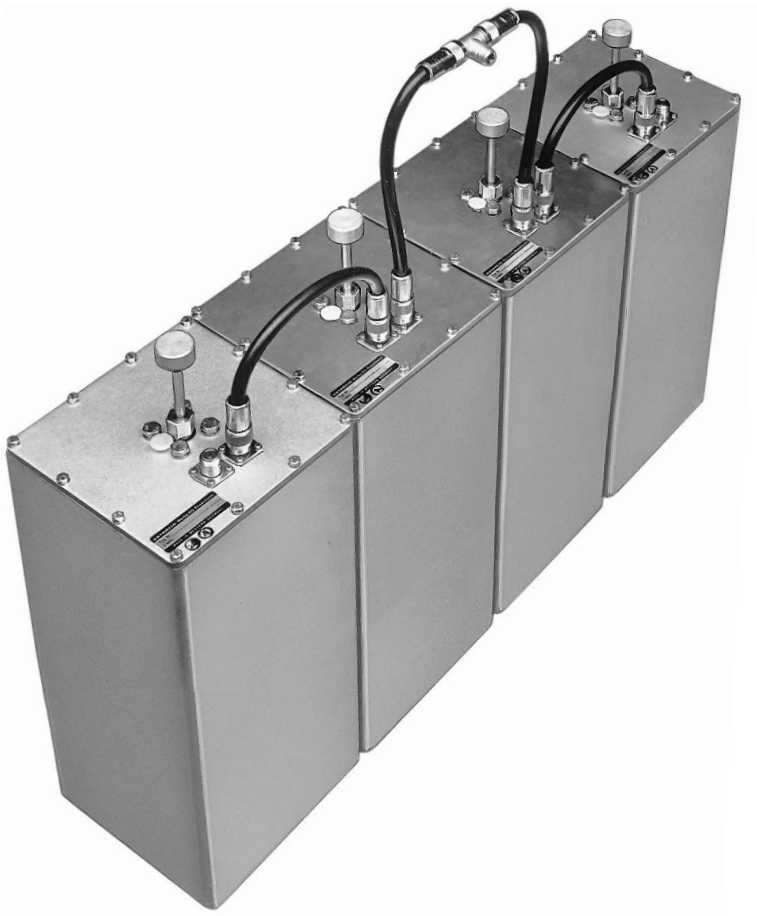
Tuning:
The stop band attenuation is dependent on the frequency spacing and the number of S-P filters. The stop band attenuation for four or six S-P filters can be read from the diagram.

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 K 65 41 25

Technical Data

Type No.	K 65 41 25	K 65 41 26
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	

Duplexer
380 … 470 MHz
Typical attenuation curves

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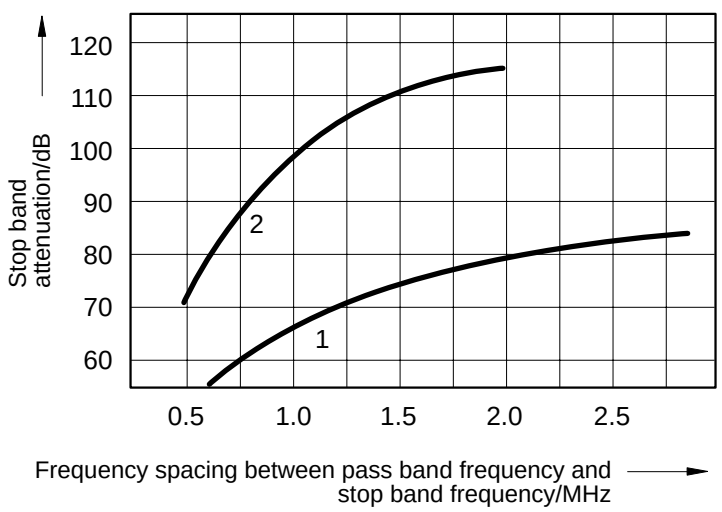
Tuning examples:

Number of resonators	Curve	Insertion loss	Type No.
4	1	1.0 dB	**K 65 41 25**
6	2	1.5 dB	**K 65 41 26**



Multiband Combiners and Transmitter Combiners

Filter Transmitter Combiners
Hybrid Transmitter Combiners
Multiband Combiners

Multiband Combiners and Transmitter Combiners:

Description	Type No.	Frequency range ... tunable bandwidth – fixed bandwidth (not tunable)	Max. input power	Page
Filter Transmitter Combiner	792 100	146 ... 174 MHz	100 W	98
Filter Transmitter Combiner	792 101	146 ... 174 MHz	100 W	98
Filter Transmitter Combiner	792 102	146 ... 174 MHz	100 W	98
Filter Transmitter Combiner	793 205	146 ... 174 MHz	100 W	98
Filter Transmitter Combiner	793 206	146 ... 174 MHz	100 W	98
Filter Transmitter Combiner	790 044	420 ... 430 MHz	50 W	99
Filter Transmitter Combiner	790 594	460 ... 470 MHz	100 W	99
Hybrid Transmitter Combiner, 2 inputs	793 297	74 – 87 MHz	25 W	100
Hybrid Transmitter Combiner, 2 inputs	793 299	74 – 87 MHz	50 W	100
Hybrid Transmitter Combiner, 3 inputs	793 306	74 – 87 MHz	50 W	100
Hybrid Transmitter Combiner, 4 inputs	793 308	74 – 87 MHz	50 W	100
Hybrid Transmitter Combiner, 2 inputs	792 059	146 – 174 MHz	25 W	102
Hybrid Transmitter Combiner, 2 inputs	792 061	146 – 174 MHz	100 W	102
Hybrid Transmitter Combiner, 3 inputs	792 064	146 – 174 MHz	100 W	102
Hybrid Transmitter Combiner, 4 inputs	792 067	146 – 174 MHz	100 W	102
Hybrid Transmitter Combiner, 2 inputs	784 10168	380 – 430 MHz	25 W	104
Hybrid Transmitter Combiner, 2 inputs	784 10167	380 – 430 MHz	100 W	104
Hybrid Transmitter Combiner, 3 inputs	784 10166	380 – 430 MHz	100 W	104
Hybrid Transmitter Combiner, 4 inputs	784 10140	380 – 430 MHz	100 W	104
Hybrid Transmitter Combiner, 5 inputs	784 10165	380 – 430 MHz	100 W	104
Hybrid Transmitter Combiner, 2 inputs	791 644	400 – 470 MHz	25 W	106
Hybrid Transmitter Combiner, 2 inputs	791 646	400 – 470 MHz	100 W	106
Hybrid Transmitter Combiner, 3 inputs	791 649	400 – 470 MHz	100 W	106
Hybrid Transmitter Combiner, 4 inputs	791 652	400 – 470 MHz	100 W	106
Hybrid Transmitter Combiner, 5 inputs	784 10063	400 – 470 MHz	100 W	106
Multiband Combiner	K 64 50 4	68 – 87.5 / 146 – 174 MHz	50 W	108
Multiband Combiner	719 035	68 – 87.5 / 146 – 174 MHz	50 W	108
Multiband Combiner	719 792	68 – 108 / 146 – 174 MHz	50 W	108
Multiband Combiner	718 500	68 – 87.5 / 146 – 174 / 400 – 470 MHz	25 W	108
Multiband Combiner	721 138	68 – 174 / 380 – 470 MHz	50 W	110
Multiband Combiner	723 013	68 – 174 / 380 – 470 MHz	50 W	110
Multiband Combiner	790 244	68 – 174 / 400 – 470 MHz	50 W	110
Multiband Combiner	790 957	68 – 174 / 400 – 470 MHz	50 W	110
Multiband Combiner	728 954	68 – 470 / 870 – 970 MHz	50 W	111
Multiband Combiner	791 463	68 – 470 / 870 – 970 MHz	50 W	111
Multiband Combiner	722 437	68 – 470 MHz / 870 – 970 MHz	500 W	111
Multiband Combiner	722 440	68 – 470 MHz / 870 – 970 MHz	500 W	111
Dual-Band Combiner	782 10369	380 – 400 / 410 – 430 MHz	200 W	112
Dual-Band Combiner	782 10460	50 – 470 / 806 – 2500 MHz	500 W	113

Filter Transmitter Combiner with 2, 3, 4, 5 or 6 Inputs 146 … 174 MHz

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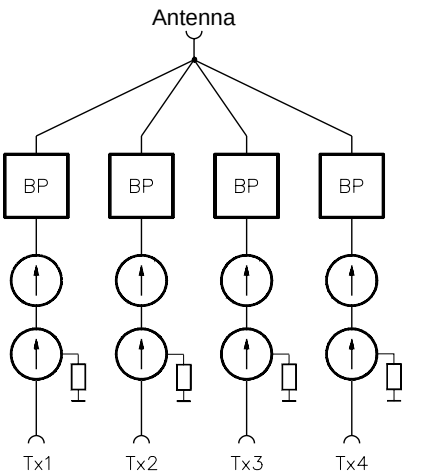
This filter transmitter combiner allows several transmitters to be combined to one common antenna.

Design and construction:
Each filter transmitter combiner consists of one 1-cavity band-pass filter and one double circulator per channel. The filter outputs are combined via defined cable lengths to one common point (star-point).

Tuning:
The band-passes must be tuned to the individual operating channels concerned. This tuning process can either be performed at our factory (in this case, please specify the relevant operating channels when ordering) or it can be carried out on site.



BP band-pass filter
↑ circulator
Tx1 ... Tx4 transmitter 1 ... transmitter 4

Filter Transmitter Combiner 792 102

793 205

Technical Data

Type No.	792 100	792 101	792 102	793 205	793 206
Frequency range	146 ... 174 MHz				
Number of inputs	2	3	4	5	6
Frequency spacing	> 300 kHz				
Insertion loss at f_0	< 3.5 dB				
Isolation Tx – Tx	> 60 dB				
VSWR	< 1.25 (at operating frequency)				
Impedance	50 Ω				
Input power	100 W of each input				
Temperature range	0 … +50 °C				
Connectors	N female				
Material band-pass filter	Outer conductor: Aluminium Inner conductor: Brass, silver-plated				
Colour	Front panel: Grey (RAL 7032)				
Packing size	620 mm x 950 mm x 820 mm				
Dimensions (w x h)	19˝ drawer, 18 hu* (800 mm)				
Plug-in depth	190 mm	380 mm	380 mm	570 mm	570 mm
Weight	33 kg	46 kg	62 kg	83 kg	101 kg

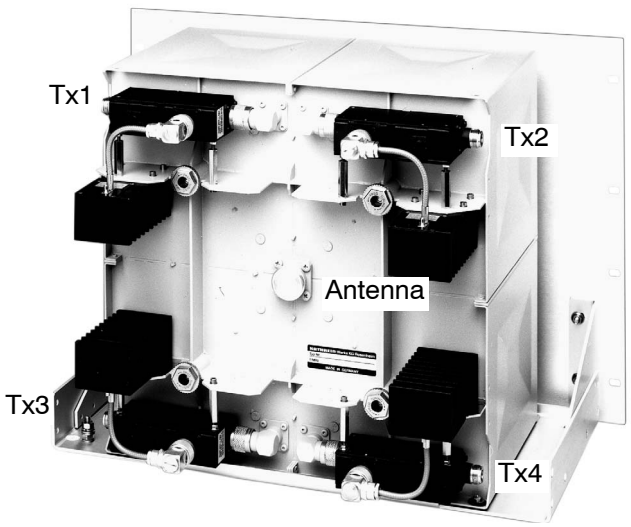
*hu = hight unit

Filter Transmitter Combiner
420 … 430 MHz
460 ... 470 MHz

KATHREIN
Antennen · Electronic

The 4-channel Transmitter Combiner is suitable for combining up to 4 transmitters to a single antenna output.

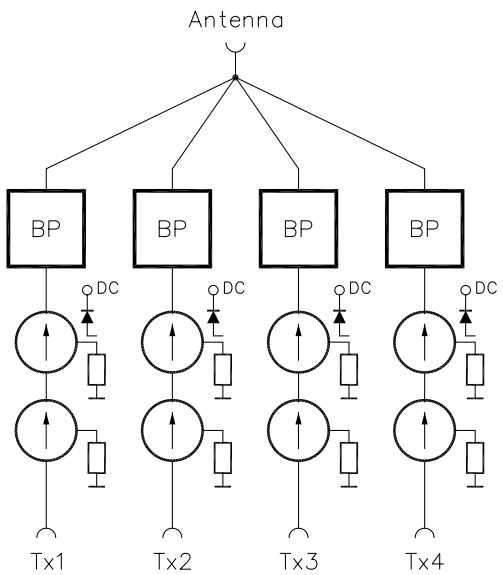
- 4 x 1-cavity high Q band-pass filters, combined in one compact unit
- 4 x double isolators, each with one internal low power 50-Ω load
- 4 x high power 50-Ω loads with integrated detectors for reflected Tx signals
- Tuning can be achieved with a Network Analyzer or with a Voltmeter by using the DC voltage signals supplied at the detector outputs
- Self-locking tuning screws
- Expansion of up to 16 channels is possible by interconnecting several 4-channel combiners with suitable starpoint cables



790 044

Technical Data

Type No.	790 044	790 594
Frequency range	420 … 430 MHz	460 ... 470 MHz
Number of channels	4	
Isolators per channel	2	
Channel spacing	> 150 kHz	
Insertion loss Tx → Antenna Channel spacing With 50 W input power With 100 W input power	 150 / 200 / 250 kHz < 4.3 / < 3.9 / < 3.6 dB < 4.5 / < 4.1 / < 3.8 dB	
Isolation Tx ↔ Tx	> 60 dB	
VSWR at Tx inputs	< 1.3	
Impedance	50 Ω	
Input power per channel	< 100 W	
Power rating of the loads	< 60 W	
Temperature range	0 … +50 °C	
Connectors Tx inputs Antenna Detector outputs (DC)	 7-16 female N female SMC male	 N female
Material	Band-pass filters: Copper / brass 19″ drawer: Aluminium	
Colour	Grey (RAL 7032)	
Weight	Approx. 22.5 kg	
Packing size	565 mm x 435 mm x 380 mm	
Dimensions (w x h x d)	19″ drawer, 8 height units, plug-in depth: 370 mm	



BP	Band-pass filter
↑	Circulator
Tx1 ... Tx4	Transmitter inputs 1 ... 4
DC	Detector outputs (DC voltage)

Expansion to ...	8-channel transmitter combiner	12-channel transmitter combiner	16-channel transmitter combiner
Insertion loss Channel spacing With 50 W input power With 100 W input power	 150 / 200 / 250 kHz < 4.7 / < 4.3 / < 4.0 dB < 4.9 / < 4.5 / < 4.2 dB	 150 / 200 / 250 kHz < 5.5 / < 5.1 / < 4.8 dB < 5.7 / < 5.3 / < 5.0 dB	 150 / 200 / 250 kHz < 5.7 / < 5.3 / < 5.0 dB < 5.9 / < 5.5 / < 5.2 dB

Hybrid Transmitter Combiner
74 – 87 MHz

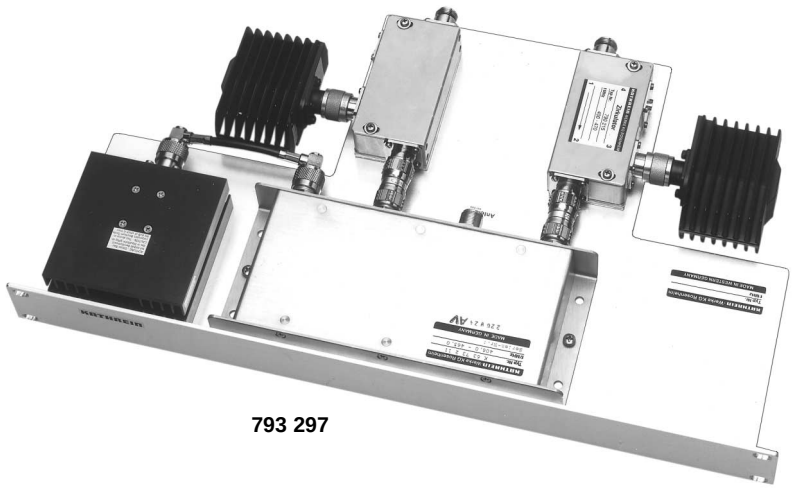
KATHREIN
Antennen · Electronic

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

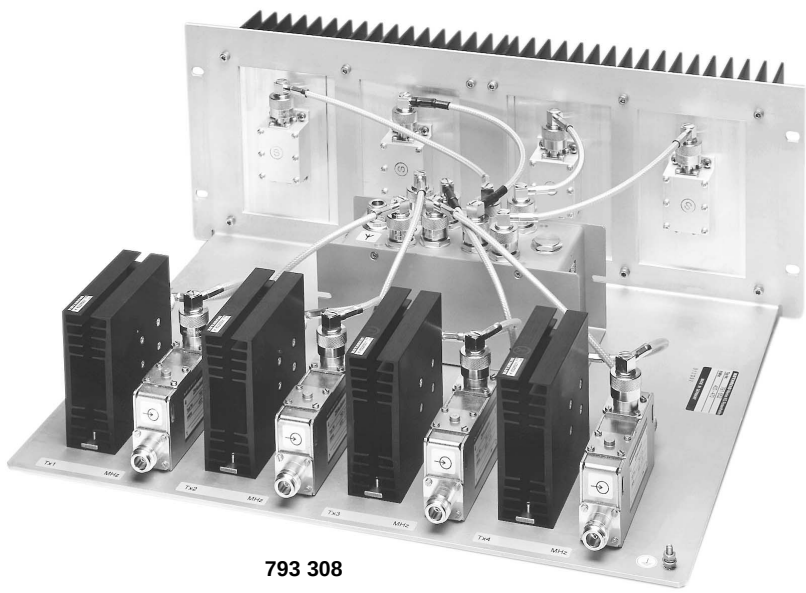
Special features:
– very small spacing of the transmitting frequencies, down to adjacent channel spacing,
– variable transmitter frequencies,
– small dimensions.

Design and construction:
The hybrid transmitter combiner has two, three or four inputs and one output.
For combining transmitters a hybrid ring junction or a decoupled power splitter is used as hybrid, 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 possible total reflection occurring at the output.

Custom versions:
Custom versions are available on request:
– with single circulator instead of dual circulator, if lower isolation is sufficient,
– with a band-pass filter at the output,
– for higher power.



793 297



793 308

Technical Data

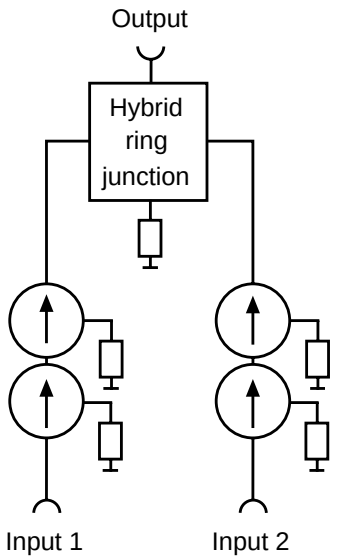
Type No.	Inputs	Insertion loss	Dimensions 19″ drawer height	Dimensions 19″ drawer plug-in depth	Input power of each input	Packing size
793 297	2	< 4.9 dB	1 hu* = 45 mm	350 mm	25 W	535 mm x 120 mm x 435 mm
793 299	2	< 4.9 dB	4 hu* = 177 mm	350 mm	50 W	535 mm x 260 mm x 490 mm
793 306	3	< 7.2 dB	4 hu* = 177 mm	350 mm	50 W	535 mm x 260 mm x 490 mm
793 308	4	< 8.4 dB	4 hu* = 177 mm	350 mm	50 W	535 mm x 260 mm x 490 mm
Frequency range			74 – 87 MHz			
Min. frequency spacing			0 MHz			
Isolation			> 60 dB			
Impedance			50 Ω			
VSWR			< 1.25			
Connectors			N female			
Colour			Front panel: Grey (RAL 7032)			

* hu = height unit

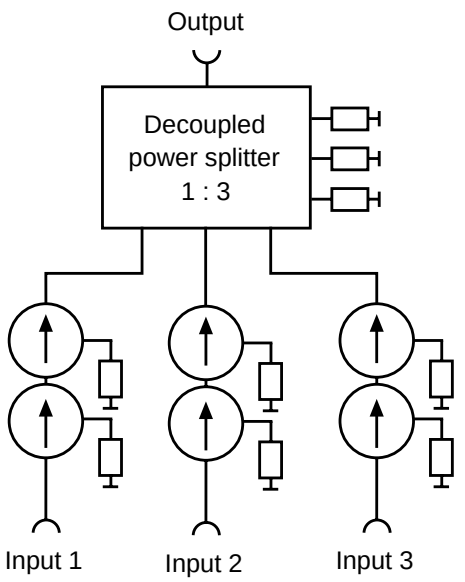
Hybrid Transmitter Combiner with 2, 3 or 4 Inputs 74 – 87 MHz

KATHREIN
Antennen · Electronic

793 297, 793 299



793 306



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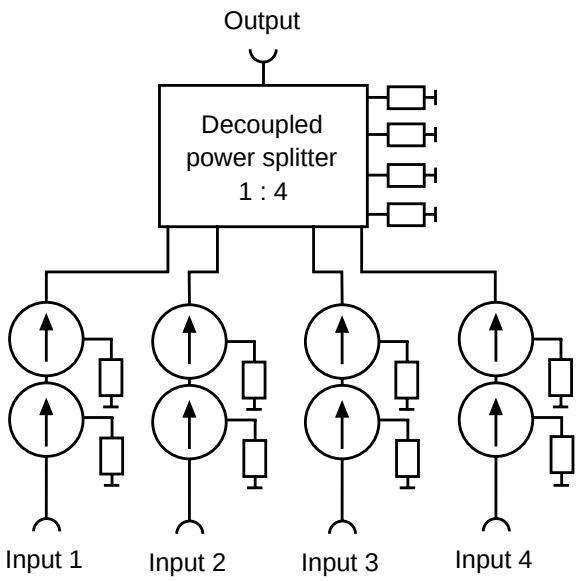


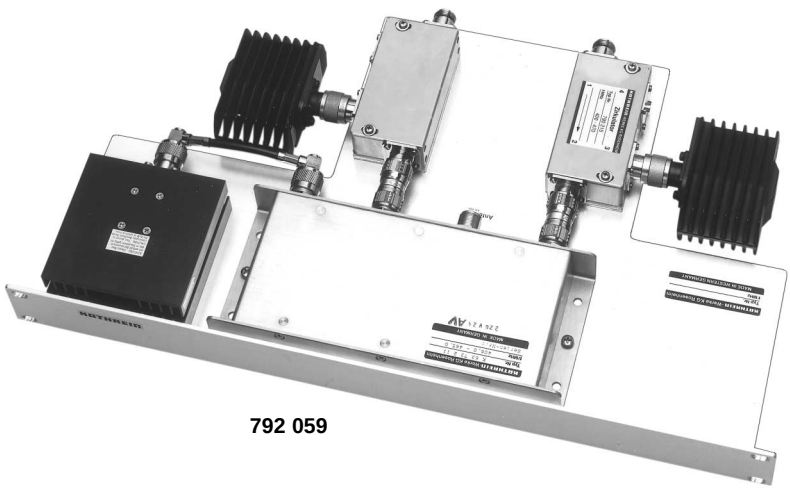
Hybrid Transmitter Combiner with 2, 3 or 4 Inputs 146 – 174 MHz

KATHREIN
Antennen · Electronic

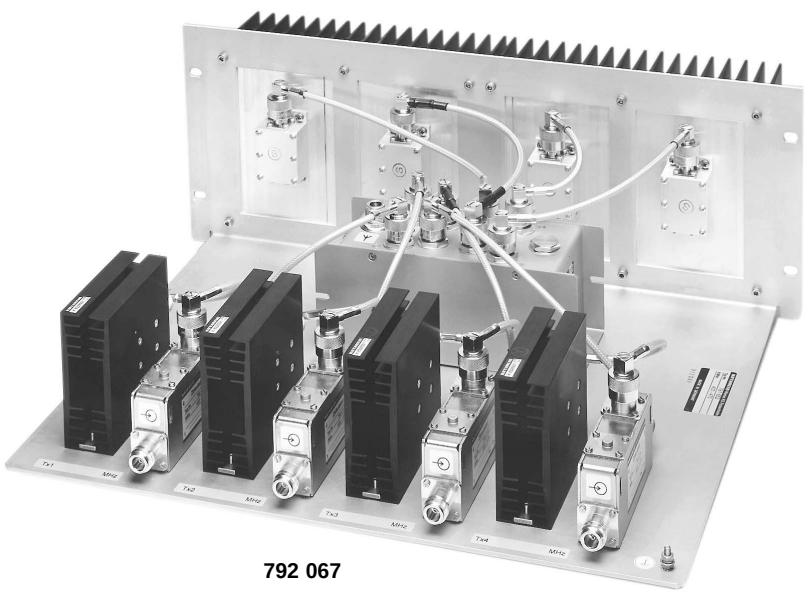
The hybrid transmitter combiner allows two or several transmitters to be combined to a common output.

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

Design and construction:
The hybrid transmitter combiner has two, three or four inputs and one output. For combining transmitters a hybrid ring junction or a decoupled power splitter is used as hybrid, 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 possible total reflection occurring at the output.



792 059



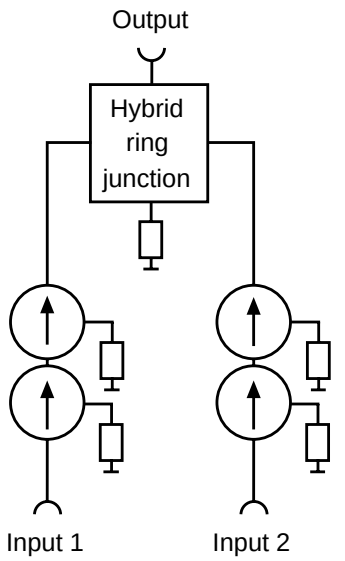
792 067

Technical Data

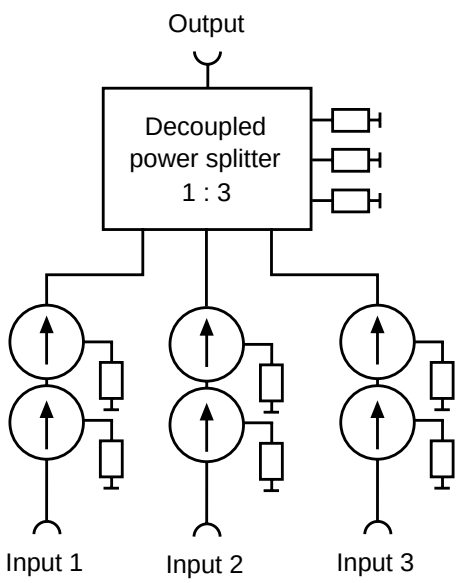
Type No.	Inputs	Insertion loss	Dimensions 19" drawer height	Dimensions 19" drawer plug-in depth	Input power of each input	Packing size
792 059	2	< 4.1 dB	1 hu* = 45 mm	350 mm	25 W	535 mm x 120 mm x 435 mm
792 061	2	< 4.1 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
792 064	3	< 6.3 dB	4 hu* = 177 mm	350 mm	100 W	540 mm x 192 mm x 520 mm
792 067	4	< 7.5 dB	4 hu* = 177 mm	350 mm	100 W	540 mm x 192 mm x 520 mm
Frequency range			146 – 174 MHz			
Min. frequency spacing			0 MHz			
Isolation			> 65 dB			
Impedance			50 Ω			
VSWR			< 1.25			
Connectors			N female			
Colour			Front panel: Grey (RAL 7032)			

* hu = height unit

792 059, 792 061



792 064



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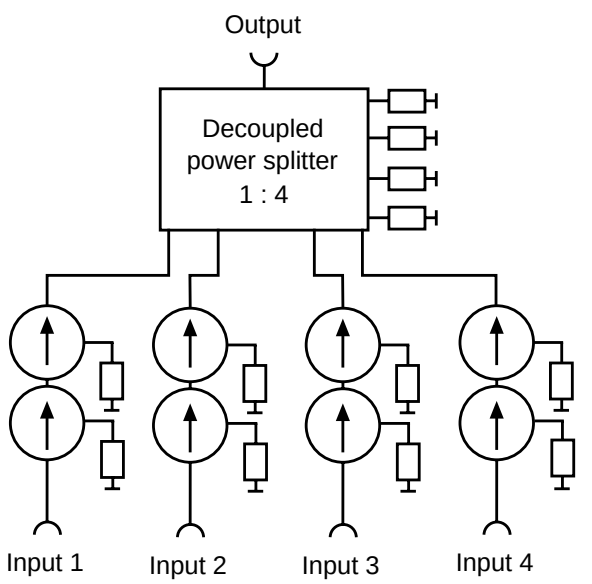


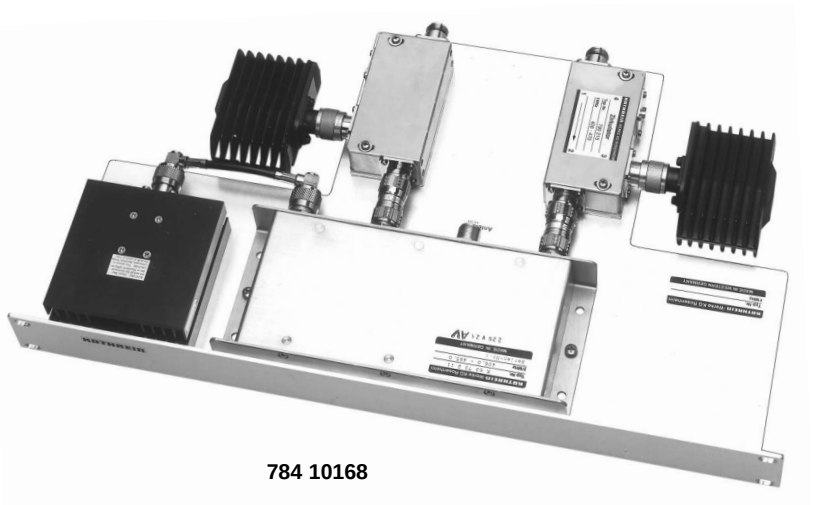
Hybrid Transmitter Combiner 380 – 430 MHz (TETRA, TETRAPOL)

KATHREIN
Antennen · Electronic

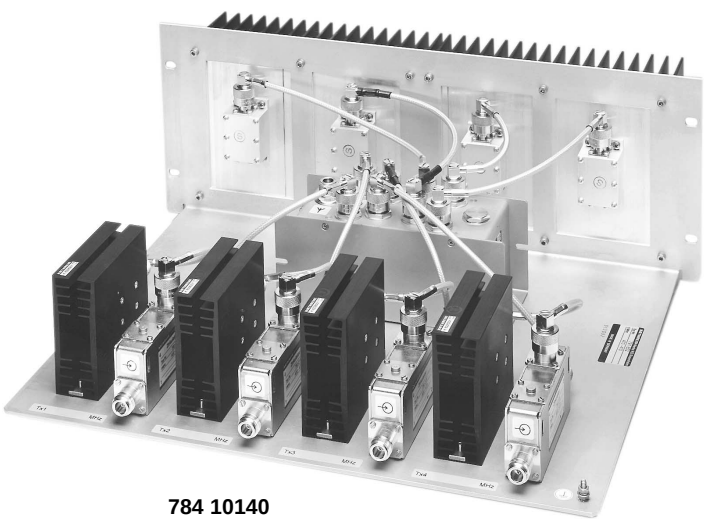
The hybrid transmitter combiner allows two or more transmitters to be combined to a common output.

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.



784 10168



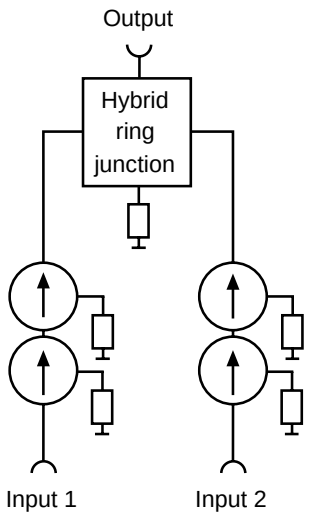
784 10140

Technical Data

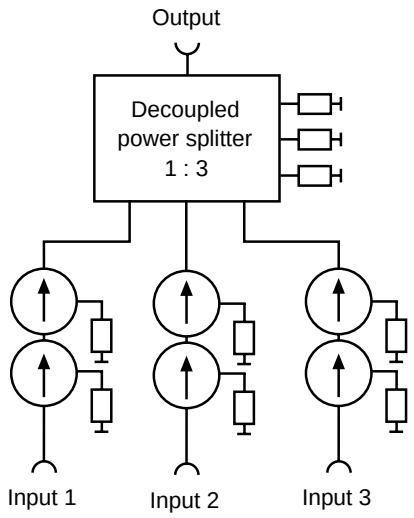
Type No.	Inputs	Insertion loss	Dimensions 19″ drawer height	Dimensions 19″ drawer plug-in depth	Input power per input	Packing size
784 10168	2	< 3.9 dB	1 hu* = 44 mm	300 mm	25 W	535 mm x 120 mm x 435 mm
784 10167	2	< 3.9 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
784 10166	3	< 6.3 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
784 10140	4	< 7.3 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
784 10165	5	< 8.3 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
Impedance	50 Ω
VSWR	< 1.2
Connectors	N female
Colour	Front panel: Grey (RAL 7032)

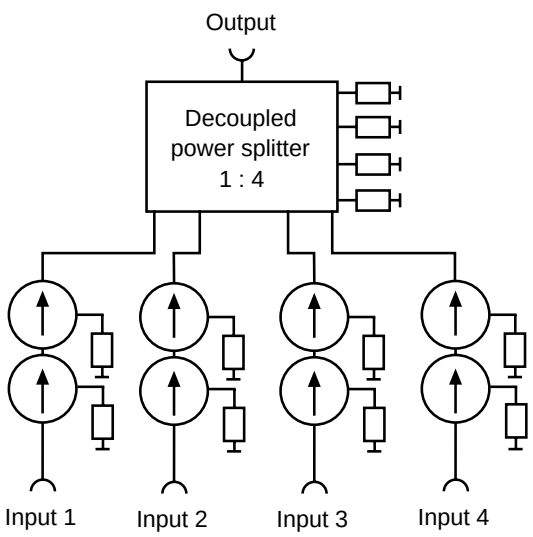
* hu = height unit



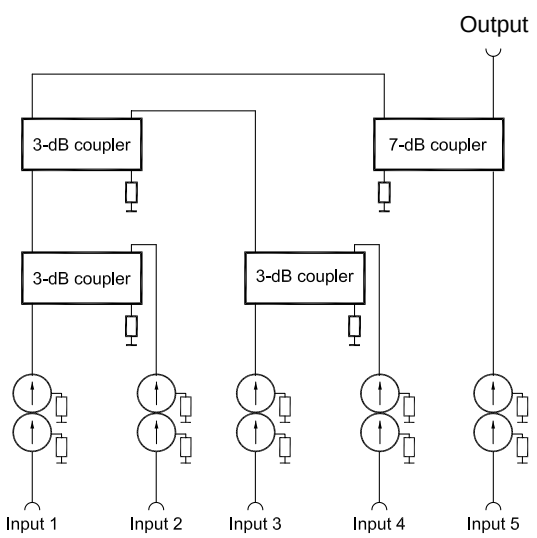
784 10168
784 10167



784 10166



784 10140



784 10165

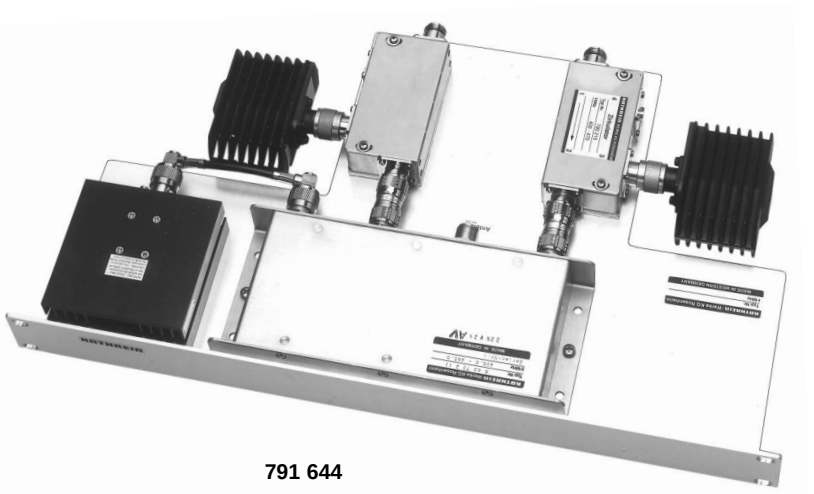
Hybrid Transmitter Combiner
400 – 470 MHz

KATHREIN
Antennen · Electronic

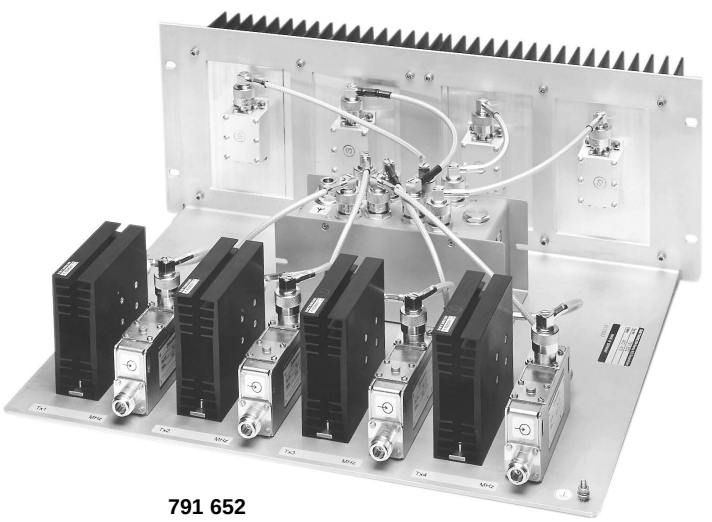
The hybrid transmitter combiner allows two or more transmitters to be combined to a common output.

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.



791 644

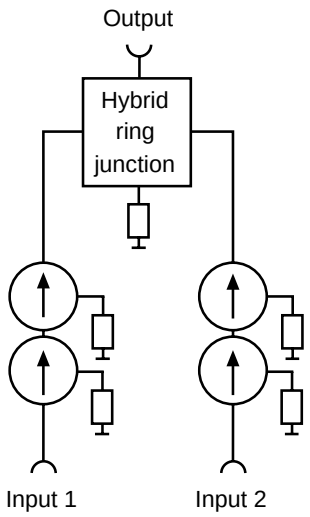


791 652

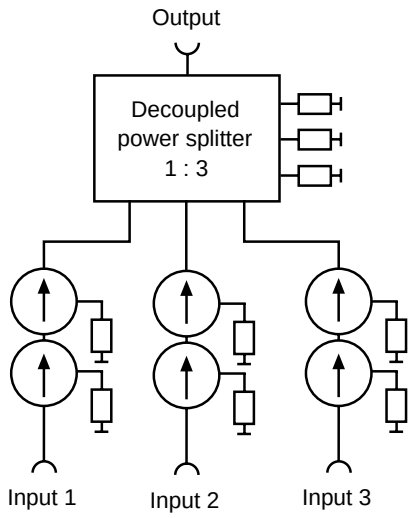
Technical Data

Type No.	Inputs	Insertion loss	Dimensions 19″ drawer height	Dimensions 19″ drawer plug-in depth	Input power per input	Packing size
791 644	2	< 3.9 dB	1 hu* = 44 mm	300 mm	25 W	535 mm x 120 mm x 435 mm
791 646	2	< 3.9 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
791 649	3	< 6.3 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
791 652	4	< 7.3 dB	4 hu* = 177 mm	350 mm	100 W	535 mm x 260 mm x 490 mm
784 10063	5	< 8.3 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			
Impedance			50 Ω			
VSWR			< 1.2			
Connectors			N female			
Colour			Front panel: Grey (RAL 7032)			

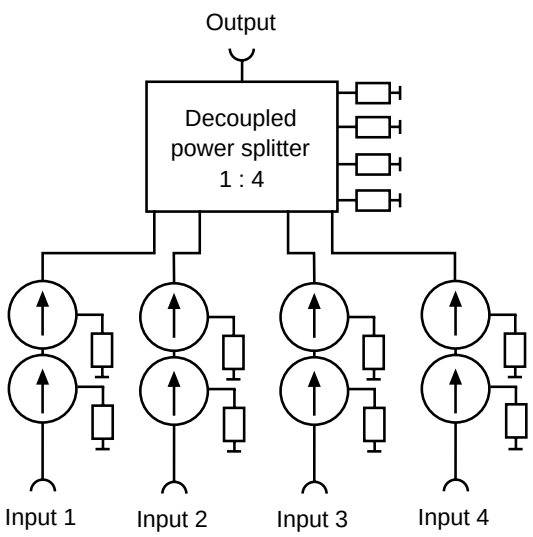
* hu = height unit



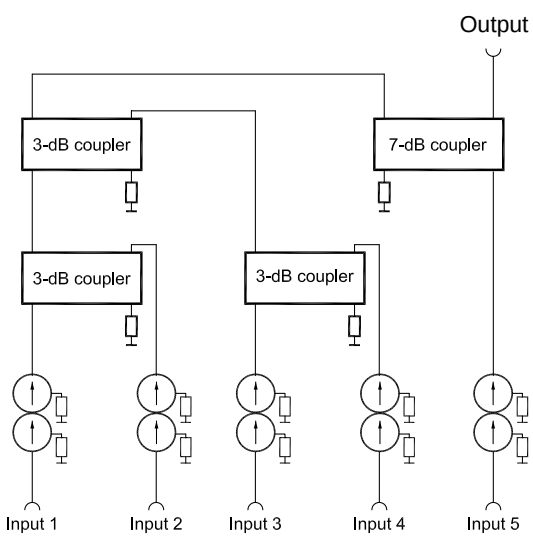
791 644
791 646



791 649



791 652



784 10063

Multiband Combiner
68 – 87.5 MHz / 146 – 174 MHz / 400 – 470 MHz

KATHREIN
Antennen · Electronic

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

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.

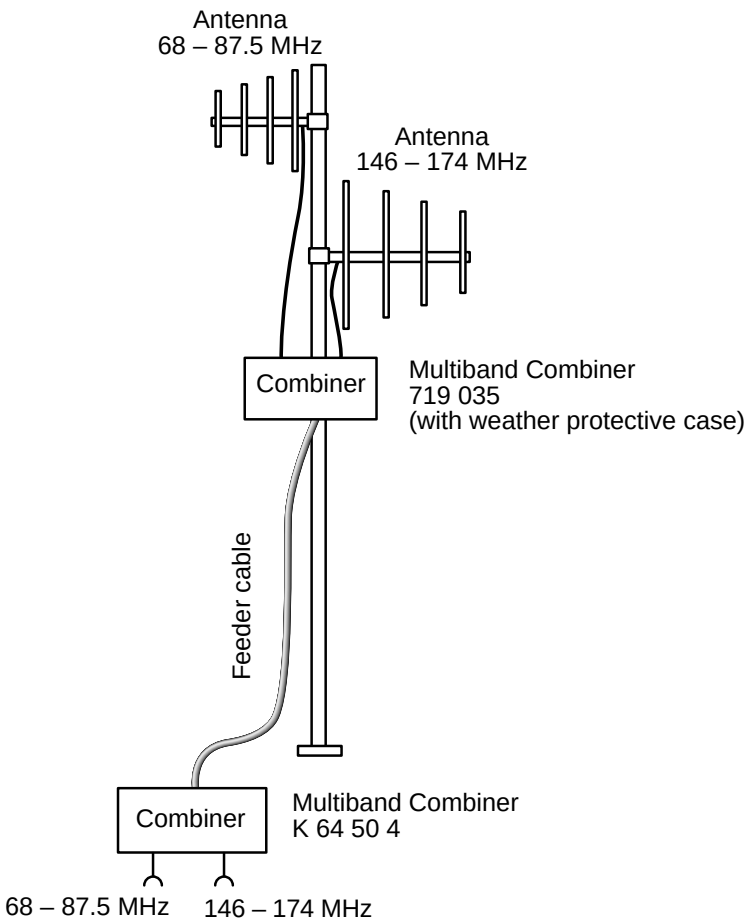
Design and construction:
The multiband combiners consist of low-pass, high-pass or band-pass filters with lumped L-C elements.

K 64 50 4

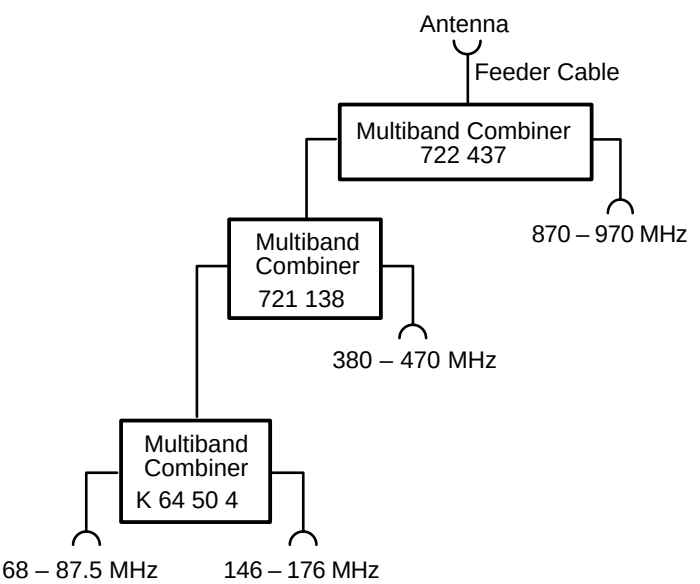
718 500

Technical Data

Type No.	2-band combiner K 64 50 4	719 035	719 792	3-band combiner 718 500
Frequency range Band 1 Band 2 Band 3	68 – 87.5 MHz 146 – 174 MHz		68 – 108 MHz 146 – 174 MHz	68 – 87.5 MHz 146 – 174 MHz 400 – 470 MHz
Insertion loss Band 1 Band 2 Band 3	< 0.5 dB < 0.5 dB		< 0.5 dB < 0.5 dB	< 1.0 dB < 1.0 dB < 1.0 dB
Isolation	> 35 dB		> 25 dB	> 30 dB
VSWR	< 1.4		< 1.4	< 1.4
Impedance	50 Ω		50 Ω	50 Ω
Input power	< 50 W of each input		< 50 W of each input	< 25 W of each input
Temperature range	–20 … +50 °C		–20 … +50 °C	–20 … +50 °C
Connectors	N female		N female	N female
Version	**Without** Weather protective case	**With** Weather protective case	**Without** Weather protective case	
Mounting	With 2 screws (max. 4 mm diameter)	To tubular masts, 60 ... 320 mm dia. with supplied noncorrosive clamp strap	With 2 screws (max. 4 mm diameter)	With 4 screws (max. 6 mm diameter)
Weight	1 kg	3 kg	1 kg	1.8 kg
Packing size by mm	190 x 95 x 100	300 x 200 x 200	190 x 95 x 100	235 x 100 x 165
Dimensions by mm (w x h x d)	175 x 70 x 80 (with connectors)	210 x 160 x 160	175 x 70 x 80 (with connectors)	172 x 90 x 160 (with connectors)



Example for the combining of 80 MHz and 160 MHz tansmitters/receivers to a common feeder cable



Example for multiband combiners in cascade

Multiband Combiner
68 – 174 / 380 – 470 MHz

KATHREIN
Antennen · Electronic

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,
- and, in the reverse operating mode, to separate several transmission or receiving frequencies into two or three frequency bands.

Design and construction:
The multiband combiners consist of low pass, high pass or band-pass filters with lumped L-C elements.
The 2-range combiners can be delivered with or without weather protective cases.

721 138

790 244

Technical Data

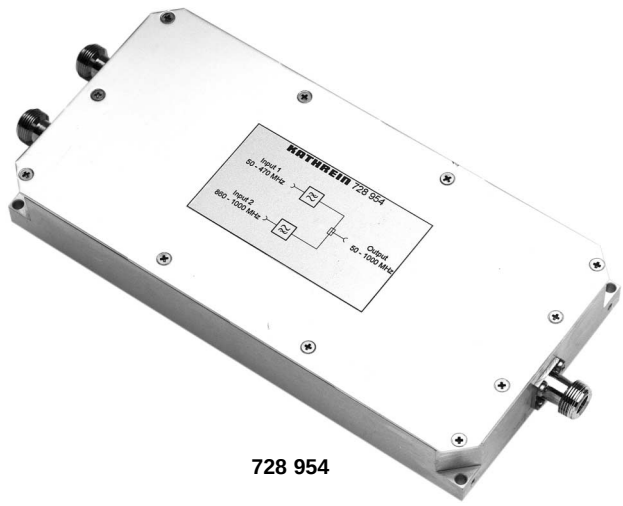
Type No.	2-range combiner			
	721 138	**723 013**	**790 244**	**790 957**
Frequency range Band 1 Band 2	68 – 174 MHz 380 – 470 MHz		68 – 174 MHz 400 – 470 MHz	
Insertion loss Band 1 Band 2	< 0.5 dB < 0.5 dB		< 0.5 dB < 0.5 dB	
Isolation	> 35 dB		> 45 dB	
VSWR	< 1.4		< 1.25	
Impedance	50 Ω		50 Ω	
Input power	< 50 W of each input		< 50 W of each input	
Temperature range	–20 … +50 °C		–20 … +50 °C	
Connectors	N female, silver-plated		N female	
Version	**Without** Weather protective case	**With** Weather protective case	**Without** Weather protective case	**With** Weather protective case
Mounting	With 2 screws (max. 4 mm diameter)	To tubular masts, 60 ... 320 mm diameter with supplied non-corrosive clamp strap	With 2 screws (max. 4 mm diameter)	To tubular masts, 60 ... 320 mm diameter with supplied non-corrosive clamp strap
Weight	1 kg	3 kg	0.3 kg	0.7 kg
Packing size	190 mm x 95 mm x 100 mm	300 mm x 200 mm x 200 mm	130 mm x 50 mm x 130 mm	240 mm x 160 mm x 130 mm
Dimensions (w x h x d)	175 mm x 70 mm x 80 mm	210 mm x 160 mm x 160 mm (including connectors)	103 mm x 38 mm x 68 mm	210 mm x 100 mm x 130 mm (including connectors)

Multiband Combiner
68 – 470 / 870 – 970 MHz

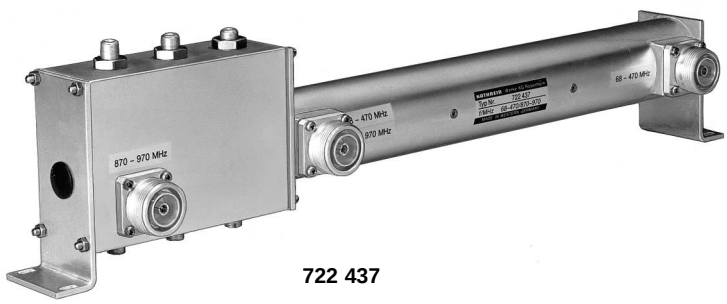
KATHREIN
Antennen · Electronic

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

Design and construction:
The multiband combiners 722 437 and 722 440 consists of a coaxial low-pass filter and a 3-cavity band-pass filter with λ/4 resonators.
The multiband combiners 728 954 and 791 463 consist of a low-pass and high-pass filter in printed circuit technology.



728 954



722 437

Technical Data

Type No.	728 954	791 463	722 437	722 440
Frequency range Input 1 Input 2	68 – 470 MHz 870 – 970 MHz		68 – 470 MHz 870 – 970 MHz	
Insertion loss 68 – 470 MHz 870 – 970 MHz	< 0.5 dB < 0.5 dB		< 0.5 dB < 0.5 dB	
Isolation	> 45 dB		> 38 dB	
VSWR	< 1.2		< 1.5	
Impedance	50 Ω		50 Ω	
Input power 68 – 470 MHz 870 – 970 MHz	**< 50 W** **< 50 W**		**< 500 W** **< 300 W**	
Temperature range	–20 … +70 °C		–20 … +50 °C	
Connectors	N female		7-16 female	
Version	**Without**	**With**	**Without**	**With**
	Weather protective case		Weather protective case	
Mounting	With 4 screws (max. 3 mm diameter)	To tubular masts, 60 ... 320 mm diameter with supplied non-corrosive clamp strap	With 4 screws (max. 4 mm diameter)	With 4 screws (max. 12 mm diameter)
Weight	1.3 kg	3 kg	3 kg	20 kg
Packing size	Approx. 280 mm x 55 mm x 125 mm	Approx. 540 mm x 120 mm x 260 mm	Approx. 145 mm x 145 mm x 625 mm	Approx. 970 mm x 240 mm x 410 mm
Dimensions (w x h x d)	269 mm x 32 mm x 112 mm (including connectors)	400 mm x 60 mm x 172 mm (including connectors)	120 mm x 76 mm x 520 mm (including connectors)	793 mm x 218 mm x 380 mm (including connectors)

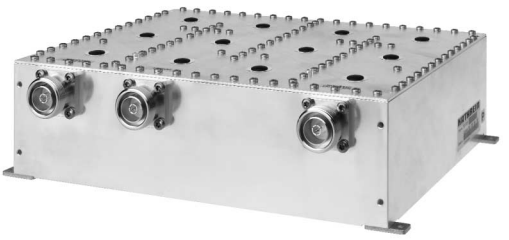
Dual-Band Combiner

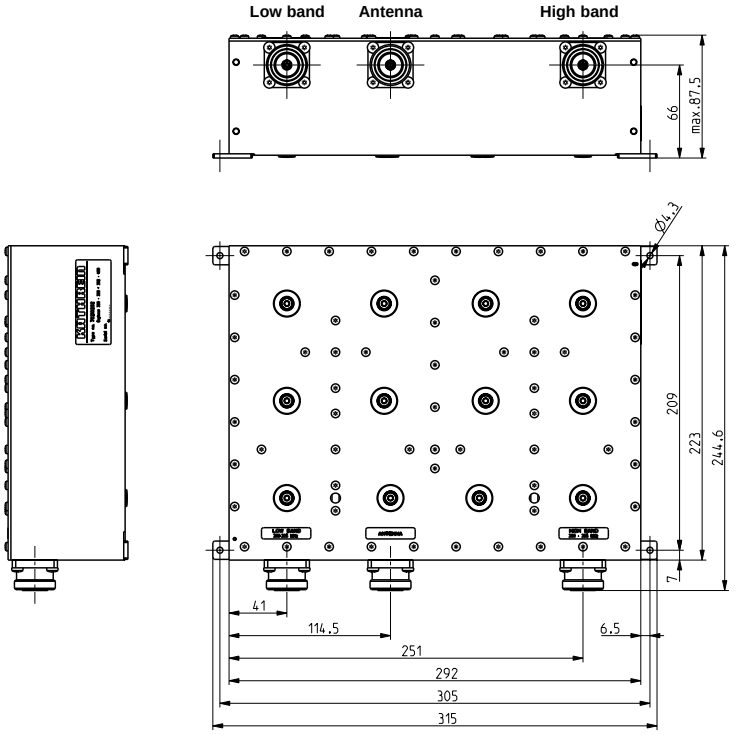
380 – 400 MHz
TETRA / TETRAPOL

410 – 430 MHz
TETRA / TETRAPOL

KATHREIN
Antennen · Electronic

- Designed for co-siting purposes
- Enables feeder sharing
- Suitable for indoor applications
- Built-in DC stop
- 19˝ drawer available on request





Technical Data

Type No.	782 10369
Pass band Band 1 Band 2	 380 – 400 MHz 410 – 430 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	 < 0.8 dB (380 – 400 MHz) < 0.8 dB (410 – 430 MHz)
Isolation Port 1 ↔ Port 2	 > 60 dB (380 – 400 MHz) > 60 dB (410 – 430 MHz)
VSWR	< 1.2 (380 – 400 / 410 – 430 MHz)
Impedance	50 Ω
Input power Band 1 Band 2	 < 200 W < 200 W
Intermodulation products	< –150 dBc (3rd order; with 2 x 20 W)
Temperature range	–20 ... +60 °C
Connectors	7-16 female
Application	Indoor
Special features	Built-in DC stop between all ports
Mounting	With 4 screws (max. 4 mm diameter)
Weight	Approx. 6.2 kg
Packing size	Approx. 320 mm x 260 mm x 200 mm
Dimensions (w x h x d)	315 mm x 87.5 mm x 244.6 mm (including connectors and mounting feet)

Calculated Attenuation Curves

Diagram I

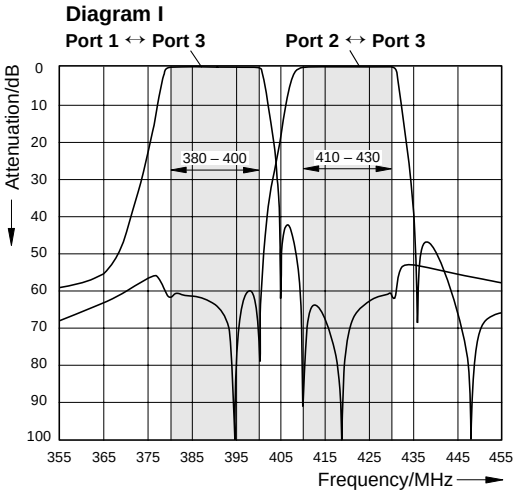
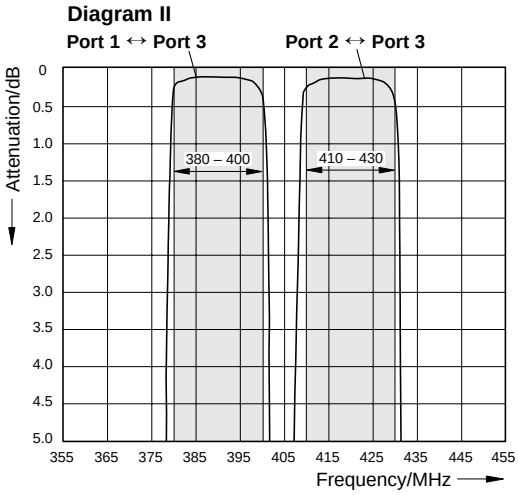


Diagram II



Dual-Band Combiner

50 – 470 MHz
PMR / TETRA / TETRAPOL

806 – 2500 MHz
CDMA 800 / GSM 900 / GSM 1800 / UMTS / WLAN

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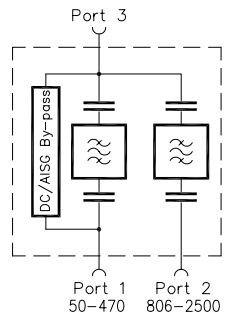
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory
- **Very low insertion loss**
- **High input power**



Technical Data

Type No.	782 10460
Pass band Band 1 Band 2	 50 – 470 MHz 806 – 960 / 1710 – 2500 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	 < 0.2 dB (50 – 470 MHz) < 0.2 dB (806 – 960 / 1710 – 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 Band 1	 < 500 W < 500 W
Intermodulation products	< –160 dBc (2nd/3rd order; with 2 x 20 W)
Temperature range	–55 ... +60 °C
Connectors	7-16 female
Application	Indoor *or* outdoor (IP 66)
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	 **By-pass** (max. 2500 mA) **Stop**
Lightning protection	3 kA, 10/350 μs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	Approx. 2.9 kg
Dimensions (w x h x d)	Approx. 125 x 350 x 64 mm (including mounting brackets)

Typical Attenuation Curves

Diagram I

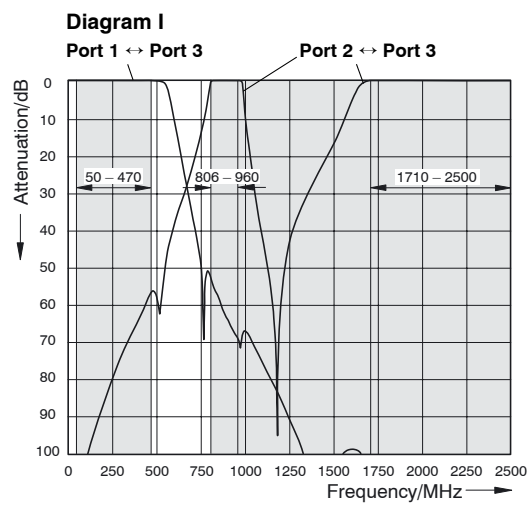
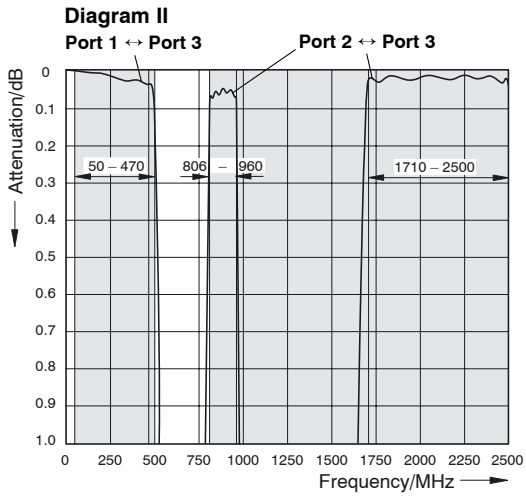


Diagram II



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:

Description	Type No.	Frequency range ... tunable bandwidth – fixed bandwidth (not tunable)	Max. input power	Page
3-dB Coupler	K 62 70 41	68 – 108 MHz	1000 W	118
3-dB Coupler	K 62 70 47	68 – 108 MHz	1000 W	118
4.7-dB Coupler	720 938	68 – 108 MHz	1000 W	119
4.7-dB Coupler	793 097	68 – 108 MHz	1000 W	119
6-dB Coupler	793 098	68 – 108 MHz	1000 W	119
6-dB Coupler	793 099	68 – 108 MHz	1000 W	119
7-dB Coupler	793 100	68 – 108 MHz	1000 W	119
7-dB Coupler	793 101	68 – 108 MHz	1000 W	119
10-dB Coupler	720 296	68 – 108 MHz	1000 W	119
10-dB Coupler	721 000	68 – 108 MHz	1000 W	119
Hybrid Ring Junction	K 62 73 41	68 – 87.5 MHz	100 W	120
Decoupled Power Splitter 1:3	724 346	68 – 87.5 MHz	100 W	121
Decoupled Power Splitter 1:4	725 870	68 – 87.5 MHz	100 W	121
Circulator	793 276	68 – 88 MHz	50 W	122
DC-Stop	721 062	68 – 87.5 / 146 – 174 / 380 – 470 MHz	10 W	123
3-dB Coupler	K 62 70 21	140 – 180 MHz	800 W	124
3-dB Coupler	K 62 70 27	140 – 180 MHz	800 W	124
4.7-dB Coupler	717 401	146 – 174 MHz	800 W	125
4.7-dB Coupler	793 102	146 – 174 MHz	800 W	125
6-dB Coupler	721 060	146 – 174 MHz	800 W	125
6-dB Coupler	793 103	146 – 174 MHz	800 W	125
7-dB Coupler	719 090	146 – 174 MHz	800 W	125
7-dB Coupler	793 104	146 – 174 MHz	800 W	125
10-dB Coupler	720 298	146 – 174 MHz	800 W	125
10-dB Coupler	722 675	146 – 174 MHz	800 W	125
Hybrid Ring Junction	K 62 73 21	146 – 174 MHz	100 W	126
Decoupled Power Splitter 1:3	724 347	146 – 174 MHz	100 W	127
Decoupled Power Splitter 1:4	725 234	146 – 174 MHz	100 W	127
Circulator	793 277	146 – 174 MHz	100 W	128
Circulator	780 060	146 – 174 MHz	100 W	129
3-dB Coupler	K 63 70 21	340 – 512 MHz	500 W	130
3-dB Coupler	K 63 70 27	340 – 512 MHz	500 W	130
4.7-dB Coupler	719 782	380 – 470 MHz	500 W	131
4.7-dB Coupler	722 488	380 – 470 MHz	500 W	131
6-dB Coupler	792 777	380 – 470 MHz	500 W	131
6-dB Coupler	790 589	380 – 470 MHz	500 W	131
7-dB Coupler	792 331	380 – 470 MHz	500 W	131
7-dB Coupler	790 590	380 – 470 MHz	500 W	131
10-dB Coupler	720 297	380 – 470 MHz	500 W	131
10-dB Coupler	720 942	380 – 470 MHz	500 W	131
Hybrid Ring Junction, TETRA, TETRAPOL	730 092	380 – 430 MHz	100 W	132
Hybrid Ring Junction	K 63 73 21 1	400 – 470 MHz	100 W	133
Decoupled Power Splitter 1 : 3	782 10231	380 – 430 MHz	100 W	134
Decoupled Power Splitter 1 : 4	782 10189	380 – 430 MHz	100 W	134
Decoupled Power Splitter 1 : 3	724 348	400 – 470 MHz	100 W	135
Decoupled Power Splitter 1 : 4	725 871	400 – 470 MHz	100 W	135
Circulator	784 10175	380 – 430 MHz	200 W	136
Circulator	790 215	400 – 470 MHz	100 W	136
Circulator	791 630	400 – 470 MHz	100 W	137

System Components:

Description	Type No.	Frequency range ... tunable bandwidth – fixed bandwidth (not tunable)	Attenuation	Max. input power	Page
Attenuator	784 10235	0 – 4000 MHz	3 dB	2 W	138
Attenuator	784 10236	0 – 4000 MHz	6 dB	2 W	138
Attenuator	784 10237	0 – 4000 MHz	10 dB	2 W	138
Attenuator	784 10238	0 – 4000 MHz	20 dB	2 W	138
Attenuator	791 918	0 – 4000 MHz	3 dB	15 W	139
Attenuator	791 919	0 – 4000 MHz	6 dB	12 W	139
Attenuator	791 920	0 – 4000 MHz	10 dB	10 W	139
Attenuator	791 921	0 – 4000 MHz	20 dB	10 W	139
50-Ω Load	K 62 26 61 1	0 – 2500 MHz	–	0.5 W	140
50-Ω Load	784 10367	0 – 4000 MHz	–	1.5 W	140
50-Ω Load	K 62 26 11 1	0 – 2500 MHz	–	2 W	140
50-Ω Load	K 62 26 40 1	0 – 2500 MHz	–	10 W	141
50-Ω Load	K 62 26 41 1	0 – 2500 MHz	–	10 W	141
50-Ω Load	K 62 26 20 1	0 – 2500 MHz	–	25 W	141
50-Ω Load	K 62 26 21 1	0 – 2500 MHz	–	25 W	141
50-Ω Load	K 62 26 20 7	0 – 2500 MHz	–	25 W	141
50-Ω Load	K 62 26 21 7	0 – 2500 MHz	–	25 W	141
50-Ω Load	K 62 26 30 1	0 – 2500 MHz	–	50 W	141
50-Ω Load	K 62 26 31 1	0 – 2500 MHz	–	50 W	141
50-Ω Load	K 62 26 30 7	0 – 2500 MHz	–	50 W	141
50-Ω Load	K 62 26 31 7	0 – 2500 MHz	–	50 W	141
50-Ω Load	K 62 26 50 1	0 – 1000 MHz	–	100 W	141
50-Ω Load	K 62 26 51 1	0 – 1000 MHz	–	100 W	141
50-Ω Load	K 62 26 50 7	0 – 1000 MHz	–	100 W	141

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

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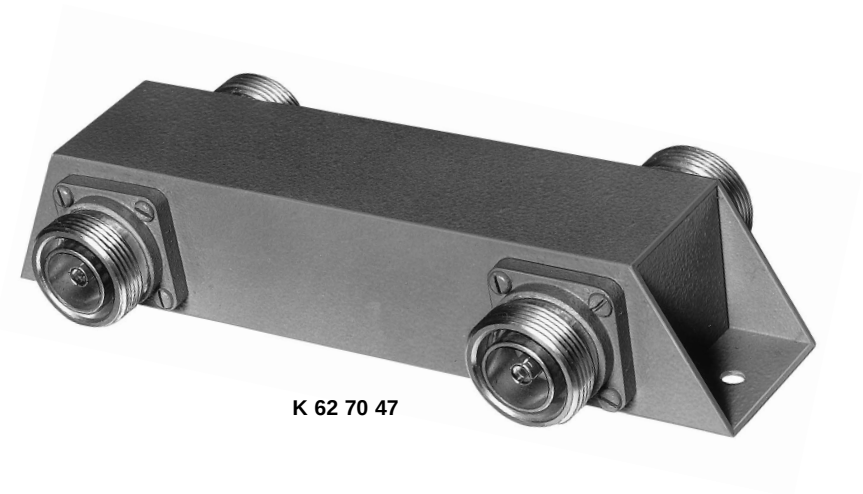
The 3-dB coupler can be used:
– as decoupled power splitter with a ratio of 1:1,
– for the decoupled combining of two transmitters with arbitrarily low frequency spacing (at 3-dB loss),
– for the decoupled combining of two receivers with arbitrarily low frequency spacing,
– for the decoupled combining 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.

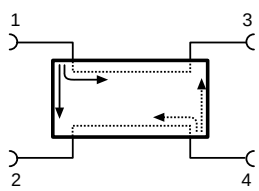


K 62 70 47

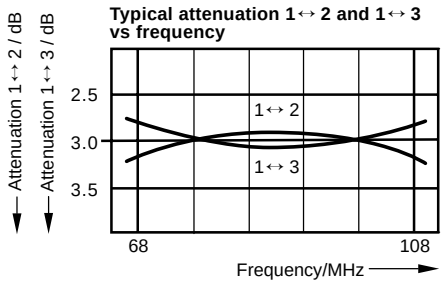
Design and function:
The 3-dB coupler has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 3. Port 4 is decoupled and without power if ports 2 and 3 are ideally matched. In practice an absorber of suitable power is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



Typical attenuation 1↔ 2 and 1↔ 3 vs frequency

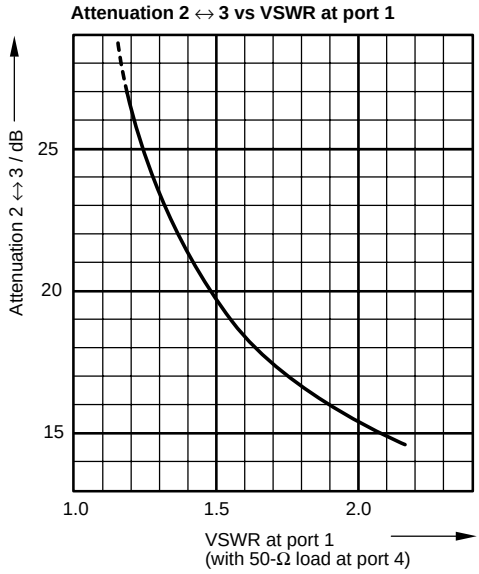


Technical Data

Type No.	K 62 70 41	K 62 70 47
Connectors	N female silver-plated	7-16 female silver-plated
Frequency range	68 – 108 MHz	
Attenuation 1 ↔ 2 / 1 ↔ 3	3 ±0.4 dB	
Attenuation 2 ↔ 3	See diagram	
Directivity	> 35 dB	
VSWR	< 1.06	
Impedance	50 Ω	
Max. power	1000 W	
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)	885 mm x 40 mm x 84 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



4.7-dB, 6-dB, 7-dB, 10-dB Coupler (90° Hybrid) 68 – 108 MHz

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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.

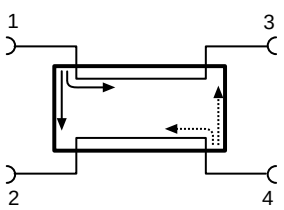
The **6-dB coupler** is used as a decoupled splitter for power splitting purposes at a 1 : 3 ratio.
An effective power entering into e.g. port 1 is divided between the ports 2 and 3 at a ratio of 1 : 3.
Thus 1/4 of the input power (attenuation: 6 dB) is available at port 2 and 3/4 of the input power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

793 097
793 099
793 101
721 000



Technical Data

Type No. N female 7-16 female	720 938 793 097	793 098 793 099	793 100 793 101	720 296 721 000
Version	4.7-dB coupler	6-dB coupler	7-dB coupler	10-dB coupler
Frequency range	68 – 108 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			
VSWR	< 1.1			
Impedance	50 Ω			
Input power	< 1000 W total power			
Connectors	Silver-plated			
Material	Brass, silver-plated			
Colour	Grey (RAL 7032)			
Installation	With 2 screws (max. 5 mm diameter)			
Weight	2.2 kg	2.8 kg	2.8 kg	3.5 kg
Packing size	910 mm x 47 mm x 115 mm			
Dimensions N female (w x h x d) 7-16 female (w x h x d)	 886 mm x 40 mm x 95 mm (with connectors) 886 mm x 40 mm x 84 mm (with connectors)			

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

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

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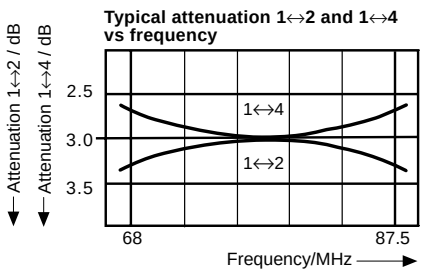
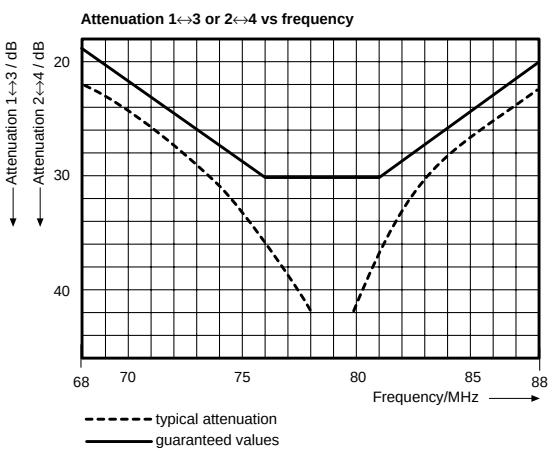
The hybrid ring junction can be used:
- as a power splitter with a ratio of 1:1,
- for the decoupled combining of two transmitters with arbitrarily low frequency spacing (at 3 dB loss),
- for the decoupled combining of two receivers with arbitrarily low frequency spacing,
- for the decoupled combining 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.

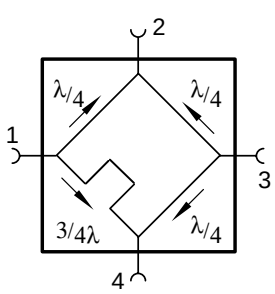




The remaining ports are terminated with 50-Ω loads.

Technical Data

Type No.	K 62 73 41
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.

Decoupled Power Splitter
68 – 87.5 MHz

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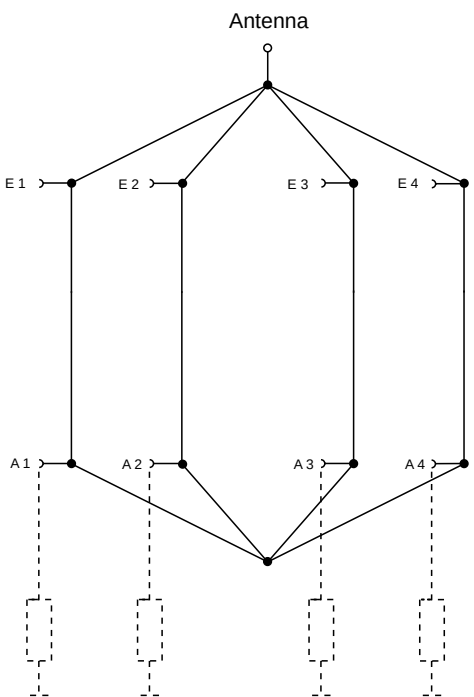
The decoupled power splitter can be used:
- for power distribution, e. g. from one common antenna to several receivers with frequency spacing as narrow as desired,
- for power distribution, e. g. from one transmitter to several outputs,
- for decoupled combining of several transmitters with frequency spacing as narrow as desired,
- for decoupled combining of several transmitting/receiving units, whose integrated duplexers are within the same frequency range.

724 346

Function:
The decoupled 1:3 power splitter has 3 inputs, one output and 3 absorber ports. The decoupled 1:4 power splitter has 4 inputs, one output and 4 absorber ports. The inputs are only decoupled if the absorber ports are terminated with 50-Ω loads of suitable power.

Dimensioning of the absorbers:
The absorbers of the 1:3-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 1:4 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.

1:4 power splitter 725 870



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

Technical Data

Type No.	724 346 1:3 power splitter	725 870 1:4 power splitter
Power ratio	1 : 3	1 : 4
Frequency range	68 – 87.5 MHz	
Power dividing loss (incl. insertion loss)	< 5.5 dB	< 6.5 dB
Isolation between inputs	> 23 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	2 kg	
Packing size	432 mm x 127 mm x 119 mm	
Dimensions (w x h x d)	405 mm x 76 mm x 104 mm (with connectors)	

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

Circulator
68 – 88 MHz

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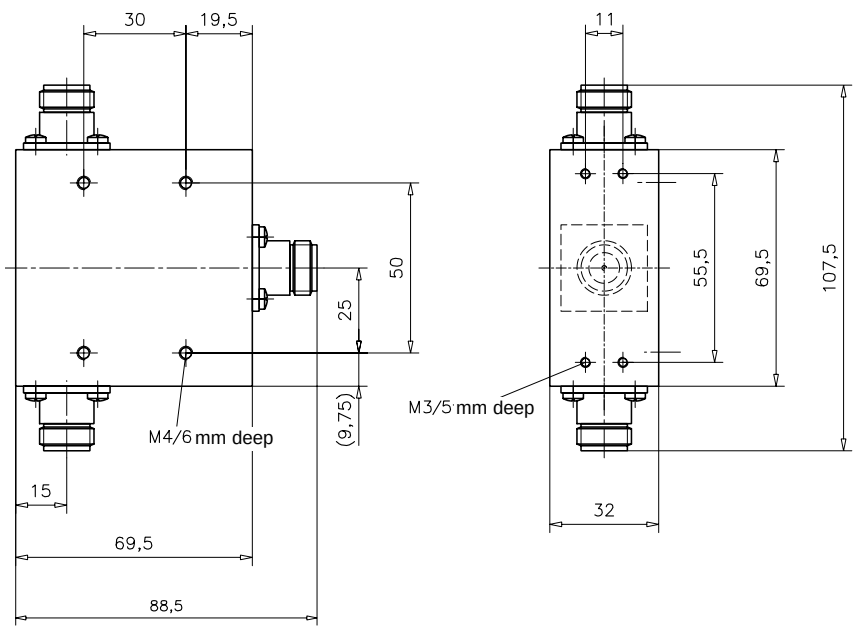
The circulator can be used:
– to increase the coupling attenuation between transmitters, to reduce intermodulation products,
– to prevent adverse effects of unmatched load impedance on amplifier performance.

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.	793 276
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

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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.

721 062

Technical Data

Type No.	721 062
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

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

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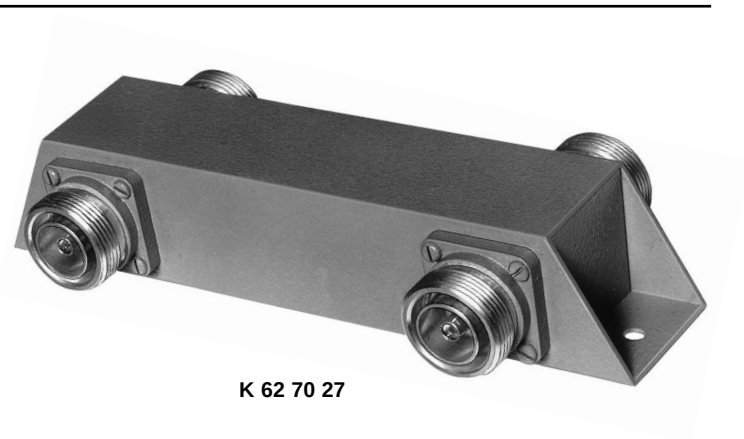
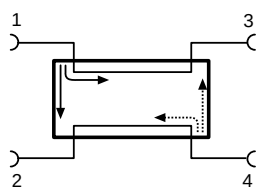
The 3-dB coupler can be used:
- as a decoupled power splitter with a ratio of 1:1,
- for the decoupled combining of two transmitters with frequency spacing as narrow as desired (at 3 dB loss),
- for the decoupled combining of two receivers with frequency spacing as narrow as desired,
- for the decoupled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

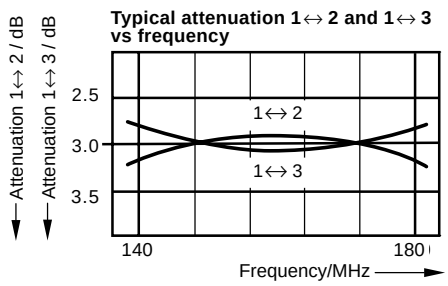
Function:
The 3-dB coupler has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 3. Port 4 is decoupled and without power if ports 2 and 3 are ideally matched. In practice an absorber of suitable power at port 4 is to be planned in accordance with the mismatch of ports 2 and 3.
Decoupled combining can be achieved via the diagonally opposite ports 2 and 3 or 1 and 4.



K 62 70 27



Typical attenuation 1↔ 2 and 1↔ 3 vs frequency

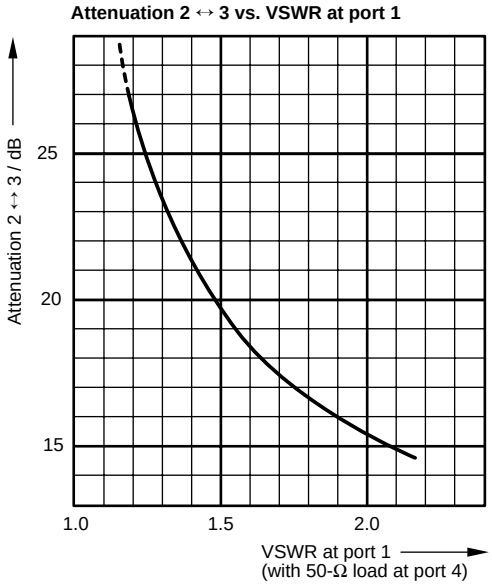


Technical Data

Type No.	K 62 70 21	K 62 70 27
Connectors	N female silver-plated	7-16 female silver-plated
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	
Material	Brass, silver-plated	
Colour	Grey (RAL 7032)	
Installation	With 2 screws (max. 5 mm diameter)	
Weight	1.4 kg	
Packing size	520 mm x 47 mm x 115mm	
Dimensions (w x h x d)	496 mm x 40 mm x 95 mm (with connectors)	496 mm x 40 mm x 84 mm (with 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



4.7-dB, 6-dB, 7-dB, 10-dB Coupler (90° Hybrid)
146 – 174 MHz

KATHREIN
Antennen · Electronic

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.

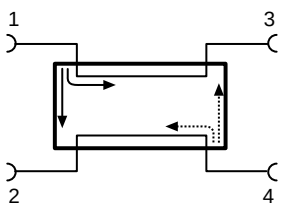
The **7-dB coupler** is used as a decoupled splitter for power splitting purposes at a 1 : 4 ratio.
An effective power entering into e.g. port 1 is divided between the ports 2 and 3 at a ratio of 1 : 4.
Thus 1/5 of the input power (attenuation: 7 dB) is available at port 2 and 4/5 of the input power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

793 102
793 103
793 104
722 675



Technical Data

Type No. N female / 7-16 female	717 401 / 793 102	721 060 / 793 103	719 090 / 793 104	720 298 / 722 675
Version	4.7-dB coupler	6-dB coupler	7-dB coupler	10-dB coupler
Frequency range	146 – 174 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			
VSWR	< 1.1			
Impedance	50 Ω			
Input power	< 800 W total power			
Connectors	Silver-plated			
Material	Brass, silver-plated			
Colour	Grey (RAL 7032)			
Installation	With 2 screws (max. 5 mm diameter)			
Weight	1.4 kg	1.7 kg	1.7 kg	2 kg
Packing size	520 mm x 47 mm x 115 mm			
Dimensions N female (w x h x d) 7-16 female (w x h x d)	496 mm x 40 mm x 95 mm (with connectors) 496 mm x 40 mm x 84 mm (with connectors)			

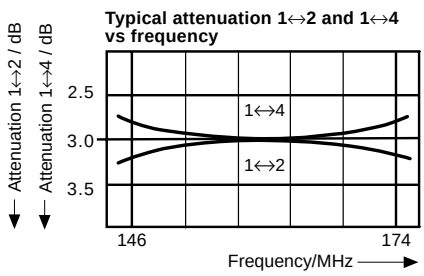
Note: VSWR and attenuation are measured when the remaining ports are terminated with 50-Ω loads.

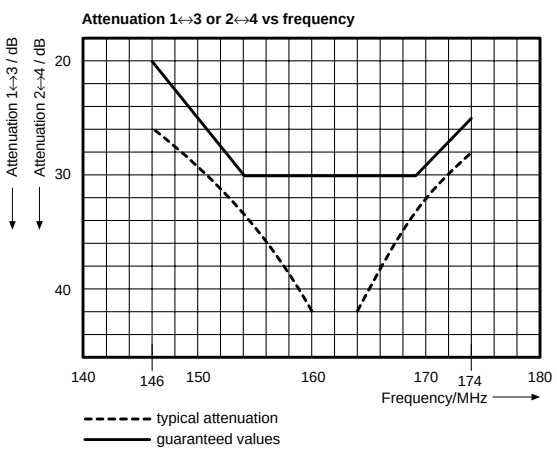
Hybrid Ring Junction (180° Hybrid)
146 – 174 MHz

KATHREIN
Antennen · Electronic

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

Description:
The hybrid ring junction has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 4, port 3 is decoupled and without power if ports 2 and 4 are ideally matched. In practice an absorber of suitable power at port 3 is to be planned for according to the mismatch of ports 2 and 4.
Decoupled combining can be made via port 1 and 3 or 2 and 4.

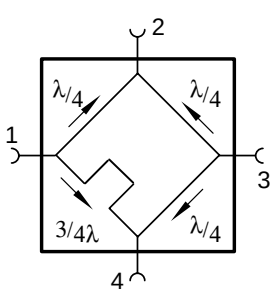




The remaining ports are terminated with 50-Ω loads.

Technical Data

Type No.	K 62 73 21
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.

Decoupled Power Splitter
146 – 174 MHz

KATHREIN
Antennen · Electronic

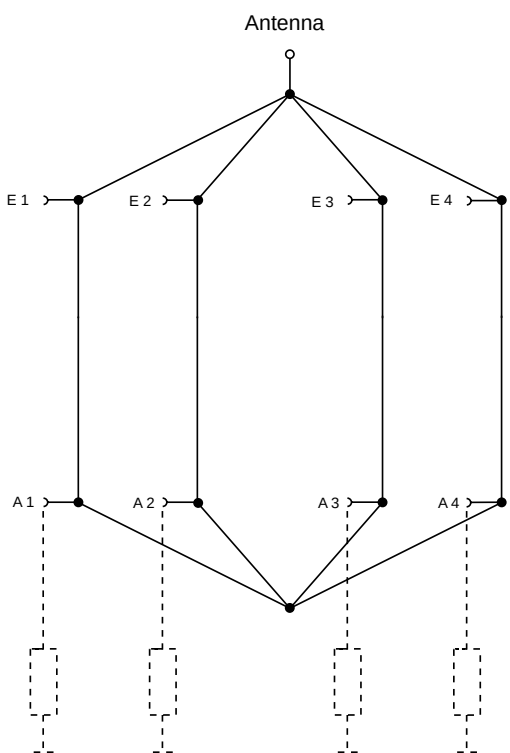
The decoupled power splitter can be used:
- for power distribution, e. g. from one common antenna to several receivers with frequency spacing as narrow as desired,
- for power distribution, e. g. from one transmitter to several outputs,
- for decoupled combining of several transmitters with frequency spacing as narrow as desired,
- for decoupled combining of several transmitting/receiving units, whose integrated duplexers are within the same frequency range.

Function:
The decoupled 1:3 power splitter has 3 inputs, one output and 3 absorber ports. The decoupled 1:4 power splitter has 4 inputs, one output and 4 absorber ports. The inputs are only decoupled if the absorber ports are terminated with 50-Ω loads of suitable power.

Dimensioning of the absorbers:
The absorbers of the 1:3 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 1:4 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.

725 234

1:4 power splitter 725 234



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

Technical Data

Type No.	724 347 1:3 power splitter	725 234 1:4 power splitter
Power ratio	1 : 3	1 : 4
Frequency range	146 – 174 MHz	
Power dividing loss (incl. insertion loss)	< 5.5 dB	< 6.5 dB
Isolation between inputs	> 23 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 kg	2 kg
Packing size	265 mm x 105 mm x 120 mm	
Dimensions (w x h x d)	240 mm x 94 mm x 114 mm (with connectors)	

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

Circulator
146 – 174 MHz

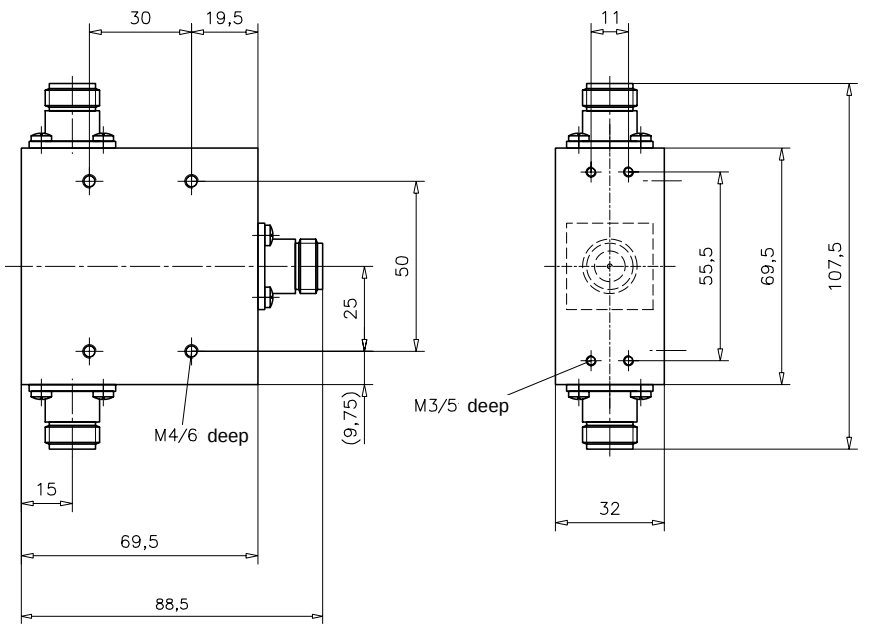
KATHREIN
Antennen · Electronic

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).

793 277



Technical Data

Type No.	793 277
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)

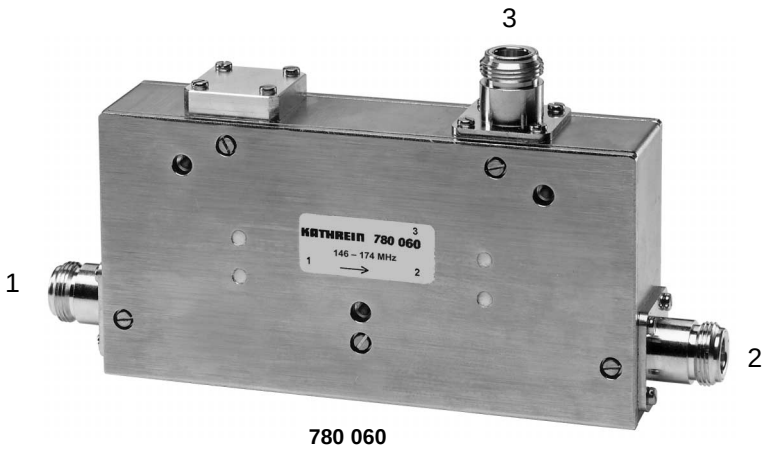
Circulator
146 – 174 MHz

KATHREIN
Antennen · Electronic

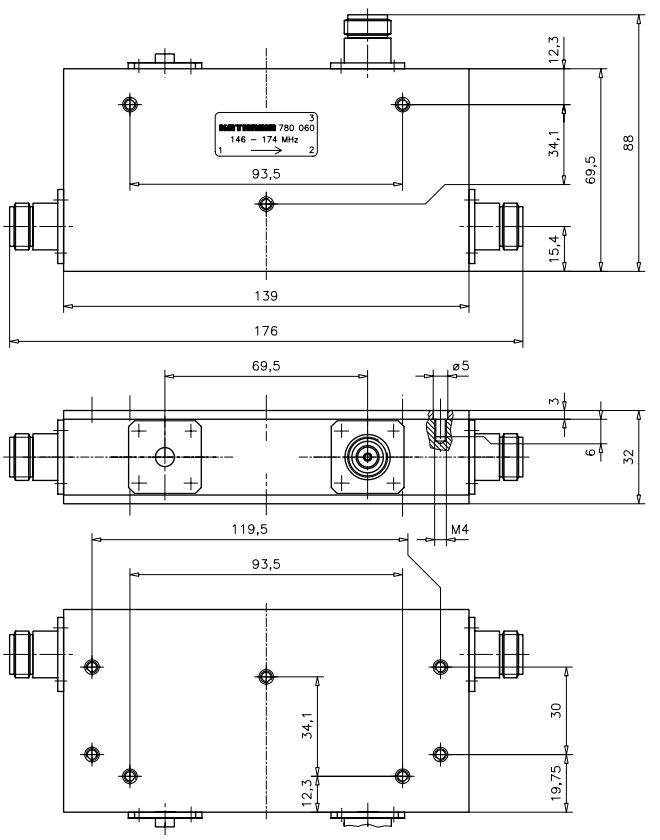
The circulator can be used:
- to increase the coupling attenuation between transmitters, to reduce intermodulation products,
- to prevent adverse effects of unmatched load impedance on amplifier performance.

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).



780 060



Technical Data

Type No.	780 060
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 kg
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

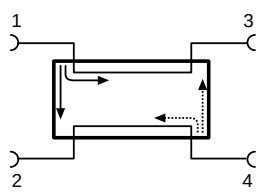
KATHREIN
Antennen · Electronic

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

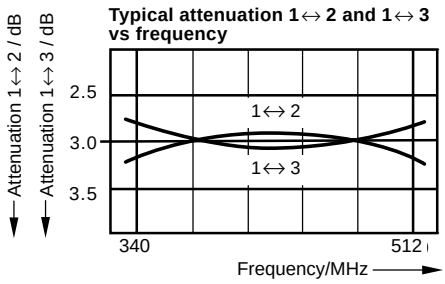
Function:
The 3-dB coupler has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 3. Port 4 is decoupled and without power if ports 2 and 3 are ideally matched. In practice an absorber of suitable power at port 4 is to be planned in accordance with the mismatch of ports 2 and 3.
Decoupled combining can be achieved via the diagonally opposite ports 2 and 3 or 1 and 4.

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

K 63 70 27



Typical attenuation 1↔ 2 and 1↔ 3 vs frequency

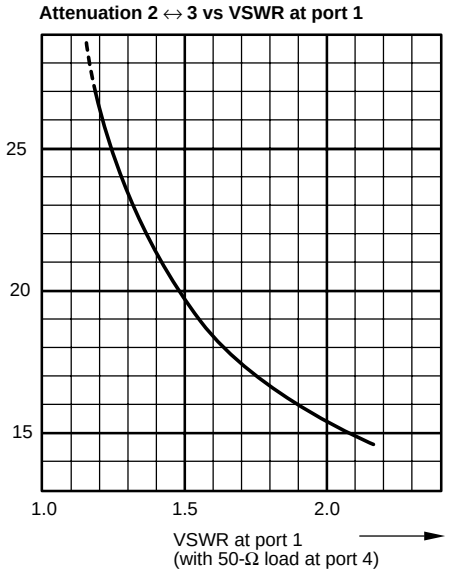


Technical Data

Type No.	K 63 70 21	K 63 70 27
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	> 35 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)

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

Attenuation 2 ↔ 3 vs VSWR at port 1



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

KATHREIN
Antennen · Electronic

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.

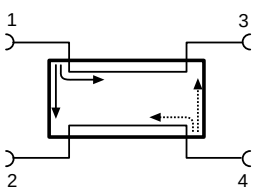
The **7-dB coupler** is used as a decoupled splitter for power splitting purposes at a 1 : 4 ratio.
An effective power entering into e.g. port 1 is divided between the ports 2 and 3 at a ratio of 1 : 4.
Thus 1/5 of the input power (attenuation: 7 dB) is available at port 2 and 4/5 of the input power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

722 488
790 589
790 590
720 942



Technical Data

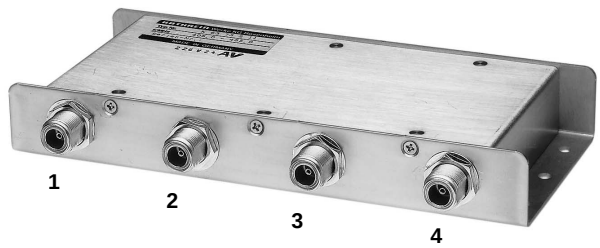
Type No. N female / 7-16 female	719 782 / 722 488	792 777 / 790 589	792 331 / 790 590	720 297 / 720 942
Version	4.7-dB coupler	6-dB coupler	7-dB coupler	10-dB coupler
Frequency range	380 – 470 MHz			
Attenuation 1↔3 (4↔2)	1.8 ±0.3 dB	1.25 ±0.2 dB	1.0 ±0.2 dB	0.5 ±0.2 dB
Attenuation 1↔2 (4↔3)	4.7 ±0.5 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	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) 7-16 female (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)			

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

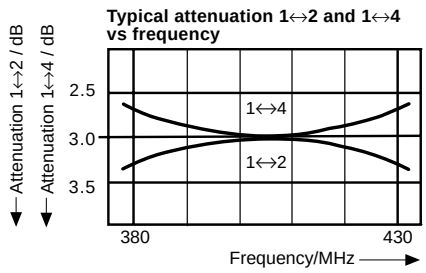
Hybrid Ring Junction (180° Hybrid)
380 – 430 MHz
TETRA, TETRAPOL

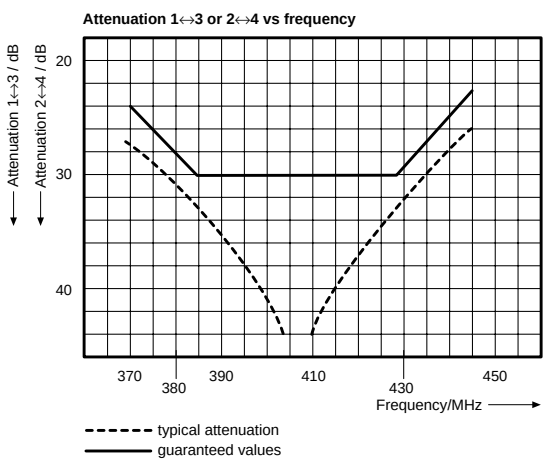
KATHREIN
Antennen · Electronic

The hybrid ring junction can be used:
- as a power splitter with a ratio of 1:1,
- for the decoupled combining of two transmitters with arbitrarily low frequency spacing (at 3 dB loss),
- for the decoupled combining of two receivers with arbitrarily low frequency spacing,
- for the decoupled combining of two transmitter/ receiver units, whose 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.

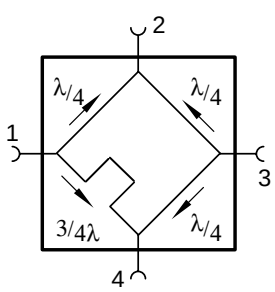




The remaining ports are terminated with 50-Ω loads.

Technical Data

Type No.	730 092
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)



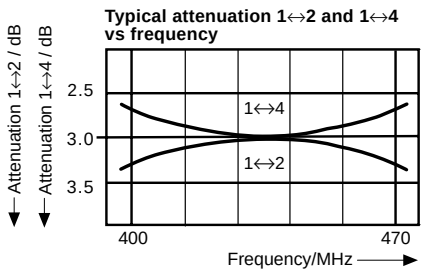
Note: VSWR and attenuation are measured when the remaining ports are terminated with 50-Ω loads.

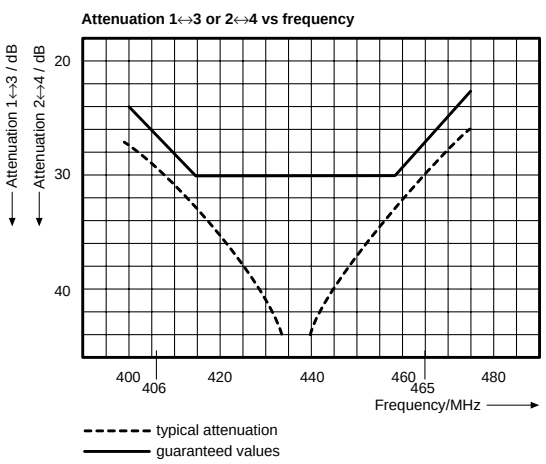
Hybrid Ring Junction (180° Hybrid)
400 – 470 MHz

KATHREIN
Antennen · Electronic

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

Description:
The hybrid ring junction has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 4, port 3 is decoupled and without power if ports 2 and 4 are ideally matched. In practice an absorber of suitable power at port 3 is to be planned for according to the mismatch of ports 2 and 4.
Decoupled combining can be made via port 1 and 3 or 2 and 4.

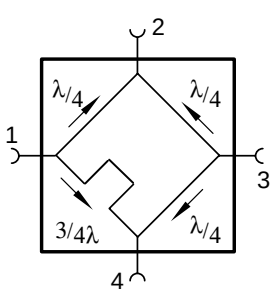




The remaining ports are terminated with 50-Ω loads.

Technical Data

Type No.	K 63 73 211
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
Antennen · Electronic

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.

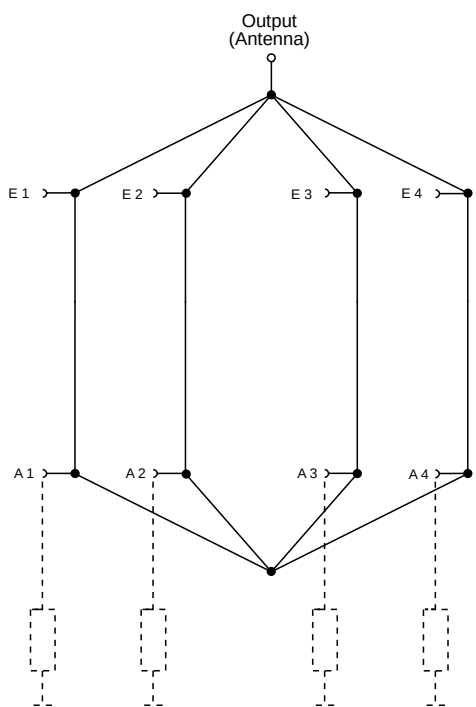
Function:
The decoupled power splitter has 3 or 4 inputs, one output, as well as 3 or 4 absorber ports. The inputs are only decoupled when the absorber ports are terminated with 50-Ω loads of suitable power.

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.

782 10189

1 : 4 power splitter 782 10189



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

Technical Data

Type No.	782 10231 1 : 3 Power splitter	782 10189 1 : 4 Power splitter
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)	

Decoupled Power Splitter
400 – 470 MHz

KATHREIN
Antennen · Electronic

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.

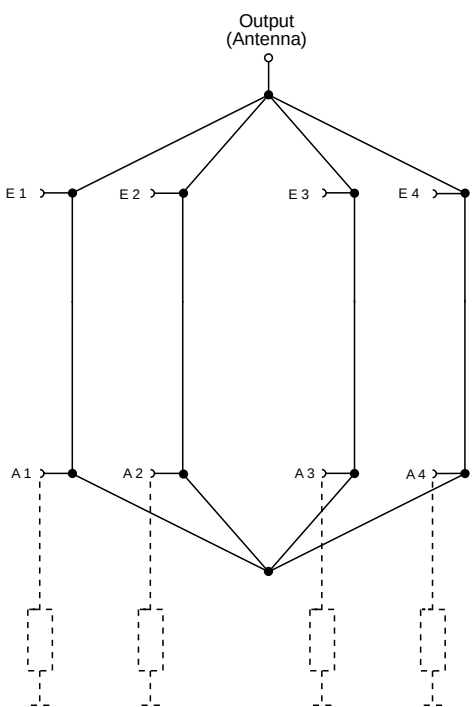
Function:
The decoupled power splitter has 3 or 4 inputs, one output, as well as 3 or 4 absorber ports. The inputs are only decoupled when the absorber ports are terminated with 50-Ω loads of suitable power.

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.

725 871

1 : 4 power splitter 725 871



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

Technical Data

Type No.	724 348 1 : 3 Power splitter	725 871 1 : 4 Power splitter
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)	

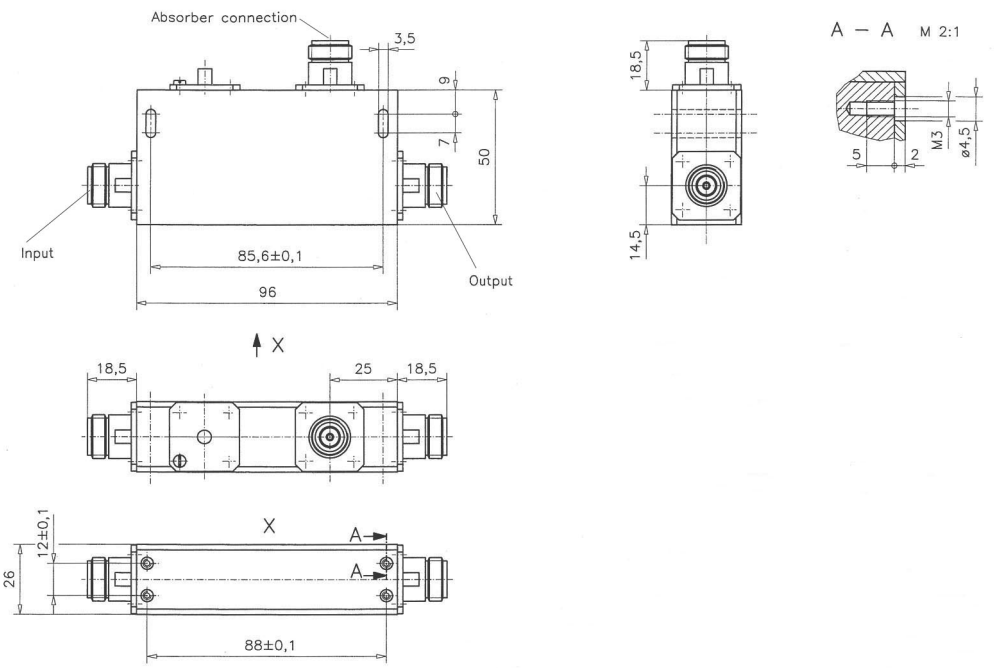
Circulator
380 – 430 MHz (TETRA, TETRAPOL)
400 – 470 MHz

KATHREIN
Antennen · Electronic

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).

784 10175
790 215



Technical Data

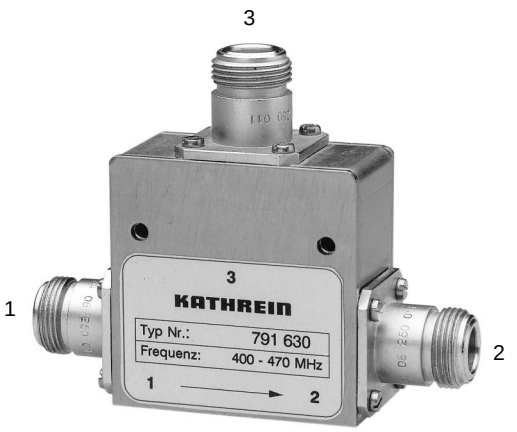
Type No.	784 10175	790 215
Frequency range	380 – 430 MHz	400 – 470 MHz
Insertion loss 1 → 2	< 0.5 dB (typ. 0.4 dB)	< 0.5 dB (typ. 0.3 dB)
Isolation 2 → 1	> 45 dB	> 50 dB
VSWR 1, 2, 3	< 1.19	< 1.22
Impedance	50 Ω	50 Ω
Input power	< 200 W	< 100 W
Temperature range	–10 … +55 °C	
Connectors	N female	
Mounting	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 connectors)	

Circulator
400 – 470 MHz

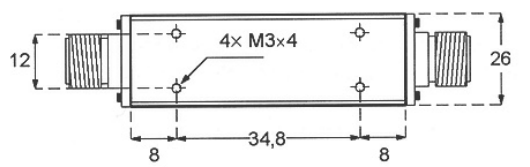
KATHREIN
Antennen · Electronic

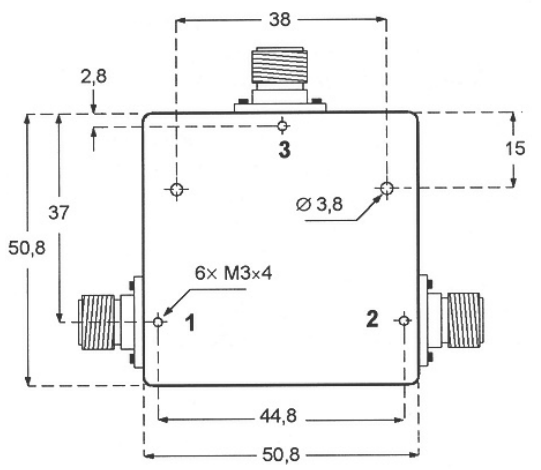
The circulator can be used:
– to increase the coupling attenuation between transmitters, to reduce intermodulation products,
– to prevent adverse effects of unmatched load impedance on amplifier performance.

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).



791 630





Technical Data

Type No.	791 630
Frequency range	400 – 470 MHz
Insertion loss 1 → 2	< 0.3 dB
Isolation 2 → 1	> 23 dB
VSWR 1, 2, 3	< 1.17
Impedance	50 Ω
Input power	< 100 W
Temperature range	–10 … +55 °C
Connectors	N female
Mounting	With 2 screws (M3)
Weight	380 g
Packing size	110 mm x 100 mm x 40 mm
Dimensions (w x h x d)	51 mm x 51 mm x 26 mm (without connectors)

Attenuator
2 W
0 – 4000 MHz

KATHREIN
Antennen · Electronic

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.	784 10235	784 10236	784 10237	784 10238
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			
Application	Indoor			
Weight	60 g			
Dimensions (L x diameter)	49 mm x 21 mm			

Attenuator
10 W / 12 W / 15 W
0 – 4000 MHz

KATHREIN
Antennen · Electronic

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.	791 918	791 919	791 920	791 921
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			
Application	Indoor			
Weight	70 g			
Dimensions (L x diameter)	50 mm x 26 mm			

Load
50 Ω

KATHREIN
Antennen · Electronic

50-Ω loads are suited as absorbers for small and medium power.

They are used:
– as termination for transmitters or amplifiers used for testing, measuring or tuning,
– as termination for circulators, directional couplers, hybrid ring junctions and decoupled power splitters.

Special features of the loads are:
– very low VSWR within a wide frequency range,
– high stability and RF shielding due to the closed aluminium construction,
– arbitrary installation position because of convectional cooling,
– 50 W and 100 W models can be installed on front or rear panels of electrical equipment for heat dissipation.

0.5 Watt *)

Type No.	K 62 26 61 1
Connector	N male
Frequency range	0 – 2500 MHz
VSWR 0 – 1000 MHz 1000 – 2000 MHz 2000 – 2500 MHz	< 1.08 < 1.15 < 1.20
Application	Indoor
Weight	40 g
Packing size	90 mm x 60 mm x 25 mm
Dimensions	33 mm / 21 mm diameter

K 62 26 61 1

1.5 Watt *)

Type No.	784 10367
Connector	7/16 male
Frequency range	0 – 4000 MHz
VSWR 0 – 2000 MHz 2000 – 4000 MHz	< 1.10 < 1.30
IP rating	**IP65**
Application	**Outdoor**
Weight	120 g
Packing size	50 mm x 90 mm x 100 mm
Dimensions	40 mm / 32 mm diameter

784 10367

2 Watt *)

Type No.	K 62 26 11 1
Connector	N male
Frequency range	0 – 2500 MHz
VSWR 0 – 1000 MHz 1000 – 2000 MHz 2000 – 2500 MHz	< 1.08 < 1.15 < 1.20
Application	Indoor
Weight	40 g
Packing size	90 mm x 60 mm x 25 mm
Dimensions	30 mm / 21 mm diameter

K 62 26 11 1

Load
50 Ω

KATHREIN
Antennen · Electronic

10 Watt *)

Type No.	K 62 26 40 1	K 62 26 41 1
Connector	N female	N male
Frequency range	0 – 2500 MHz	
VSWR 0 – 1000 MHz 1000 – 2000 MHz 2000 – 2200 MHz 2200 – 2500 MHz	< 1.08 < 1.15 < 1.20 < 1.25	
Application	Indoor	
Weight	Approx. 250 g	
Packing size	50 mm x 90 mm x 100 mm	
Dimensions (w x h x d) by mm	40 x 82 x 77 (incl. connector)	40 x 82 x 85 (incl. connector)

K 62 26 40 1

25 Watt *)

Type No.	K 62 26 20 1	K 62 26 21 1	K 62 26 20 7	K 62 26 21 7
Connector	N female	N male	7-16 female	7-16 male
Frequency range	0 – 2500 MHz			
VSWR 0 – 1000 MHz 1000 – 2000 MHz 2000 – 2500 MHz	< 1.08 < 1.15 < 1.20			
Application	Indoor			
Weight	Approx. 500 g			
Packing size	50 mm x 100 mm x 135 mm			
Dimensions by mm (w x h x d)	35 x 94 x 113 (incl. connector)	35 x 94 x 121 (incl. connector)	35 x 94 x 125 (incl. connector)	35 x 94 x 124 (incl. connector)

K 62 26 20 1

50 Watt *)

Type No.	K 62 26 30 1	K 62 26 31 1	K 62 26 30 7	K 62 26 31 7
Connector	N female	N male	7-16 female	7-16 male
Frequency range	0 – 2500 MHz			
VSWR 0 – 1000 MHz 1000 – 2000 MHz 2000 – 2500 MHz	< 1.08 < 1.15 < 1.20			
Application	Indoor			
Weight	Approx. 800 g			
Packing size	80 mm x 95 mm x 145 mm			
Dimensions by mm (w x h x d)	67 x 90 x 130 (incl. connector)	67 x 90 x 138 (incl. connector)	67 x 90 x 134 (incl. connector)	67 x 90 x 133 (incl. connector)

K 62 26 30 1

100 Watt *)

Type No.	K 62 26 50 1	K 62 26 51 1	K 62 26 50 7
Connector	N female	N male	7-16 female
Frequency range	0 – 1000 MHz		
VSWR 0 – 1000 MHz	< 1.08		
Application	Indoor		
Weight	Approx. 2.4 kg		
Packing size	130 mm x 195 mm x 180 mm		
Dimensions by mm (w x h x d)	114 x 153 x 156 (including connector)	114 x 161 x 156 (including connector)	114 x 170 x 156 (including connector)

K 62 26 50 1

*) Rated power at 40 °C ambient temperature. The max. power rating increases or decreases with falling or rising ambient temperature.

Active Multicouplers

68 – 87.5 MHz
146 – 174 MHz
380 – 470 MHz

Receiver Multicouplers:

Description	Type No.	Frequency range ... tunable bandwidth – fixed bandwidth (not tunable)	Gain	Outputs	Page
Receiver Multicoupler	780 234	68 – 87.5 MHz	3 dB	8	146
Receiver Multicoupler	780 235	68 – 87.5 MHz	1 dB	16	147
Receiver Multicoupler	780 232	146 – 174 MHz	3 dB	8	148
Receiver Multicoupler	780 233	146 – 174 MHz	1 dB	16	149
Receiver Multicoupler	727 621	380 – 470 MHz	3 dB	8	150
Receiver Multicoupler	727 622	380 – 470 MHz	1 dB	16	151

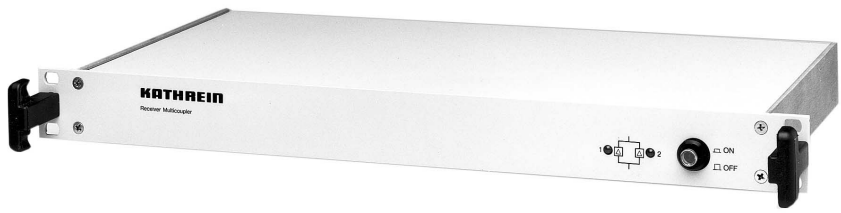
Active Duplex Multicouplers:

Description	Type No.	Frequency range ... tunable bandwidth – fixed bandwidth (not tunable)	Gain / Input power	Inputs	Page
Active Duplex Multicoupler	K 60 21 41 12 A	68 ... 87.5 MHz	+1.7 dB / 2 x 10 W	2	152
Active Duplex Multicoupler	K 60 21 41 12 B	68 ... 87.5 MHz	+1.7 dB / 2 x 10 W	2	152
Active Duplex Multicoupler	K 60 21 41 A	68 ... 87.5 MHz	0 dB / 3 x 10 W	3	152
Active Duplex Multicoupler	K 60 21 41 B	68 ... 87.5 MHz	0 dB / 3 x 10 W	3	152
Active Duplex Multicoupler	K 60 21 41 14 A	68 ... 87.5 MHz	–1.3 dB / 4 x 10 W	4	152
Active Duplex Multicoupler	K 60 21 41 14 B	68 ... 87.5 MHz	–1.3 dB / 4 x 10 W	4	152
Active Duplex Multicoupler	K 60 21 41 15 A	68 ... 87.5 MHz	–2.3 dB / 5 x 10 W	5	152
Active Duplex Multicoupler	K 60 21 41 15 B	68 ... 87.5 MHz	–2.3 dB / 5 x 10 W	5	152
Active Duplex Multicoupler	K 60 21 21 12 A	146 ... 174 MHz	+1.7 dB / 2 x 10 W	2	153
Active Duplex Multicoupler	K 60 21 21 12 B	146 ... 174 MHz	+1.7 dB / 2 x 10 W	2	153
Active Duplex Multicoupler	K 60 21 21 A	146 ... 174 MHz	0 dB / 3 x 10 W	3	153
Active Duplex Multicoupler	K 60 21 21 B	146 ... 174 MHz	0 dB / 3 x 10 W	3	153
Active Duplex Multicoupler	K 60 21 21 14 A	146 ... 174 MHz	–1.3 dB / 4 x 10 W	4	153
Active Duplex Multicoupler	K 60 21 21 14 B	146 ... 174 MHz	–1.3 dB / 4 x 10 W	4	153
Active Duplex Multicoupler	K 60 21 21 15 A	146 ... 174 MHz	–2.3 dB / 5 x 10 W	5	153
Active Duplex Multicoupler	K 60 21 21 15 B	146 ... 174 MHz	–2.3 dB / 5 x 10 W	5	153

Receiver Multicoupler
68 – 87.5 MHz

KATHREIN
Antennen · Electronic

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

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 =).

Rear side

Technical Data

Type No.	**780 234**
Number of inputs	1
Number of outputs	8
Frequency range	68 – 87.5 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.

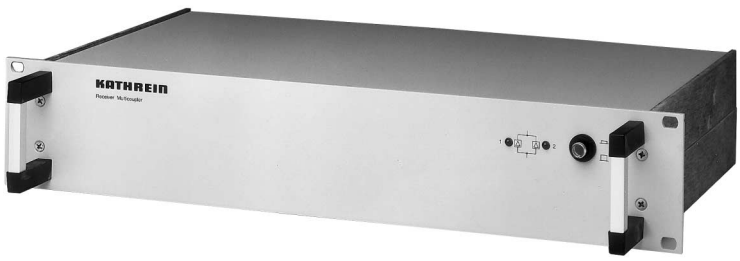
Receiver Multicoupler
68 – 87.5 MHz

KATHREIN
Antennen · Electronic

This receiver multicoupler makes it possible to operate up to 16 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 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 =).



Front side

Rear side

Technical Data

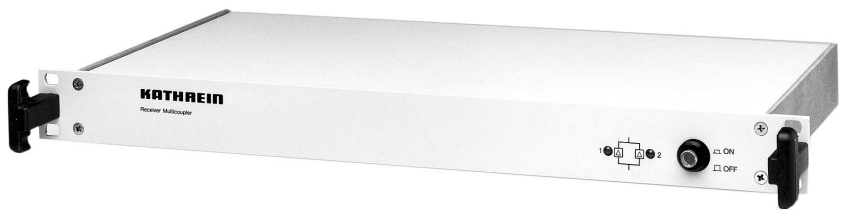
Type No.	**780 235**
Number of inputs	1
Number of outputs	16
Frequency range	68 – 87.5 MHz
Gain	1.0 dB (+1.5 / –1.5 dB)
Noise figure	< 4.5 dB (+0.5 dB)
3rd order intercept point	> 20 dBm (typ. 22 dBm)
Isolation	> 25 dB (typ. 30 dB) between any two outputs
VSWR Input Output	< 1.4 < 1.4
Impedance	50 Ω
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	5.9 kg
Packing size	560 mm x 115 mm x 385 mm
Dimensions (w x h x d)	483 mm x 88 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
146 – 174 MHz

KATHREIN
Antennen · Electronic

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

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 =).

Rear side

Technical Data

Type No.	**780 232**
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.

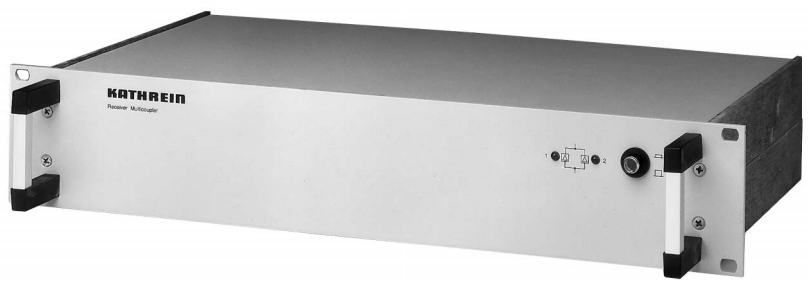
Receiver Multicoupler
146 – 174 MHz

KATHREIN
Antennen · Electronic

This receiver multicoupler makes it possible to operate up to 16 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 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 =).



Front side

Rear side

Technical Data

Type No.	**780 233**
Number of inputs	1
Number of outputs	16
Frequency range	146 – 174 MHz
Gain	1.0 dB (+1.5 / –1.5 dB)
Noise figure	< 4.5 dB (+0.5 dB)
3rd order intercept point	> 20 dBm (typ. 22 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	5.9 kg
Packing size	560 mm x 115 mm x 385 mm
Dimensions (w x h x d)	483 mm x 88 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
Antennen · Electronic

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 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 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.	**727 621**
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 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 V DC, minus grounded
Power Consumption	< 9 W (230 V, 50 Hz) < 20 W (+11 … +48 V DC)
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.

Receiver Multicoupler
380 – 470 MHz

KATHREIN
Antennen · Electronic

This receiver multicoupler makes it possible to operate up to 16 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 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 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.	**727 622**
Number of Inputs	1
Number of Outputs	16
Frequency range	380 – 470 MHz Special tuning is possible in the range of 350 to 550 MHz
Gain	1 dB +1.5 / –1.5 dB
Noise figure	< 4.3 dB +0.5 / –1 dB
3rd order intercept point	> 12 dBm (typ. 16 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 DC, minus grounded
Power Consumption	< 9 W (230 V, 50 Hz) < 20 W (+11 … +48 V DC)
Temperature range	–20 … +55 °C
Connectors	N female
Colour	Front panel: Grey (RAL 7032)
Attached hardware	Power cable and 4 pin DC connector
Weight	5.9 kg
Packing size	560 mm x 115 mm x 435 mm
Dimensions (w x h x d)	483 mm x 88 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.

Active Duplex Multicoupler
68 ... 87.5 MHz

KATHREIN
Antennen · Electronic

The active duplex multicoupler allows the simultaneous operation of up to five full duplex transceivers on a common antenna. It is especially suited for expanding existing radio sites where no mast space is available for additional antennas. For new radio sites the use of the active duplex multicoupler can reduce the cost of masts and antennas.

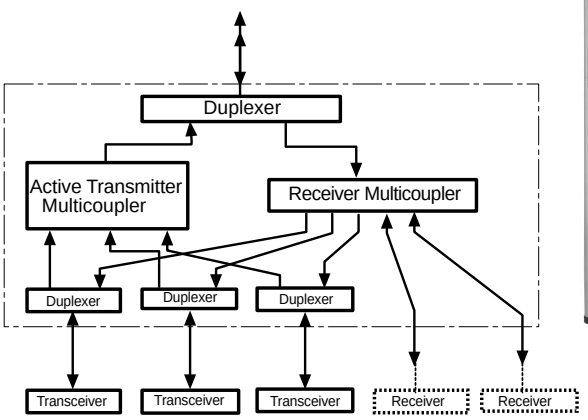
Operation, tuning, maintenance:
Simple operation without any adjustment. The frequency channels can be arbitrarily varied down to the lowest possible channel spacing within the specified bandwidth.

The active transmitter multicoupler can easily be put into operation by connecting the power supply, the antenna, the transmitters and turning on the units.

The operating mode (transmission in the “high band“ or in the “low band“) is set at the factory. All transceivers connected to the active duplex multicoupler have to be switched to the corresponding operating mode. Protective circuitry prevents inadvertent switching to the impermissible mode.

Not used RF input connectors need not be terminated due to the high isolation between the inputs of the active duplex multicoupler. Interferences on one channel do not affect the other channels, because each transmitter input has its own power amplifier and its own voltage supply. Due to the built-in reliability of the fanless convection cooling the active duplex multicouplers requires no maintenance.

Ordering:
Please specify the type number as well as the operating mode (transmission in the “high band“ or “low band“).
For custom versions please specify the duplex spacing, the bandwidth and its position in the frequency band from 68 – 87.5 MHz.



K 60 21 41 14

Technical Data

Type No. **Transmission in the high band** **Transmission in the low band**	**K 60 21 41 12 A** **K 60 21 41 12 B**	**K 60 21 41 A** **K 60 21 41 B**	**K 60 21 41 14 A** **K 60 21 41 14 B**	**K 60 21 41 15 A** **K 60 21 41 15 B**
Number of inputs	2	3	4	5
Frequency range High band Low band	68 ... 87.5 MHz 84.015 – 87.455 MHz 74.215 – 77.655 MHz			
Duplex spacing	9.8 MHz			
Switching bandwidth	3.4 MHz			
Input power	2 x 10 W	3 x 10 W	4 x 10 W	5 x 10 W
Output power	2 x 15 W	3 x 10 W	4 x 7,5 W	5 x 6 W
Gain (at rated input power)	+1.7 dB (+1/–0.5 dB)	0 dB (+1/–0.5 dB)	–1.3 dB (+1/–0.5 dB)	–2.3 dB (+1/–0.5 dB)
Operation mode	Transmission in the “high band“ respectivly in the “low band“ the same for all channels (factory-set after customers requirement)			
Gain in the receive path	1 dB (+2 / –0.5 dB)			
Harmonic suppression	> 75 dB			
Intermodulation suppression	> 65 dB			
VSWR	< 1.4			
Impedance	50 Ω			
Power supply	230 V ~ (+10 / –15 %), 47 – 53 Hz (additional +27 V =, minus grounded) other supply voltages upon request			
Power consumption during receive mode only at 230 V ~ at 27 V =	 40 W 20 W	 50W 20 W	 60 W 20 W	 70 W 20 W
Power consumption during full transmit and receive mode at 230 V ~ at 27 V =	 450 W 270 W	 650 W 400 W	 850 W 540 W	 1050 W 670 W
Temperature range	–20 ... +50 °C			
Connectors	N female			
Colour	Grey (RAL7032)			
Housing	19” rack			
Weight	60 kg	72 kg	86 kg	97 kg
Packing size (by mm)	700 x 850 x 700	700 x 980 x 700	700 x 1100 x 700	700 x 1250 x 700
Dimensions (w x h x d, by mm)	555 x 595 x 563	555 x 728 x 563	555 x 862 x 563	555 x 995 x 563

Active Duplex Multicoupler
146 ... 174 MHz

KATHREIN
Antennen · Electronic

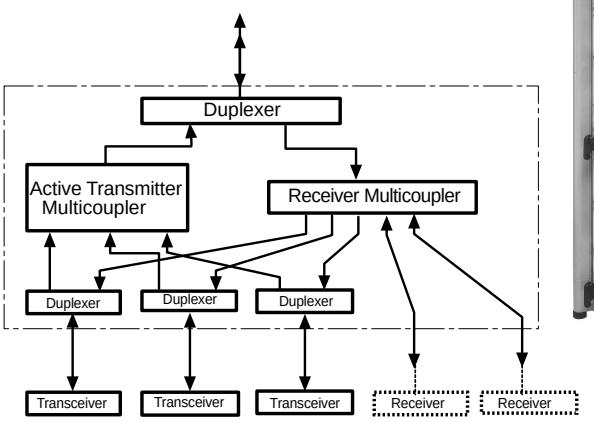
The active duplex multicoupler allows the simultaneous operation of up to five full duplex transceivers on a common antenna. It is especially suited for expanding existing radio sites where no mast space is available for additional antennas. For new radio sites the use of the active duplex multicoupler can reduce the cost of masts and antennas.

Operation, tuning, maintenance:
Simple operation without any adjustment. The frequency channels can be arbitrarily varied down to the lowest possible channel spacing within the specified bandwidth.

The active transmitter multicoupler can easily be put into operation by connecting the power supply, the antenna, the transmitters and turning on the units.

The operating mode (transmission in the “high band“ or in the “low band“) is set at the factory. All transceivers connected to the active duplex multicoupler have to be switched to the corresponding operating mode. Protective circuitry prevents inadvertent switching to the impermissible mode.
Not used RF input connectors need not be terminated due to the high isolation between the inputs of the active duplex multicoupler.
Interferences on one channel do not affect the other channels, because each transmitter input has its own power amplifier and its own voltage supply. Due to the built-in reliability of the fanless convection cooling the active duplex multicouplers requires no maintenance.

Ordering:
Please specify the type number as well as the operating mode (transmission in the “high band“ or “low band“).
For custom versions please specify the duplex spacing, the bandwidth and its position in the frequency band from 146 – 174 MHz.



K 60 21 21 14

Technical Data

Type No. **Transmission in the high band** **Transmission in the low band**	**K 60 21 21 12 A** **K 60 21 21 12 B**	**K 60 21 21 A** **K 60 21 21 B**	**K 60 21 21 14 A** **K 60 21 21 14 B**	**K 60 21 21 15 A** **K 60 21 21 15 B**
Number of inputs	2	3	4	5
Frequency range High band Low band	146 ... 174 MHz 172.14 – 174.12 MHz 167.54 – 169.52 MHz			
Duplex spacing	4.6 MHz			
Switching bandwidth	2.0 MHz			
Input power	2 x 10 W	3 x 10 W	4 x 10 W	5 x 10 W
Output power	2 x 15 W	3 x 10 W	4 x 7.5 W	5 x 6 W
Gain (at rated input power)	+1.7 dB (+1/–0.5 dB)	0 dB (+1/–0.5 dB)	-1.3 dB (+1/–0.5 dB)	-2.3 dB (+1/–0.5 dB)
Operation mode	Transmission in the “high band“ respectivly in the “low band“ the same for all channels (factory-set after customers requirement)			
Gain in the receive path	1 dB (+2 / –0.5 dB)			
Harmonic suppression	> 75 dB			
Intermodulation suppression	> 65 dB			
VSWR	< 1.4			
Impedance	50 Ω			
Power supply	230 V ~ (+10 / –15 %), 47 – 53 Hz (additional +27 V =, minus grounded) other supply voltages upon request			
Power consumption during receive mode only at 230 V ~ at 27 V =	 40 W 20 W	 50W 20 W	 60 W 20 W	 70 W 20 W
Power consumption during full transmit and receive mode at 230 V ~ at 27 V =	 450 W 270 W	 650 W 400 W	 850 W 540 W	 1050 W 670 W
Temperature range	–20 ... +50 °C			
Connectors	N female			
Colour	Grey (RAL7032)			
Housing	19” rack			
Weight	60 kg	72 kg	86 kg	97 kg
Packing size (by mm)	700 x 850 x 700	700 x 980 x 700	700 x 1100 x 700	700 x 1250 x 700
Dimensions (w x h x d, by mm)	555 x 595 x 563	555 x 728 x 563	555 x 862 x 563	555 x 995 x 563

Combiner Systems

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

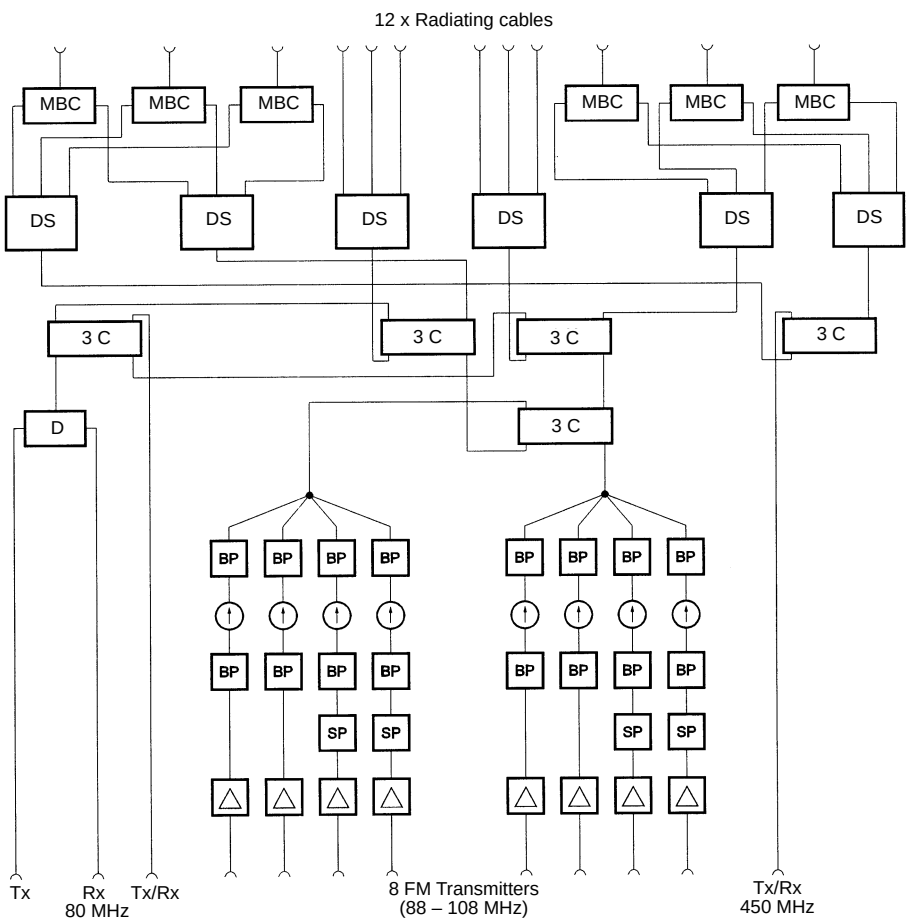
KATHREIN
Antennen · Electronic

Combiner system for mobile communication coverage in a large road tunnel for public authorities, emergency services, professional mobile radio, FM radio and mobile telephones

Frequency ranges: 68 – 88 MHz,
88 – 108 MHz, 450 – 470 MHz

For combining 8 FM transmitters, whose signals are amplified from 10 mW to 100 W, with further transceiver units of other frequency bands. Distribution to 12 feeder points within the tunnels.

MBC = Multi-band combiner
DS = Decoupled power splitter
3 C = 3-dB coupler
D = Duplexer
BP = Band-pass filter
SP = S-P filter
↑ = Isolator
△ = Power amplifier
Tx/Rx = Tansceiver unit
Tx = Tansmitter unit
Rx = Receiver unit



Combiner Systems
Example

KATHREIN
Antennen · Electronic

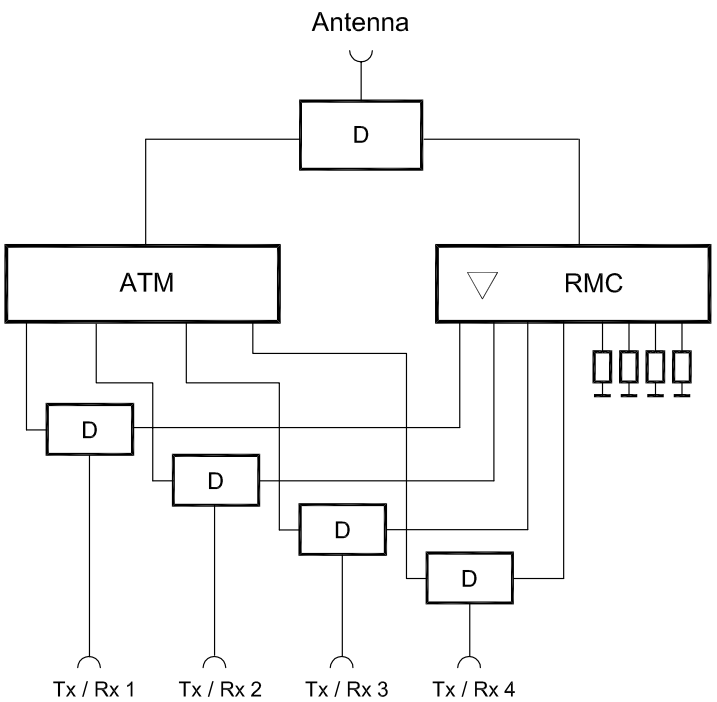
Active Duplex Multicoupler for a police communication network

Frequency range: 74 – 88 MHz

For combining of 4 transceiver units to one common antenna. Consisting of an active transmitter multicoupler and a receiver multicoupler in order to aviod insertion loss.

D = Duplexer
ATM = Active transmitter multicoupler
RMC = Receiver multicoupler
Tx/Tx = Transceiver units

Transceiver units



Combiner Systems
Example

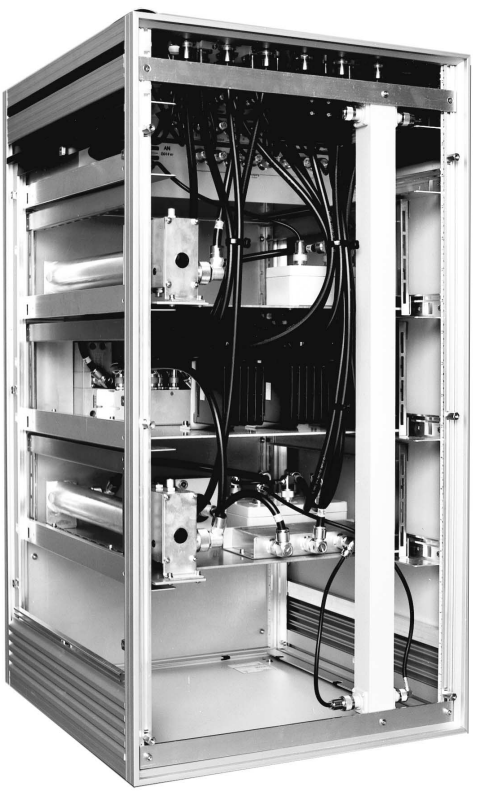
KATHREIN
Antennen · Electronic

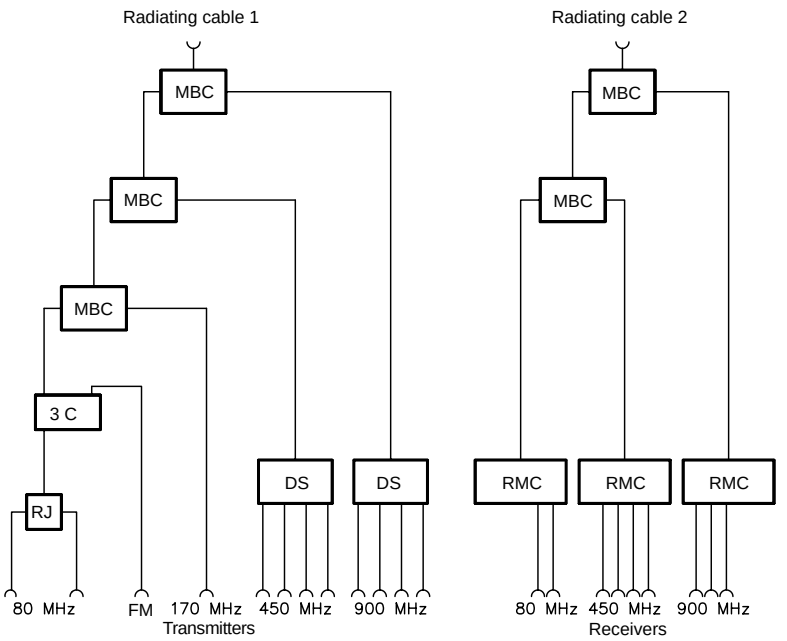
Combiner network for mobile communication coverage in tunnels for public authorities, emergency services, FM radio, paging systems and mobile telephones

Frequency ranges:
75 – 85 MHz, 88 – 108 MHz, 170 MHz,
380 – 470 MHz, 870 – 960 MHz

For combining several transmitters and / or receivers of different frequency bands onto one radiating cable each.

MBC = Multiband combiner
3 C = 3-dB coupler
RJ = Hybrid ring junction
DS = Decoupled power splitter
RMC = Receiver multicoupler





Combiner Systems
Example

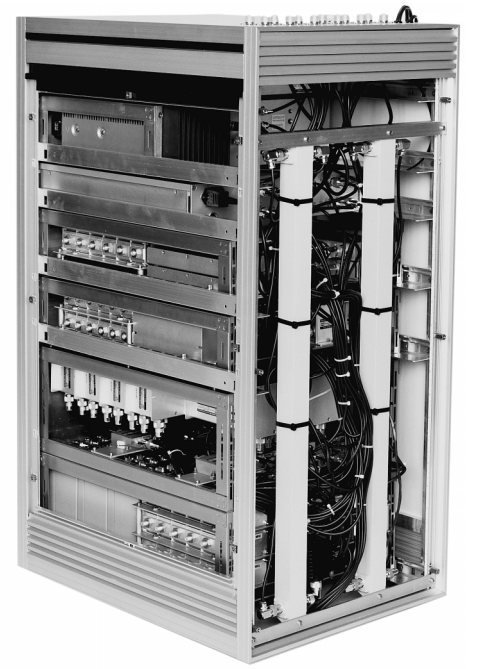
KATHREIN
Antennen · Electronic

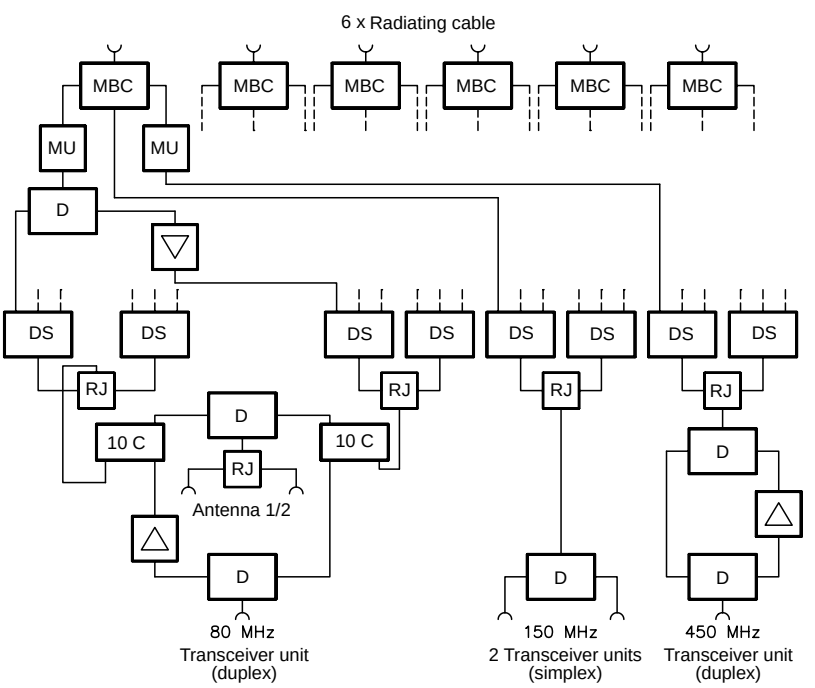
Combiner system for mobile communication coverage in tunnels for public authorities, emergency services and railway services, e. g. for suburban railways

Frequency range: 80 MHz, 150 MHz, 450 MHz

For combining several transceiver units (simplex and duplex) of different frequency bands and splitting to six radiating cables and additionally two antennas (at 80 MHz), including remote-control monitoring.

MBC = Multiband combiner
MU = Measurement unit
D = Duplexer
DS = Decoupled splitter
RJ = Hybrid ring junction
10 C = 10-dB coupler
▽ = Receiver amplifier
△ = Power amplifier





Combiner Systems
Example

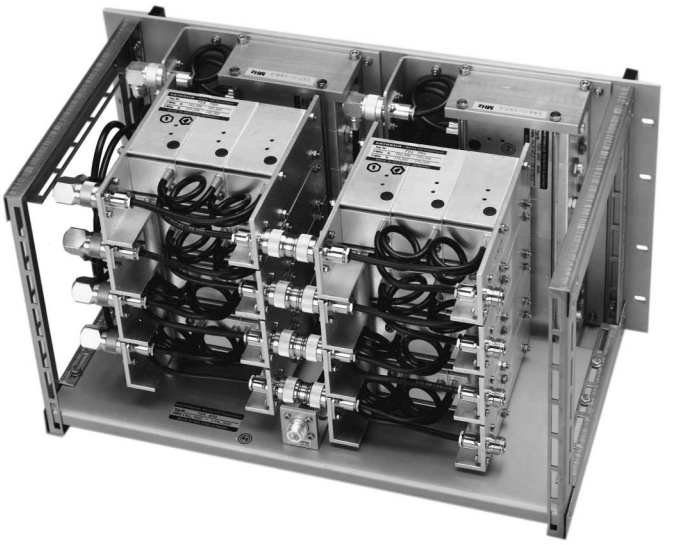
KATHREIN
Antennen · Electronic

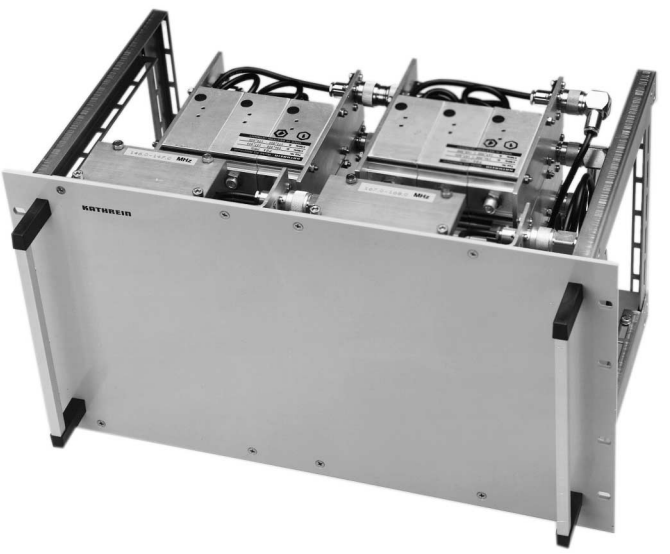
Combiner system for a mobile communication network for motor-racing vehicles

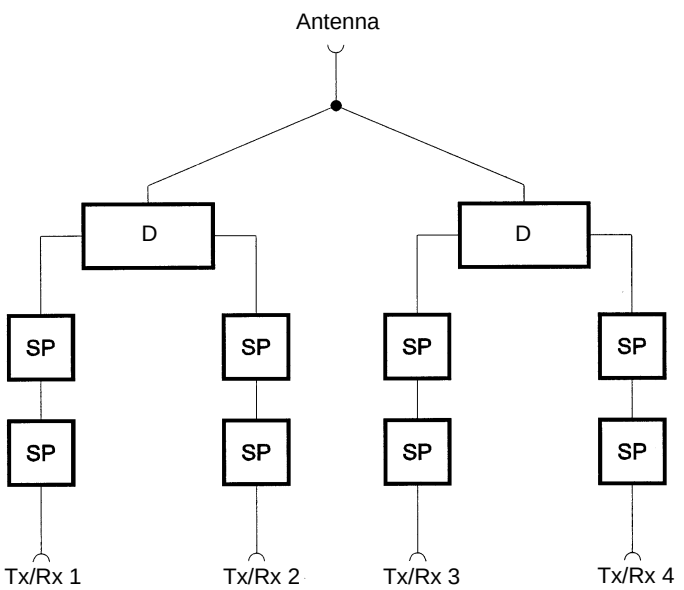
Frequency range: 146 – 174 MHz

For combining 4 simplex transceivers with variable frequencies onto one common antenna.

D = Duplexer
SP = S-P filter
Tx/Rx = Transceiver unit







Combiner Systems
Example

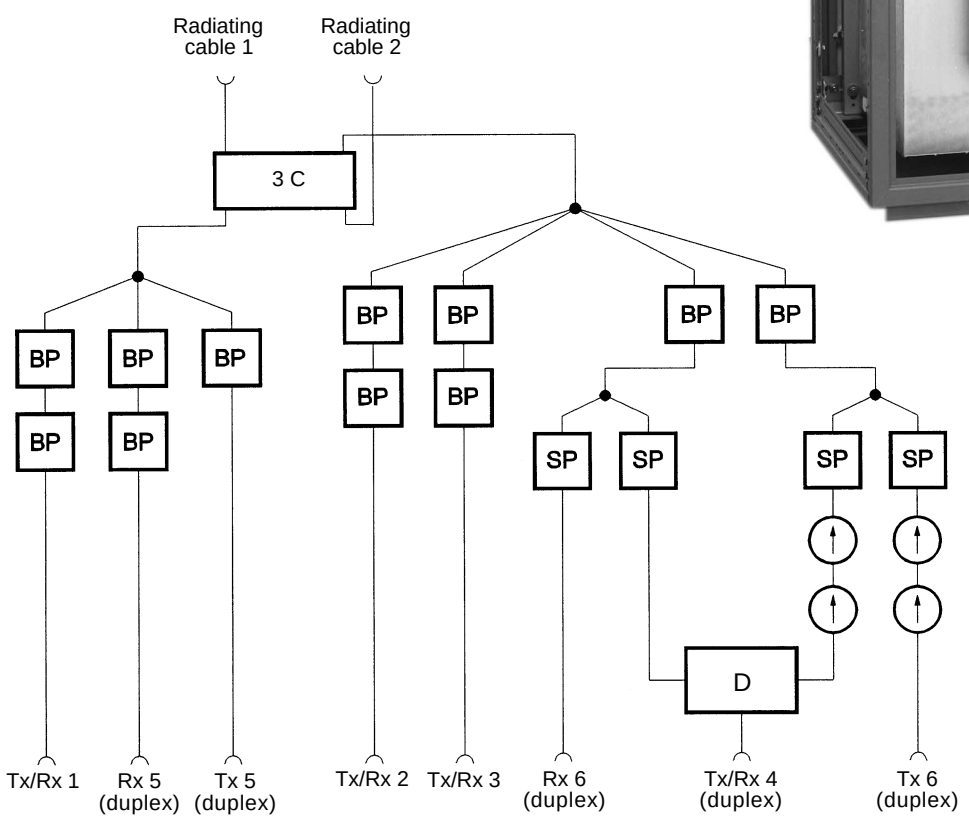
KATHREIN
Antennen · Electronic

Combiner system for the mobile communication network of a public transport company (e. g. underground railway) for professional mobile radio, public authorities and emergency services

Frequency range: 148 – 173 MHz

For combining several transceiver units (simplex and duplex) with minimal frequency spacing and splitting to two radiating cables.

3 C = 3-dB coupler
D = Duplexer
BP = Band-pass filter
SP = S-P filter
↑ = Isolator
Tx/Rx = Transceiver unit
Tx = Transmitter unit
Rx = Receiver unit



Combiner Systems
Example

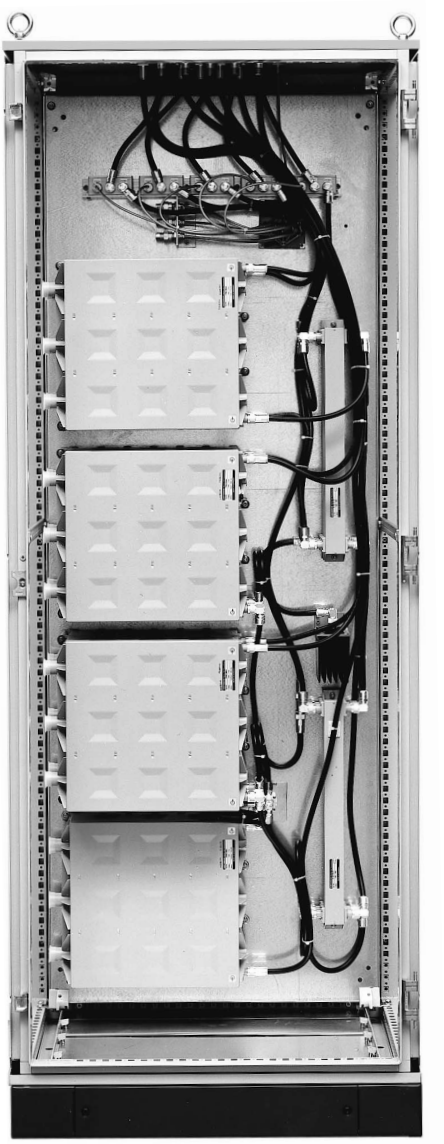
KATHREIN
Antennen · Electronic

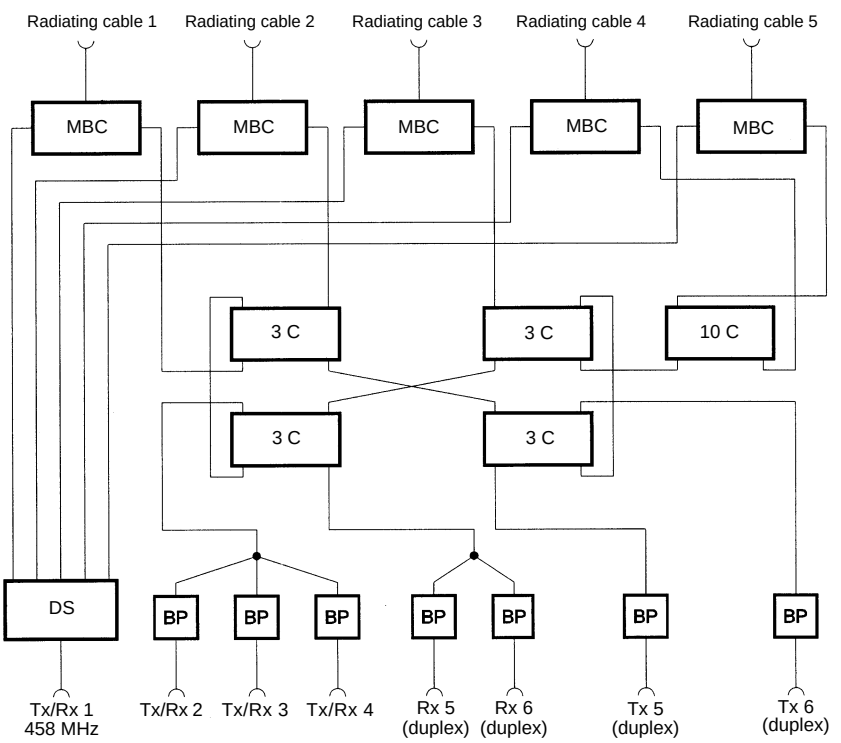
Combiner system for coverage in a tunnel

Frequency ranges: 148 – 173 MHz
and 458 MHz

For combining several transmitters and/or receivers (duplex/simplex) with minimal frequency spacing and splitting to five radiating cables.

MBC = Multiband combiner
3 C = 3-dB coupler
10 C = 10-dB coupler
DS = Decoupled splitter
BP = Band-pass filter
Tx/Rx = Transceiver unit
Tx = Transmitter unit
Rx = Receiver unit





Combiner Systems
Example

KATHREIN
Antennen · Electronic

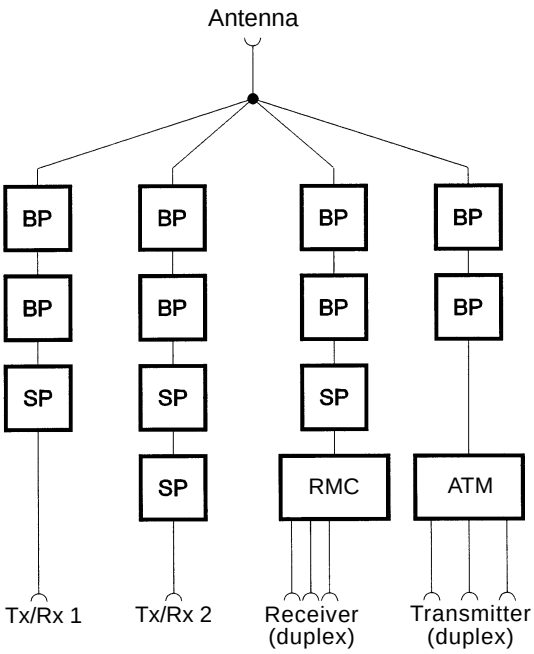
Active combiner system for a common data and voice communication network

Frequency range: 148 – 156 MHz

For combining several duplex and simplex channels to one common antenna.

The duplex channels are combined on the transmitting side via an active transmitter multicoupler and on the receiving side via a receiver multicoupler, in order to reduce insertion loss.

BP = Band-pass filter
SP = S-P filter
RMC = Receiver multicoupler
ATM = Active transmitter multicoupler
Tx/Rx = Transceiver unit



Combiner Systems
Example

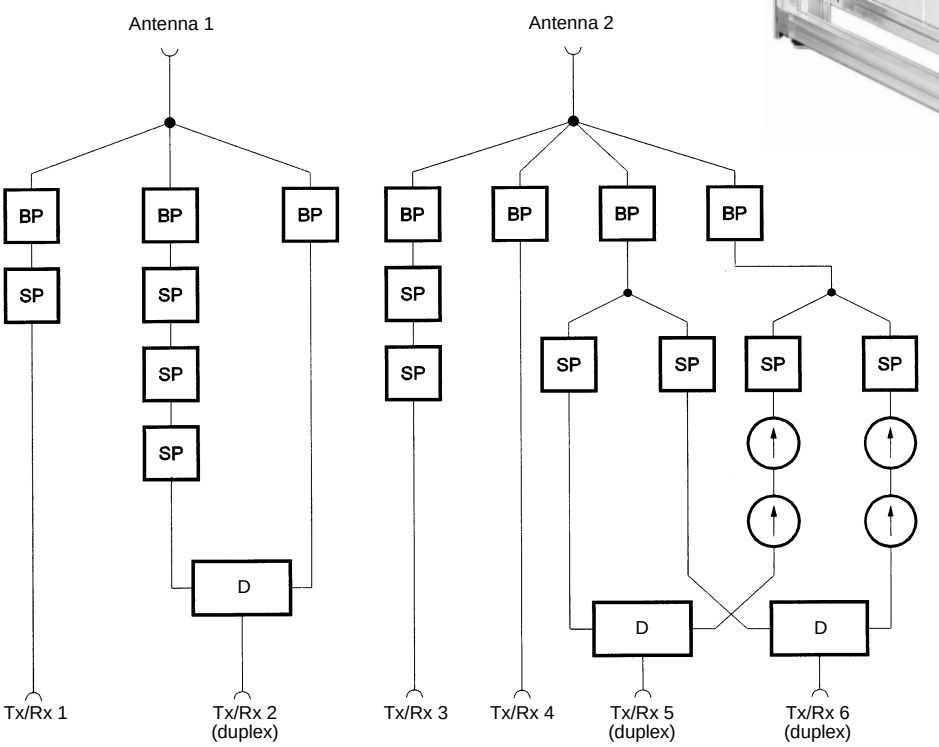
KATHREIN
Antennen · Electronic

Combiner system for a mobile communication network of a public transport company

Frequency range: 148 – 165 MHz

For combining several transceivers (simplex and duplex) with minimal frequency spacing onto two base-station antennas.

BP = Band-pass filter
SP = S-P filter
D = Duplexer
↑ = Isolator
Tx/Rx = Transceiver unit



Combiner Systems
Example

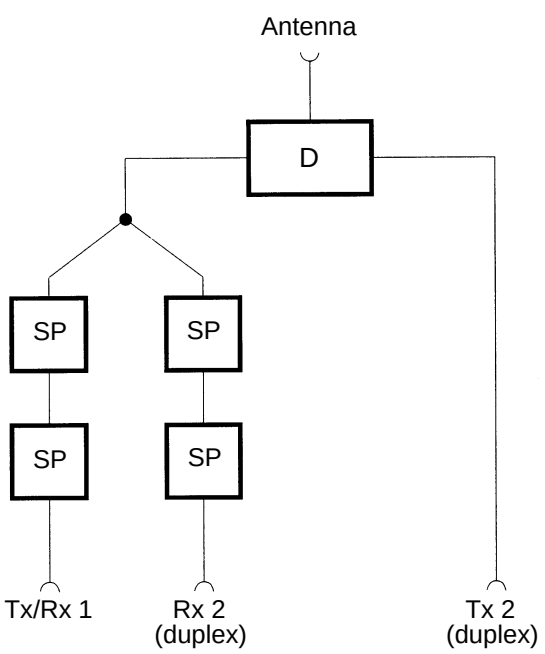
KATHREIN
Antennen · Electronic

Combiner system for the mobile communication network of an underground railway public transport company.
This network is used for data and voice communication.

Frequency range: 149 – 156 MHz

For combining one simplex transceiver with one duplex transceiver onto one common antenna.

D = Duplexer
SP = S-P filter
Tx/Rx = Transceiver unit
Tx = Transmitter unit
Rx = Receiver unit



Combiner Systems
Example

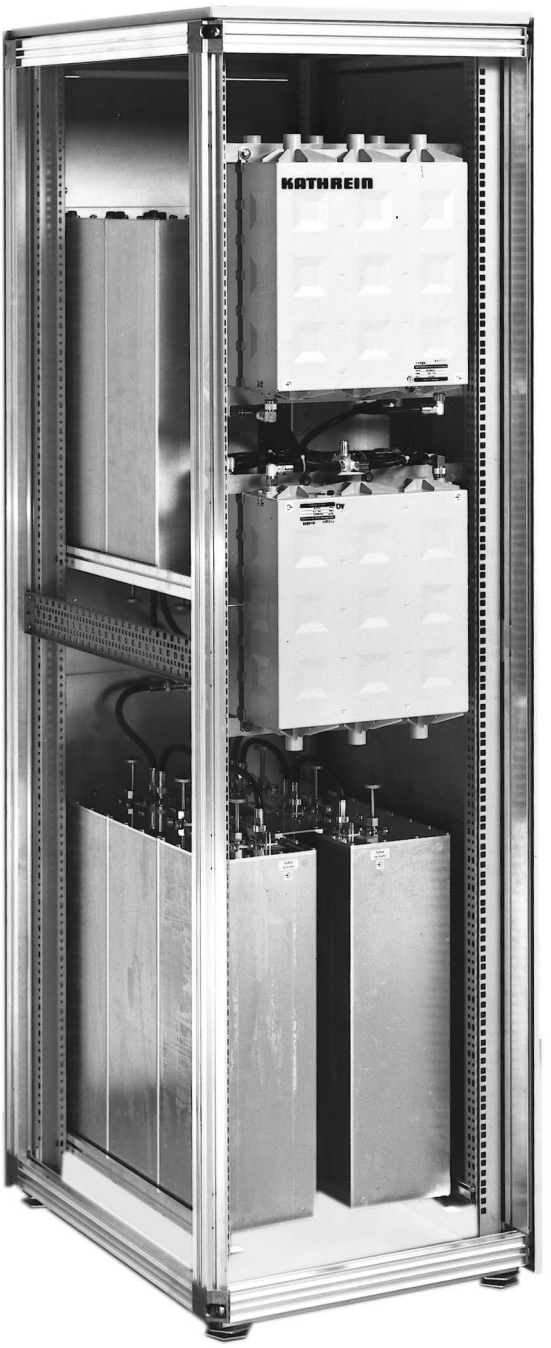
KATHREIN
Antennen · Electronic

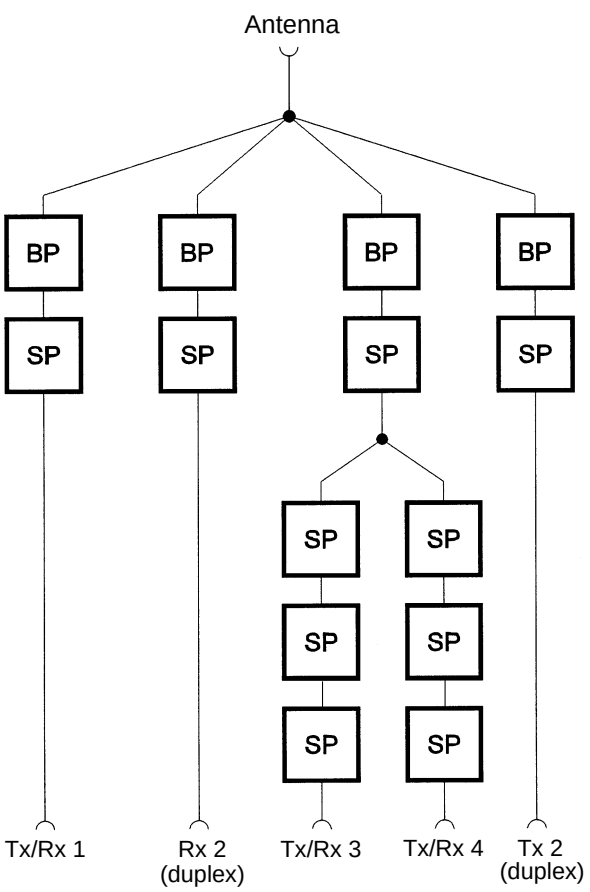
Combiner system for the synchronized radio network of a public transport company

Frequency range: 149 – 156 MHz

For combining of several transceiving units (simplex and duplex) with minimal frequency spacing onto one base station antenna.

BP = Band-pass filter
SP = S-P filter
Tx/Rx = Transceiver unit
Tx = Transmitter unit
Rx = Receiver unit





Combiner Systems
Example

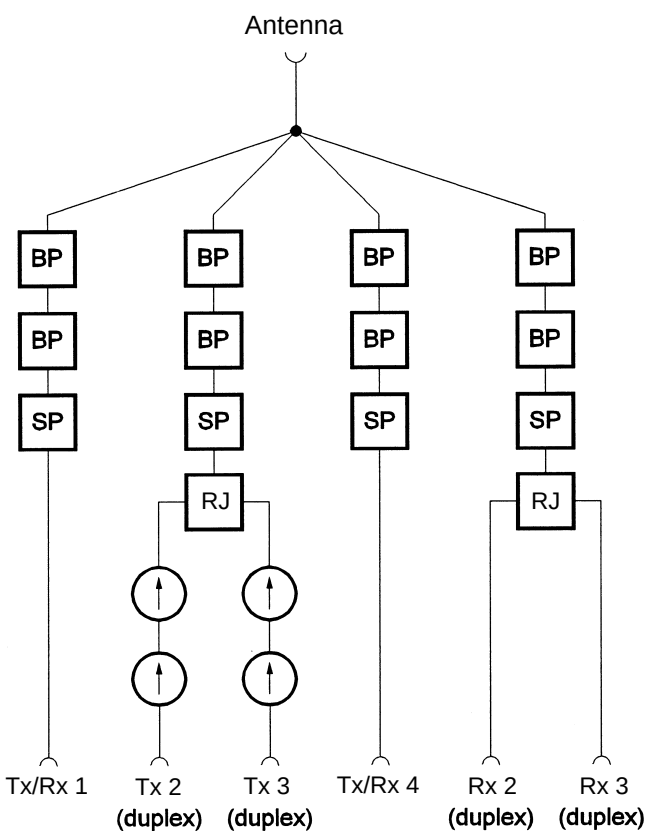
KATHREIN
Antennen · Electronic

Combiner system for a mobile communication network of a public transport company for data and voice communication

Frequency range: 149 – 156 MHz

For combining several transceiver units (simplex and duplex) with minimal frequency spacing onto one base-station antenna.

BP = Band-pass filter
SP = S-P filter
RJ = Hybrid ring junction
↑ = Isolator
Tx/Rx = Transceiver unit
Tx = Transmitter unit
Rx = Receiver unit



Combiner Systems
Example

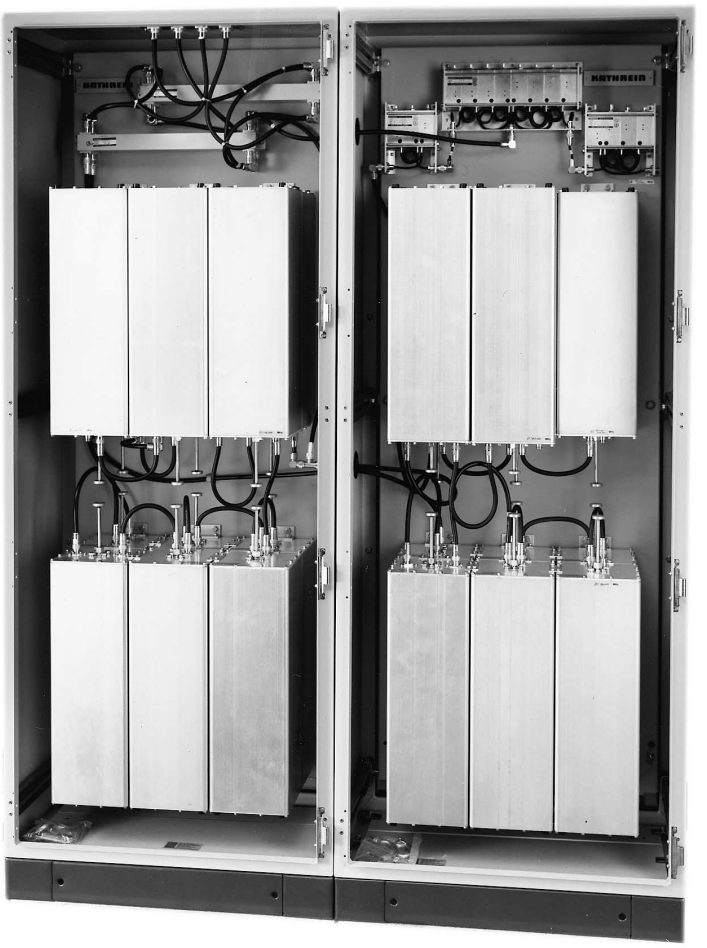
KATHREIN
Antennen · Electronic

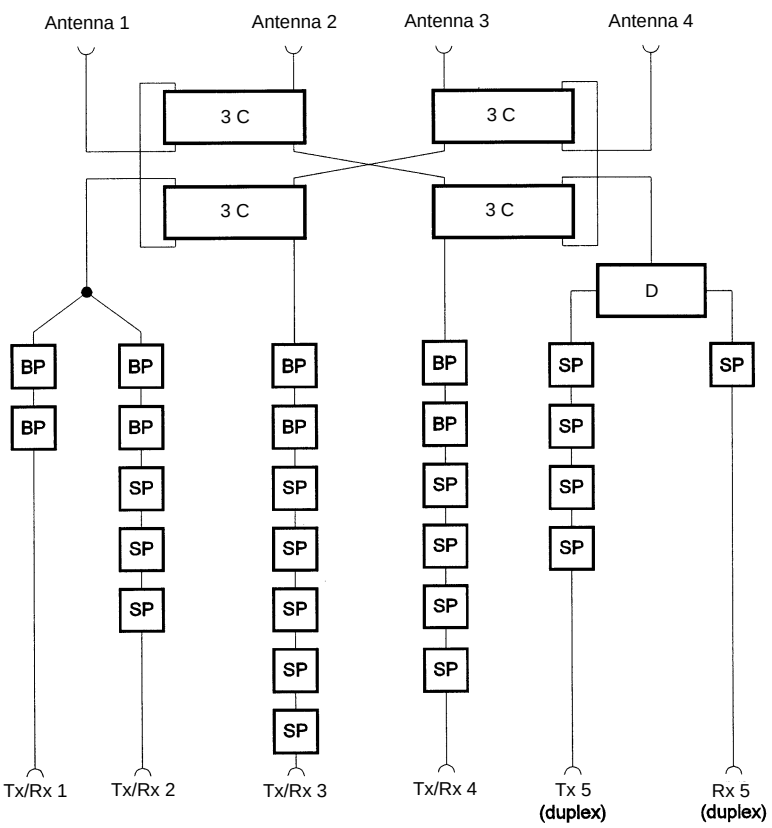
Combiner system for mobile communication coverage in a railway station for professional mobile radio, public authorities and emergency services

Frequency range: 151 – 174 MHz

For combining several transceivers (duplex and simplex) with minimal frequency spacing and distributing them onto 4 antennas.

3 C = 3-dB coupler
D = Duplexer
BP = Band-pass filter
SP = S-P filter
Tx/Rx = Transceiver unit
Tx = Transmitter unit
Rx = Receiver unit





Combiner Systems
Example

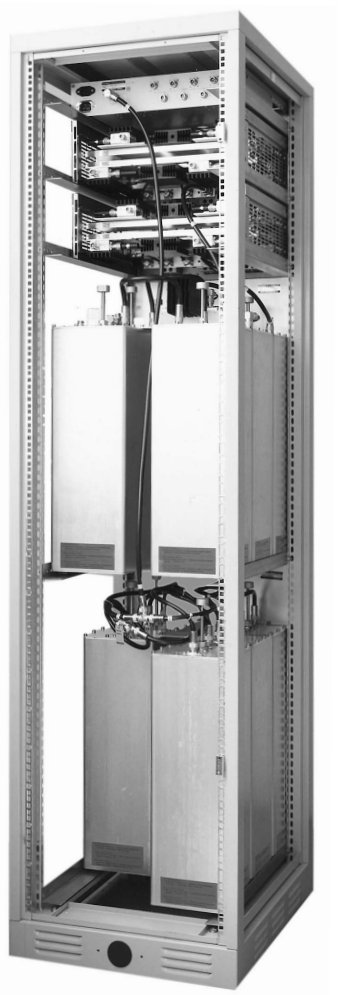
KATHREIN
Antennen · Electronic

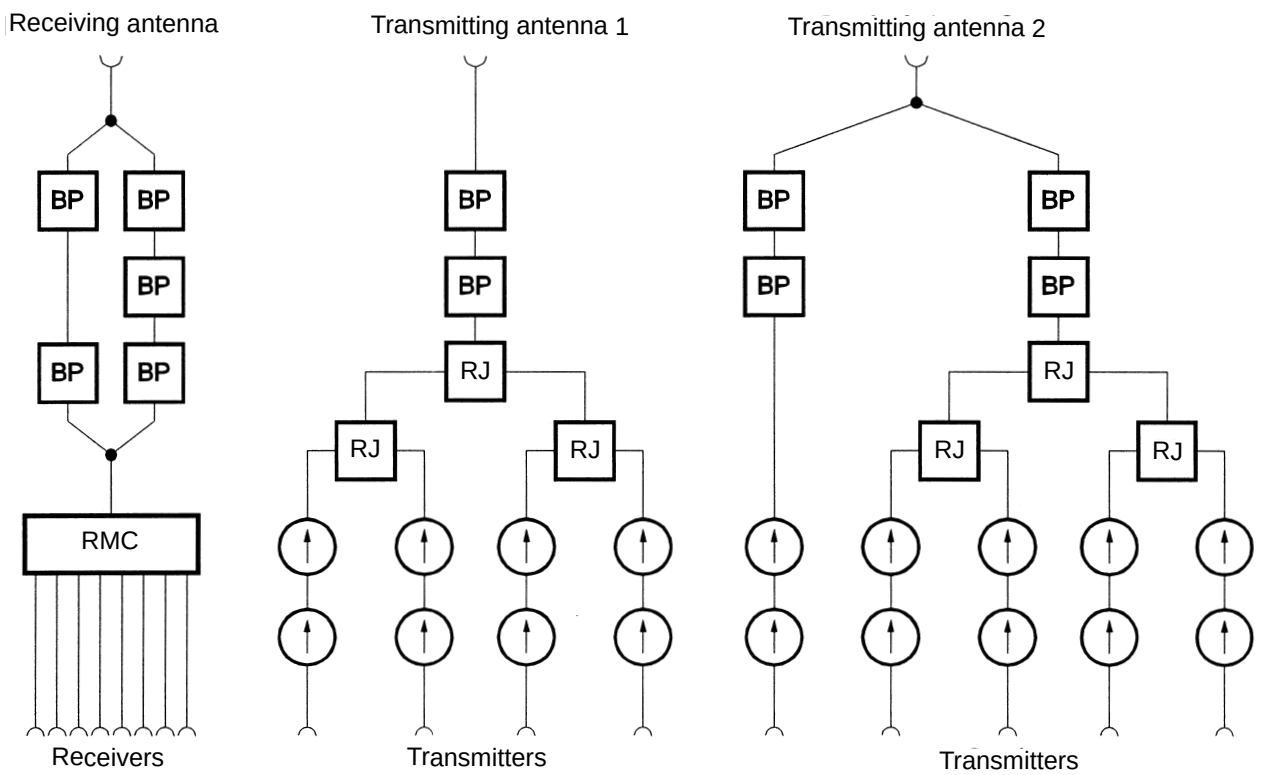
Combiner system for a mobile communication network for security services

Frequency range: 158 – 169 MHz

For combining several duplex transceiving units, whereby one frequency pair is operated in exchanged band position.

BP = Band-pass filter
RJ = Hybrid ring junction
RMC = Receiver multicoupler
↑ = Isolator





Combiner Systems
Example

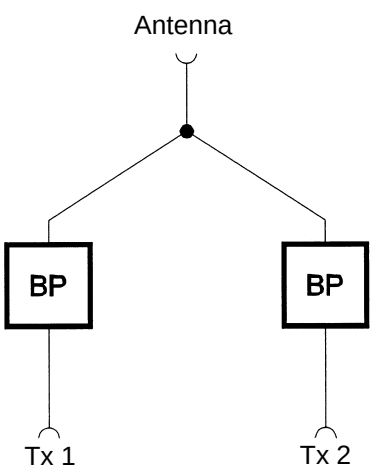
KATHREIN
Antennen · Electronic

Combiner system for an ERMES paging network and one further paging system

Frequency range: 169 – 173 MHz

For combining two transmitters to one common antenna.

BP = Band-pass filter
Tx = Transmitter unit



Combiner Systems
Example

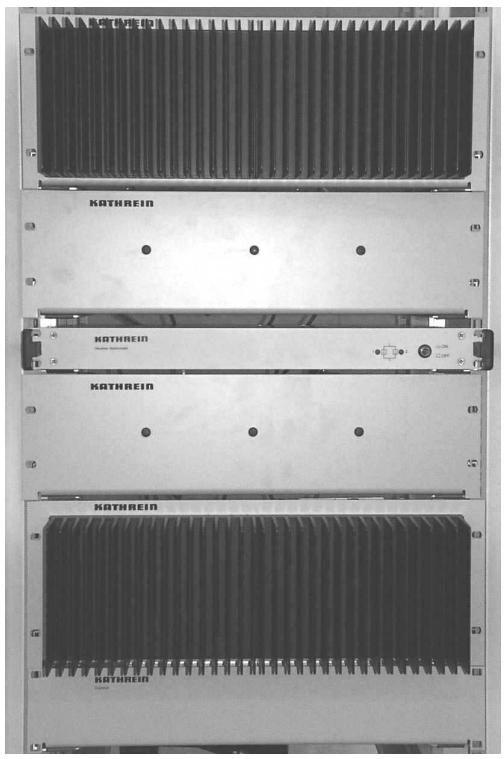
KATHREIN
Antennen · Electronic

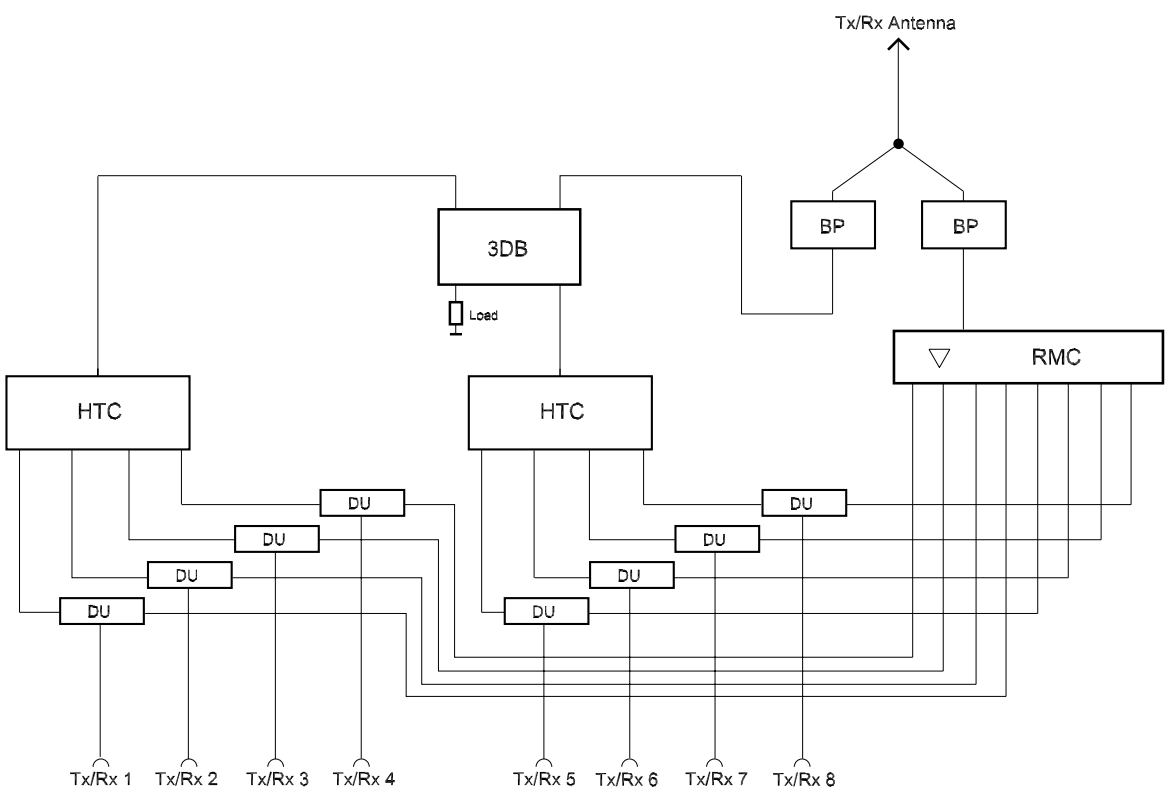
Combiner system for a police mobile communication TETRA network

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

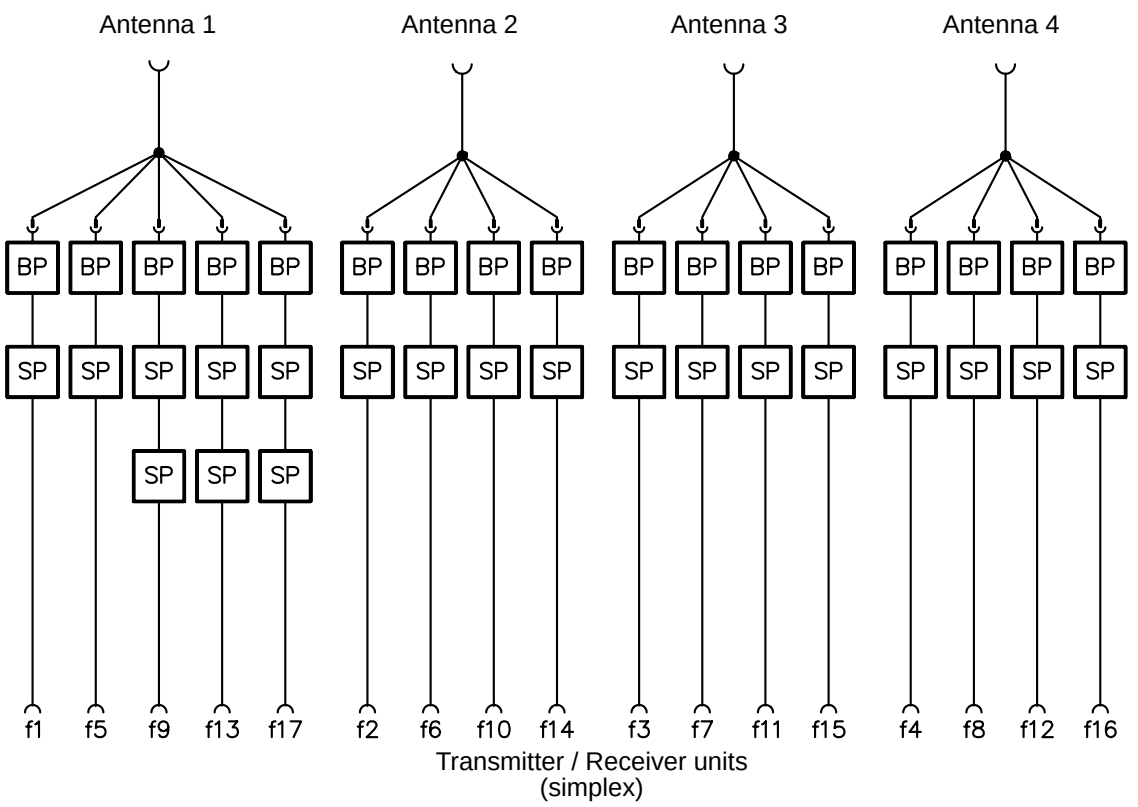
KATHREIN
Antennen · Electronic

Combiner system for a mobile communication network of a railway station

Frequency range 410 … 420 MHz

For combining of several receiving/transmitting units (simplex) to four antennas.

BP = Band-pass filter
SP = S-P filter



Combiner Systems
Example

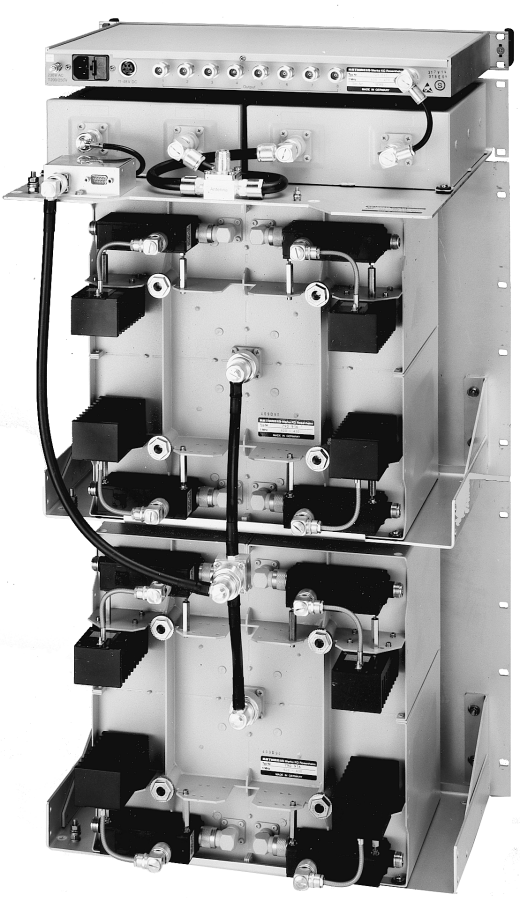
KATHREIN
Antennen · Electronic

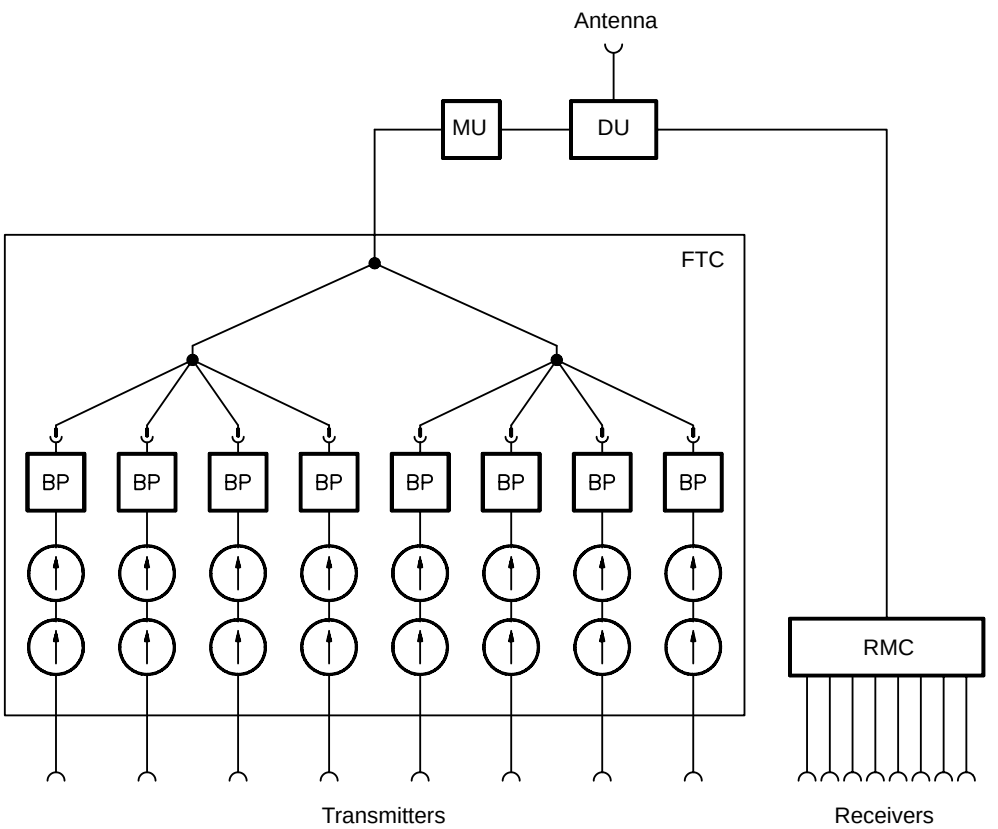
Combiner system for trunking system base stations

Frequency range 410 … 430 MHz

For combining of 8 transmitters and 8 receivers each to one common transmitting/receiving antenna.

DU = Duplexer
MU = Measuring unit
BP = Band-pass filter
RMC = Receiver multicoupler
FTC = Filter transmitter combiner
↑ = Isolator





Combiner Systems
Example

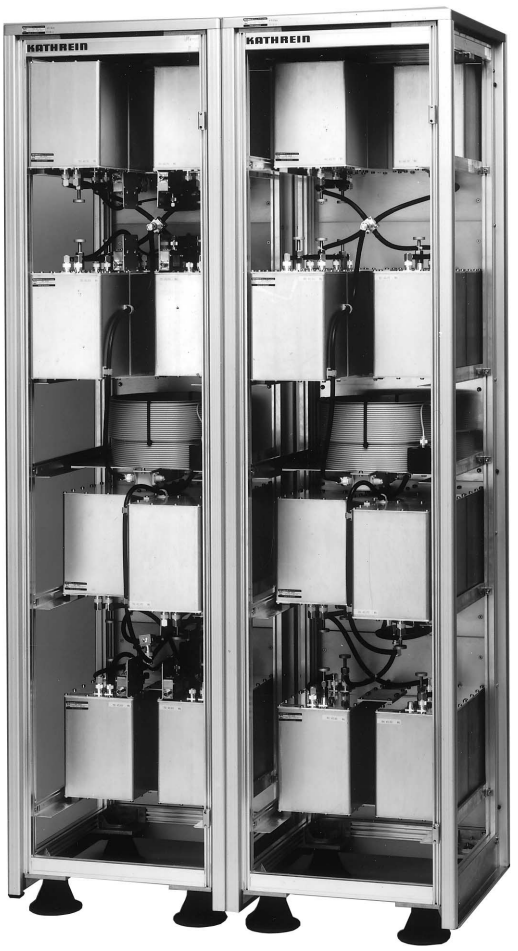
KATHREIN
Antennen · Electronic

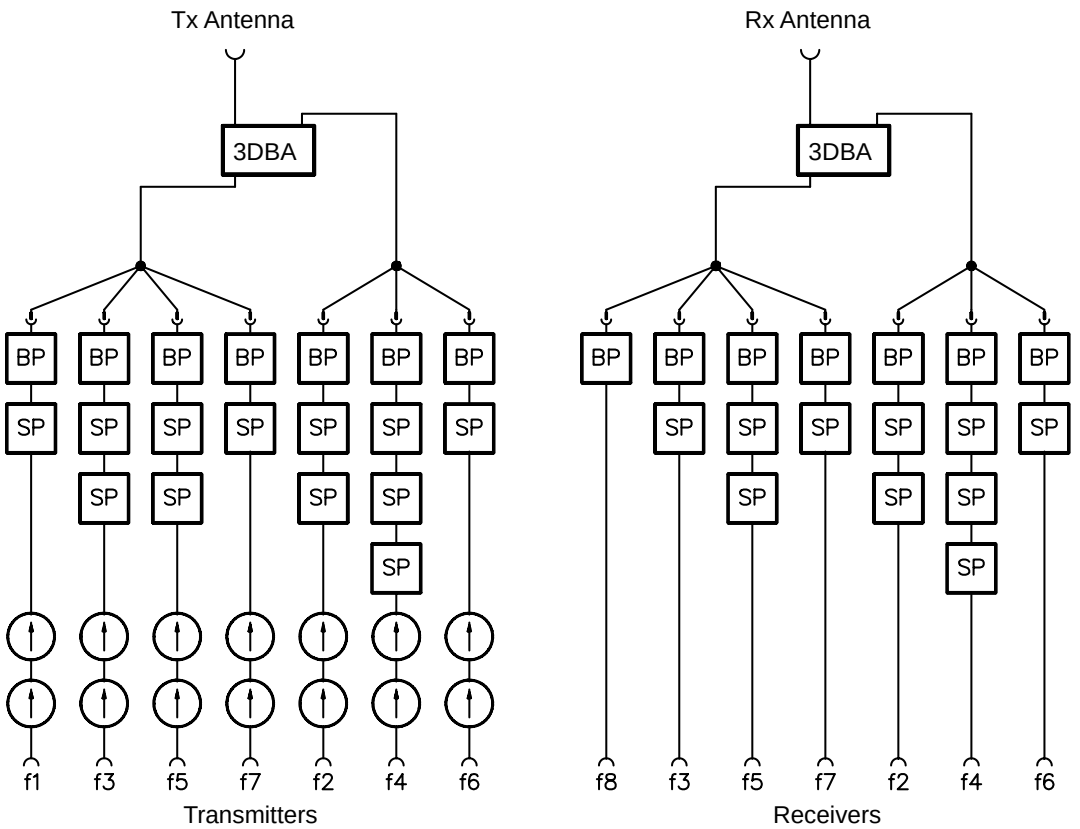
Combiner system for police base stations

Frequency range 450 … 460 MHz

Combining of several transmitting/receiving units (simplex and duplex) to one transmitting (Tx) antenna each and one receiving (Rx) antenna each

3DBA = 3-dB coupler with cable absorber
BP = Band-pass filter
SP = S-P filter
↑ = Isolator





Combiner Systems
Example

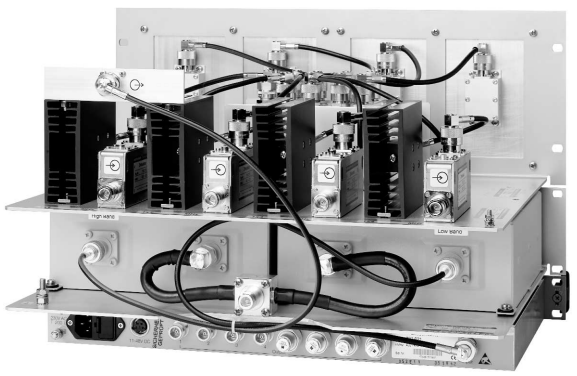
KATHREIN
Antennen · Electronic

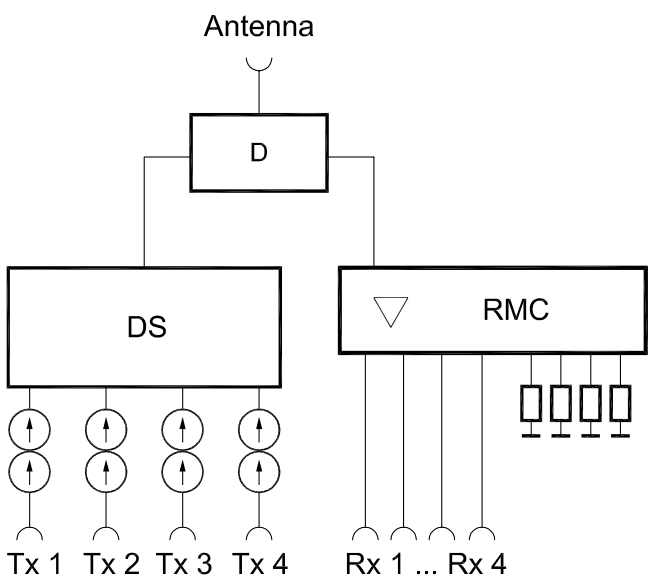
Service radio for governmental and emergency

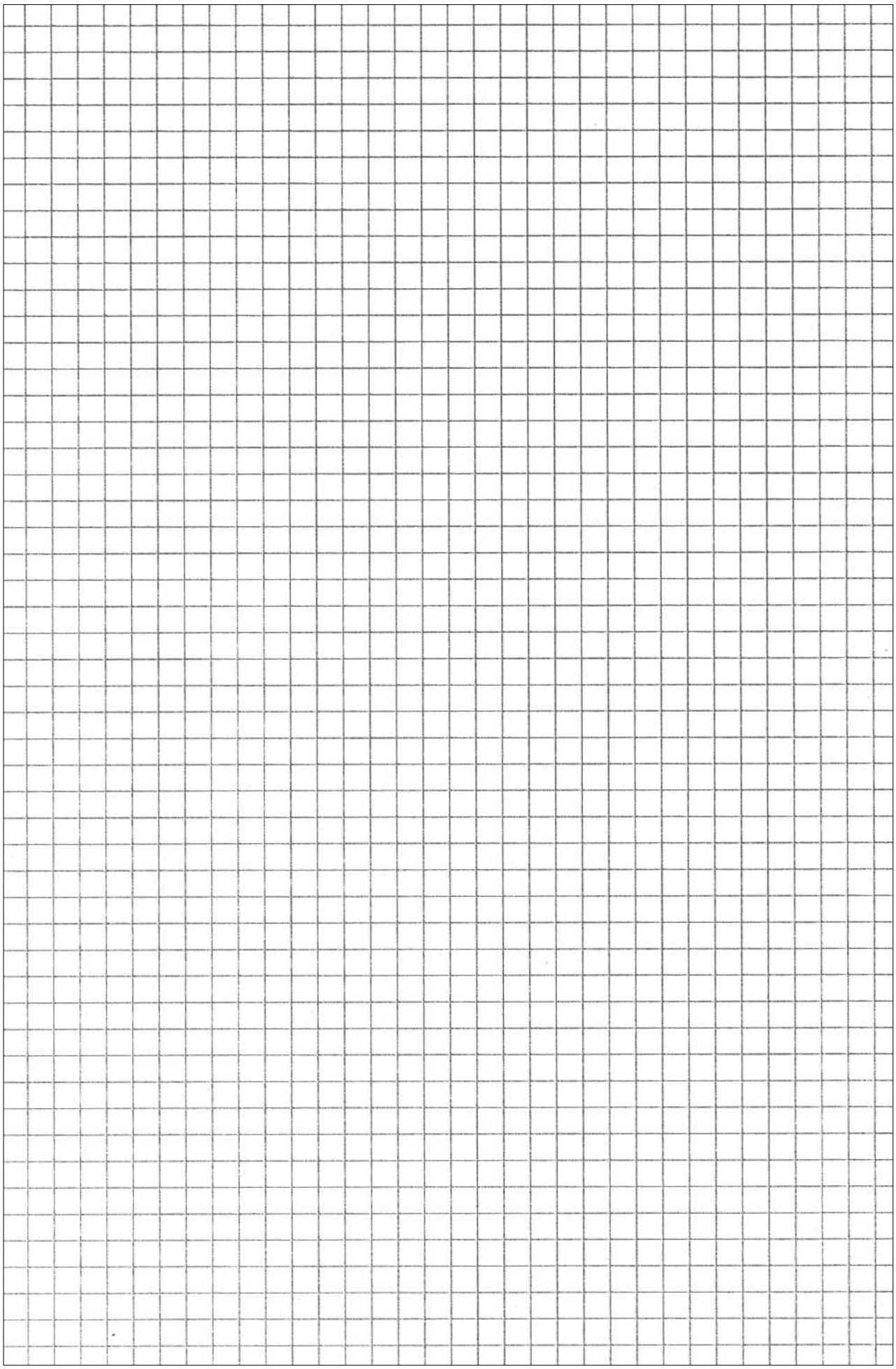
Frequency range: 450 – 465 MHz

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

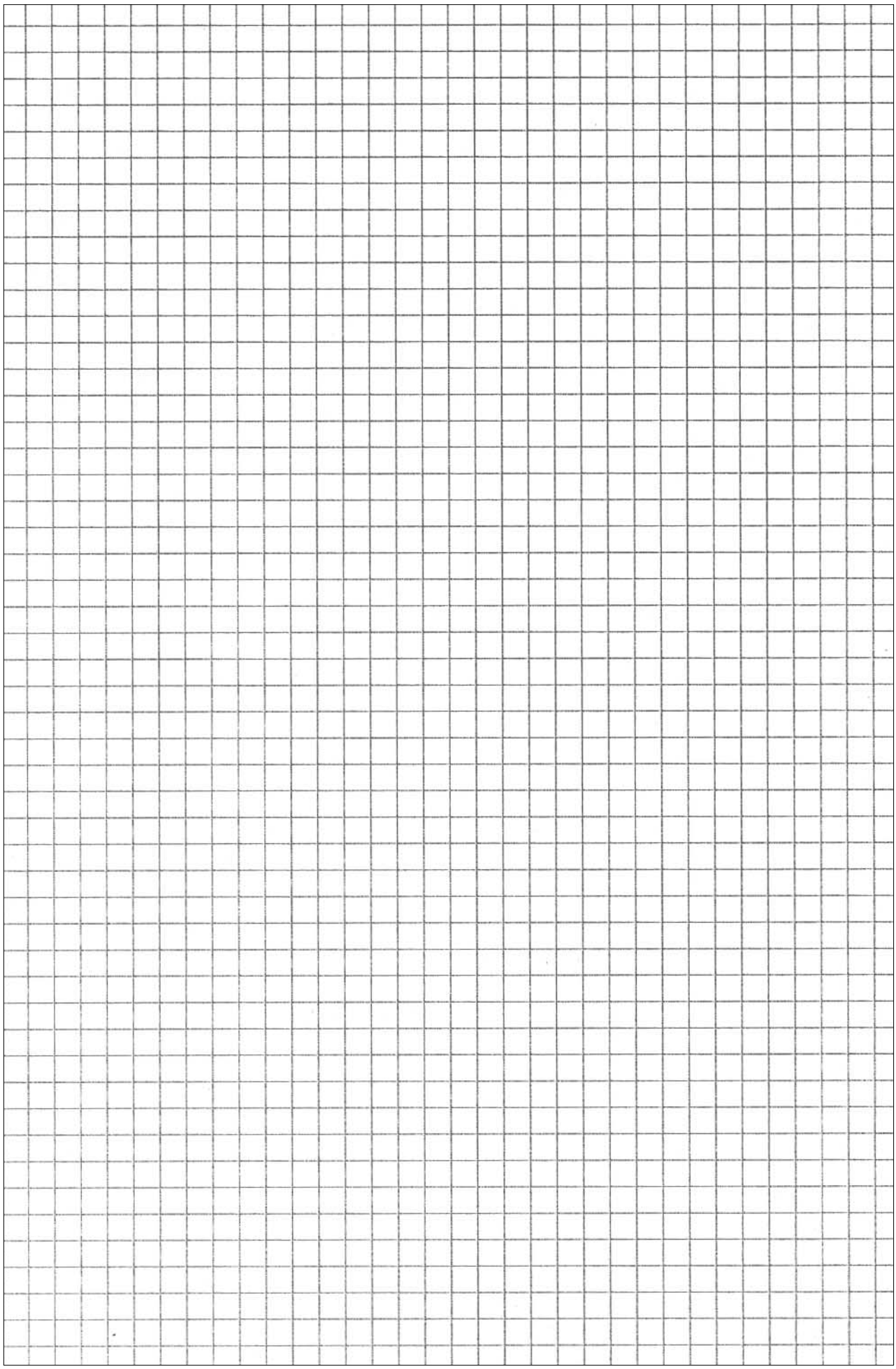
D = Duplexer
DS = Decoupled power splitter
RMC = Receiver multicoupler
↑ = Isolator
Tx = Transmitter
Rx = Receiver

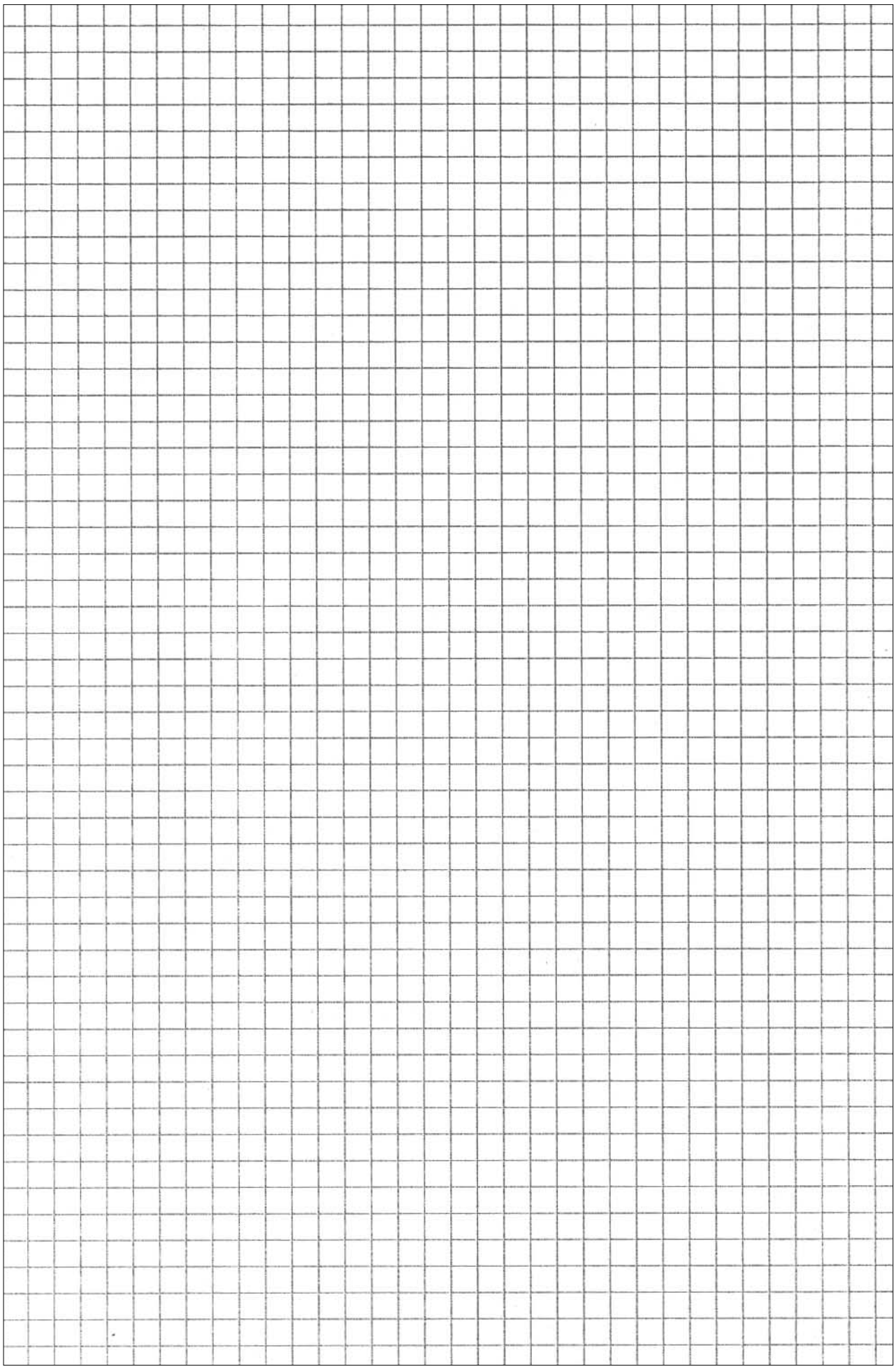






Note





9987.212/0905/3/ZWT/HA Subject to alteration.

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