

# Professional Antennas for Ground-to-Air Communications



# Professional Antennas



**KATHREIN** Professional Antennas are available for virtually all operating conditions encountered in actual practice. They will continue to operate even under severe weather conditions and can withstand extremely high wind velocities. In addition to corrosion-resistant materials, sturdy design and electrical and mechanical quality control testing of each and every antenna, a safety factor of 2 against mechanical failure is your guarantee of maximum reliability and years of maintenance-free operation.

For this reason, we guarantee the full serviceability of our antennas for at least 5 years. However experience has shown that the antennas require absolutely no maintenance whatsoever for up to 15 years and longer.

This catalogue includes standard antennas and accessories for antenna systems for ground to air communications and navigation. In addition, we also manufacture many types of special models, matched to your specifications or specific conditions.

9985.550/0598/1/WB/HA Subject to alteration.

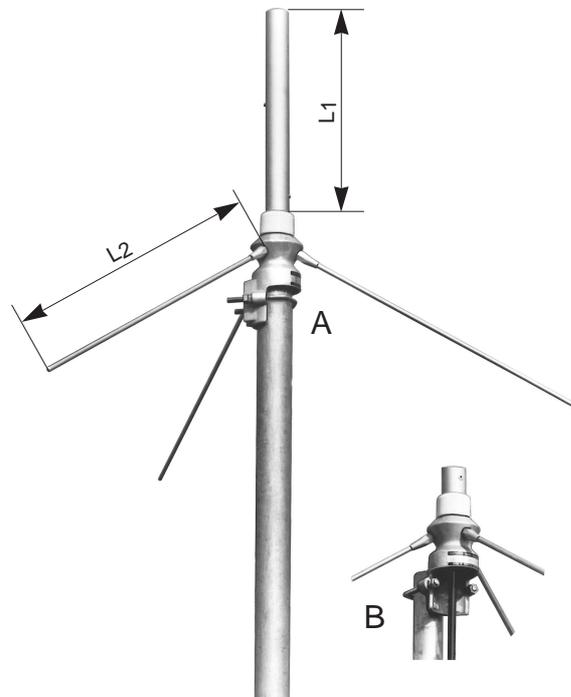
# Omnidirectional Antenna

## 116 – 152 MHz

### K 51 26 31

#### Broadband aluminium groundplane-antenna with stainless steel radials

| Type No.           | K 51 26 31                                       |
|--------------------|--|
| Input              | N female connector in the antenna base           |
| Connector position | Bottom   |
| Frequency range    | 116 – 152 MHz                                    |
| Bandwidth          | 36 MHz   |
| VSWR               | < 1.6 (118 – 144 MHz)<br>< 2.0 (116 – 152 MHz)   |
| Gain               | 0 dB (ref. to the half wave dipole)              |
| Impedance          | 50 $\Omega$                                      |
| Polarization       | Vertical   |
| Max. power         | 60 Watt (at 50 °C ambient temperature)           |
| Weight             | 1.5 kg   |
| Wind load          | 50 N (at 160 km/h)                               |
| Max. wind velocity |  |
| w/o ice            | 200 km/h   |
| 1/2" radial ice    | 135 km/h   |
| Packing size       | 100 x 85 x 720 mm                                |
| Height             | L <sub>1</sub> : 430 mm, L <sub>2</sub> : 700 mm |



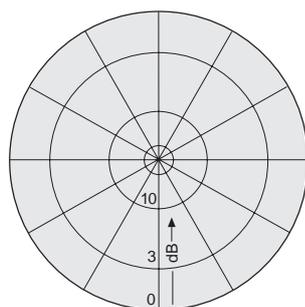
**Material:** Radiator: Heavy duty alodined aluminum.  
Radials: Stainless steel 8 mm diameter.  
Base: High strength cast aluminum.  
All screws and nuts: Stainless steel.

**Mounting:** The antenna can be mounting by means of a supplied stainless steel clamp in such a manner as to permit the cable to be run either inside a 40 – 54 mm pipe (Fig. A) or outside a 20 – 54 mm pipe (Fig. B).

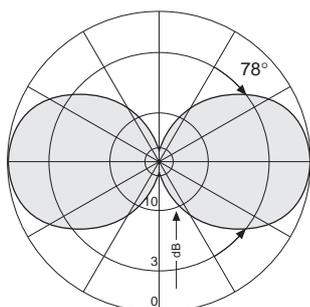
**Grounding:** The antenna is DC grounded by a cross section of 120 mm<sup>2</sup> aluminum.

**Scope of supply:** Antenna including mounting hardware.

#### Radiation Pattern (at mid-band)



Horizontal Pattern

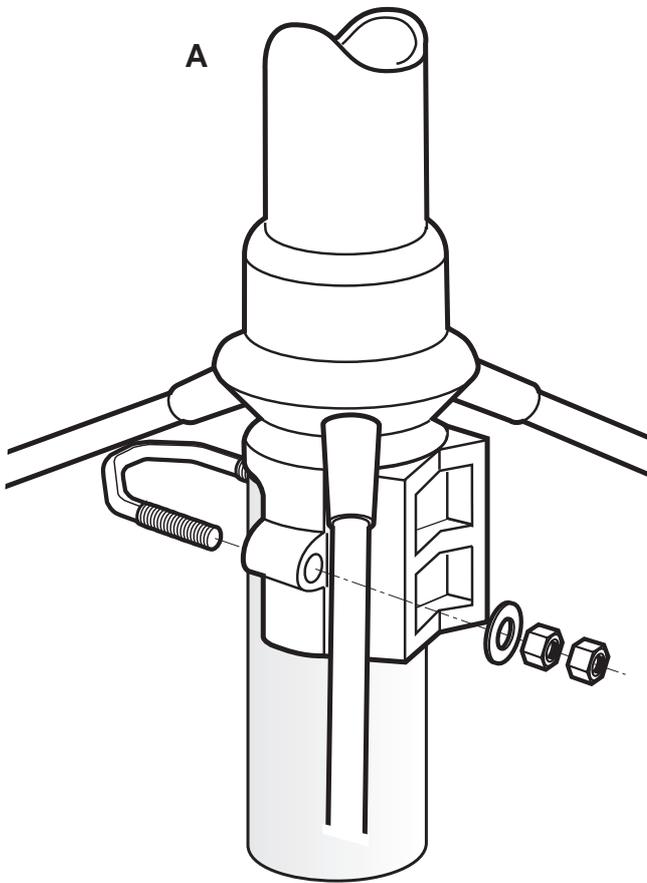


Vertical Pattern

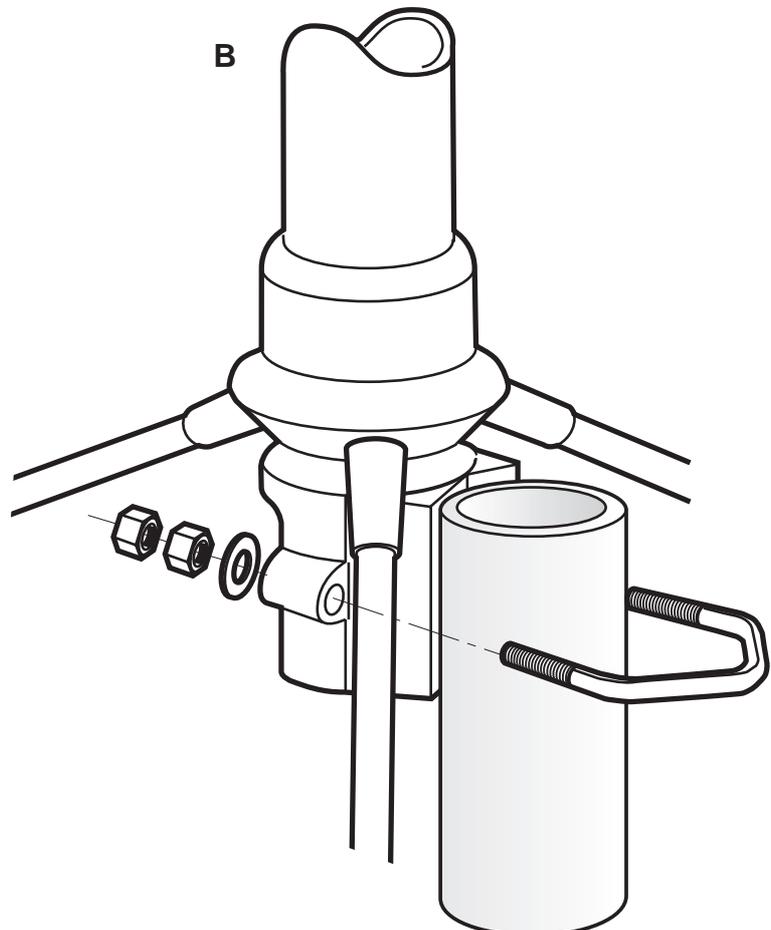
# Mounting Instruction

## Omnidirectional Antenna

### K 51 26 31



A: for pipes of 40 – 54 mm Ø  
B: for pipes of 20 – 54 mm Ø



#### Side mounting on a mast

Brackets for pipes of 55 to 105 mm OD are available for this mounting mode:

| Distance between pipe and antenna | 500 mm    | 1000 mm   |
|-----------------------------------|-----------|-----------|
| Model No.                         | K 61 33 3 | K 61 33 4 |

With this mounting mode the standing wave ratio (VSWR) will be altered somewhat as a factor of clearance and mast diameter.

# Omnidirectional Antenna

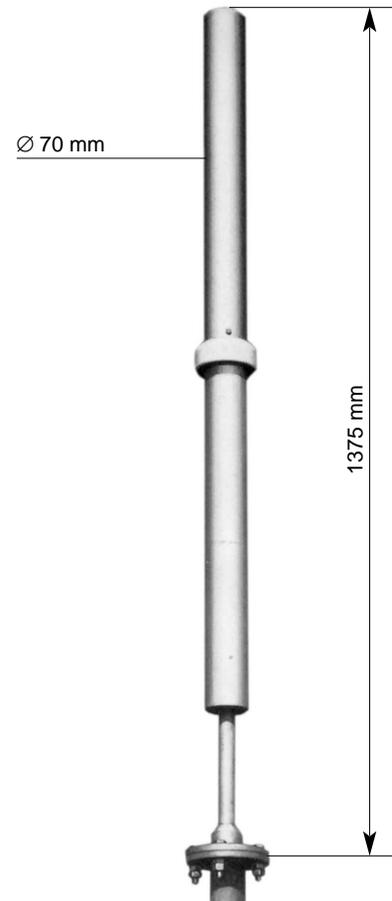
## 118 – 137 MHz

### K 55 20 31

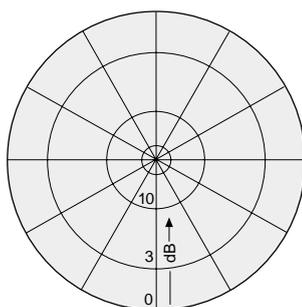
#### Broadband omnidirectional antenna Hot dip galvanized steel

| Type No.           | K 55 20 31                               |
|--------------------|--|
| Input              | N female connector in the antenna base   |
| Connector position | Bottom                                   |
| Frequency range    | 118 – 137 MHz                            |
| Bandwidth          | 19 MHz                                   |
| VSWR               | < 2.0                                    |
| Gain               | 0 dB (ref. to the half wave dipole)      |
| Impedance          | 50 Ω                                     |
| Polarization       | Vertical                                 |
| Max. power         | 1000 Watt (at 50 °C ambient temperature) |
| Weight             | 6.6 kg                                   |
| Radiator diameter  | 70 mm                                    |
| Wind load          | 125 N (at 160 km/h)                      |
| Max. wind velocity | 200 km/h (incl. 1/2" radial ice)         |
| Packing size       | 1390 x 140 x 140 mm                      |
| Height             | 1375 mm                                  |

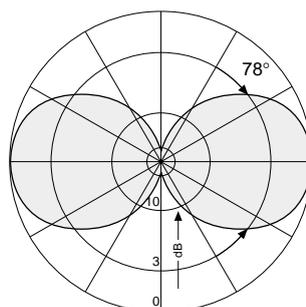
- Material:** Hot dip galvanized steel pipes and mounts.  
All screws and nuts: Stainless steel.
- Mounting:** Flange 130 mm OD for mounting on a flanged supporting pipe (see mounting instruction).
- Grounding:** The antenna is DC grounded by a cross section of 218 mm<sup>2</sup> hot dip galvanized steel.
- Scope of supply:** Antenna with neoprene O-ring at the flange, but without mounting hardware.



#### Radiation Pattern (at mid-band)

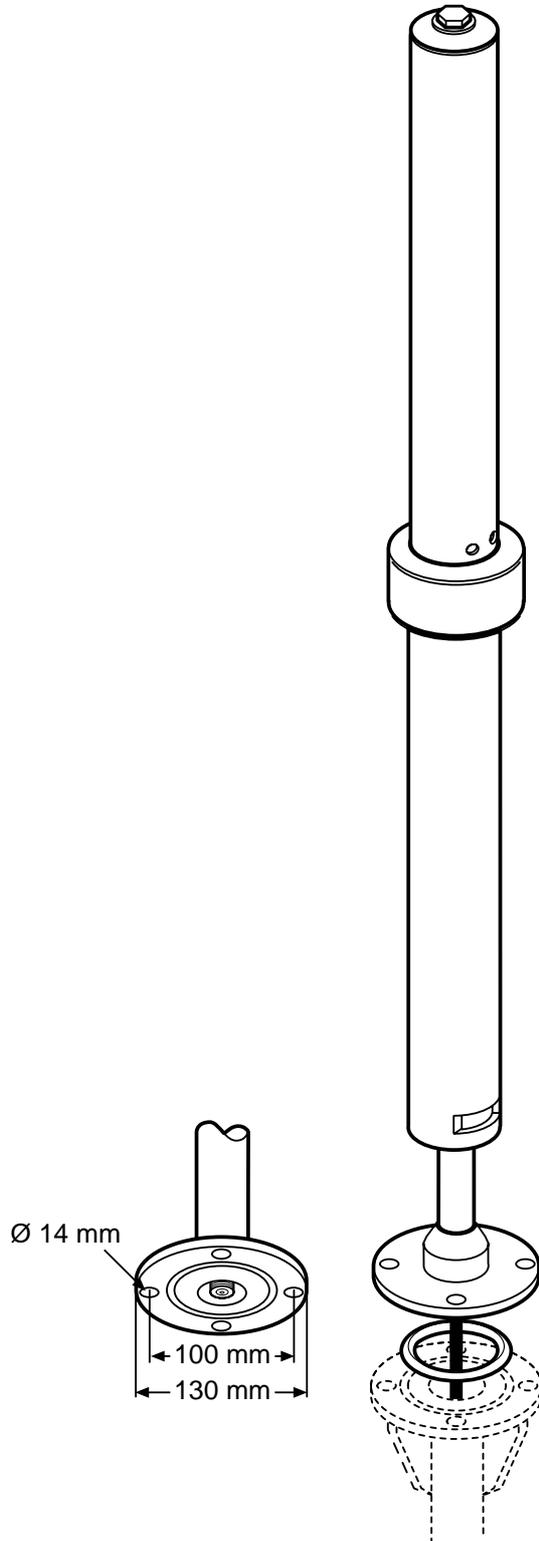


Horizontal Pattern



Vertical Pattern

**Mounting Instruction**  
**Omnidirectional Antenna**  
**K 55 20 31**



# Omnidirectional Antenna

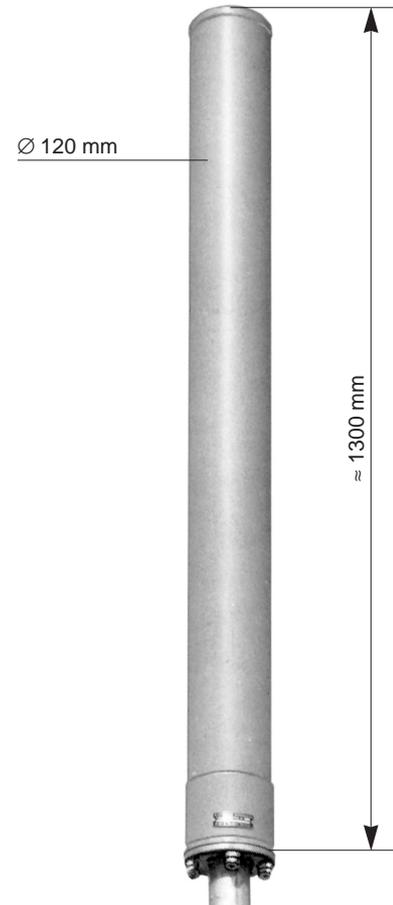
## 108 – 152 MHz

### K 55 21 31

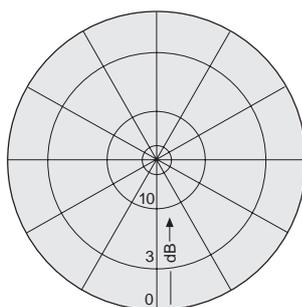
#### Broadband omnidirectional antenna in fiberglass radome

| Type No.           | K 55 21 31                              |
|--------------------|---|
| Input              | N female connector in the antenna base  |
| Connector position | Bottom                                  |
| Frequency range    | 108 – 152 MHz                           |
| Bandwidth          | 44 MHz                                  |
| VSWR               | < 2.0                                   |
| Gain               | 0 dB (ref. to the half wave dipole)     |
| Impedance          | 50 $\Omega$                             |
| Polarization       | Vertical                                |
| Max. power         | 110 Watt (at 50 °C ambient temperature) |
| Weight             | 5.2 kg                                  |
| Radome diameter    | 120 mm                                  |
| Wind load          | 120 N (at 160 km/h)                     |
| Max. wind velocity | 200 km/h (incl. 1/2" radial ice)        |
| Packing size       | 650 x 130 x 100 mm                      |
| Height             | appr. 1300 mm                           |

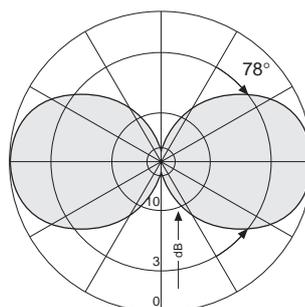
- Material:** Aluminum radiator in fiberglass radome.  
Colour: Grey RAL 7001.  
Hot dip galvanized steel bottom.  
All screws and nuts: Stainless steel.
- Mounting:** By means of 4 studs M 12 to flange 130 mm  $\varnothing$ .
- Grounding:** The antenna is DC grounded by a cross section of 26 mm<sup>2</sup> aluminum.
- Scope of supply:** Antenna including 1 neoprene O-ring and 4 mounting studs, each with 2 nuts and 1 washer.



#### Radiation Pattern (at mid-band)

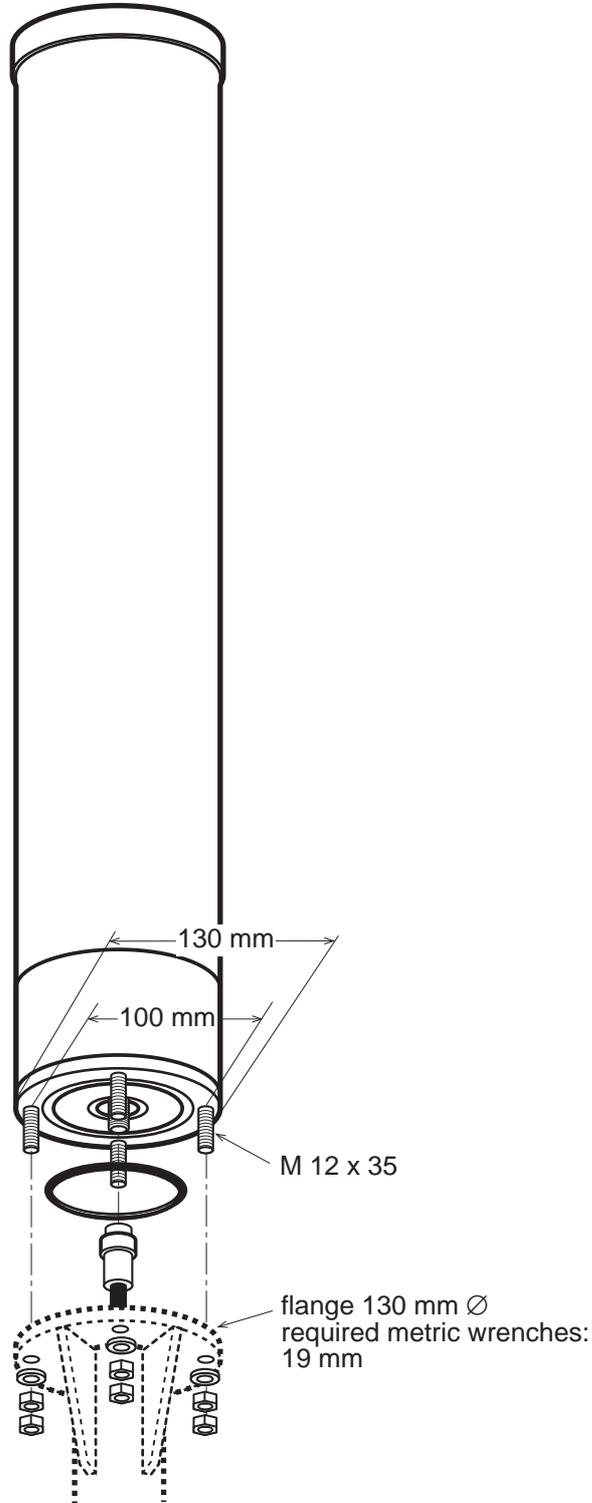


Horizontal Pattern



Vertical Pattern

**Mounting Instruction**  
**Omnidirectional Antenna**  
**K 55 21 31**

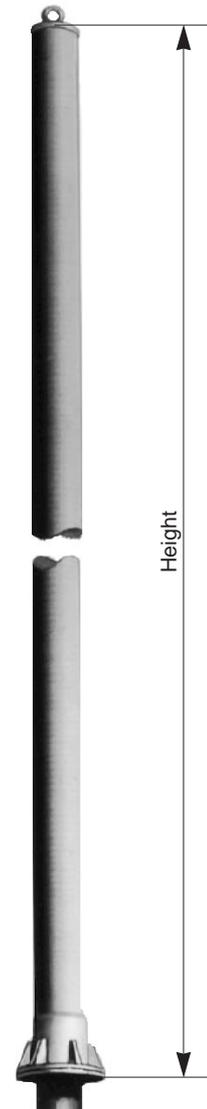


# Omnidirectional Antenna – Multiple-unit 116 ... 152 MHz 717 280, 717 587, 719 557

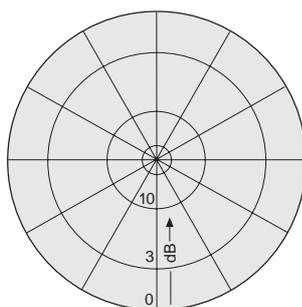
2 or 3-element antenna, consisting of several independently fed dipoles arranged in line

| Type No.                     | 717 587   | 719 557       | 717 280       |
|------------------------------|---|---------------|---------------|
| Input                        | N female connector inside of mounting flange            |               |               |
| No. of dipoles               | 2   | 2             | 3             |
| Connector position           | Bottom  |               |               |
| Frequency range              | 118 – 137 MHz   | 116 – 152 MHz | 118 – 137 MHz |
| Bandwidth                    | 19 MHz  | 36 MHz        | 19 MHz        |
| VSWR                         | < 1.8   | < 2.0         | < 1.8         |
| Gain                         | 0.5 dB  | 0 dB          | 0.5 dB        |
|                              | (ref. to the half wave dipole)                          |               |               |
| Attenuation                  | > 27 dB   | > 25 dB       | > 25 dB       |
|                              | between adjacent dipoles                                |               |               |
| Horizontal radiation pattern | Deviation from circularity $\pm 0.3$ dB for each dipole |               |               |
| Impedance                    | 50 $\Omega$   |               |               |
| Polarization                 | Vertical  |               |               |
| Max. power                   | 100 Watt (at 50 °C ambient temperature)                 |               |               |
| Weight                       | 33 kg   | 48 kg         | 54 kg         |
| Radome diameter              | 120 mm  | 188 mm        | 120 mm        |
| Wind load                    | 480 N   | 724 N         | 700 N         |
|                              | (at 160 km/h)   |               |               |
| Max. wind velocity           | 200 km/h  |               |               |
| Height                       | 4300 mm   | 4800 mm       | 6000 mm       |

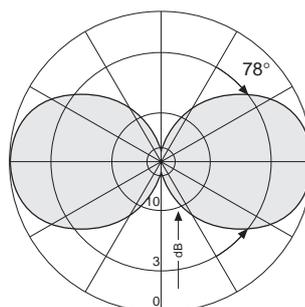
- Material:** Radiator: Hot dip galvanized steel.  
Radome: Fibreglas, colour: Brown (RAL 1019).  
Flange: Aluminum (OD 320 mm). Hot dip galvanized steel (OD 265 mm).  
All screws and nuts: Stainless steel.
- Mounting:** Flange 320 mm OD (719 557).  
Flange 265 mm OD (717 280, 717 587).
- Grounding:** The antenna is DC grounded by a cross section of 214 mm<sup>2</sup> (719 557) and 110 mm<sup>2</sup> (717 280, 717 587) hot dip galvanized steel.
- Scope of supply:** Antenna with neoprene O-ring at the flange, but without mounting hardware.



**Radiation Pattern (at mid-band)**



Horizontal Pattern



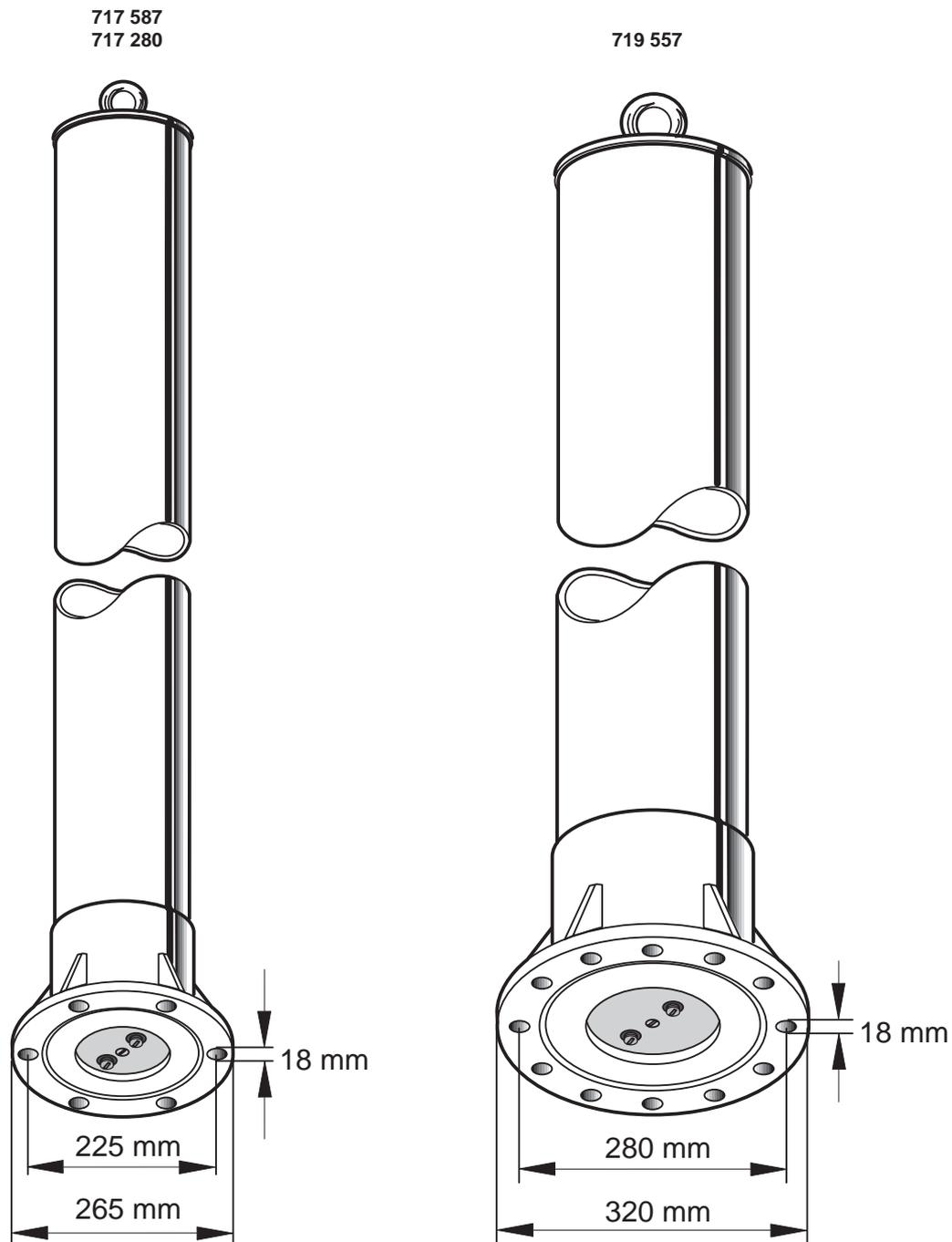
Vertical Pattern

# Mounting Instruction

## Omnidirectional Antenna

717 280, 717 587, 719 557

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- Mount the aluminum flange on plane surface only (max. unevenness 0.5 mm)
- Put the O-ring carefully into the circular groove of the flange
- Mounting screws: M 16 stainless or hot dip galvanized steel  
(min. strength 5.6 accord. DIN 267)  
Max. torque: 50 Nm (screws should be greased with MoS<sub>2</sub>)
- Put a stainless steel washer between aluminum flange and screw head or nut

9985.581/0898/0.5/ZW/HA Subject to alteration.

# Omnidirectional Gain Antenna

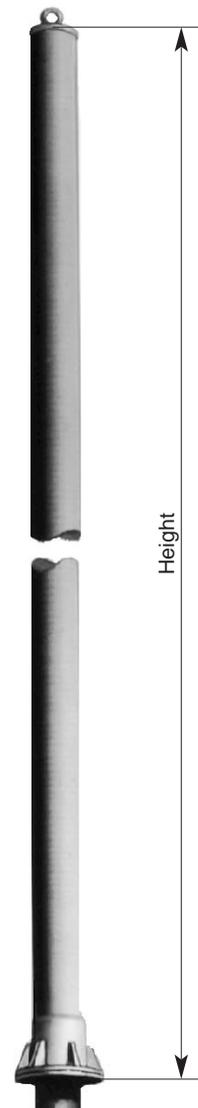
## 116 ... 152 MHz

### 717 265, 717 266, 719 543

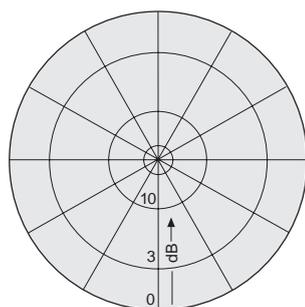
#### Omnidirectional gain antenna in a fiberglass-tube

| Type No.                     | 719 543                                      | 717 265       | 717 266       |
|------------------------------|--|---------------|---------------|
| Input                        | N female connector inside of mounting flange |               |               |
| Connector position           | Bottom                                       |               |               |
| Frequency range              | 116 – 152 MHz                                | 118 – 137 MHz | 118 – 137 MHz |
| Bandwidth                    | 36 MHz                                       | 19 MHz        | 19 MHz        |
| VSWR                         | < 2.0  | < 1.7         | < 1.8         |
| Gain                         | 3.0 dB                                       | 3.5 dB        | 4.5 dB        |
|                              | (ref. to the half wave dipole)               |               |               |
| Horizontal radiation pattern | ± 0.3 dB Deviation from circularity          |               |               |
| Impedance                    | 50 Ω   |               |               |
| Polarization                 | Vertical                                     |               |               |
| Max. power                   | 200 Watt (at 50 °C ambient temperature)      |               |               |
| Weight                       | 46 kg  | 33 kg         | 51 kg         |
| Radome diameter              | 188 mm                                       | 120 mm        | 120 mm        |
| Wind load                    | 765 N  | 430 N         | 700 N         |
|                              | (at 160 km/h)                                |               |               |
| Max. wind velocity           | 200 km/h                                     |               |               |
| Height                       | 4600 mm                                      | 4000 mm       | 6000 mm       |

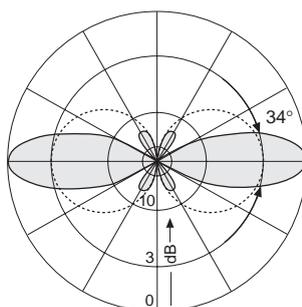
- Material:** Radiator: Hot dip galvanized steel.  
Radome: Fiberglass, color: Brown (RAL 1019).  
Flange: Aluminum (OD 320 mm). Hot dip galvanized steel (OD 265 mm).  
All screws and nuts: Stainless steel.
- Mounting:** Flange 320 mm OD (719 543).  
Flange 265 mm OD (717 265, 717 266).
- Grounding:** The antenna is DC grounded by a cross section of 214 mm<sup>2</sup> (719 543) and 110 mm<sup>2</sup> (717 265, 717 266) hot dip galvanized steel.
- Scope of supply:** Antenna with neoprene O-ring at the flange, but without mounting hardware.



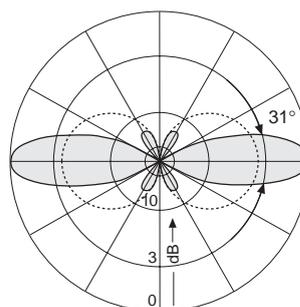
#### Radiation Pattern (at mid-band)



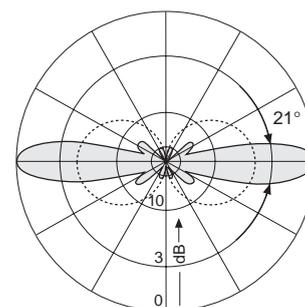
Horizontal Pattern



Vertical Pattern  
719 543



Vertical Pattern  
717 265



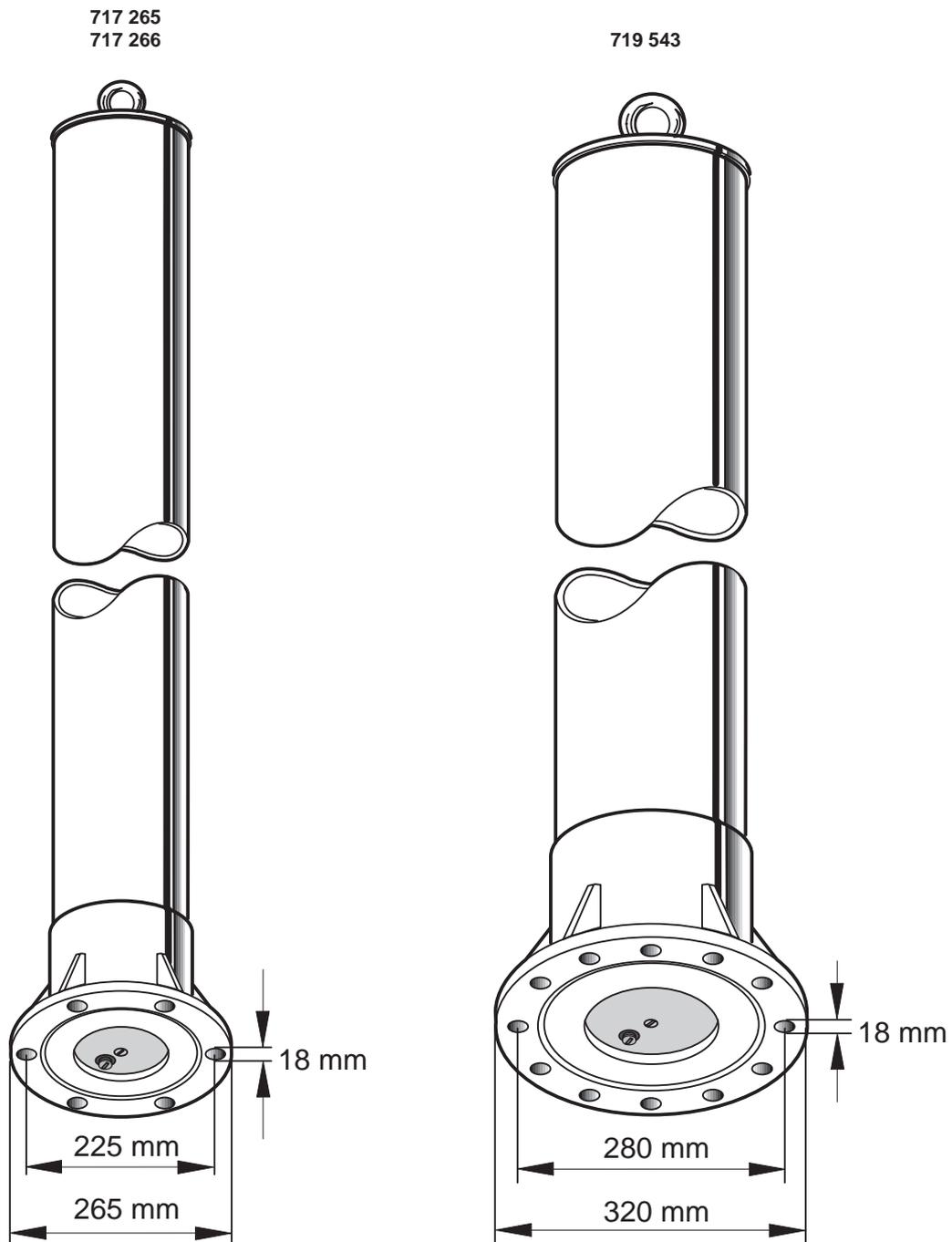
Vertical Pattern  
717 266

# Mounting Instruction

## Omnidirectional Gain Antenna

717 265, 717 266, 719 543

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- Mount the aluminum flange on plane surface only (max. unevenness 0.5 mm)
- Put the O-ring carefully into the circular groove of the flange
- Mounting screws: M 16 stainless or hot dip galvanized steel  
(min. strength 5.6 accord. DIN 267)  
Max. torque: 50 Nm (screws should be greased with MoS<sub>2</sub>)
- Put a stainless steel washer between aluminum flange and screw head or nut

9985.582/1099/0.5/ZW/HA Subject to alteration.

# Offset Pattern Gain Antenna

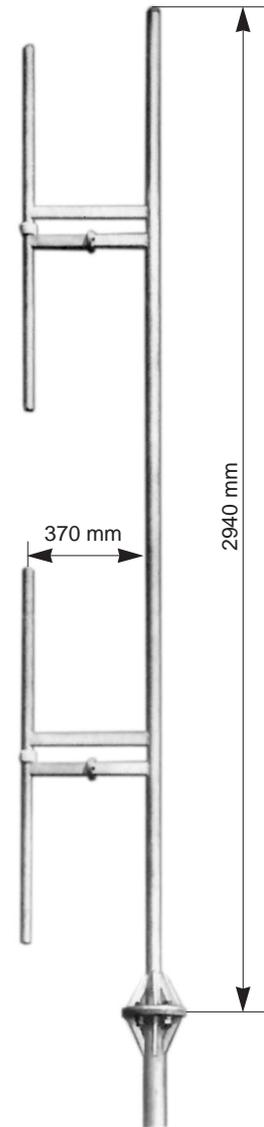
## 118 – 136 MHz

### K 55 31 31

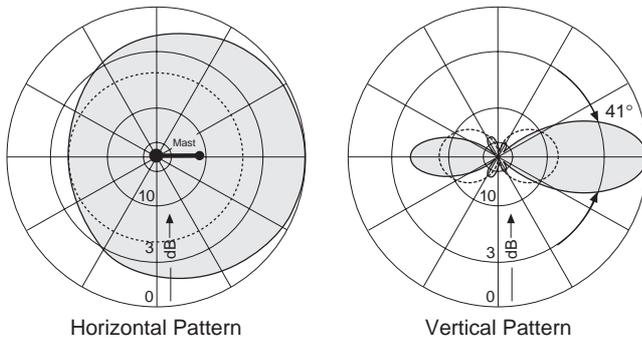
**5 dB offset pattern antenna.**  
**Hot dip galvanized steel.**

| Type No.                       | K 55 31 31  |
|--------------------------------|---|
| Input                          | N female<br>connector inside of the mounting flange |
| Frequency range                | 118 – 136 MHz                                       |
| VSWR                           | < 1.5   |
| Gain (ref. $\lambda/2$ dipole) | 5 dB  |
| Impedance                      | 50 $\Omega$   |
| Polarization                   | Vertical  |
| Max. Power                     | 280 Watt (at 50 °C ambient temperature)             |
| Weight                         | 20 kg   |
| Windload                       | 370 N (at 160 km/h)                                 |
| Max. wind velocity             |   |
| w/o ice                        | 200 km/h  |
| $1/2$ " radial ice             | 150 km/h  |
| Packing size                   | 3000 x 510 x 200 mm                                 |
| Antenna height                 | 2940 mm   |
| Distance dipole/mast           | 370 mm  |

- Material:** Hot-dip galvanized steel.  
All screws and nuts: Stainless steel.
- Mounting:** Flange 190 mm OD for mounting on a flanged pipe (see rearside).
- Grounding:** The antenna is DC grounded by a cross-section of 342 mm<sup>2</sup> hot dip galvanized steel.
- Scope of supply:** Antenna with neoprene O-ring at the flange, but without mounting hardware.



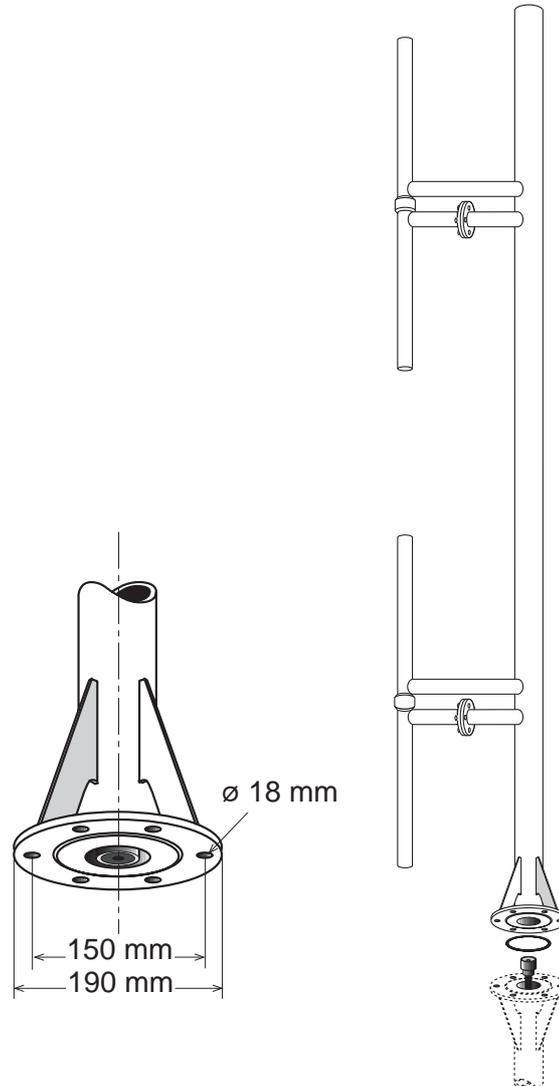
**Radiation Pattern (at mid-band)**



# Mounting Instruction

## Offset Pattern Gain Antenna

### K 55 31 31



# Offset Pattern High Gain Antenna

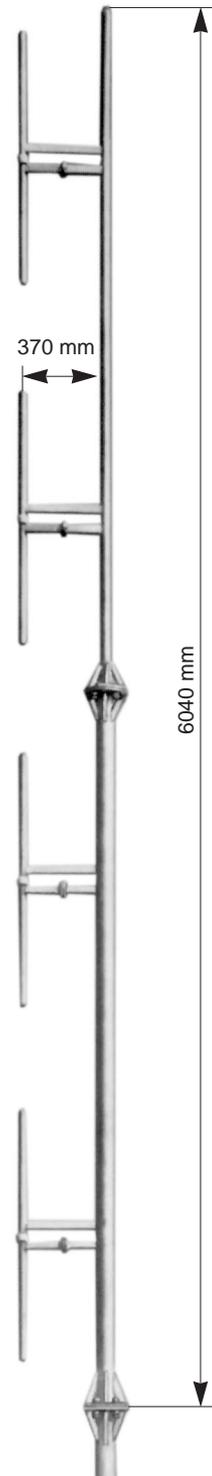
## 118 – 144 MHz

### K 55 32 31

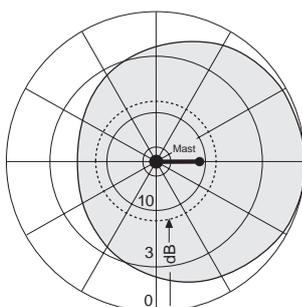
**8 dB offset pattern antenna.**  
**Hot dip galvanized steel.**

| Type No.                       | K 55 32 31   |
|--------------------------------|--|
| Input                          | N female<br>connector inside of the mounting flange  |
| Frequency range                | 118 – 144 MHz  |
| VSWR                           | < 1.5  |
| Gain (ref. $\lambda/2$ dipole) | 8 dB   |
| Impedance                      | 50 $\Omega$  |
| Polarization                   | Vertical   |
| Max. Power                     | 220 Watt (at 50 °C ambient temperature)              |
| Weight                         | 54 kg  |
| Windload                       | 950 N (at 160 km/h)                                  |
| Max. wind velocity             |  |
| w/o ice                        | 170 km/h   |
| $1/2$ " radial ice             | 135 km/h   |
| Packing size                   | 2 pcs.: 3600 x 510 x 200 mm +<br>3000 x 510 x 200 mm |
| Antenna height                 | 6040 mm  |
| Distance dipole/mast           | 370 mm   |

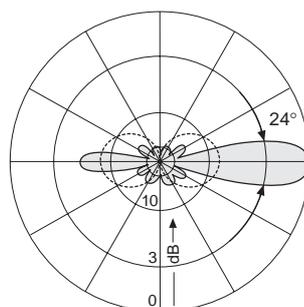
- Material:** Hot dip galvanized steel.  
All screws and nuts: Stainless steel.
- Mounting:** Flange 210 mm OD for mounting on a flanged supporting pipe (see mounting instruction).
- Grounding:** The antenna is DC grounded by a cross-section of 798 mm<sup>2</sup> hot dip galvanized steel.
- Scope of supply:** Antenna with neoprene O-ring at the flange, but without mounting hardware.



**Radiation Pattern (at mid-band)**



Horizontal Pattern

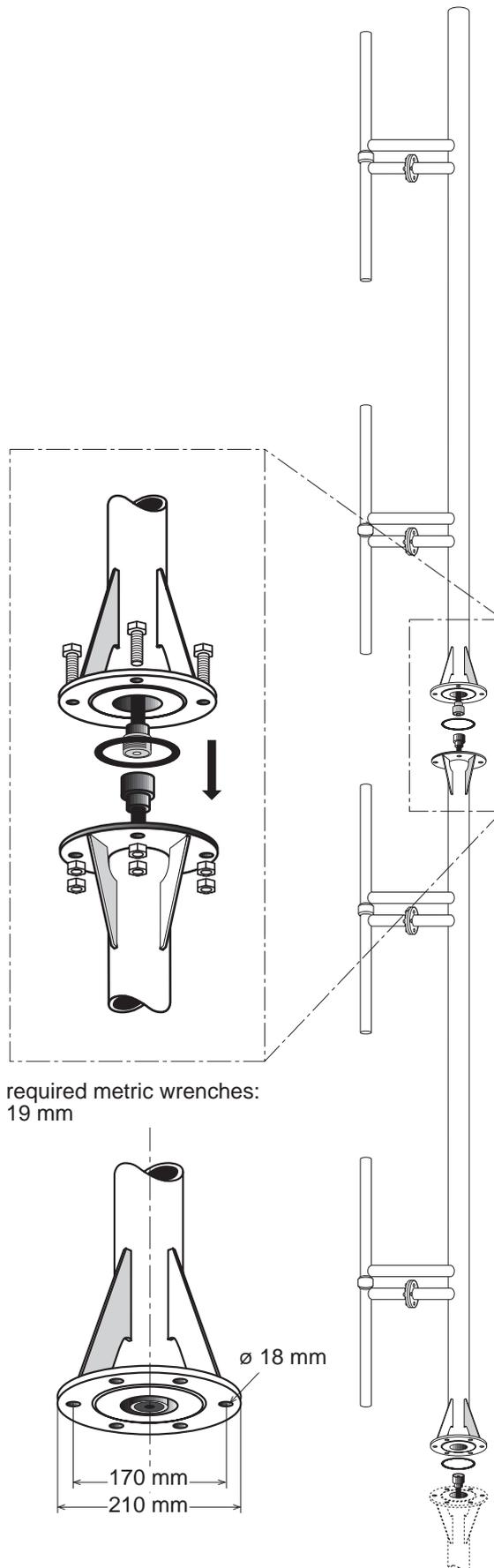


Vertical Pattern

# Mounting Instruction

## Offset Pattern High Gain Antenna

### K 55 32 31



# Directional Antenna

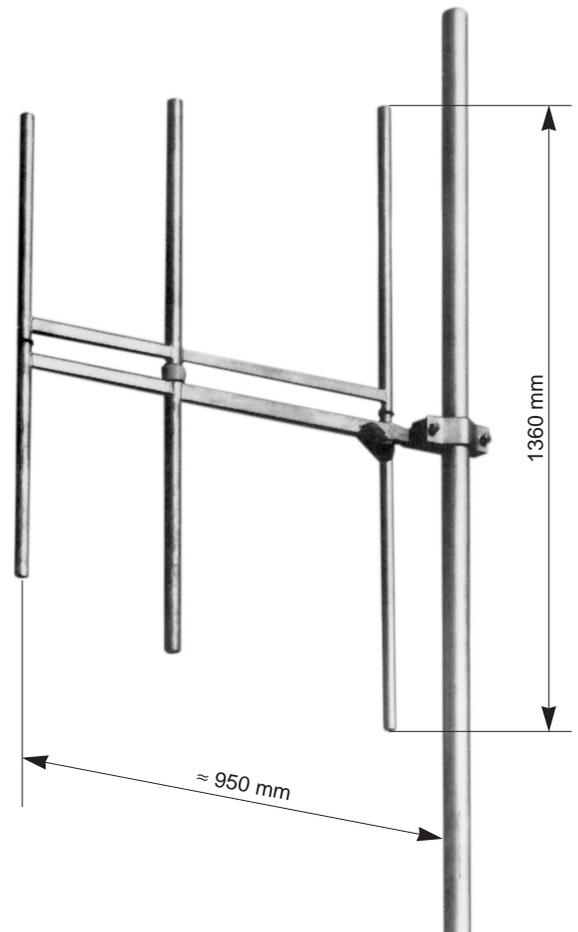
## 118 – 144 MHz

### K 53 18 31

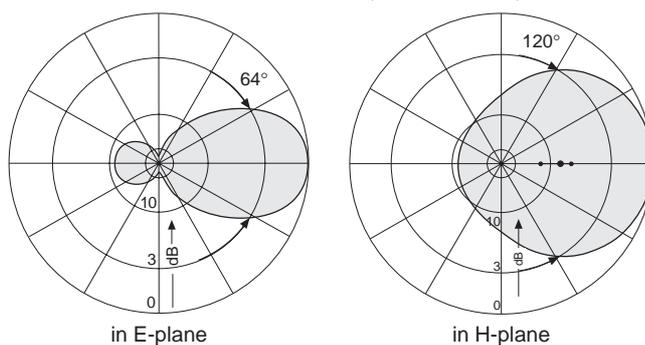
#### 3-element broadband-yagi, 4dB gain, hot dip galvanized steel

| Type No.                       | K 53 18 31   |
|--------------------------------|--|
| Input                          | N female<br>connector in a weather protective housing<br>directly at the antenna |
| Frequency range                | 118 – 144 MHz  |
| VSWR                           | < 1.5  |
| Gain (ref. $\lambda/2$ dipole) | 4 dB   |
| Impedance                      | 50 $\Omega$  |
| Polarization                   | Usable for horizontal or vertical polarization                                   |
| Max. Power                     | 160 Watt (at 50 °C ambient temperature)  |
| Weight                         | 10 kg  |
| Windload                       | 250 N (at 160 km/h)  |
| Max. wind velocity             | 200 km/h (incl. $\frac{1}{2}$ " radial ice)                                      |
| Packing size                   | 1500 x 1150 x 90 mm  |
| Antenna height                 | 1360 mm  |

- Material:** Hot dip galvanized steel.  
All screws and nuts: Stainless steel.
- Mounting:** To pipes of 60 – 115 mm OD by means of hot dip galvanized steel clamp, supplied.
- Grounding:** The antenna is DC grounded by a cross section of 256 mm<sup>2</sup> hot dip galvanized steel.
- Scope of supply:** Antenna including mounting hardware.

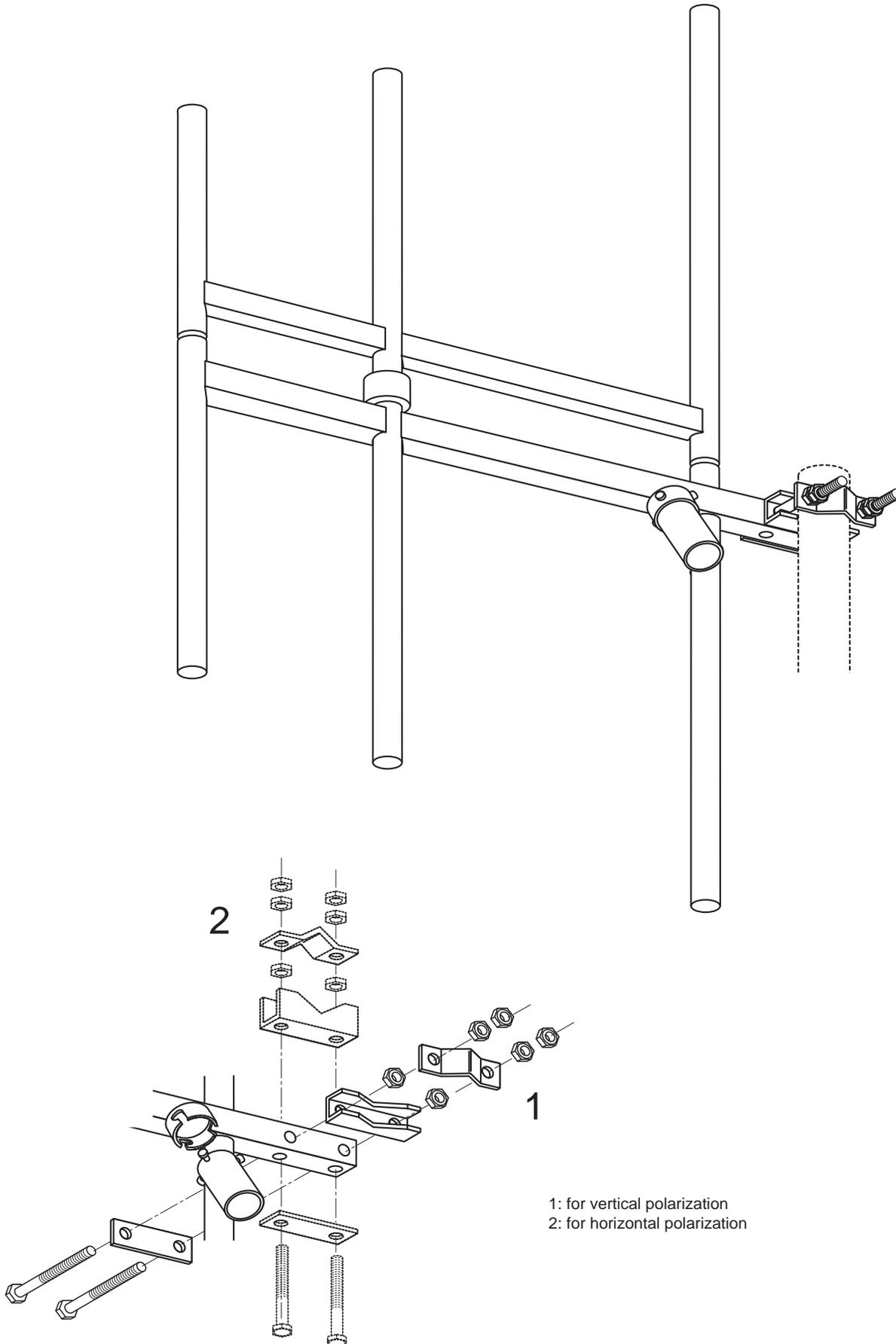


#### Radiation Pattern (at mid-band)



# Mounting Instruction Directional Antenna K 53 18 31

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9985.585/0898/0.5/ZW/HA Subject to alteration.

# Directional Antenna

## 108 – 137 MHz

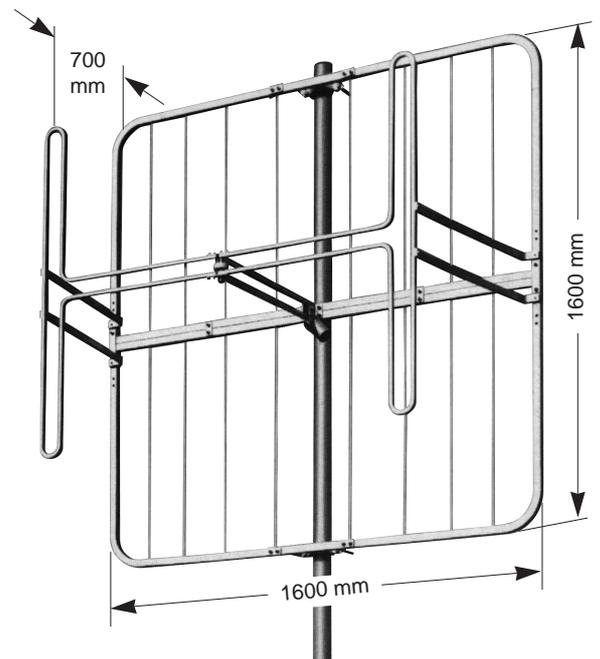
### K 52 31 31

**Broadband 7 dB directional antenna,  
weatherresistant aluminum.**

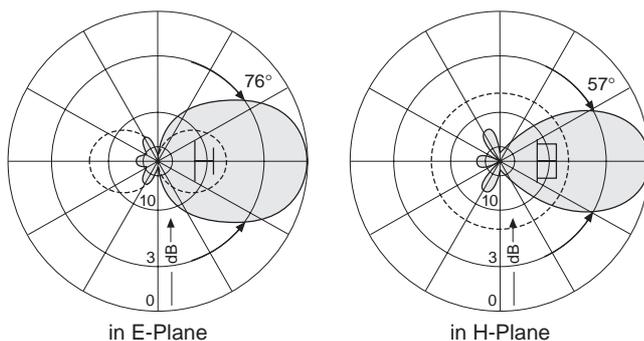
| Type No.                          | K 52 31 31  |
|-----------------------------------|---|
| Input                             | N female<br>connector in a weather protective housing |
| Frequency range                   | 108 – 137 MHz   |
| VSWR                              | < 1.4   |
| Gain (ref. to $\lambda/2$ dipole) | 7 dB  |
| Impedance                         | 50 $\Omega$   |
| Polarization                      | Vertical or horizontal                                |
| Half-power beam width             | H-plane: 57°/ E-plane: 76°                            |
| Max. power input (CW)             | 880 Watt (at 50 °C ambient temperature)               |
| Weight                            | 12 kg   |
| Lateral thrust                    | 560 N at 160 km/h                                     |
| Max. wind velocity                |   |
| w/o ice                           | 200 km/h  |
| 1/2" radial ice                   | 160 km/h  |
| Width/height/depth                | 1600 / 1600 / 700 mm                                  |
| Packing size                      | 1620 x 850 x 200 mm                                   |



- Material:** Reflector screen and dipoles: Heavy duty alodined aluminum.  
Mounting clamps: Hot dip galvanized steel.  
All screws and nuts: Stainless steel.
- Scope of supply:** Antenna including mounting hardware.
- Mounting:** To masts of 60 – 115 mm OD.
- Lightning protection:** All metal parts of the antenna are DC grounded.

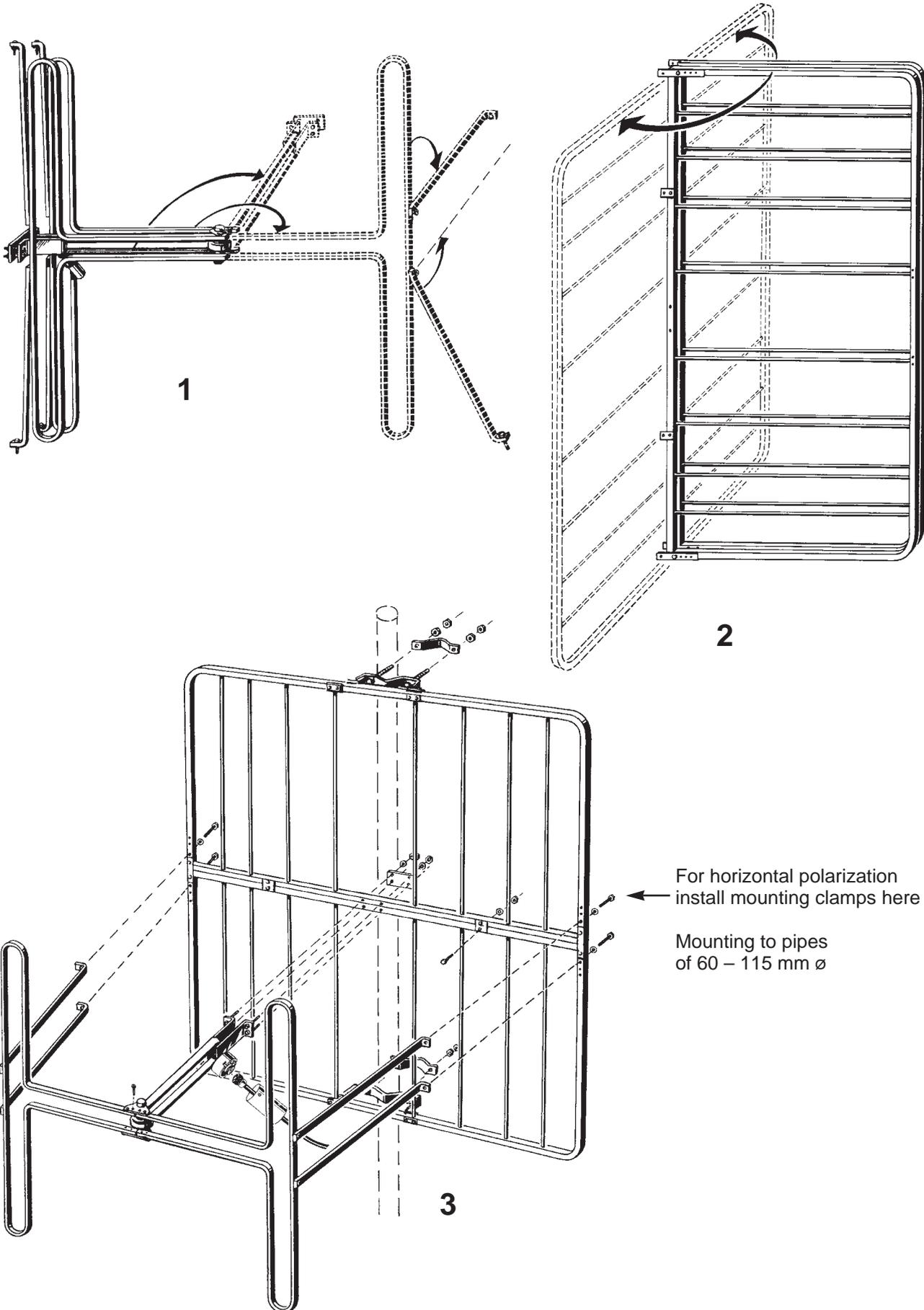


**Radiation Pattern (at mid-band)**



# Mounting Instruction Directional Antenna K 52 31 31

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# Directional Antenna

## 100 – 160 MHz

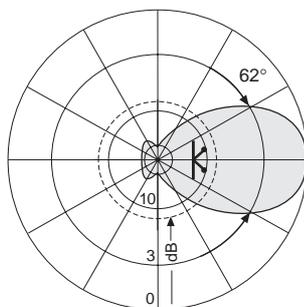
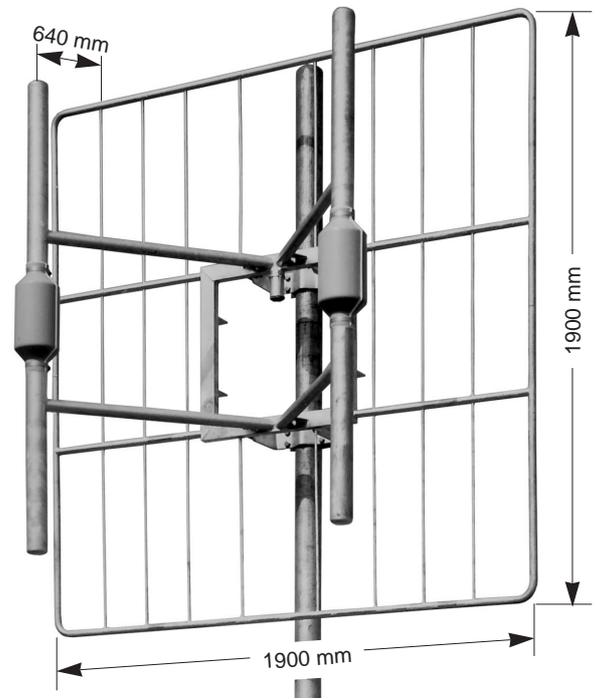
### K 52 30 31

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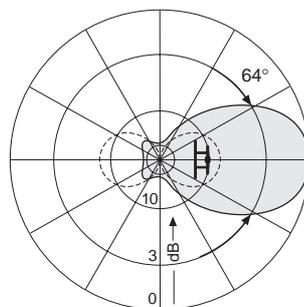
**A heavy duty 8 dB gain panel of hot dip galvanized steel for use under heavy icing**

| Type No.                       | K 52 30 31   |
|--------------------------------|--|
| Input                          | N female connector in a weather protective housing directly at the antenna |
| Frequency range                | 100 – 160 MHz  |
| VSWR                           | < 1.3  |
| Gain (ref. $\lambda/2$ dipole) | 8 dB   |
| Impedance                      | 50 $\Omega$  |
| Polarization                   | Horizontal or vertical   |
| Max. Power                     | 1590 Watt (at 50 °C ambient temperature)                                   |
| Weight                         | 35 kg  |
| Windload                       | 1200 N (at 160 km/h)   |
| Max. wind velocity             | 200 km/h (incl. $1/2''$ radial ice)  |
| Packing size                   | 2000 x 2000 x 850 mm   |
| Height/width/depth             | 1900 x 1900 x 640 mm   |

- Material:** Hot dip galvanized steel.  
All screws and nuts: Stainless steel.
- Montage:** By means of a pair of hot dip galvanized steel clamps K 61 12 0 to pipes of 60 – 115 mm OD or the pair of clamps K 61 13 0 to pipes of 115 – 200 mm.
- Grounding:** All metal parts of the antenna including the mounting kit are DC grounded.
- Scope of supply:** Panel without mounting hardware.
- Special features:** The fiberglass cover of the radiators keeps the electrical characteristics, even under heavy icing conditions, nearly constant.



Horizontal Pattern

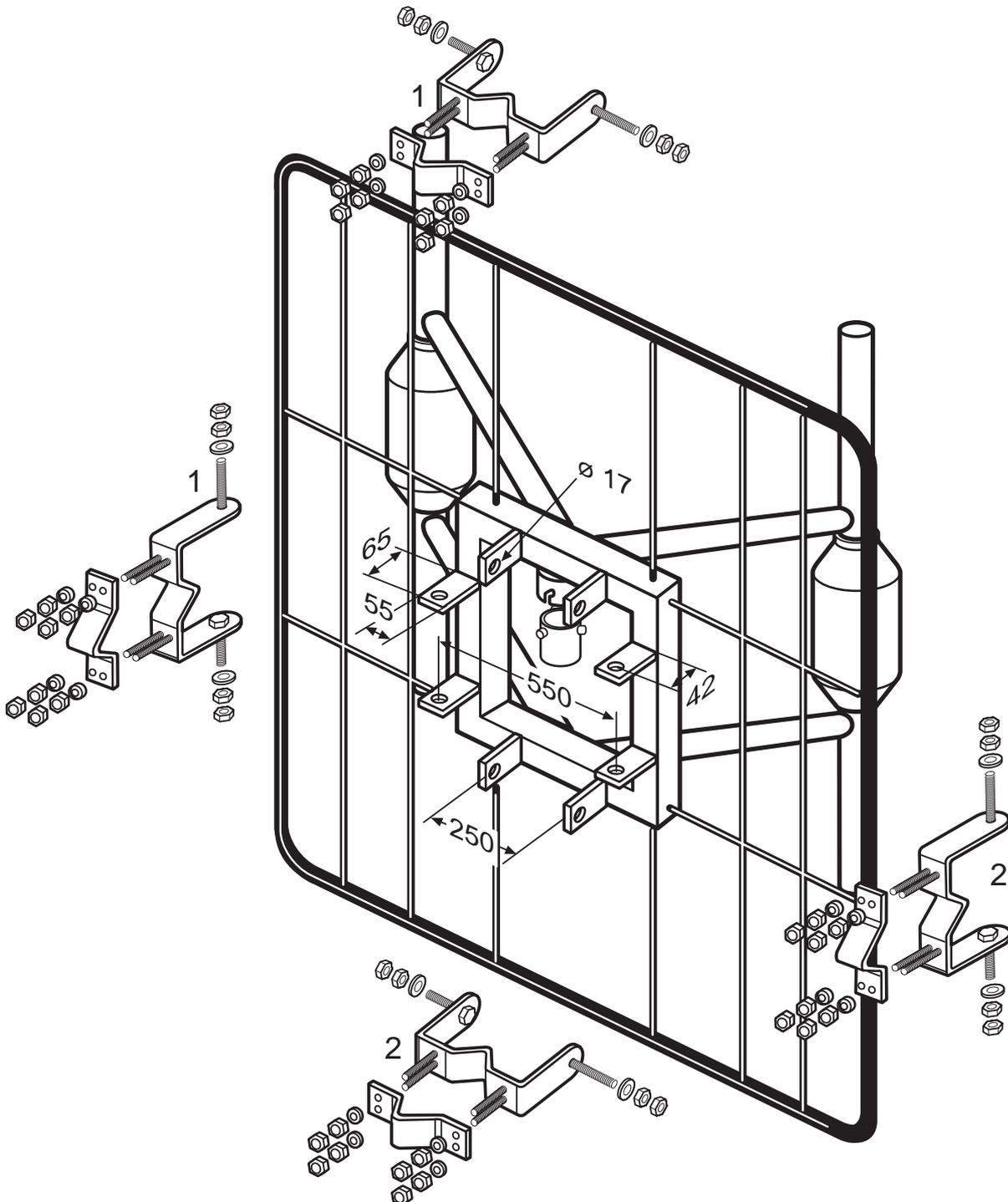


Vertical Pattern

# Mounting Instruction

## Directional Antenna

### K 52 30 31



1, 2: Pair of clamps K 61 12 0 for pipes of 60 – 115 mm OD or pair of clamps K 61 13 0 for pipes of 115 – 200 mm OD

Required metric wrenches: 19 mm and 24 mm

# Omnidirectional Antenna

## 225 – 400 MHz

### K 75 40 1. .

- Multi-element antenna, consisting of several separately fed dipoles arranged in line.
- Special models of gain antennas with an integrated power splitter.

#### Standard models: Multiple-unit antenna

| Type No.                              | K 75 40 12 1 | K 75 40 13 1 | K 75 40 14 1 | K 75 40 15 1 |
|---------------------------------------|--------------|--------------|--------------|--------------|
| Gain (ref. to the $\lambda/2$ dipole) | 2 x 1 dB     | 3 x 1 dB     | 4 x 1 dB     | 5 x 1 dB     |

#### Special models I: Omni-directional gain antenna

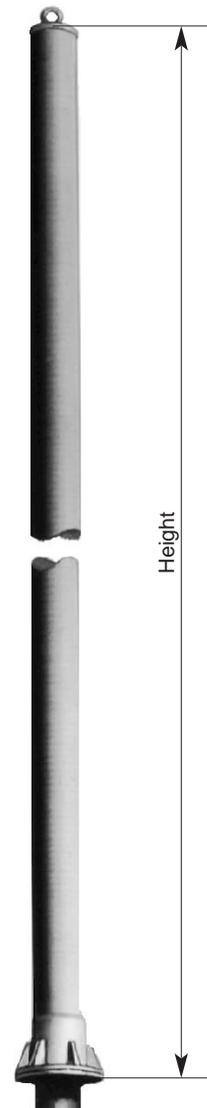
| Type No.                              | 723 141 | 725 626 | 725 772 | 723 517 |
|---------------------------------------|---------|---------|---------|---------|
| Gain (ref. to the $\lambda/2$ dipole) | 3 dB    | 4.5 dB  | 6 dB    | 7 dB    |

#### Special models II: Multiple unit omni-directional gain antenna

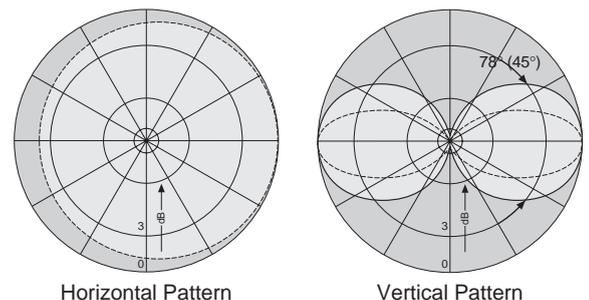
| Type No.                              |  |  | 723 142  |  |
|---------------------------------------|--|--|----------|--|
| Gain (ref. to the $\lambda/2$ dipole) |  |  | 2 x 3 dB |  |

|                       |  |  |         |         |
|-----------------------|--|--|---------|---------|
| Length                | 2650 mm                                      | 3690 mm  | 4730 mm | 5770 mm |
| Weight                | 29 kg  | 37 kg  | 49 kg   | 67 kg   |
| Wind load             | 430 N  | 590 N  | 760 N   | 940 N   |
| Bending moment        | 560 Nm                                       | 1070 Nm  | 1780 Nm | 2690 Nm |
|                       |  | at 160 km/h<br>at 160 km/h (at attachment point) |         |         |
| Radome diameter       |  | 188 mm   |         |         |
| Max. wind velocity    |  | 200 km/h   |         |         |
| Frequency range       |  | 225 – 400 MHz                                    |         |         |
| Bandwidth             |  | 175 MHz  |         |         |
| Input                 | Type N female connectors in the antenna base |  |         |         |
| VSWR                  | < 2.0  |  |         |         |
| Attenuation           | > 27 dB between adjacent dipoles             |  |         |         |
| Max. input power (CW) | 110 Watt (at 50 °C ambient temperature)      |  |         |         |
| Polarization          | Vertical                                     |  |         |         |

|                  |   |
|------------------|---|
| Material:        | Radiating elements: Hot dip galvanized steel.<br>Base: Weatherproof aluminum.<br>Radome: Fiberglass, colour: Brown.<br>Internal screws and nuts: Stainless steel. |
| Mounting:        | Flange 320 mm OD for mounting on a flanged supporting pipe.   |
| Scope of supply: | Antenna with neoprene O-ring at the flange, but without screws.   |
| Grounding:       | The antenna is DC grounded by a cross section of 214 mm <sup>2</sup> hot dip galvanized steel.  |



#### For standard models

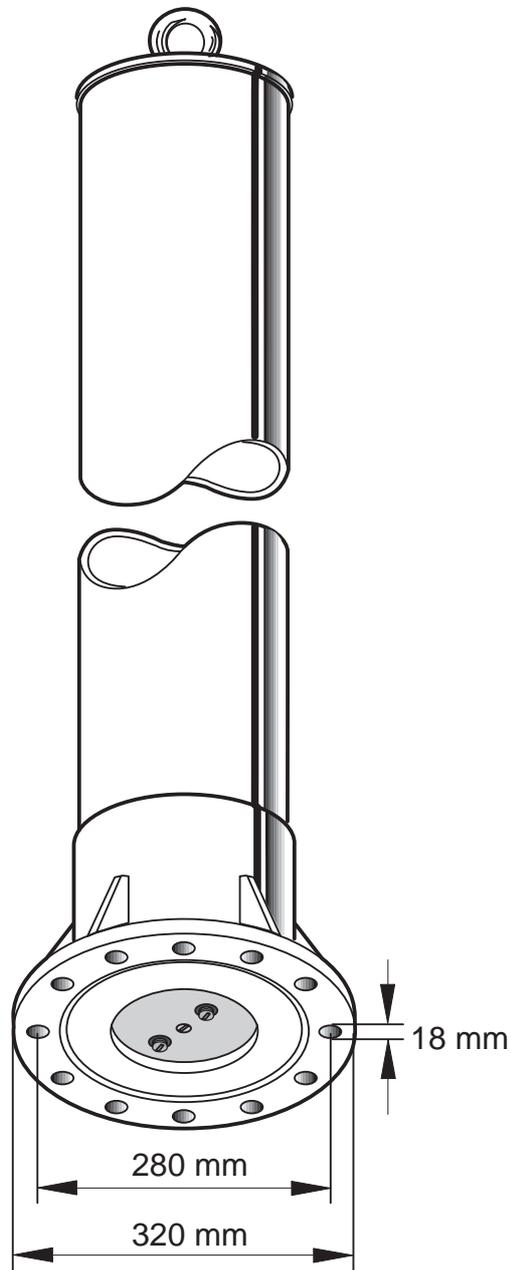


Radiation Pattern ——— 225 MHz ..... 400 MHz

**Omnidirectional Antenna**  
**225 – 400 MHz**  
**K 75 40 1..**

**KATHREIN**  
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K 75 40 12 1



- Mount the aluminum flange on plane surface only (max. unevenness 0.5 mm)
- Put the O-ring carefully into the circular groove of the flange
- Mounting screws: M 16 stainless or hot dip galvanized steel  
(min. strength 5.6 accord. DIN 267)  
Max. torque: 50 Nm (screws should be greased with MoS<sub>2</sub>)
- Put a stainless steel washer between aluminum flange and screw head or nut

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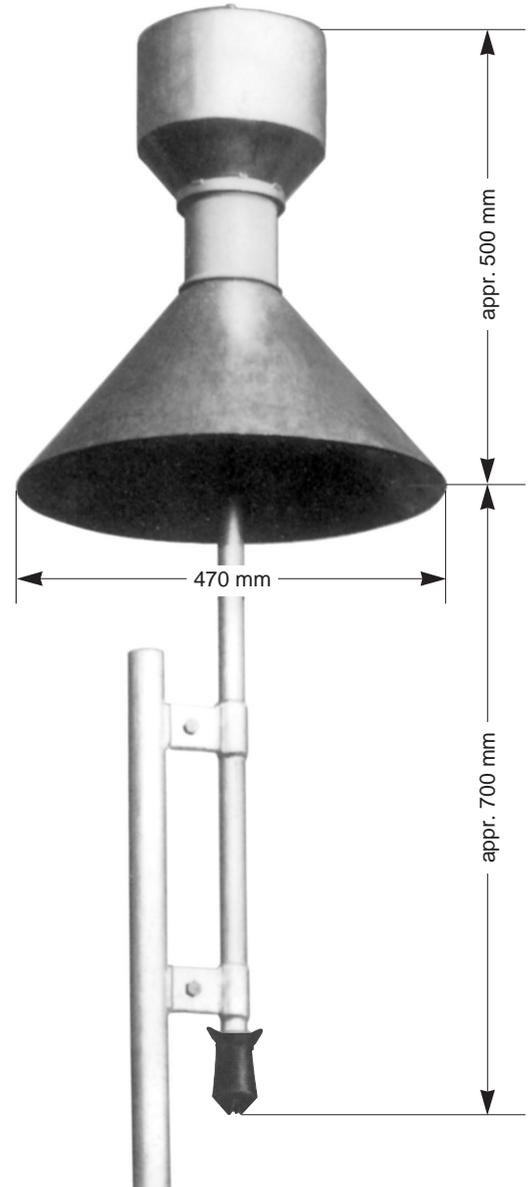
# Cone Antenna

## 225 – 400 MHz

### K 75 10 11

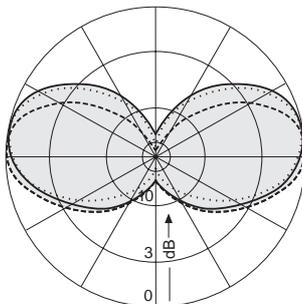
| Type No.                       | K 75 10 11  |
|--------------------------------|---|
| Input                          | N female<br>connector in a weather protective housing<br>at the end of the support pipe |
| Frequency range                | 225 – 400 MHz   |
| VSWR                           | < 1.8   |
| Gain (ref. $\lambda/2$ dipole) | 0.5 dB  |
| Impedance                      | 50 $\Omega$   |
| Polarization                   | Vertical  |
| Max. Power                     | 290 Watt (at 50 °C ambient temperature)   |
| Weight                         | 9.5 kg  |
| Windload                       | 160 N (at 160 km/h)   |
| Max. wind velocity             | 200 km/h (incl. $1/2''$ radial ice)   |
| Packing size                   | 1250 x 520 x 520 mm   |

- Material:** Hot-dip galvanized steel.  
All screws and nuts: Stainless steel.
- Montage:** Parallel mounting at the top of the mast by means of two butt straps (see mounting instruction).
- Grounding:** The antenna is DC grounded by a cross-section of 400 mm<sup>2</sup> hot dip galvanized steel.
- Scope of supply:** Antenna without mounting hardware.



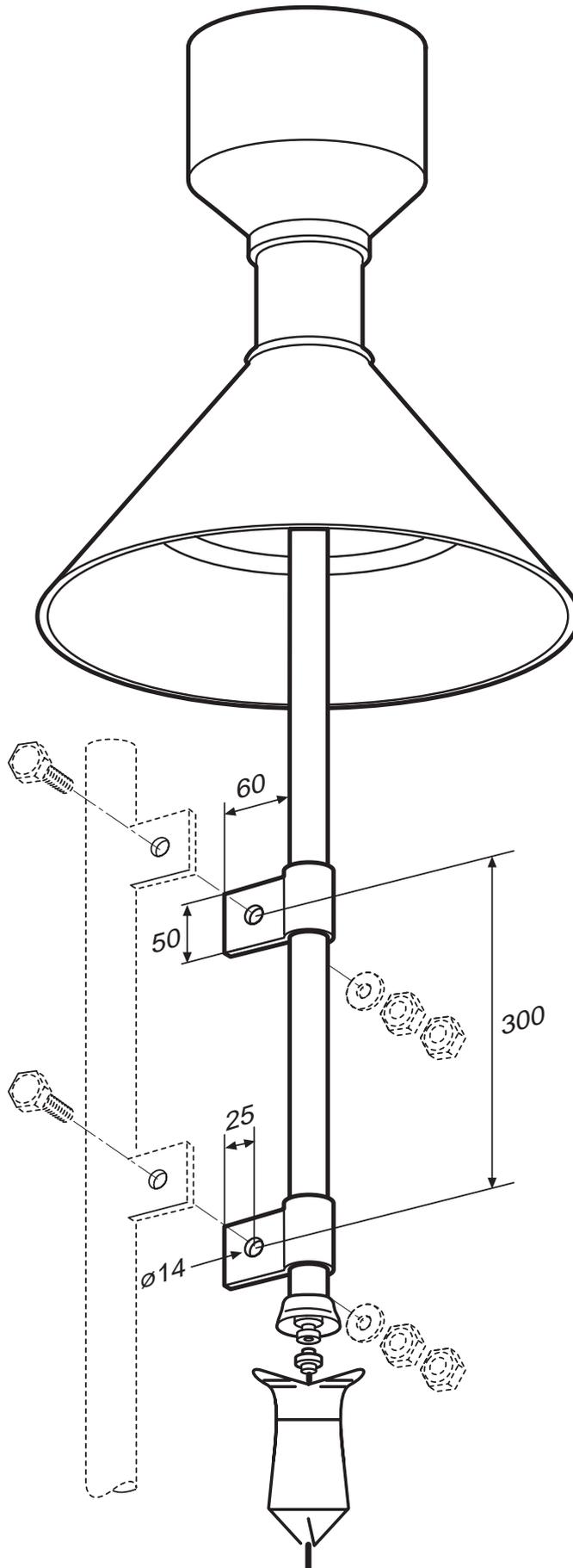
#### Radiation Pattern (at mid-band)

— 225 MHz    ..... 310 MHz    - - - - 400 MHz



Vertical Pattern

**Mounting Instruction**  
**Cone Antenna**  
**K 75 10 11**



# Offset Pattern Gain Antenna

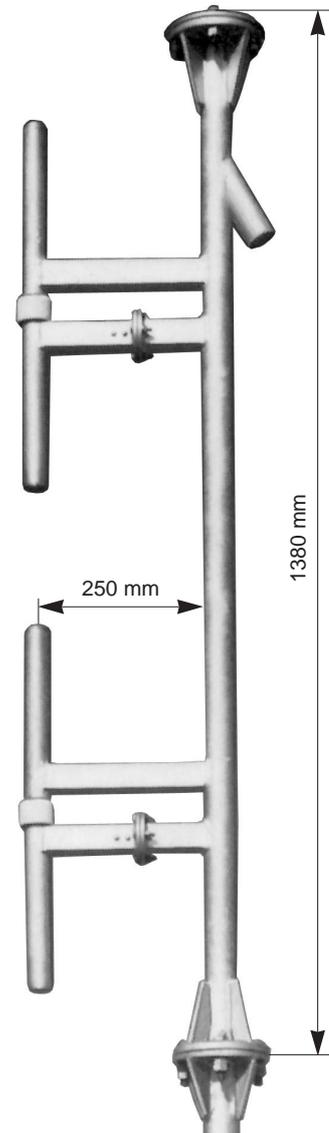
## 225 – 400 MHz

### K 75 31 11

#### 5.5 dB offset pattern antenna Hot dip galvanized steel

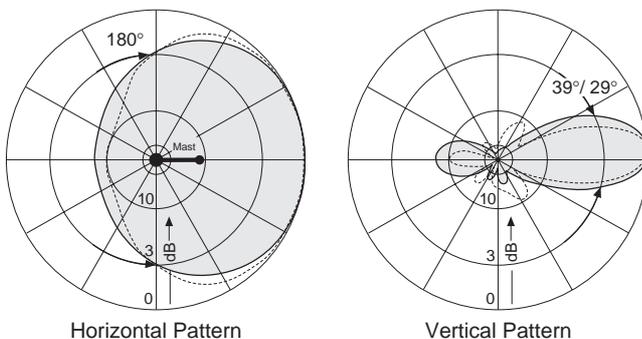
| Type No.                       | K 75 31 11  |
|--------------------------------|---|
| Input                          | N female<br>connector inside of the mounting flange |
| Frequency range                | 225 – 400 MHz                                       |
| VSWR                           | < 1.7   |
| Gain (ref. $\lambda/2$ dipole) | 5.5 dB  |
| Impedance                      | 50 $\Omega$   |
| Polarization                   | Vertical  |
| Max. Power                     | 260 Watt (at 50 °C ambient temperature)             |
| Radiation pattern              | Preferred direction: Mast to radiator.              |
| Weight                         | 18 kg   |
| Windload                       | 200 N (at 160 km/h)                                 |
| Max. wind velocity             | 200 km/h (incl. $1/2''$ radial ice)                 |
| Packing size                   | 1450 x 400 x 200 mm                                 |
| Antenna height                 | ca. 1380 mm   |
| Distance dipole/mast           | 250 mm  |

- Material:** Hot dip galvanized steel.  
All screws and nuts: Stainless steel.
- Mounting:** Via standard flange 130 mm diameter.  
The upper flange is suitable for installation of an obstruction light.
- Grounding:** All metal parts of the antenna including the mounting kit are DC grounded.



#### Radiation Pattern (at mid-band)

— 225 MHz ..... 400 MHz

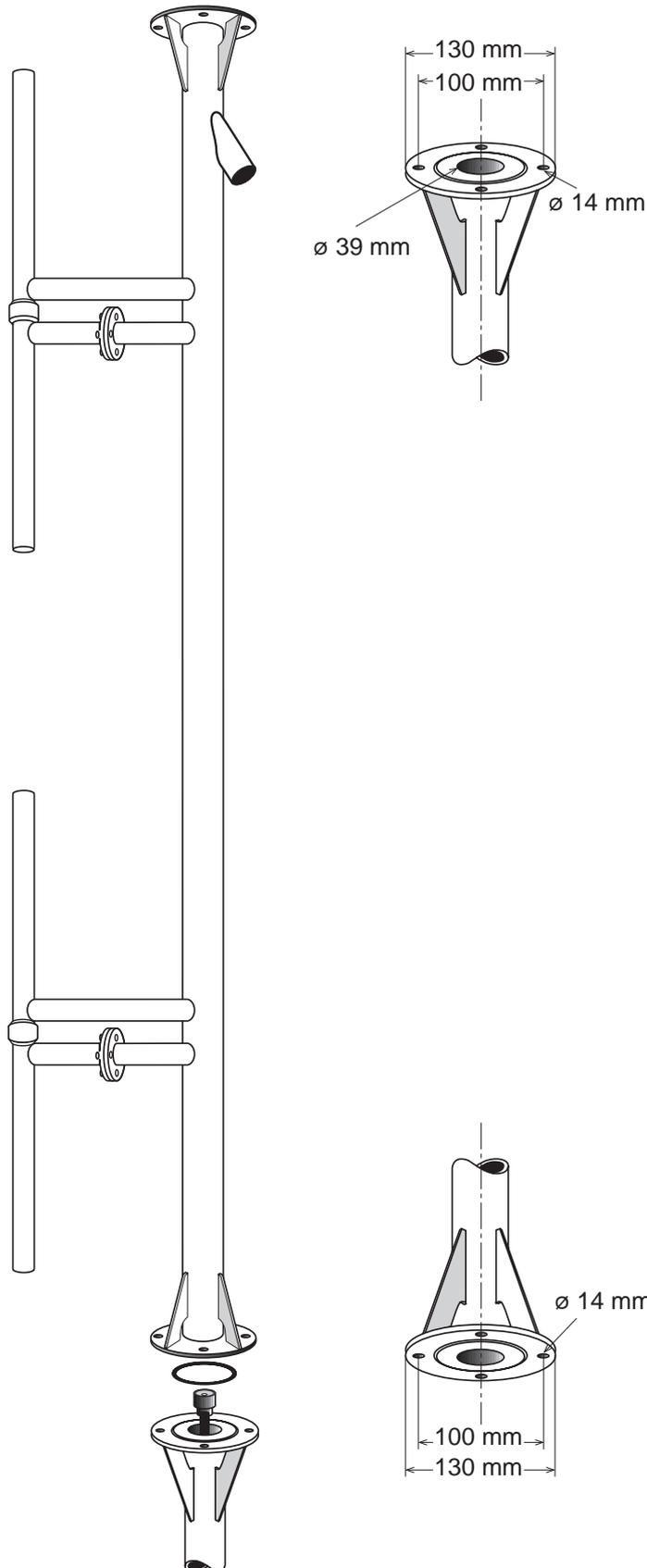


# Mounting Instruction

## Offset Pattern Gain Antenna

### K 75 31 11

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# Offset Pattern High Gain Antenna

## 225 – 400 MHz

### K 75 32 11

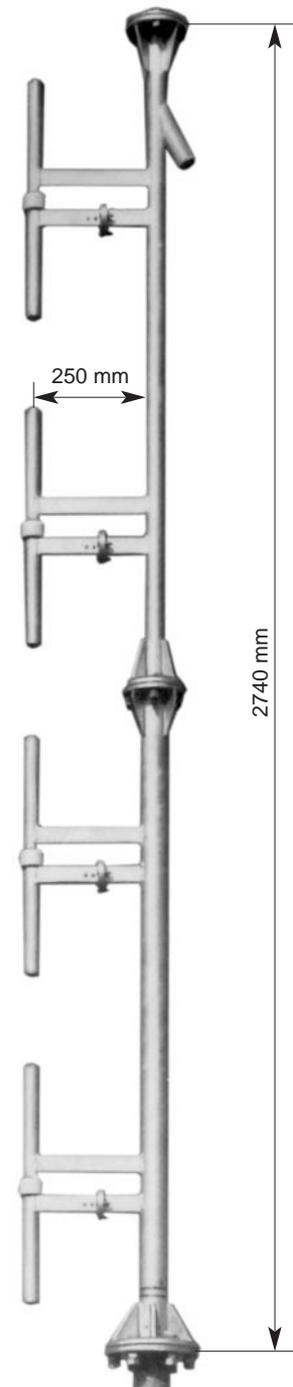
**8 dB offset pattern antenna.**  
**Hot dip galvanized steel.**

| Type No.                       | K 75 32 11  |
|--------------------------------|---|
| Input                          | N female<br>connector inside of the mounting flange |
| Frequency range                | 225 – 400 MHz                                       |
| VSWR                           | < 1.7   |
| Gain (ref. $\lambda/2$ dipole) | 8 dB  |
| Impedance                      | 50 $\Omega$   |
| Polarization                   | Vertical  |
| Max. Power                     | 300 Watt (at 50 °C ambient temperature)             |
| Weight                         | 40 kg   |
| Windload                       | 450 N (at 160 km/h)                                 |
| Max. wind velocity             | 200 km/h (incl. $1/2''$ radial ice)                 |
| Packing size                   | 2800 x 400 x 200 mm                                 |
| Antenna height                 | 2740 mm   |
| Distance dipole/mast           | 250 mm  |

**Material:** Hot dip galvanized steel.  
All screws and nuts: Stainless steel.

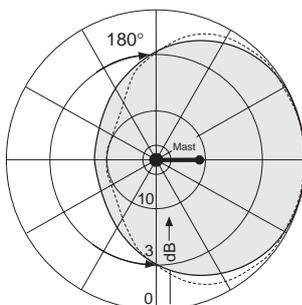
**Mounting:** Via standard flange 190 mm diameter.  
The upper flange is suitable for installation of an obstruction light.

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

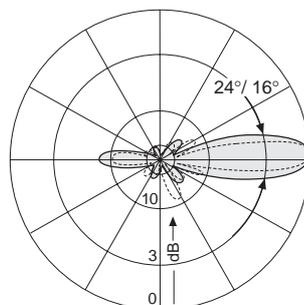


#### Radiation Pattern (at mid-band)

— 225 MHz ..... 400 MHz



Horizontal Pattern

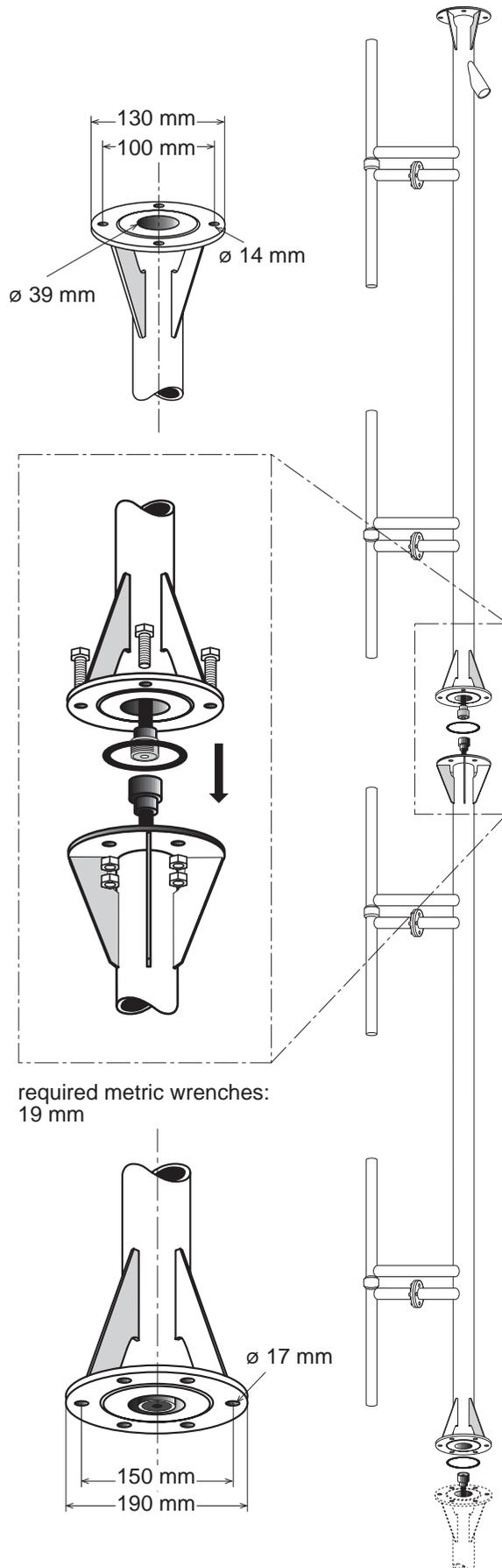


Vertical Pattern

# Mounting Instruction

## Offset Pattern High Gain Antenna

### K 75 32 11



# Monitor-Antenna

## 328 – 336 MHz

### 715 630

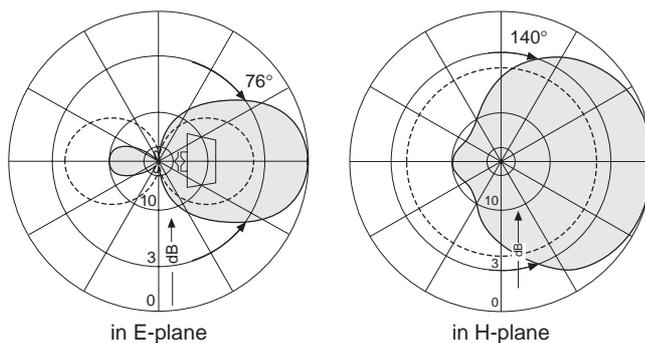
#### Half wave dipole in front of a reflector screen in a fiberglass radome

| Type No.           | 715 630   |
|--------------------|---|
| Input              | N female connector in a weather protective rubber cap directly at the antenna |
| Connector position | Rearside  |
| Frequency range    | 328 – 336 MHz   |
| VSWR               | < 1.3   |
| Gain               | 4 dB (ref. to the half wave dipole)   |
| Impedance          | 50 $\Omega$   |
| Polarization       | Horizontal  |
| Max. power         | 60 Watt (at 50 °C ambient temperature)  |
| Weight             | 4.3 kg  |
| Wind load          | 140 N (at 160 km/h)   |
| Max. wind velocity | 200 km/h (incl. 1/2" radial ice)  |
| Height/width/depth | 300 / 480 / 135 mm  |

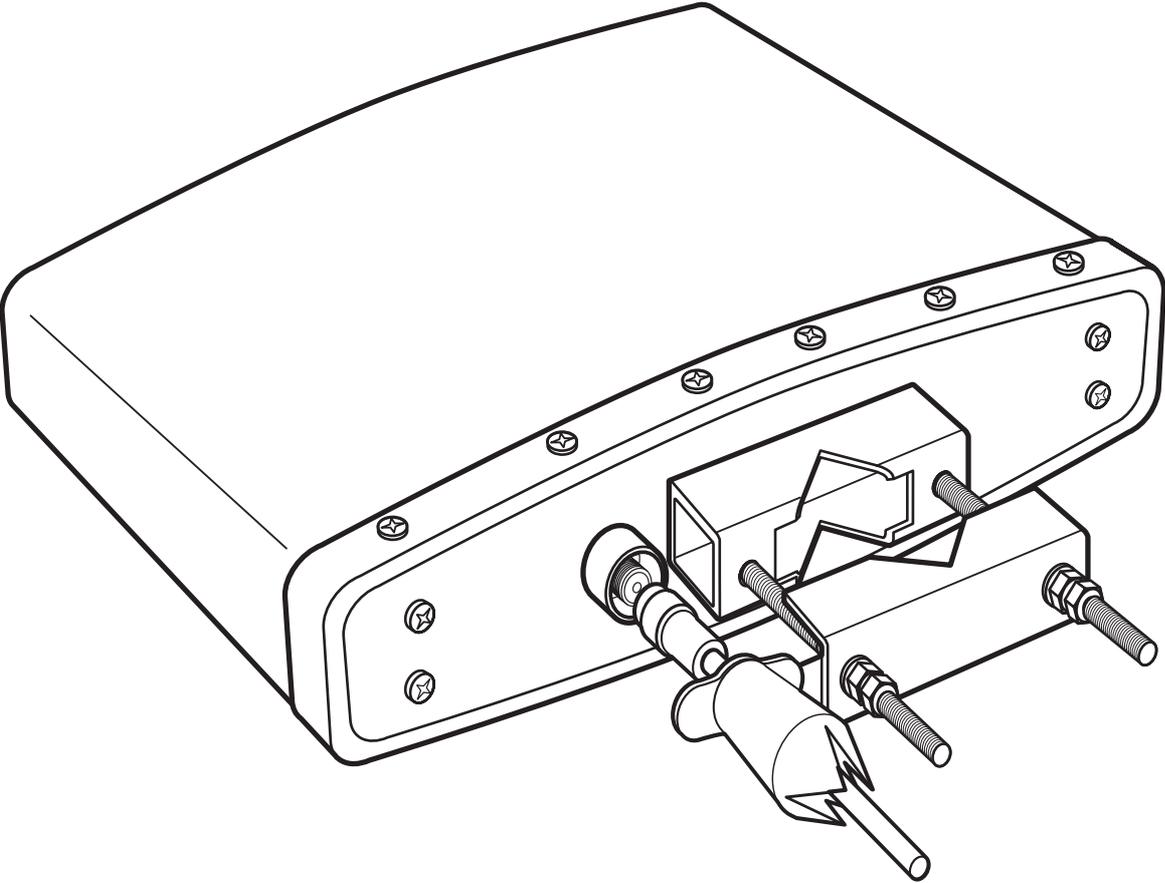


- Material:** Radiators: Heavy duty aluminum.  
Reflector screen: High strength aluminum alloy sheet. Radome: Impact-resistant fiberglass.  
Hot dip galvanized steel clamps.  
All screws and nuts: Stainless steel.
- Ice protection:** The rugged, impact-resistant fiberglass radome keeps the electrical characteristics, even under heaviest icing, nearly constant.
- Mounting:** To pipes of 60 – 120 mm OD by means of hot dip galvanized steel clamp, supplied.
- Grounding:** The antenna is DC grounded by a cross section of 304 mm<sup>2</sup> aluminum.
- Scope of supply:** Antenna including mounting hardware.

#### Radiation Pattern (at mid-band)



**Mounting Instruction**  
**Monitor-Antenna**  
**715 630**



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# Glide Path Antenna

## 328 – 335.5 MHz

### 713 316 B

#### RF monitor system integrated

| Type No.              | 713 316 B                               |
|-----------------------|---|
| Input                 | Type N female connector                 |
| Frequency range       | 328 – 335.5 MHz                         |
| VSWR                  | < 1.1                                   |
| Gain                  | 12 dBd                                  |
| Impedance             | 50 Ω                                    |
| Polarization          | Horizontal                              |
| Half-power beam width | H-plane: 80°/ E-plane: 25°              |
| Max. power input (CW) | 60 Watt (at 50 °C ambient temperature)  |
| Max. current (DC)     | 1 A (between inner and outer conductor) |
| Weight                | 19 kg                                   |
| Max. exp. area        | 1.0 m <sup>2</sup>                      |
| Lateral thrust        | 1450 N at 160 km/h                      |
| Max. wind velocity    | 200 km/h (incl. 1/2" radial ice)        |
| Width/height/depth    | 2000 / 500 / 190 mm                     |
| Packing size          | 2100 x 510 x 260 mm                     |



**Material:**  
 Dipole system: Cast aluminum.  
 Reflector: Weatherproof aluminum.  
 Radome: Fiberglass (white).  
 All screws and nuts: Stainless steel.

**Scope of supply:**  
 Antenna with two weather protective rubber caps for the connectors, but without mounting hardware.

**Mounting hardware:**

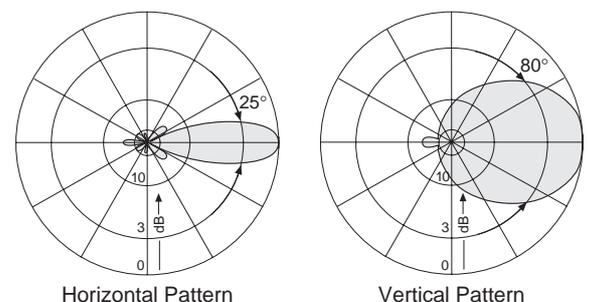
| Type No.   | Mast diameter |
|------------|---------------|
| K 61 32 4  | 60 – 115 mm   |
| K 61 32 41 | 115 – 200 mm  |

**Lightning protection:**  
 The antenna is DC grounded including the inner conductors.



| RF monitor system    |                         |
|----------------------|-------------------------|
| Input                | Type N female connector |
| Frequency range      | 328 – 335.5 MHz         |
| VSWR                 | < 1.3                   |
| Coupling attenuation | 31 ± 1 dB               |

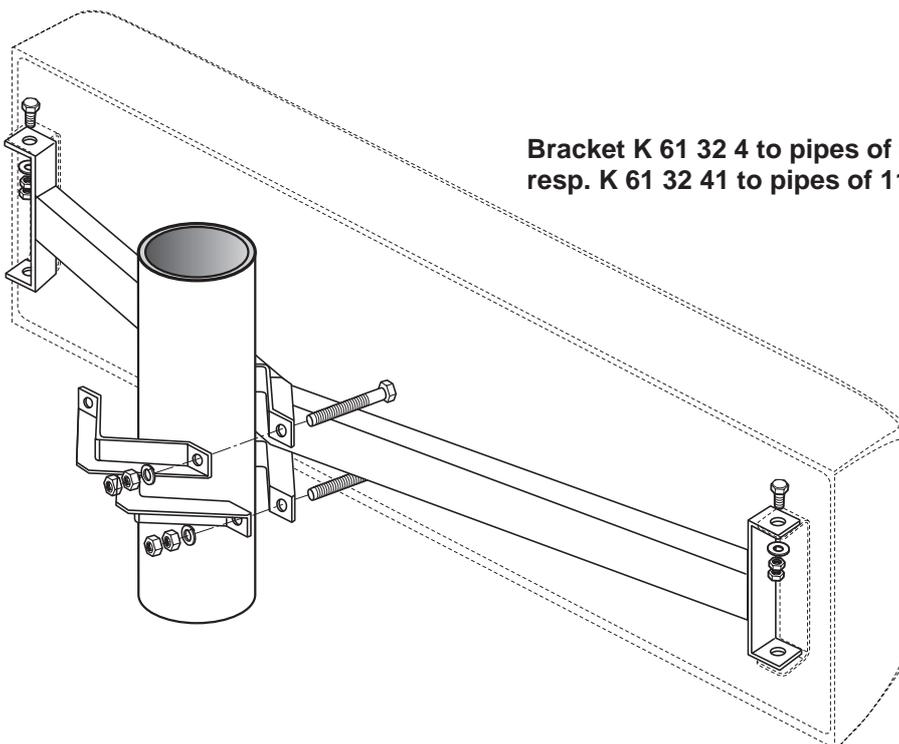
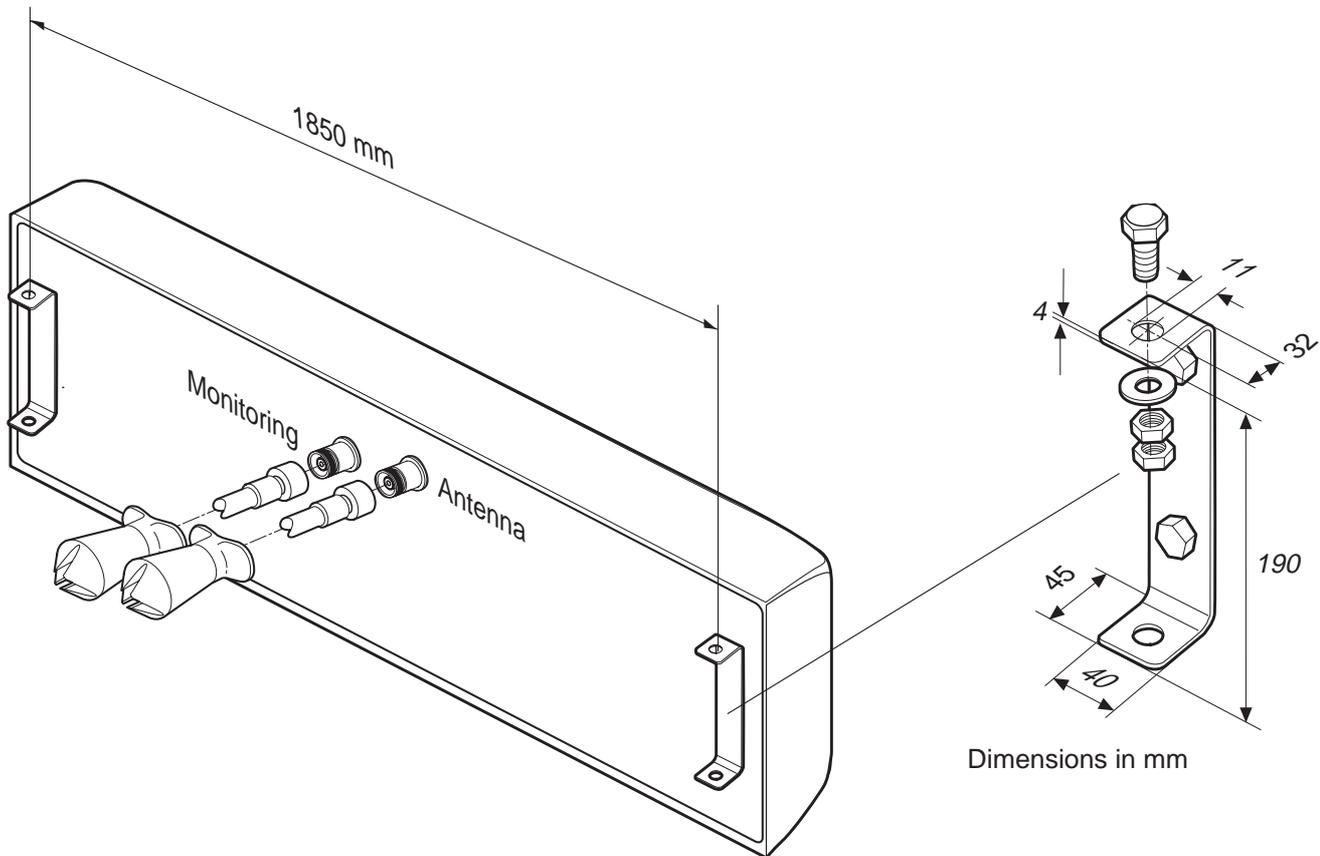
#### Radiation Pattern (at mid-band)



# Mounting Instruction

## Glide Path Antenna

### 713 316 B



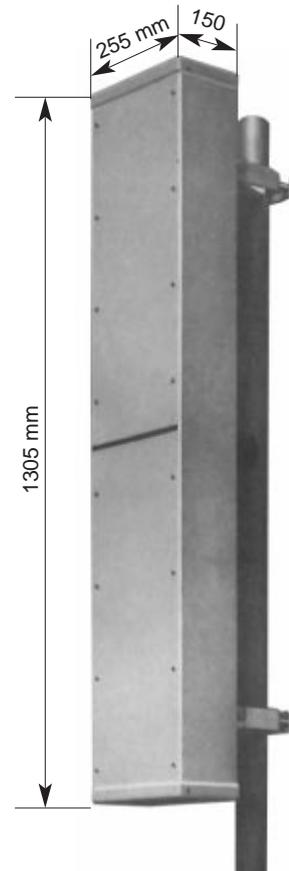
# Directional Antenna

## 960 – 1215 MHz

### 716 405

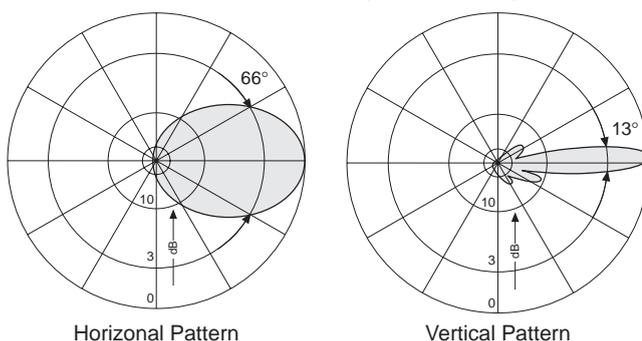
The directional antenna 716 405 has been specially designed for DME ground beacons and particularly for DMS-ILS colocation. The antenna provides a typical pattern to allow satisfactory DME range into localizer and glide path coverage sectors. A rapid fall-off below horizon and the cosecant-squared shaping above the main beam ensures the best use of energy within the ILS protected volume. The 14 dB gain allows the use of very low power full solid state DME ground beacon. Two coupling probes for monitoring the signal radiated by the antenna are located inside the fiberglass board (see fig. at the reserve side).

| Type No.                           | 716 405   |
|------------------------------------|---|
| Input (antenna and monitor probes) | N female connector in a weather protective rubber cap directly at the antenna |
| Connector position                 | Rearside  |
| Frequency range                    | 960 – 1215 MHz  |
| Bandwidth                          | 255 MHz   |
| VSWR                               | < 1.6 (antenna input)   |
| Gain                               | 14 dB   |
| Impedance                          | 50 Ω  |
| Coupling attention                 | 25 ± 3 dB (antenna/monitor probes)  |
| Beam tilt                          | + 4° ± 0.5°   |
| R. F. peak power                   | 10 kW; duty cycle 2%  |
| Polarization                       | Vertical  |
| Temperature range                  | -30° to + 60° ambient   |
| Weight                             | 12 kg   |
| Wind load                          | 600 N (at 160 km/h)   |
| Max. wind velocity                 | 200 km/h (incl. 1/2" radial ice)  |
| Packing size                       | 1420 x 360 x 250 mm   |
| Height/width/depth                 | 1305 / 255 / 150 mm   |



- Material:** Radiators: Brass. Reflector screen: High strength aluminum alloy sheet. Cover: Fiberglass. Clamps: Hot dip galvanized steel. All screws and nuts: Stainless steel.
- Mounting:** To pipes of 40 – 95 mm OD by means of mounting clamps, supplied. Clamps for thicker masts see reverse side.
- Grounding:** The antenna is DC grounded by a cross section of 640 mm<sup>2</sup> hot dip galvanized steel.
- Scope of supply:** Antenna including mounting hardware and three weather protective rubber caps for the connectors.

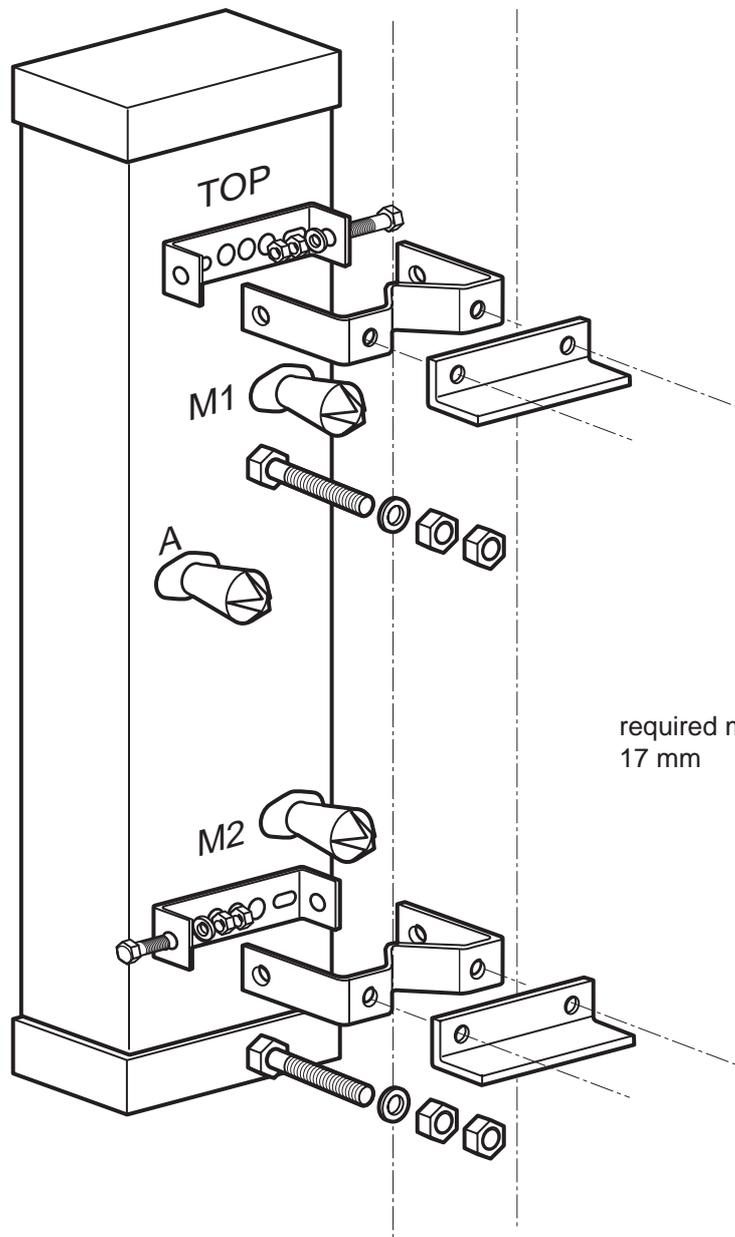
#### Radiation Pattern (at mid-band)



# Mounting Instruction

## Directional Antenna

### 716 405

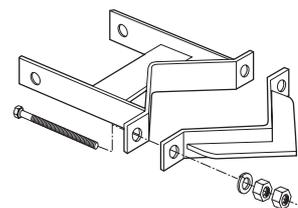


M1 = upper monitor  
M2 = lower monitor  
A = antenna

required metric wrenches:  
17 mm

#### Accessories (order separately)

| Type No.   | Description | Remarks                     | Weight<br>appr. | Units per<br>antenna |
|------------|-------------|-----------------------------|-----------------|----------------------|
| K 61 14 02 | 2 clamps    | Mast: 60 – 115 mm diameter  | 1.6 kg          | 1                    |
| K 61 14 03 | 2 clamps    | Mast: 116 – 210 mm diameter | 4.0 kg          | 1                    |
| K 61 14 04 | 2 clamps    | Mast: 210 – 380 mm diameter | 7.2 kg          | 1                    |



K 61 14 03

# D.M.E. Omnidirectional Gain Antenna

## 960 – 1215 MHz

### 715 986, 722 394

The antenna consists of a number of identical, decoupled half-wave dipoles, phase-feeding cables and transformer. Each dipole is mounted onto a central supporting brass tube. The horizontal pattern is obtained by the circular characteristic of the single dipole, the vertical pattern varying phase and distance of the single dipoles. All metal parts are DC grounded and, therefore, widely immune to damage from lightning. The top of the antenna is fitted with a dual obstruction light (type no. 715 986). Two antenna monitor probes are located inside the fiberglass tube. All feedlines and monitor cables descend inside the supporting brass tube.

| Type No.                 | 715 986  | 722 394  |
|--------------------------|--|----------|
| Obstruction light        | Yes  | No       |
| Input (antenna/monitors) | N female   |          |
| Connector position       | Bottom   |          |
| Frequency range          | 960 – 1215 MHz                                       |          |
| Bandwidth                | 255 MHz  |          |
| VSWR                     | < 1.8 (antenna input)                                |          |
| Gain                     | 9 ± 0.5 dBi  |          |
| Impedance                | 50 Ω   |          |
| Horizontal pattern       | Omnidirectional: deviation from omni better ± 1.5 dB |          |
| Vertical pattern up tilt | 3 ± 0.5°   |          |
| Coupling attention       | 25 ± 3 dB (antenna/monitor probes)                   |          |
| R. F. peak power         | 10 kW, modulated as per ICAO recommendation          |          |
| Polarization             | Vertical   |          |
| Temperature range        | -40° to + 60° ambient                                |          |
| Weight                   | 28 kg  | 21 kg    |
| Wind load                | 400 N  | 270 N    |
|                          | (at 150 km/h with 12 mm radial ice)                  |          |
| Max. wind velocity       | 150 km/h   | 200 km/h |
|                          | (incl. 12 mm radial ice)                             |          |
| Radome diameter          | 86 mm  |          |

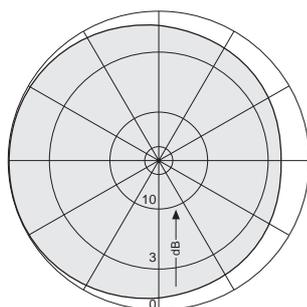
**Material:** Dipoles, decoupling elements, supporting tube and transformer: High quality brass.  
Base: Weather-resistant aluminum.  
Radome: Fiberglass, colour: Grey.  
All screws and nuts: Stainless steel.

**Mounting:** To pipes of 60 – 62 mm OD by means of mounting clamps, supplied.

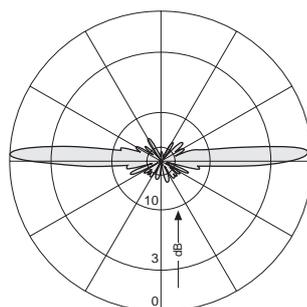
**Grounding:** The antenna is DC grounded by a cross section of 98 mm<sup>2</sup> brass.



#### Radiation Pattern (at mid-band)



Horizontal Pattern

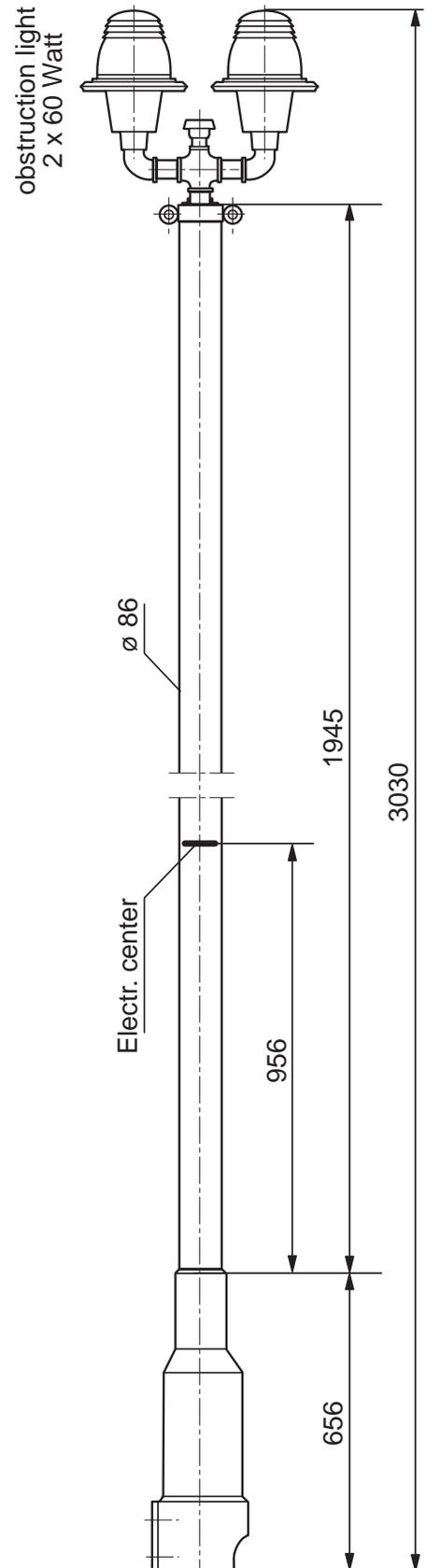
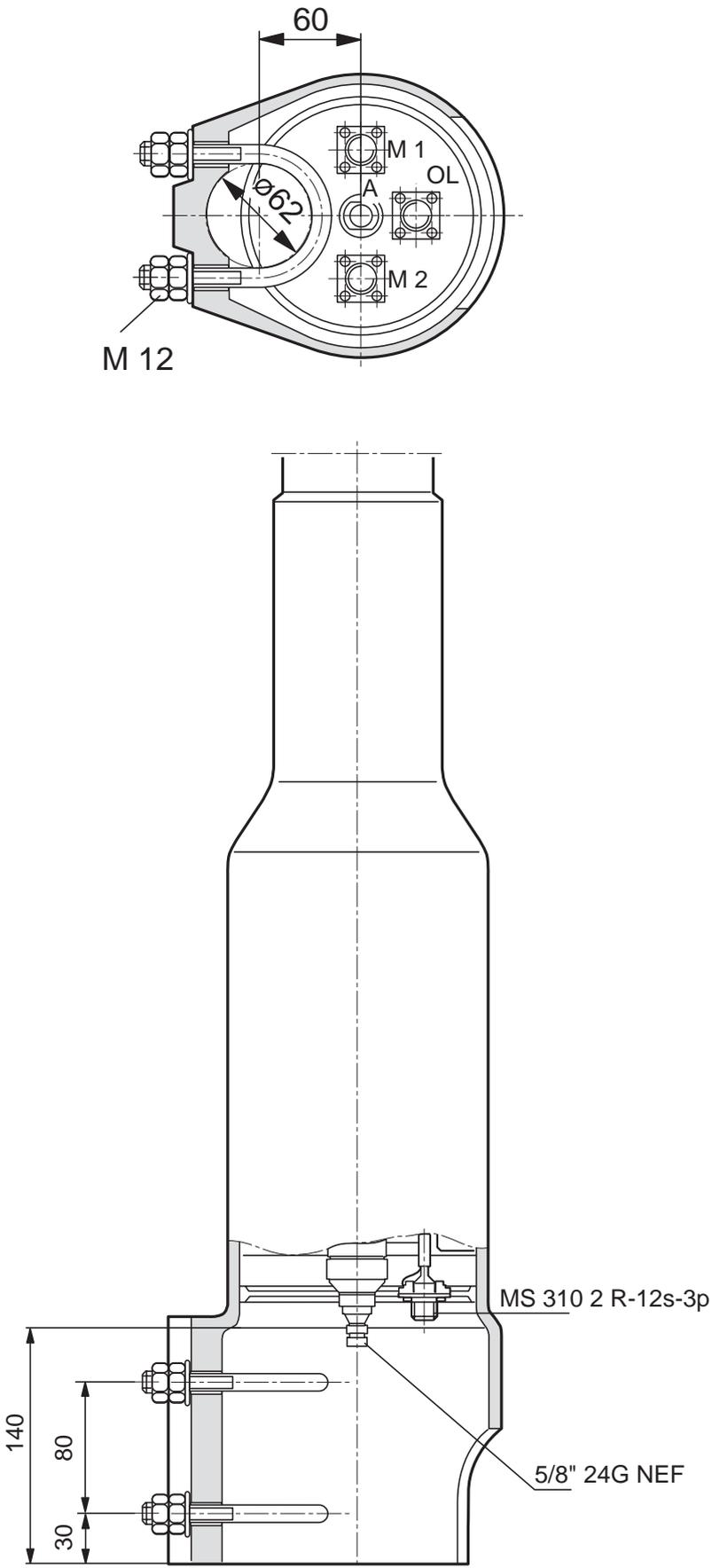


Vertical Pattern

# Mounting Instruction

## D.M.E. Omnidirectional Gain Antenna

715 986, 722 394



# Power Splitter

## 100 – 156 MHz / 225 – 400 MHz

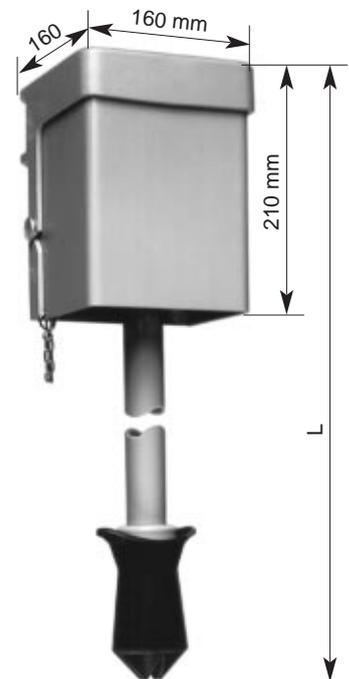
### K 62 55 3., K 62 56 3., K 62 57 3., K 63 55 1.

Power Splitters for low-loss connection of several antennas:

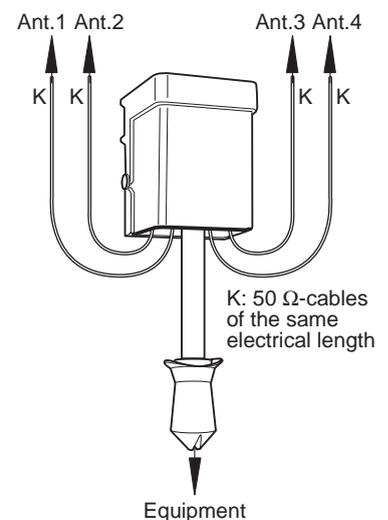
| Frequency-range<br>MHz | For connecting<br>... antennas | Length L<br>approx.<br>mm | Max.<br>power *)<br>Watt | Type No. for female connection<br>(equipment and antenna side) |            |
|------------------------|--------------------------------|---------------------------|--------------------------|--|------------|
|                        |                                |                           |                          | 7-16   | N          |
| 100 – 156              | 2                              | 660                       | 630                      | K 62 55 3  | K 62 55 31 |
|                        | 3                              | 720                       | 420                      | K 62 56 3  | K 62 56 31 |
|                        | 4                              | 760                       | 430                      | K 62 57 3  | K 62 57 31 |
| 225 – 400              | 2                              | 870                       | 750                      | K 63 55 1  | K 63 55 11 |

\*) at 50 °C ambient temperature

|                   |   |
|-------------------|---|
| Impedance:        | 50 Ω  |
| Input and output: | N female or 7-16 female connector.  |
| VSWR:             | < 1.15  |
| Insertion loss:   | < 0.05 dB (of the transformation line)  |
| Material:         | Protective case on the antenna side: Cast aluminum.<br>Weather protection on the equipment side: UV-resistant elastomere.<br>Transformation tube: Aluminum and brass.<br>All parts are protected with paint.<br>All screws and nuts: Stainless steel. |
| Mounting:         | On tubular masts of 60 – 320 mm by means of stainless steel tightening band 1020 x 20 x 1 mm, supplied.<br>Transformers with a total length of more than 700 mm are delivered with a supporting clamp.  |



Example of 4-way antenna transformer

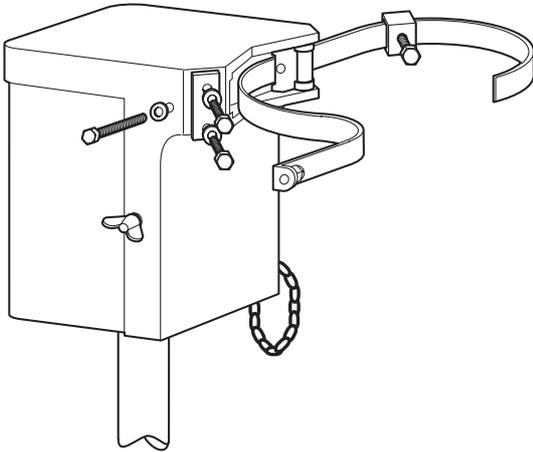


# Mounting Instruction Power Splitter

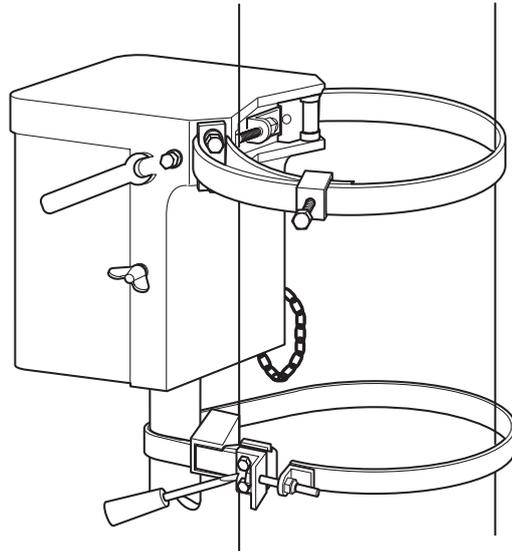
K 62 55 3., K 62 56 3., K 62 57 3., K 63 55 1.

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Antennen · Electronic

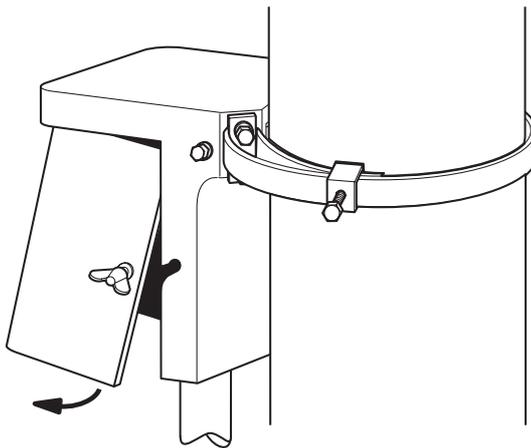
1



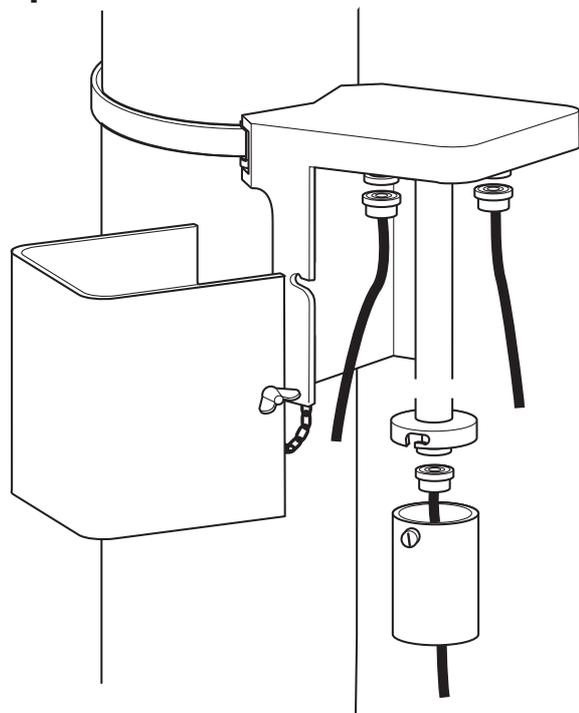
2



3



4



9985.608/0900/0.5/ZW/HA Subject to alteration.

# Receiver Multicoupler

## 117.5 – 144 MHz, 8 Outputs

### 780 265

The use of the receiver multicoupler 780 265 is appropriate if several receivers are operated simultaneously at the same site. With this receiver multicoupler up to 8 receivers can be connected to one common antenna.

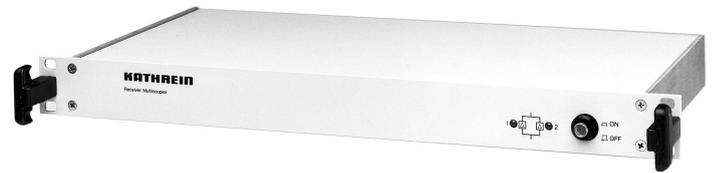
This results in considerable savings for the antenna system. The low noise figure and the excellent inter-modulation properties guarantee a high dynamic range and thereby improved receiving conditions. This is of particular significance in locations where transmitters are also operated next to receivers.

#### The receiver multicoupler consists of:

- a low noise amplifier,
- a power splitter,
- a voltage supply.

The receiver multicoupler has an active redundancy due to the two amplifier modules in parallel which are located in the low noise amplifier. This means that the receiver multicoupler still supplies all connected receivers even if one of the amplifier modules fails. The signal levels in this case decrease by approximately 6 dB.

Each amplifier module is designed for operation with its own voltage supply of 230 V AC or +11 ... +48 V DC.



Front view



Back view

#### Technical Data

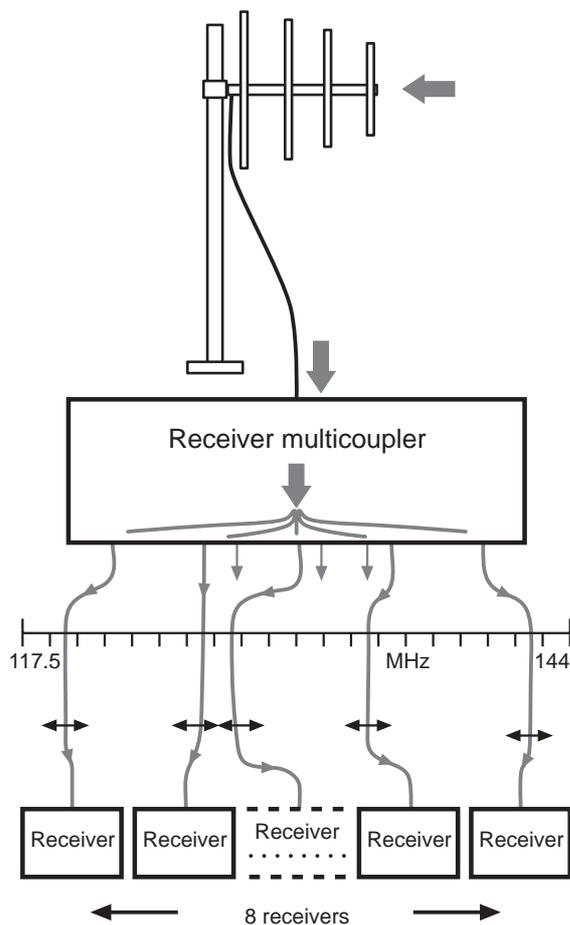
| Type No.                  | 780 265  |
|---------------------------|--|
| Number of inputs          | 1  |
| Number of outputs         | 8  |
| Frequency range           | 117.5 – 144 MHz  |
| Gain                      | 3.0 dB ±1.5 dB   |
| Noise figure              | 4.0 dB +0.5 dB   |
| 3rd order intercept point | > 23 dBm (typ. 25 dBm)                                   |
| Isolation                 | > 25 dB (typ. 30 dB) between any two outputs             |
| VSWR                      |  |
| Input                     | < 1.4  |
| Output                    | < 1.4  |
| Impedance                 | 50 Ω   |
| Power supply              | 230 V +10/-15 %, 50 ... 60 Hz and/or<br>+11 ... +48 V DC |
| Power consumption         | < 9 W (230 V, 50 Hz)<br>< 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                    | 3.9 kg   |
| Packing size              | Approx. 540 x 105 x 410 mm                               |
| Dimensions (w x h x d)    | 483 x 44 x 250 mm, 19" drawer                            |

Note: Unused outputs have to be terminated using a 50-Ω load in order to comply with the specifications.

# Receiver Multicoupler

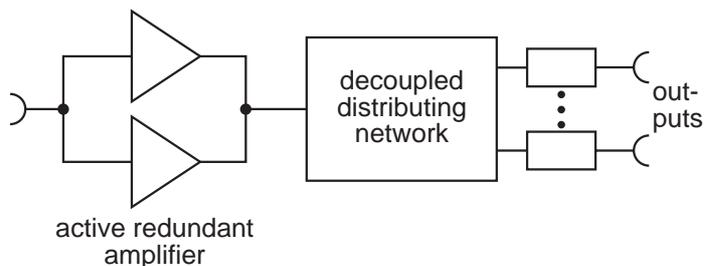
## 117.5 – 144 MHz, 8 Outputs

### 780 265



Example receiver multicoupler  
117.5 – 144 MHz

### Block diagram receiver multicoupler



9985.609/0199/0.5/ZW/HA Subject to alteration.

# Receiver Multicoupler

## 117.5 – 144 MHz, 16 Outputs

### 780 266

The use of the receiver multicoupler 780 266 is appropriate if several receivers are operated simultaneously at the same site. With this receiver multicoupler up to 16 receivers can be connected to one common antenna.

This results in considerable savings for the antenna system. The low noise figure and the excellent intermodulation properties guarantee a high dynamic range and thereby improved receiving conditions. This is of particular significance in locations where transmitters are also operated next to receivers.

#### The receiver multicoupler consists of:

- a low noise amplifier,
- a power splitter,
- a voltage supply.

The receiver multicoupler has an active redundancy due to the two amplifier modules in parallel which are located in the low noise amplifier. This means that the receiver multicoupler still supplies all connected receivers even if one of the amplifier modules fails. The signal levels in this case decrease by approximately 6 dB.

Each amplifier module is designed for operation with its own voltage supply of 230 V AC or +11 ... +48 V DC.



Front view



Back view

#### Technical Data

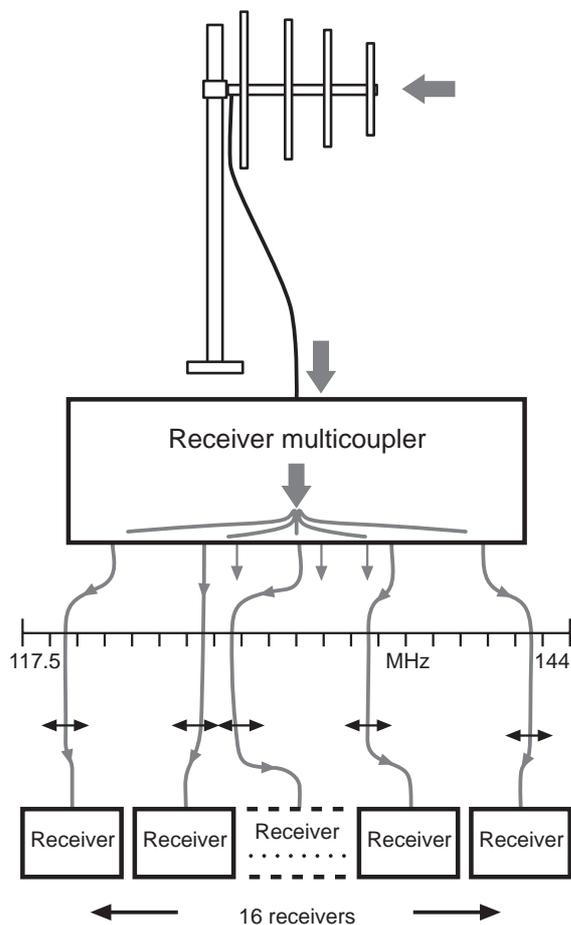
| Type No.                  | 780 266  |
|---------------------------|--|
| Number of inputs          | 1  |
| Number of outputs         | 16   |
| Frequency range           | 117.5 – 144 MHz  |
| Gain                      | 1.0 dB ± 1.5 dB  |
| Noise figure              | 4.5 dB ± 0.5 dB  |
| 3rd order intercept point | > 12 dBm (typ. 16 dBm)   |
| Isolation                 | > 25 dB (typ. 30 dB) between any two outputs                             |
| VSWR                      |  |
| Input                     | < 1.4  |
| Output                    | < 1.4  |
| Impedance                 | 50 Ω   |
| Power supply              | 230 V +10/-15 %, 50 ... 60 Hz and/or<br>+11 ... +48 V DC, minus grounded |
| Power consumption         | < 9 W (230 V, 50 Hz)<br>< 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                    | 5.9 kg   |
| Packing size              | Approx. 540 x 115 x 460 mm   |
| Dimensions (w x h x d)    | 483 x 88 x 250 mm, 19" drawer  |

Note: Unused outputs have to be terminated using a 50-Ω load in order to comply with the specifications.

# Receiver Multicoupler

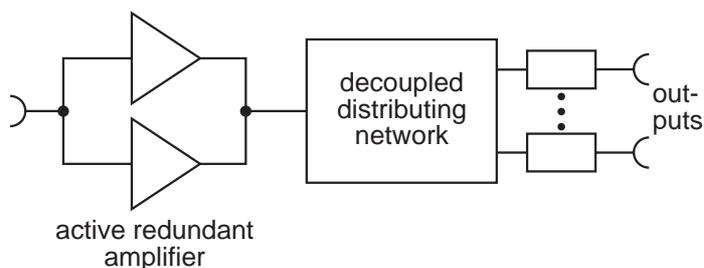
## 117.5 – 144 MHz, 16 Outputs

### 780 266



Example receiver multicoupler  
117.5 – 144 MHz

### Block diagram receiver multicoupler



# Receiver Multicoupler

## 225 – 400 MHz, 8 Outputs

### 780 231

The use of the receiver multicoupler 780 231 is appropriate if several receivers are operated simultaneously at the same site. With this receiver multicoupler up to 8 receivers can be connected to one common antenna.

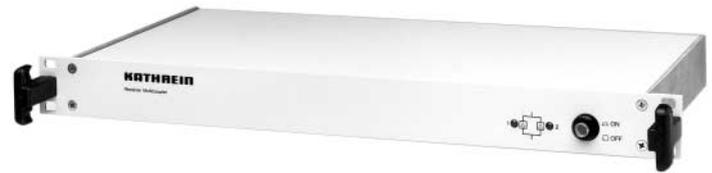
This results in considerable savings for the antenna system. The low noise figure and the excellent inter-modulation properties guarantee a high dynamic range and thereby improved receiving conditions. This is of particular significance in locations where transmitters are also operated next to receivers.

#### The receiver multicoupler consists of:

- a low noise amplifier,
- a power splitter,
- a voltage supply.

The receiver multicoupler has an active redundancy due to the two amplifier modules in parallel which are located in the low noise amplifier. This means that the receiver multicoupler still supplies all connected receivers even if one of the amplifier modules fails. The signal levels in this case decrease by approximately 6 dB.

Each amplifier module is designed for operation with its own voltage supply of 230 V ~ or 11 ... 48 V =.



Front view



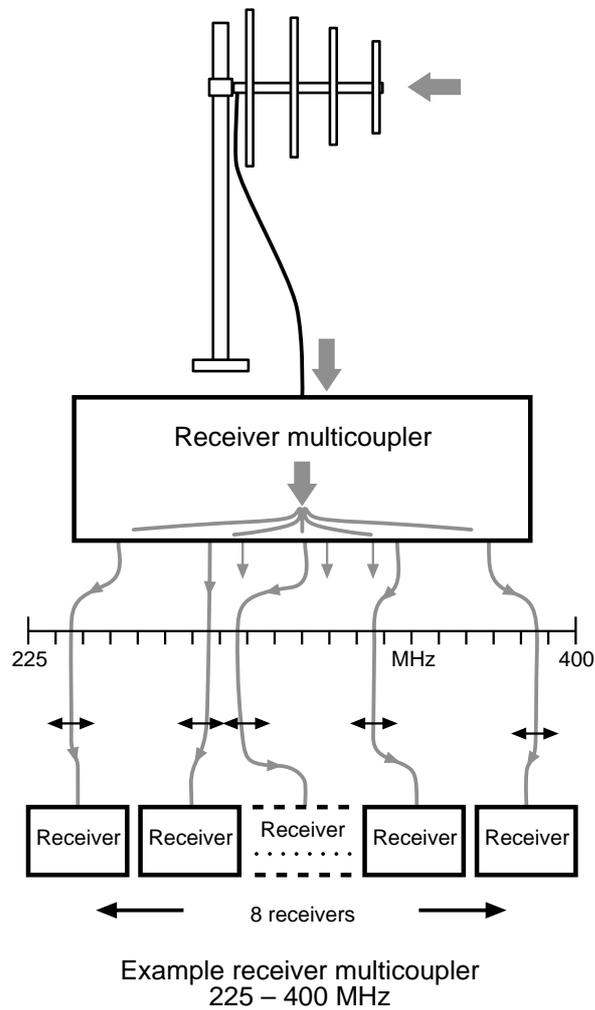
Back view

#### Technical Data

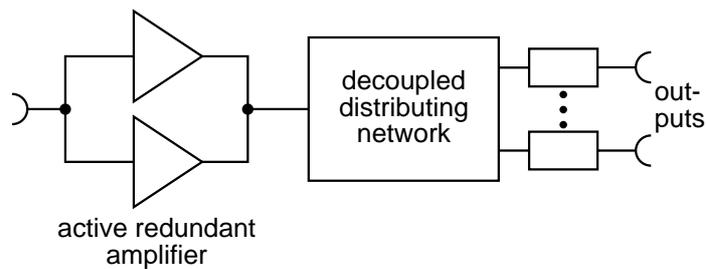
| Type No.                  | 780 231  |
|---------------------------|--|
| Number of inputs          | 1  |
| Number of outputs         | 8  |
| Frequency range           | 225 – 400 MHz  |
| Gain                      | 3.0 dB $\pm$ 1.5 dB  |
| Noise figure              | 4.0 dB +0.5 dB   |
| 3rd order intercept point | > 23 dBm (typ. 25 dBm)   |
| Isolation                 | > 25 dB (typ. 30 dB) between any two outputs                   |
| VSWR                      |  |
| Input                     | < 1.4  |
| Output                    | < 1.4  |
| Impedance                 | 50 $\Omega$  |
| Power supply              | 230 V +10/-15 %, 50 ... 60 Hz and/or<br>11 ... 48 V = floating |
| Power consumption         | < 9 W (230 V, 50 Hz)<br>< 20 W (11 ... 48 V =)                 |
| Temperature range         | -20 ... +50 °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              | Approx. 540 x 105 x 410 mm                                     |
| Dimensions (w x h x d)    | 483 x 44 x 250 mm, 19" drawer                                  |

Note: Unused outputs have to be terminated using a 50- $\Omega$  load in order to comply with the specifications.

**Receiver Multicoupler**  
**225 – 400 MHz, 8 Outputs**  
**780 231**



**Block diagram receiver multicoupler**



9985.655/0701/0.5/ZW/HA Subject to alteration.

# Band-pass Filter

## 118 ... 137 MHz

### K 64 21 35 1

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  $\lambda/4$  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  $\lambda/4$ . 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;

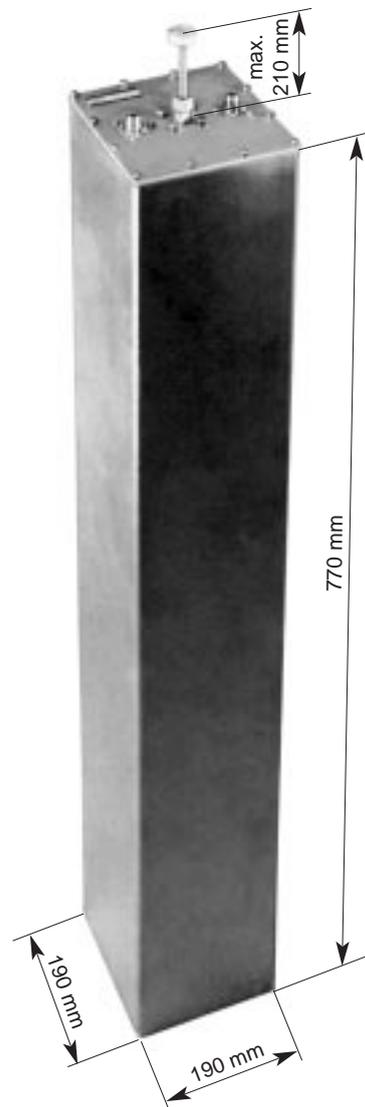
n = number of individual filters.

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 64 21 35 1  |
|------------------------|---|
| Frequency range        | 118 ... 137 MHz   |
| Insertion loss         | 0.5 ... 2 dB, tunable   |
| VSWR                   | < 1.5   |
| Impedance              | 50 $\Omega$   |
| Input power            | < 200 W   |
| Temperature range      | -30 ... +60 °C  |
| Connectors             | N female, silver-plated   |
| Material               | Outer conductor: aluminium<br>Inner conductor: brass, silver-plated |
| Installation           | Free standing or<br>wall mounting with mounting angles              |
| Attached hardware      | Filter with 2 mounting angles<br>and 2 connecting pieces            |
| Weight                 | 13 kg   |
| Packing size           | 207 x 1125 x 207 mm   |
| Dimensions (w x h x d) | 190 x max. 980 x 190 mm (with tuning rod)                           |

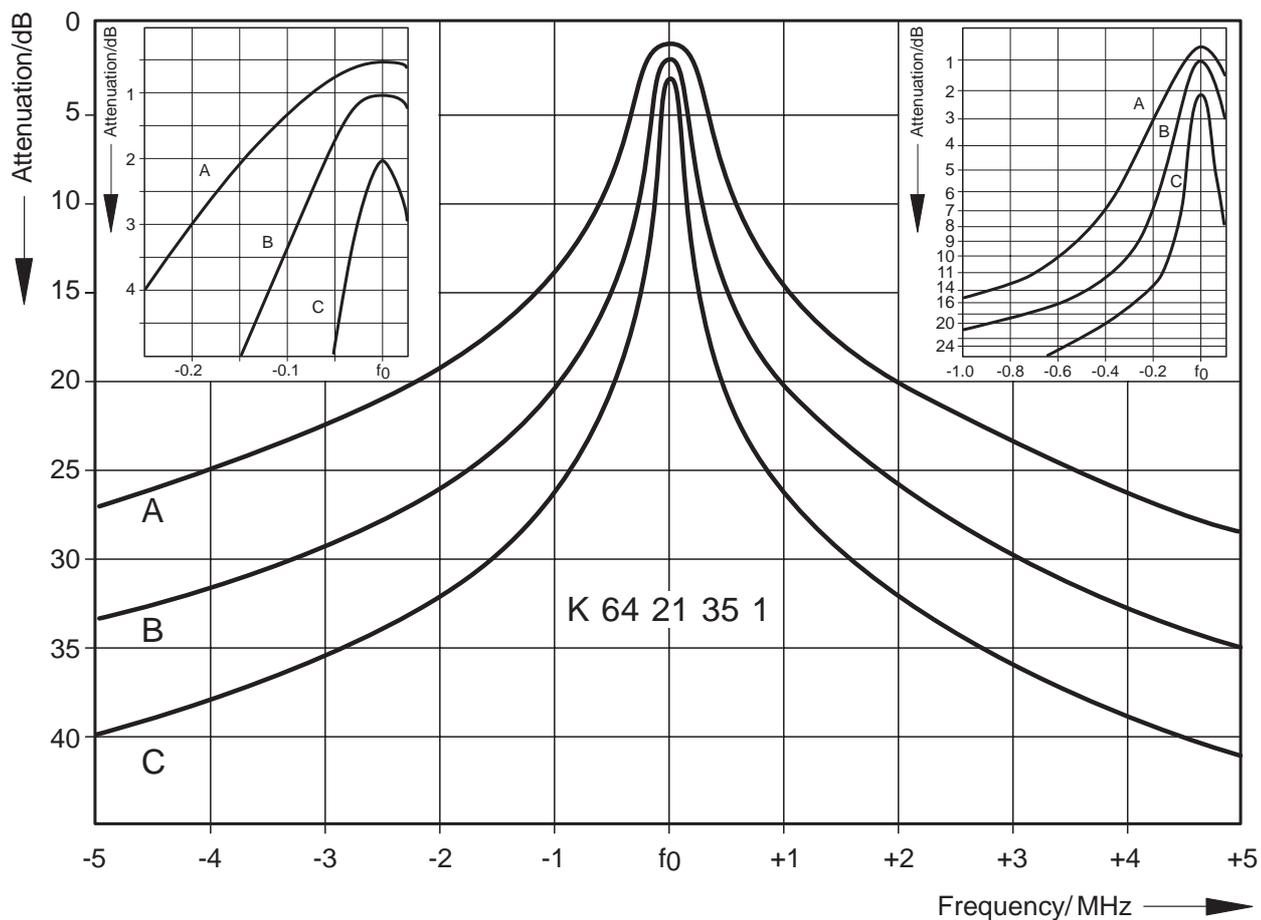
# Band-pass Filter

## 118 ... 137 MHz

### Typical attenuation curves

Tuning examples:

Band-pass Filter  
K 64 21 35 1



| Curve | Insertion loss |
|-------|----------------|
| A     | 0.5 dB         |
| B     | 1.0 dB         |
| C     | 2.0 dB         |

# S-P Filter

## 118 ... 137 MHz

### K 64 21 36 1, K 64 21 37 1

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 inter-modulation 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  $\lambda/4$  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  $\lambda/4$ .

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;

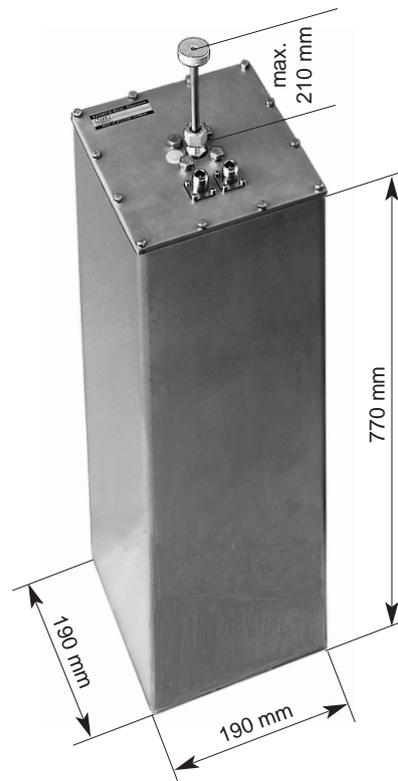
n = number of individual filters.

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.



#### Technical Data

| Type No.               | K 64 21 36 1  | K64 21 37 1                 |
|------------------------|---|-----------------------------|
| Pass frequency         | <b>below</b> stop frequency   | <b>above</b> stop frequency |
| Frequency range        | 118 ... 137 MHz   |                             |
| Frequency separation   |   |                             |
| Minimum                | 0.2 MHz   |                             |
| Maximum                | 5 MHz   |                             |
| Insertion loss         | 0.5 ± 0.15 dB   |                             |
| VSWR                   | < 1.5   |                             |
| 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<br>Inner conductor: Brass, silver-plated |                             |
| Installation           | Free standing or<br>wall mounting with mounting angles              |                             |
| Attached hardware      | S-P filter with 2 mounting angles<br>and 2 connecting pieces        |                             |
| Weight                 | 13 kg   |                             |
| Packing size           | 207 x 1125 x 207 mm   |                             |
| Dimensions (w x h x d) | 190 x max. 980 x 190 mm (with tuning rod)                           |                             |

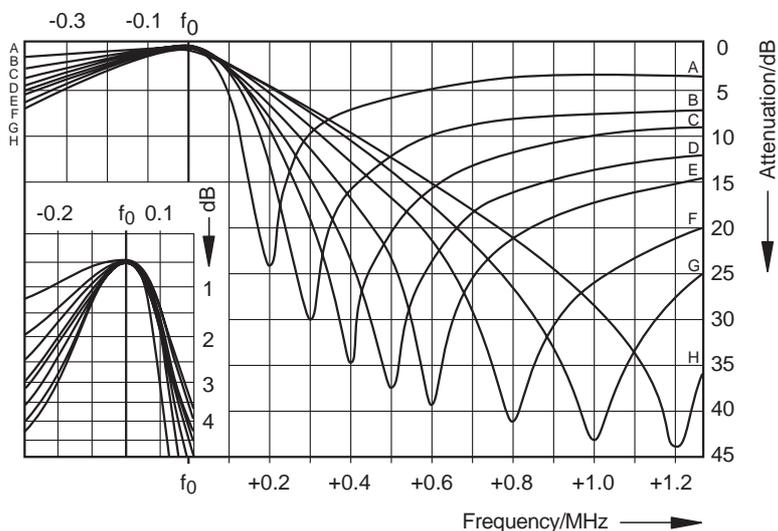
# S-P Filter

## 118 ... 137 MHz

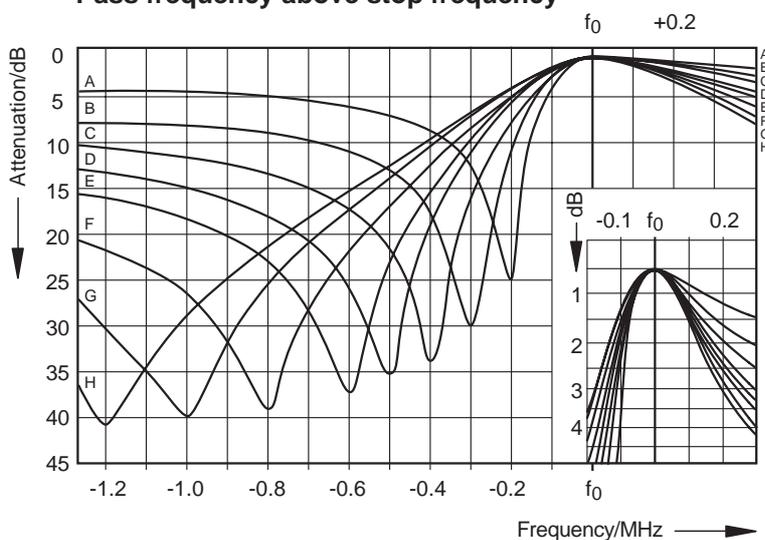
### Typical attenuation curves

Tuning examples:

**K 64 21 36 1**  
Pass frequency below stop frequency



**K 64 21 37 1**  
Pass frequency above stop frequency



| Curve | Frequency separation<br>stop band frequency / pass band frequency |
|-------|---|
| A     | 0.2 MHz   |
| B     | 0.3 MHz   |
| C     | 0.4 MHz   |
| D     | 0.5 MHz   |
| E     | 0.6 MHz   |
| F     | 0.8 MHz   |
| G     | 1.0 MHz   |
| H     | 1.2 MHz   |

# Band-pass Filter

## 100 ... 156 MHz

### K 64 12 31, K 64 13 31

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 consists of two or three high Q capacitively coupled resonators. The pass band frequency, the coupling between the resonators as well as the input and output coupling are adjustable.

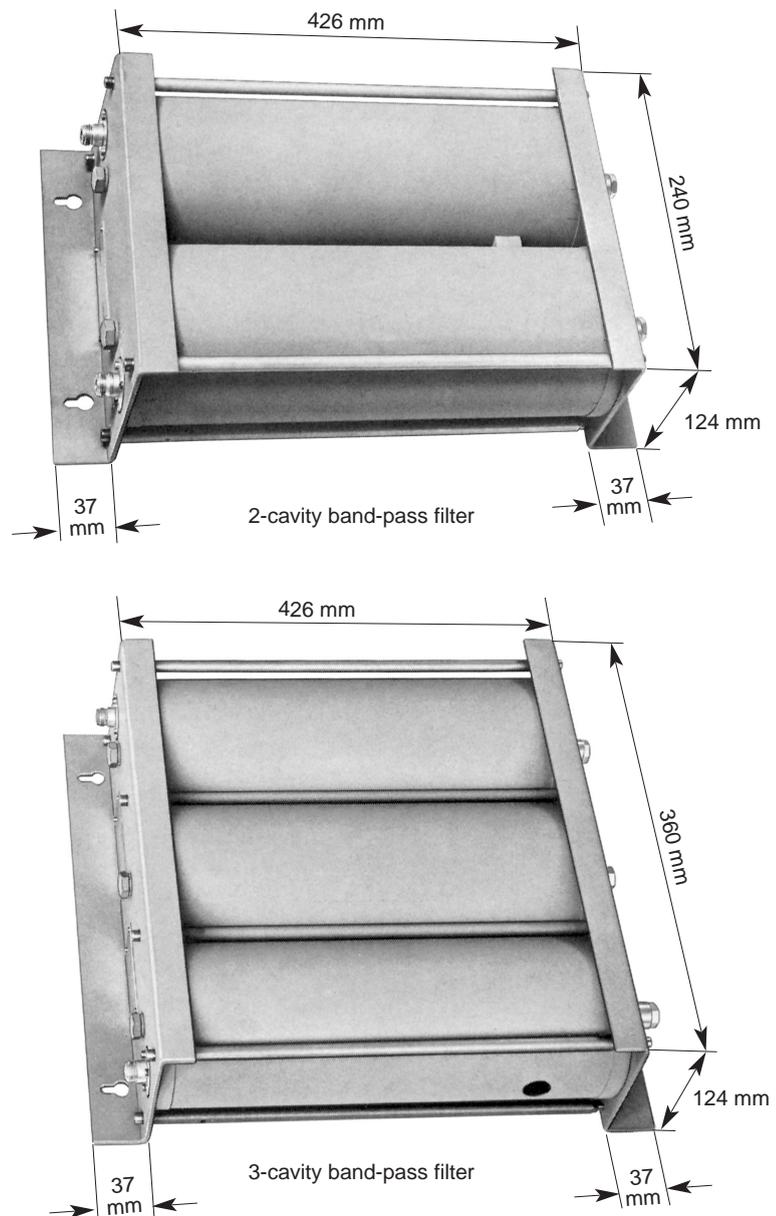
#### Filter characteristics:

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) when ordering.

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



#### Technical Data

| Type No.                | K 64 12 31   |                          | K 64 13 31               |                          |
|-------------------------|--|--------------------------|--------------------------|--------------------------|
| Frequency range         | 100 ... 156 MHz  |                          |                          |                          |
| Insertion loss          | 1 ... 2 dB, tunable  |                          | 1.5 ... 2 dB, tunable    |                          |
|                         | <b>1.0 dB</b><br>curve A                                     | <b>2.0 dB</b><br>curve B | <b>1.5 dB</b><br>curve A | <b>2.0 dB</b><br>curve B |
| VSWR                    | < 1.2  |                          |                          |                          |
| Impedance               | 50 Ω   |                          |                          |                          |
| Input power             | < 50 W   | < 25 W                   | < 50 W                   | < 25 W                   |
| Temperature range       | –30° ... +60° C  |                          |                          |                          |
| Temperature coefficient | < 18 x 10 <sup>-6</sup> /°C                                  |                          |                          |                          |
| Connector               | N female   |                          |                          |                          |
| Material                | Outer conductor and inner conductor:<br>Brass, silver-plated |                          |                          |                          |
| Colour                  | Grey (RAL 7032)  |                          |                          |                          |
| Installation            | With 4 screws (max. 6 mm diameter)                           |                          |                          |                          |
| Weight                  | 12 kg  |                          | 18 kg                    |                          |
| Packing size            | 614 x 195 x 314 mm   |                          | 614 x 195 x 434 mm       |                          |
| Dimensions (w x h x d)  | 426 x 124 x 240 mm   |                          | 426 x 124 x 360 mm       |                          |

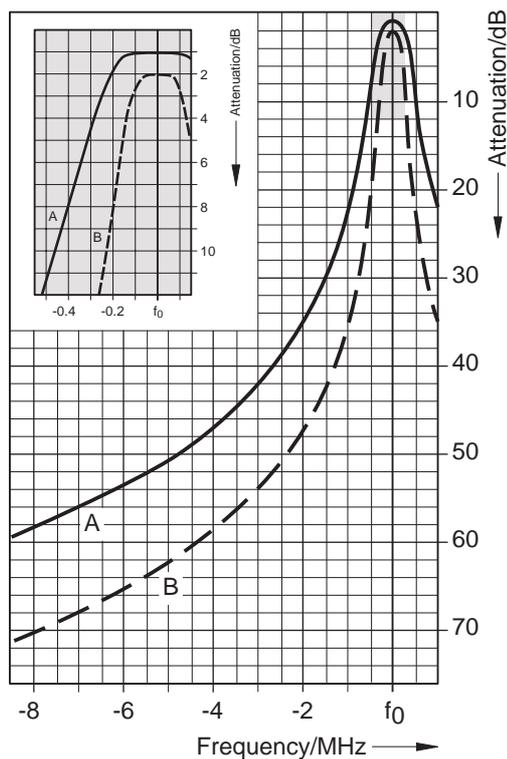
# Band-pass Filter

## 100 ... 156 MHz

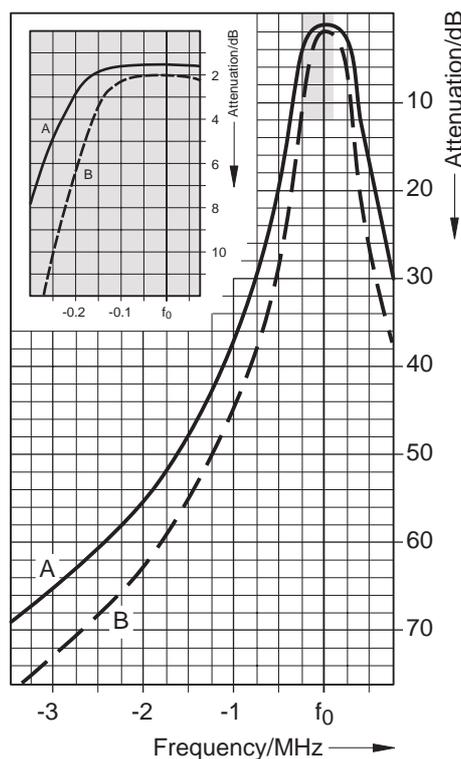
### Typical attenuation curves

Tuning examples:

2-cavity band-pass filter K 64 12 31



3-cavity band-pass filter K 64 13 31



| Curve | Model      | Insertion loss | Type No.   |
|-------|------------|----------------|------------|
| A     | 2 cavities | 1.0 dB         | K 64 12 31 |
| B     | 2 cavities | 2.0 dB         | K 64 12 31 |
| A     | 3 cavities | 1.5 dB         | K 64 13 31 |
| B     | 3 cavities | 2.0 dB         | K 64 13 31 |

# Band-stop Filter

## 118 ... 137 MHz

### 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  $\lambda/4$  coaxial resonators. The resonators of the 2- and 3-cavity band-stop filter are interconnected by cables of  $\lambda/4$  length.

### Filter characteristics:

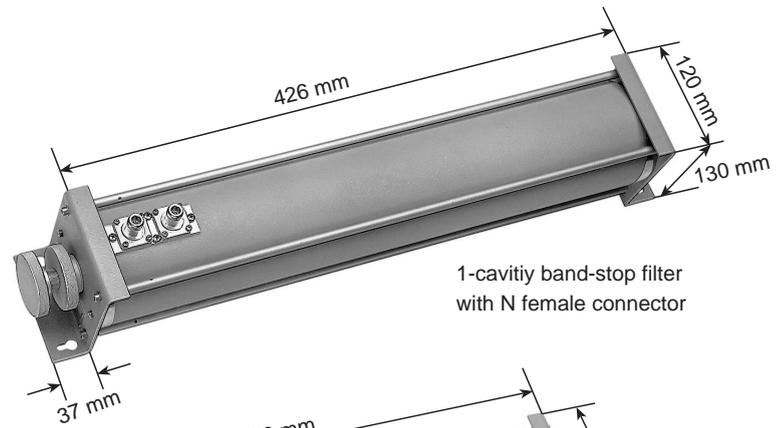
Narrow stop band range with high stop band attenuation, low insertion loss outside the stop band range.

### Tuning:

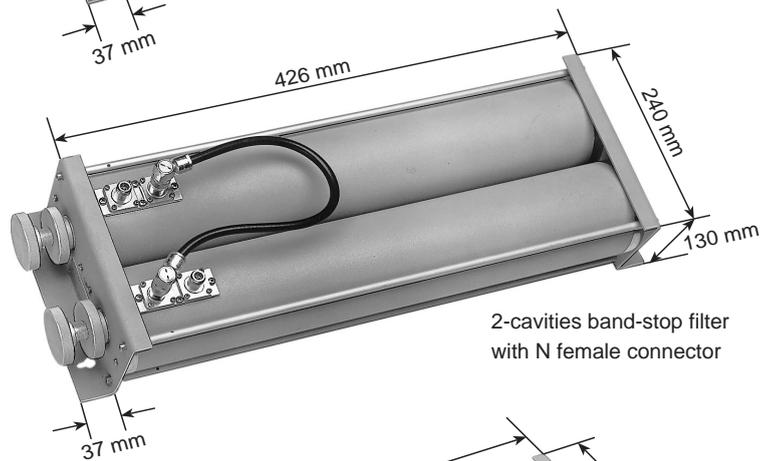
The band-stop filter is tuned to the desired stop band frequency at the factory. When ordering please specify stop band frequency.

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

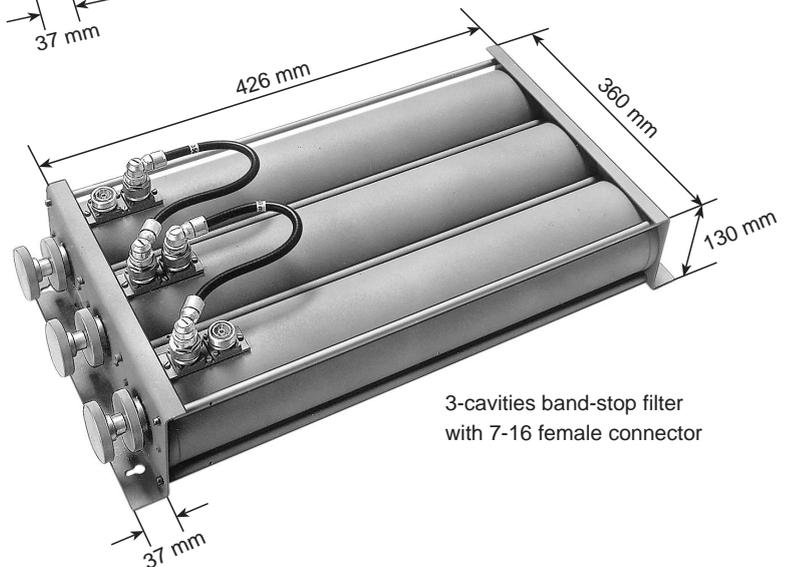
The resonators of the 2-cavity or 3-cavity band-stop filters can be tuned independently. In this way, 2 or 3 different interfering signals can be suppressed or one single interfering signal can be especially attenuated.



1-cavity band-stop filter with N female connector



2-cavities band-stop filter with N female connector



3-cavities band-stop filter with 7-16 female connector

### Technical Data

| Type No.   | Connector   | Version    | Packing size       | Weight  |
|------------|-------------|------------|--------------------|---------|
| K 64 31 31 | N female    | 1 cavity   | 614 x 194 x 195 mm | 5.6 kg  |
| K 64 31 37 | 7-16 female | 1 cavity   | 614 x 194 x 195 mm | 5.6 kg  |
| K 64 32 31 | N female    | 2 cavities | 614 x 314 x 195 mm | 11.2 kg |
| K 64 32 37 | 7-16 female | 2 cavities | 614 x 314 x 195 mm | 11.2 kg |
| K 64 33 31 | N female    | 3 cavities | 614 x 434 x 195 mm | 17.0 kg |
| K 64 33 37 | 7-16 female | 3 cavities | 614 x 434 x 195 mm | 17.0 kg |

|                         |  |
|-------------------------|--|
| Frequency range         | 118 ... 137 MHz  |
| Impedance               | 50 $\Omega$  |
| Input power             | < 300 Watt at insertion loss < 1 dB                          |
| Temperature range       | -30° ... +60° C  |
| Temperature coefficient | < 18 x 10 <sup>-6</sup> /°C                                  |
| Material                | Outer conductor and inner conductor:<br>Brass, silver-plated |
| Colour                  | Grey (RAL 7032)  |
| Installation            | With 4 screws (max. 6 mm diameter)                           |

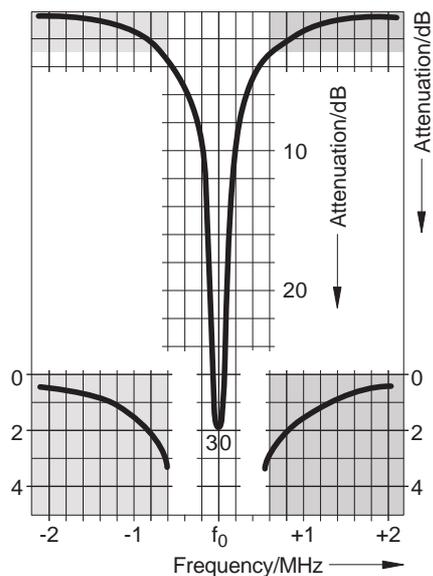
# Band-stop Filter

## 118 ... 137 MHz

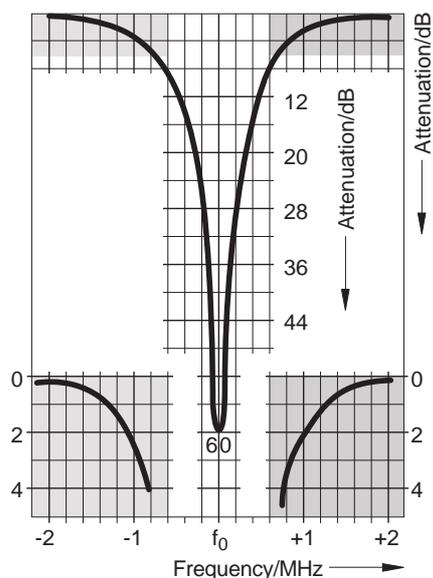
### Typical attenuation curves

Tuning examples:

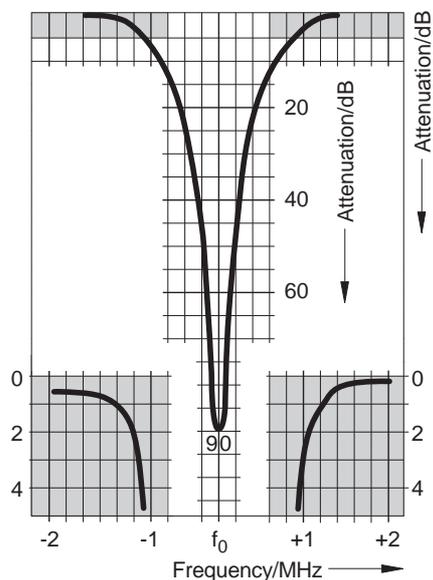
1-cavity  
Band-stop Filter  
K 64 31 3..



2-cavities  
Band-stop Filter  
K 64 32 3..



3-cavities  
Band-stop Filter  
K 64 33 3..



# Band-pass Filter

## 225 ... 400 MHz

### K 65 13 11

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 consists of three high Q capacitively coupled resonators. The pass band frequency, the coupling between the resonators as well as the input and output coupling are adjustable.

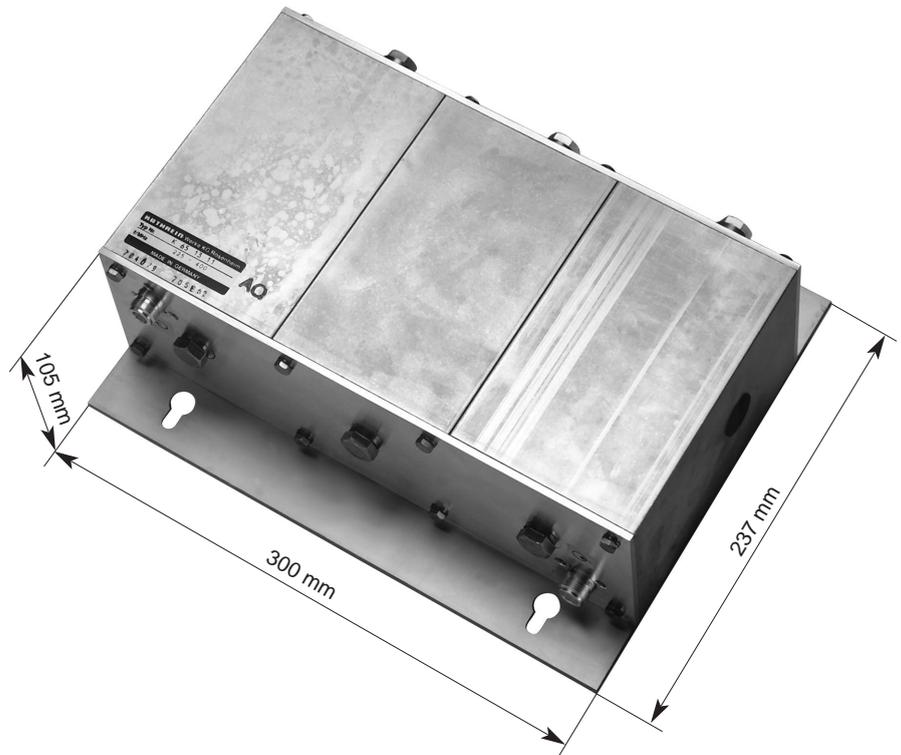
#### Filter characteristics:

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) when ordering.

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



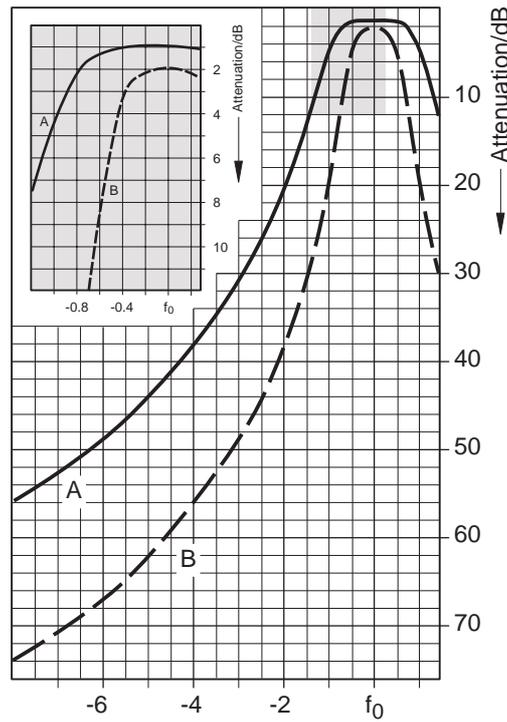
### Technical Data

| Type No.                | K 65 13 11   |
|-------------------------|--|
| Frequency range         | 225 ... 400 MHz  |
| Insertion loss          | 1 ... 2 dB, tunable<br><b>1.0 dB</b> curve A   <b>2.0 dB</b> curve B |
| VSWR                    | < 1.2  |
| Impedance               | 50 Ω   |
| Input power             | < 50 W   < 25 W  |
| Temperature range       | –30° ... +60° C  |
| Temperature coefficient | < 15 x 10 <sup>-6</sup> /°C  |
| Connector               | N female   |
| Material                | Outer conductor: aluminium<br>Inner conductor: Brass, silver-plated  |
| Weight                  | 6.5 kg   |
| Mounting                | Via 4 screws (max. 6 mm diameter)                                    |
| Packing size            | 372 x 205 x 292 mm   |
| Dimensions (w x h x d)  | 300 x 105 x 237 mm   |

# Band-pass Filter 225 ... 400 MHz Typical attenuation curves

Tuning example:

3-cavities Band-pass Filter K 65 13 11



# 3-dB Coupler (90° Hybrid)

## 100 – 150 MHz

### K 62 70 31, K 62 70 37

#### The 3-dB coupler can be used:

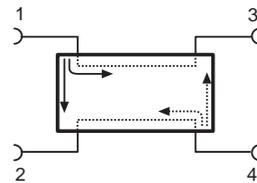
- as decoupled power splitter with a ratio of 1:1,
- for the decoupled combining of two transmitters with arbitrarily low frequency spacing (at 3-dB loss),
- for the decoupled combining of two receivers with arbitrarily low frequency spacing,
- for the decoupled combining of two transmitter/receiver 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 37

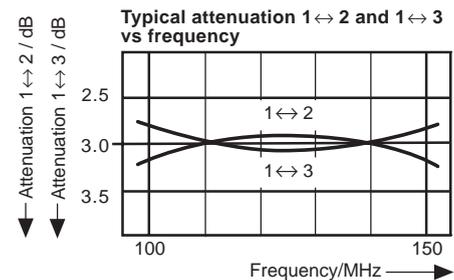
#### Design and function:

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.



#### Custom versions:

On request couplers with a coupling attenuation between 3 dB and 10 dB are available.

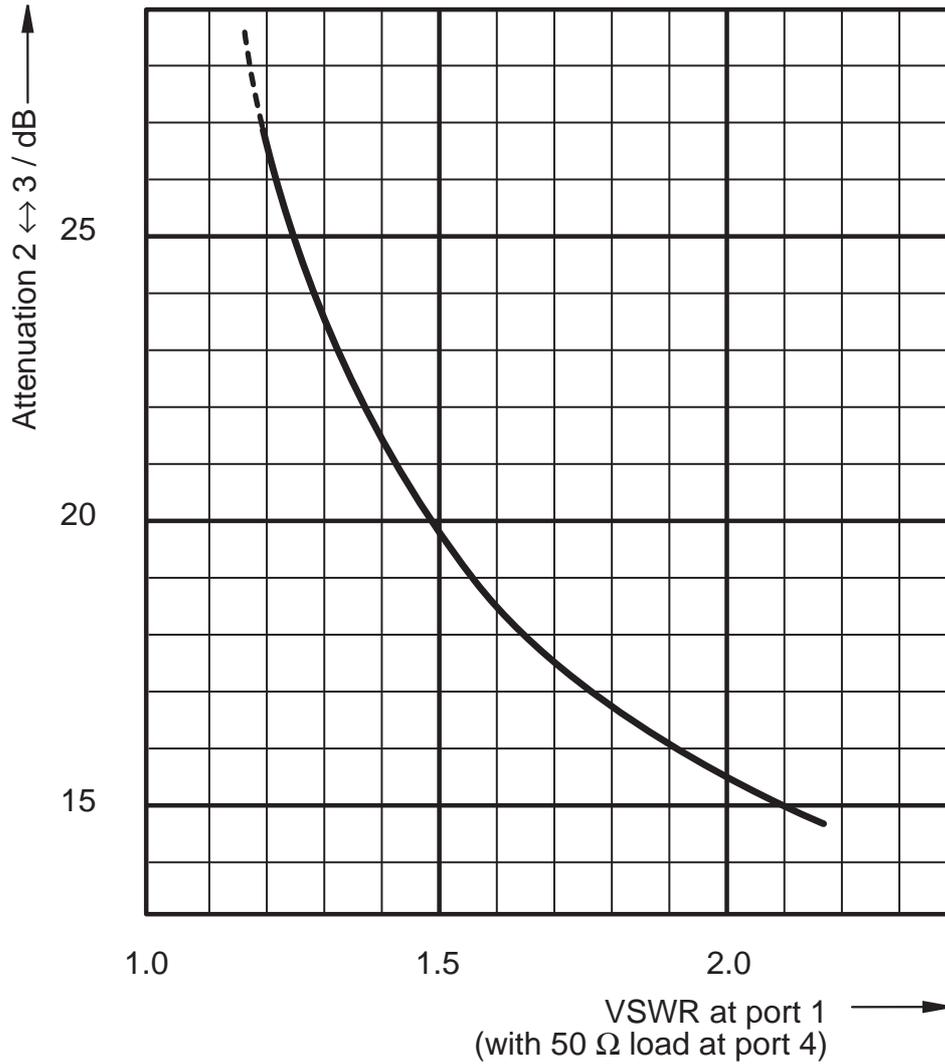


#### Technical Data

| Type No.                  | K 62 70 37                             | K 62 70 31                             |
|---------------------------|--|--|
| Connectors                | 7-16 female                            | N female                               |
| Frequency range           | 100 – 150 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                | 500 W                                  |  |
| Material                  | Brass, silver-plated                   |  |
| Colour                    | Grey (RAL 7032)                        |  |
| Installation              | With 2 screws (max. 6 mm diameter)     |  |
| Weight                    | 1.6 kg                                 |  |
| Packing size              | 931 x 54 x 126 mm                      |  |
| Dimensions (w x h x d)    | 625 x 40 x 84 mm<br>(incl. connectors) | 625 x 40 x 95 mm<br>(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**



# 3-dB Coupler (90° Hybrid)

## 225 – 400 MHz

### K 63 70 11, K 63 70 17

#### The 3-dB coupler can be used:

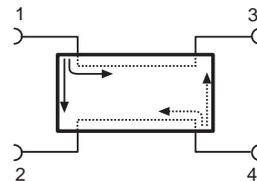
- as decoupled power splitter with a ratio of 1:1,
- for the decoupled combining of two transmitters with arbitrarily low frequency spacing (at 3-dB loss),
- for the decoupled combining of two receivers with arbitrarily low frequency spacing,
- for the decoupled combining of two transmitter/receiver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



K 63 70 17

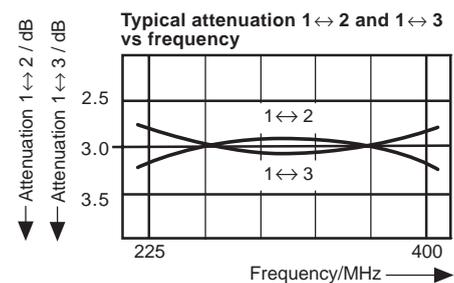
#### Design and function:

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.



#### Custom versions:

On request couplers with a coupling attenuation between 3 dB and 10 dB are available.

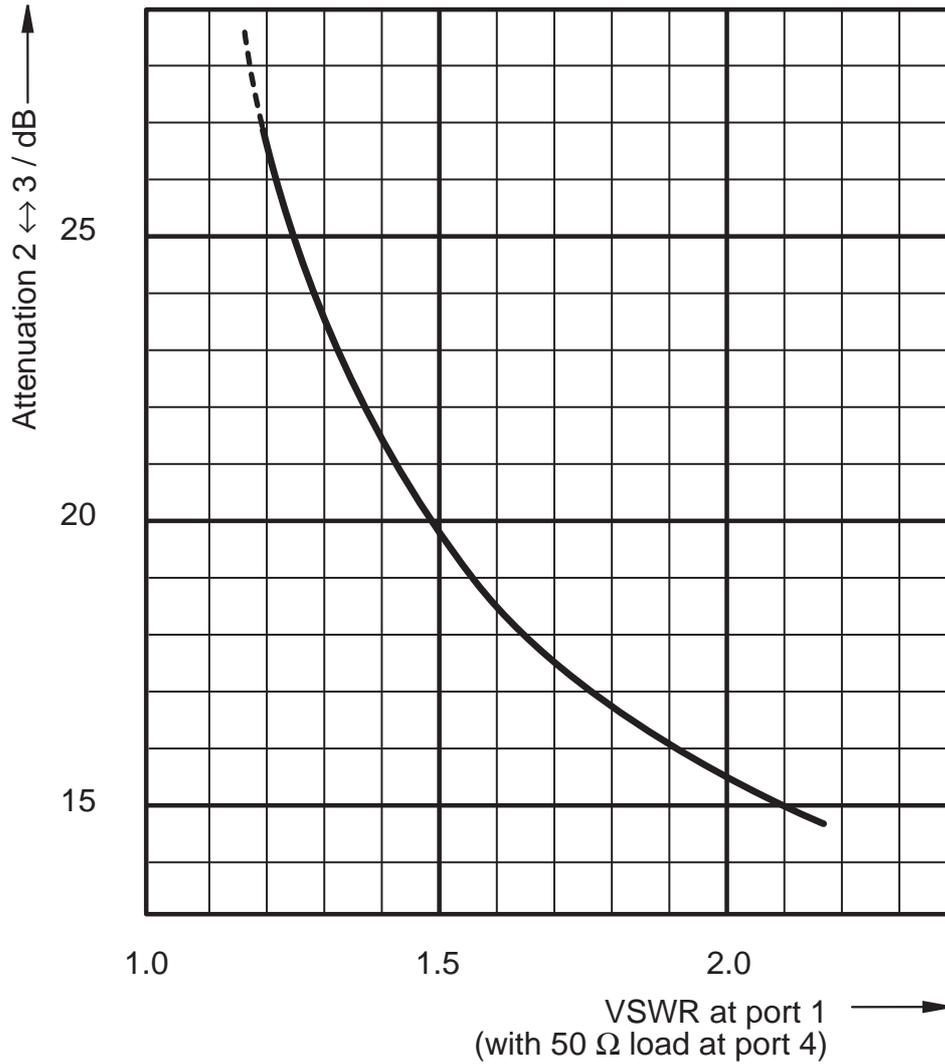


#### Technical Data

| Type No.                  | K 63 70 17                             | K 63 70 11                             |
|---------------------------|--|--|
| Connectors                | 7-16 female                            | N female                               |
| Frequency range           | 225 – 400 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                | 400 W                                  |  |
| Material                  | Brass, silver-plated                   |  |
| Colour                    | Grey (RAL 7032)                        |  |
| Installation              | With 2 screws (max. 6 mm diameter)     |  |
| Weight                    | 0.9 kg                                 |  |
| Dimensions (w x h x d)    | 312 x 40 x 84 mm<br>(incl. connectors) | 312 x 40 x 95 mm<br>(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



# Circulator

## 118 – 138 MHz

### 791 653

#### The circulator can be used:

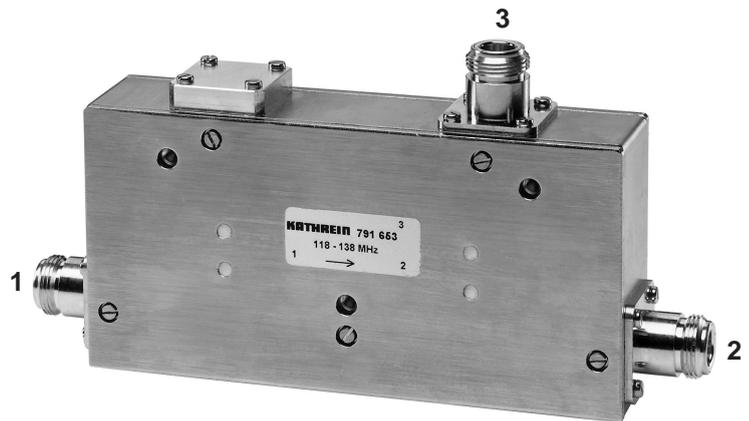
- to increase the coupling attenuation between transmitters, to reduce intermodulation products,
- to prevent adverse effects to unmatched load impedance on amplifier performance.

#### 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, since the reflected power at the output (2) is passed to the absorber port (3), which must be terminated with an absorber.

#### Dimensions of the absorbers:

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



#### Technical Data

| Type No.               | 791 653                             |
|------------------------|-------------------------------------|
| Frequency range        | 118 – 138 MHz                       |
| Insertion loss 1 → 2   | < 0.8 dB                            |
| Isolation 2 → 1        | > 40 dB                             |
| VSWR                   | < 1.25                              |
| Impedance              | 50 Ω                                |
| Input power (CW)       | < 120 W                             |
| Temperature range      | 0 ... + 50 °C                       |
| Connectors             | N female                            |
| Material               | Brass case, nickel plated           |
| Weight                 | Approx. 1.2 kg                      |
| Dimensions (w x h x d) | 180 x 32 x 90 mm (incl. connectors) |



# Circulator

## 225 – 400 MHz

### 792 008

#### The circulator can be used:

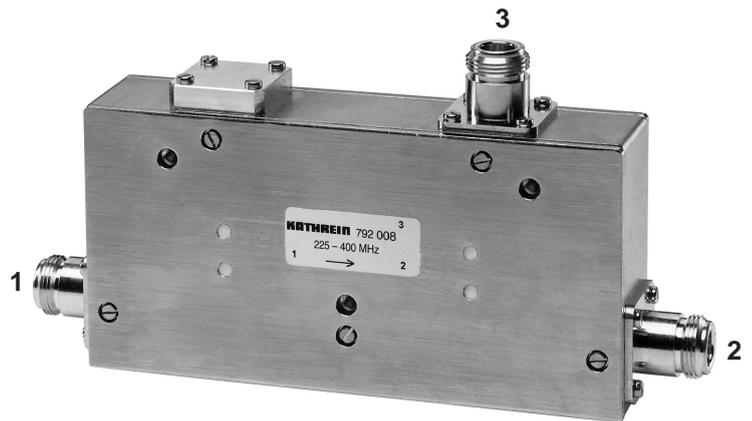
- to increase the coupling attenuation between transmitters, to reduce intermodulation products,
- to prevent adverse effects to unmatched load impedance on amplifier performance.

#### 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, since the reflected power at the output (2) is passed to the absorber port (3), which must be terminated with an absorber.

#### Dimensions of the absorbers:

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



#### Technical Data

| Type No.               | 792 008                             |
|------------------------|-------------------------------------|
| Frequency range        | 225 – 400 MHz                       |
| Insertion loss 1 → 2   | < 1.5 dB                            |
| Isolation 2 → 1        | > 38 dB                             |
| VSWR                   | < 1.3                               |
| Impedance              | 50 Ω                                |
| Input power (CW)       | < 100 W                             |
| Temperature range      | – 20 ... + 60 °C                    |
| Connectors             | N female                            |
| Material               | Brass case, nickel plated           |
| Weight                 | Approx. 1.2 kg                      |
| Dimensions (w x h x d) | 180 x 32 x 90 mm (incl. connectors) |



50-Ω loads are suitable for use 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:**

- 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 – 2000 MHz    |
| VSWR 0 – 1000 MHz | < 1.08          |
| 1000 – 2000 MHz   | < 1.15          |
| Weight            | 40 g            |
| Packing size      | 90 x 60 x 25 mm |
| Dimensions        | 33 mm / ø 21 mm |



K 62 26 61 1  
K 62 26 11 1

**2 Watt \***

| Type No.          | K 62 26 11 9       | K 62 26 11 1       |
|-------------------|--------------------|--------------------|
| Connector         | BNC male           | N male             |
| Frequency range   | 0 – 2000 MHz       |                    |
| VSWR 0 – 1000 MHz | < 1.08             |                    |
| 1000 – 2000 MHz   | < 1.15             |                    |
| Weight            | 20 g               | 40 g               |
| Packing size      | 90 x 60 x 25 mm    |                    |
| Dimensions        | 30 mm /<br>ø 15 mm | 33 mm /<br>ø 21 mm |



K 62 26 11 9

**10 Watt \***

| Type No.               | K 62 26 40 1                         | K 62 26 41 1                         |
|------------------------|--------------------------------------|--------------------------------------|
| Connector              | N female                             | N male                               |
| Frequency range        | 0 – 2000 MHz                         |                                      |
| VSWR 0 – 1000 MHz      | < 1.08                               |                                      |
| 1000 – 2000 MHz        | < 1.15                               |                                      |
| Weight                 | Approx. 250 g                        |                                      |
| Packing size           | 50 x 90 x 100 mm                     |                                      |
| Dimensions (w x h x d) | 40 x 82 x 77 mm<br>(incl. connector) | 40 x 82 x 85 mm<br>(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 – 2000 MHz                          |                                       |                                       |                                       |
| VSWR 0 – 1000 MHz      | < 1.08                                |                                       |                                       |                                       |
| 1000 – 2000 MHz        | < 1.15                                |                                       |                                       |                                       |
| Weight                 | Approx. 500 g                         |                                       |                                       |                                       |
| Packing size           | 50 x 100 x 135 mm                     |                                       |                                       |                                       |
| Dimensions (w x h x d) | 35 x 94 x 113 mm<br>(incl. connector) | 35 x 94 x 121 mm<br>(incl. connector) | 35 x 94 x 125 mm<br>(incl. connector) | 35 x 94 x 124 mm<br>(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 – 2000 MHz                          |                                       |                                       |                                       |
| VSWR 0 – 1000 MHz      | < 1.08                                |                                       |                                       |                                       |
| 1000 – 2000 MHz        | < 1.15                                |                                       |                                       |                                       |
| Weight                 | Approx. 800 g                         |                                       |                                       |                                       |
| Packing size           | 80 x 95 x 145 mm                      |                                       |                                       |                                       |
| Dimensions (w x h x d) | 67 x 90 x 130 mm<br>(incl. connector) | 67 x 90 x 138 mm<br>(incl. connector) | 67 x 90 x 134 mm<br>(incl. connector) | 67 x 90 x 133 mm<br>(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                                  |   |   |
| Weight                 | Approx. 2.4 kg                          |   |   |
| Packing size           | 130 x 195 x 180 mm                      |   |   |
| Dimensions (w x h x d) | 114 x 153 x 156 mm<br>(incl. connector) | 114 x 161 x 156 mm<br>(incl. connector) | 114 x 170 x 156 mm<br>(incl. 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.

# Filter Transmitter Combiner, 100 W with 2, 3, 4, 5 or 6 inputs 118 ... 137 MHz

The Tx combiner enables several transmitters to be combined to one common antenna output.

### Special features:

- narrow channel spacing between Tx frequencies possible,
- low insertion loss,
- high isolation between Tx inputs,
- high filter selectivity at Rx frequencies.

### Design and construction:

The Tx combiner consists of one double circulator and one 1pole band-pass filter per channel. The band-pass filter is designed as a temperature stabilized  $\lambda/4$  coaxial resonator. The outputs of the filters are connected via pre-defined cable lengths onto a common starpoint. This starpoint then forms the output of the combiner.

### Tuning:

The bandpasses must be tuned to the individual operating channels. Upon request this tuning may be performed at our factory (in this case please state the operating channels when ordering) or it may be undertaken on site.



792 504

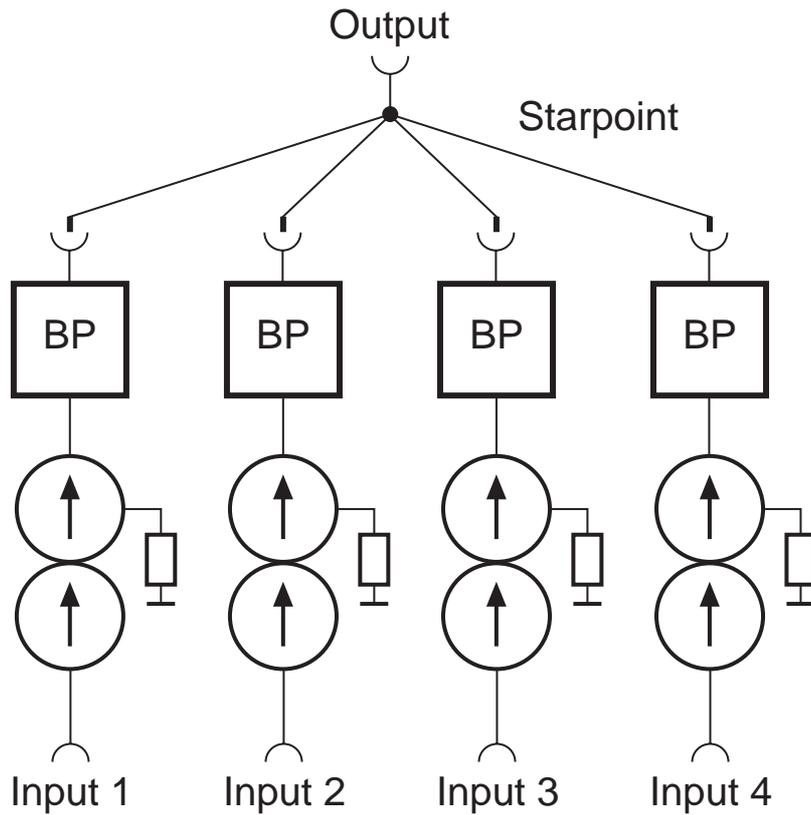
## Technical Data

The insertion loss and isolation values apply to the minimum frequency spacing.

| Type No.               | Inputs | Max. power (CW)  | Dimensions        |        | Weight |
|------------------------|--------|--|-------------------|--------|--------|
|                        |        |  | 19" drawer height | depth  |        |
| 791 527                | 2      | 2 x 100 W  | 22 hu* / 977 mm   | 380 mm | 42 kg  |
| 791 526                | 3      | 3 x 100 W  | 22 hu* / 977 mm   | 380 mm | 61 kg  |
| 791 525                | 4      | 4 x 100 W  | 22 hu* / 977 mm   | 380 mm | 81 kg  |
| 792 558                | 5      | 5 x 100 W  | 22 hu* / 977 mm   | 570 mm | 103 kg |
| 792 504                | 6      | 6 x 100 W  | 22 hu* / 977 mm   | 570 mm | 122 kg |
| Frequency range        |        | 118 ... 137 MHz (tunable)  |                   |        |        |
| Min. frequency spacing |        | 200 kHz  |                   |        |        |
| Insertion loss         |        | < 3.5 dB   |                   |        |        |
| Isolation              |        | > 60 dB  |                   |        |        |
| VSWR                   |        | < 1.25   |                   |        |        |
| Impedance              |        | 50 $\Omega$  |                   |        |        |
| Temperatur range       |        | 0 ... + 50 °C  |                   |        |        |
| Connectors             |        | N female   |                   |        |        |
| Material               |        | Outer conductor: aluminum<br>Inner conductor: brass, silver plated |                   |        |        |
| Colour of front plate  |        | Grey (RAL 7032)  |                   |        |        |

\* hu = height unit

**Filter Transmitter Combiner, 100 W**  
**with 2, 3, 4, 5 or 6 inputs**  
**118 ... 137 MHz**



**Tx combiner 791 525**

BP: Band-pass filter  
↑: Circulator

# Rx Combiner

## with 2, 3, 4, 5 or 6 outputs

### 118 ... 137 MHz

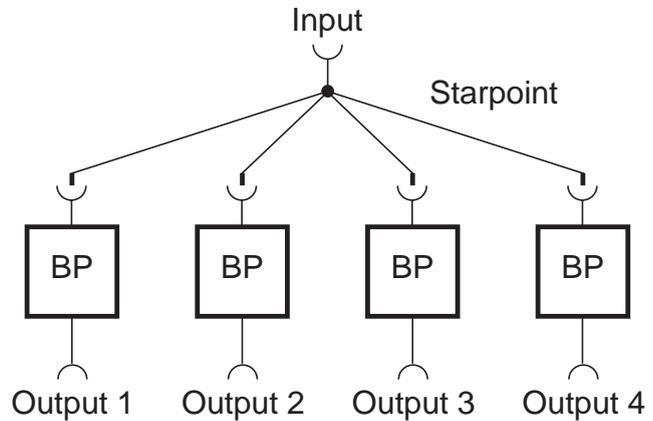
The Rx combiner enables several receivers to be combined to one common antenna input.

The Rx combiner consists of one 1pole band-pass filter per channel.

The band-pass filter is designed as a temperature stabilized  $\lambda/4$  coaxial resonator. The inputs of the filters are connected via pre-defined cable lengths onto a common starpoint. This starpoint then forms the input of the combiner.

#### Tuning:

The bandpasses must be tuned to the individual operating channels. Upon request this tuning may be performed at our factory (in this case please state the operating channels when ordering) or it may be undertaken on site.



**Rx combiner 791 859**

BP: Band-pass filter

#### Technical Data

The insertion loss and isolation values apply to the minimum frequency spacing.

| Type No.               | Outputs | Dimensions   |        | Weight |
|------------------------|---------|--|--------|--------|
|                        |         | height   | depth  |        |
| 792 318                | 2       | 22 hu* / 977 mm  | 190 mm | 36 kg  |
| 791 857                | 3       | 22 hu* / 977 mm  | 380 mm | 49 kg  |
| 791 859                | 4       | 22 hu* / 977 mm  | 380 mm | 62 kg  |
| 792 329                | 5       | 22 hu* / 977 mm  | 570 mm | 75 kg  |
| 792 330                | 6       | 22 hu* / 977 mm  | 570 mm | 88 kg  |
| Frequency range        |         | 118 ... 137 MHz (tunable)  |        |        |
| Min. frequency spacing |         | 200 kHz  |        |        |
| Insertion loss         |         | < 2.5 dB   |        |        |
| Isolation              |         | > 18 dB  |        |        |
| VSWR                   |         | < 1.25   |        |        |
| Impedance              |         | 50 $\Omega$  |        |        |
| Temperatur range       |         | 0 ... + 50 °C  |        |        |
| Connectors             |         | N female   |        |        |
| Material               |         | Outer conductor: aluminum<br>Inner conductor: brass, silver plated |        |        |
| Colour of front plate  |         | Grey (RAL 7032)  |        |        |

\* hu = height unit



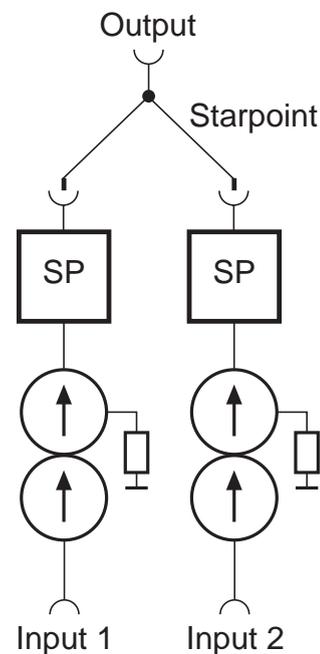
# Duplexer, 100 W for extremely narrow frequency spacing 118 ... 137 MHz

The duplexer enables two transmitters to be combined to one common antenna output.

The duplexer consists of one double circulator and one S-P filter per channel. The outputs of the filters are connected via pre-defined cable lengths onto a common starpoint. This starpoint then forms the output of the duplexer.

### Tuning:

The S-P filters must be tuned to the individual operating channels. Upon request this tuning may be performed at our factory (in this case please state the operating channels when ordering) or it may be undertaken on site.



### Technical Data

The insertion loss and isolation values apply to the minimum frequency spacing.

| Type No.              | 792 317  |
|-----------------------|--|
| Inputs                | 2  |
| Frequency range       | 118 ... 137 MHz (tunable)  |
| Frequency spacing     |  |
| Minimum               | 100 kHz  |
| Maximum               | 3 MHz  |
| Insertion loss        | < 3.0 dB   |
| Isolation             | > 60 dB  |
| VSWR                  | < 1.25   |
| Impedance             | 50 $\Omega$  |
| Input power (CW)      | 2 x 100 W  |
| Temperatur range      | 0 ... + 50 °C  |
| Connectors            | N female   |
| Material              | Outer conductor: aluminum<br>Inner conductor: brass, silver plated |
| Colour of front plate | Grey (RAL 7032)  |
| Weight                | 42 kg  |
| Dimensions            | 19" drawer<br>(height: 22 hu* = 977 mm, depth: 380 mm)             |

\* hu = height unit



# Filter Transmitter Combiner, 100 W with 2, 3, or 4 inputs 225 ... 400 MHz

The Tx combiner enables several transmitters to be combined to one common antenna output.

#### Special features:

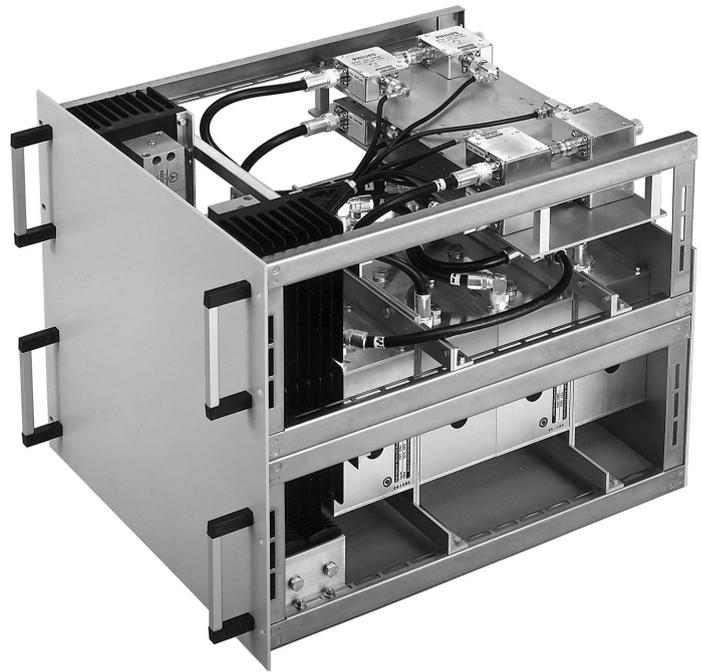
- narrow channel spacing between Tx frequencies possible,
- low insertion loss,
- high isolation between Tx inputs,
- high filter selectivity at Rx frequencies.

#### Design and construction:

The Tx combiner consists of one double circulator and one 3pole band-pass filter per channel. The outputs of the filters are connected via pre-defined cable lengths onto a common starpoint. This starpoint then forms the output of the combiner.

#### Tuning:

The bandpasses must be tuned to the individual operating channels at our factory (please state the operating channels when ordering).



791 990

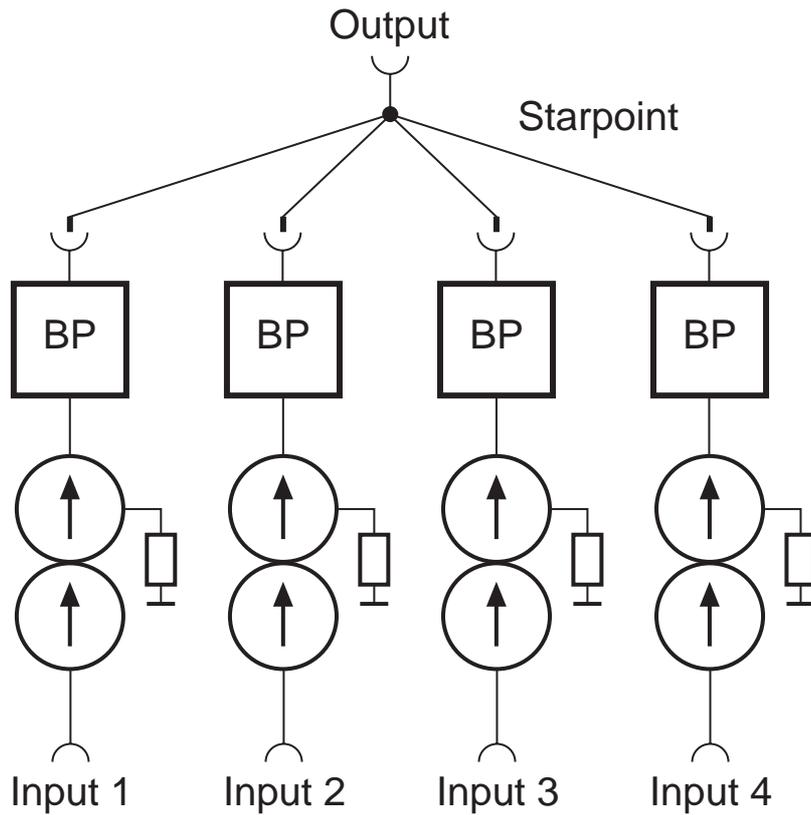
## Technical Data

The insertion loss and isolation values apply to the minimum frequency spacing.

| Type No.               | Inputs   | Max. power (CW) | Weight |
|------------------------|--|-----------------|--------|
| 791 988                | 2  | 2 x 100 W       | 26 kg  |
| 791 989                | 3  | 3 x 100 W       | 36 kg  |
| 791 990                | 4  | 4 x 100 W       | 46 kg  |
| Frequency range        | 225 ... 400 MHz (tunable)  |                 |        |
| Min. frequency spacing | 3 MHz  |                 |        |
| Insertion loss         | < 3.5 dB   |                 |        |
| Isolation              | > 60 dB  |                 |        |
| VSWR                   | < 1.25   |                 |        |
| Impedance              | 50 Ω   |                 |        |
| Temperatur range       | 0 ... + 50 °C  |                 |        |
| Connectors             | N female   |                 |        |
| Material               | Outer conductor: aluminum<br>Inner conductor: brass, silver plated |                 |        |
| Colour of front plate  | Grey (RAL 7032)  |                 |        |
| Dimensions (h, d)      | 19" drawer<br>(height: 10 hu* = 445 mm, depth: 600 mm)             |                 |        |

\* hu = height unit

**Filter Transmitter Combiner, 100 W**  
**with 2, 3, or 4 inputs**  
**225 ... 400 MHz**



**Tx combiner 791 990**

BP: Band-pass filter  
↑: Circulator

# Decoupling unit, 100 Watt 118 – 138 MHz 791 528

This decoupling unit can be used to increase the isolation between transmitters, if the used antennas are situated very close together.

The decoupling unit consists of a double circulator and an absorber.

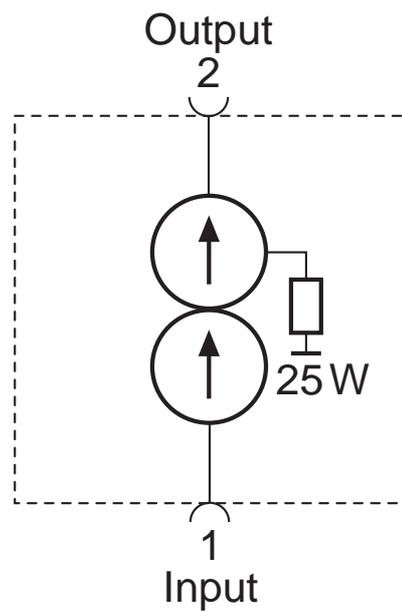
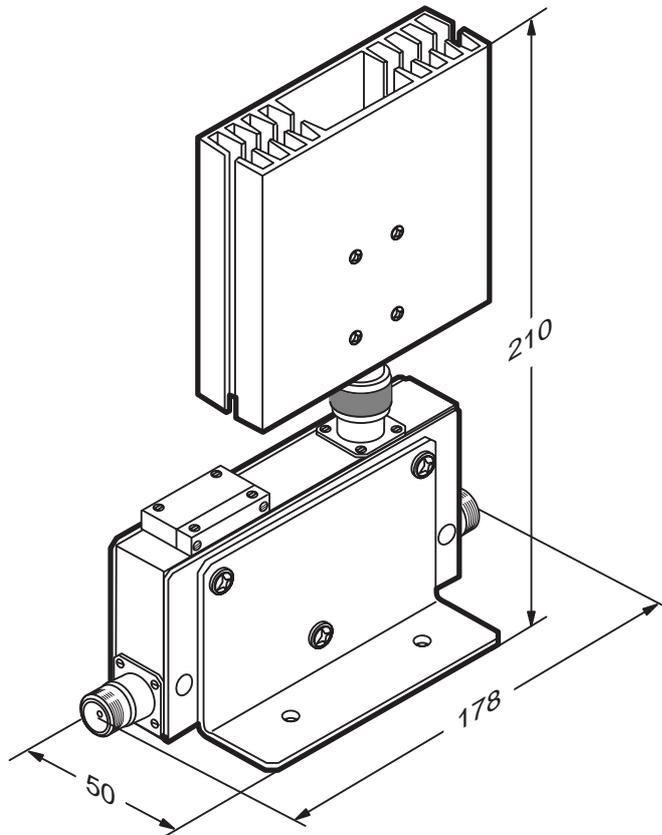
The impedance at the input of the decoupling unit is constant and is independent of the antenna's VSWR. The signal received or reflected by the antenna is fed to the absorber.



## Technical Data

| Type No.             | 791 528                            |
|----------------------|------------------------------------|
| Frequency range      | 118 – 138 MHz                      |
| Insertion loss 1 ↔ 2 | < 0.8 dB                           |
| Isolation            | > 40 dB                            |
| VSWR                 | < 1.25                             |
| Impedance            | 50 Ω                               |
| Input power          | < 100 W                            |
| Return power         | < 25 W                             |
| Temperatur range     | 0 ... + 50 °C                      |
| Connectors           | N female                           |
| Installation         | With 2 screws (max. 4 mm diameter) |
| Weight               | 1.8 kg                             |
| Packing size         | 241 x 202 x 115 mm                 |

**Decoupling unit, 100 Watt**  
**118 – 138 MHz**  
**791 528**



# Decoupling unit, 100 Watt 225 – 400 MHz 792 246

This decoupling unit can be used to increase the isolation between transmitters, if the used antennas are situated very close together.

The decoupling unit consists of a double circulator and an absorber.

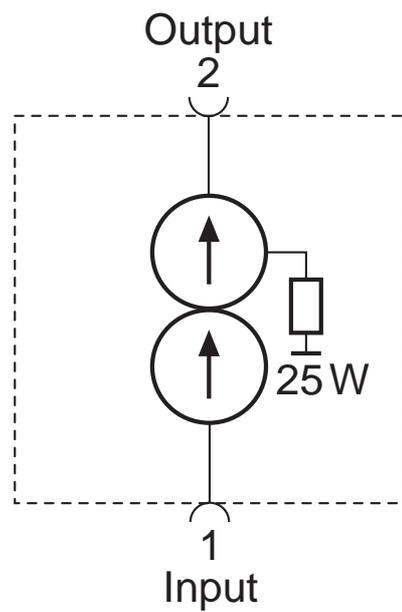
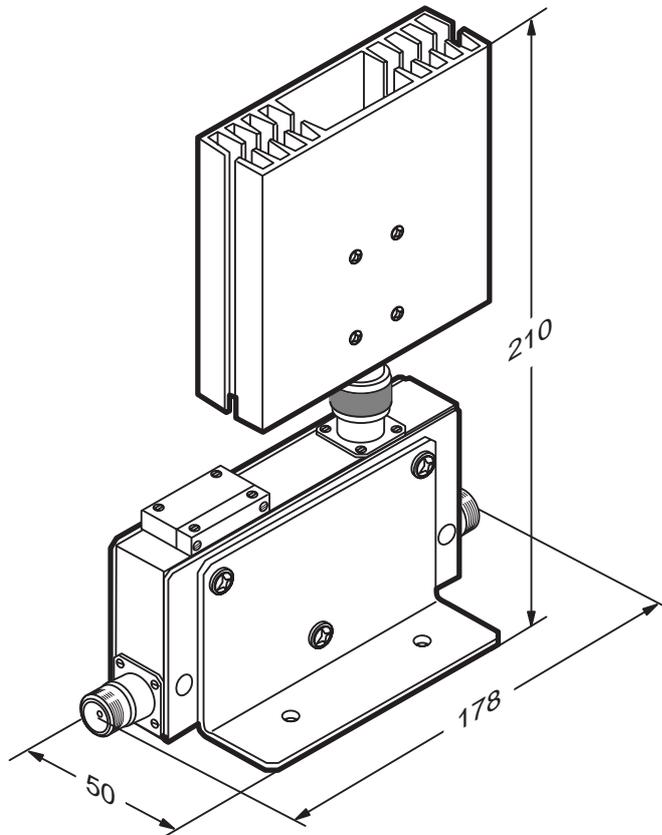
The impedance at the input of the decoupling unit is constant and is independent of the antenna's VSWR. The signal received or reflected by the antenna is fed to the absorber.



## Technical Data

| Type No.             | 792 246                            |
|----------------------|------------------------------------|
| Frequency range      | 225 – 400 MHz                      |
| Insertion loss 1 ↔ 2 | < 1.5 dB                           |
| Isolation            | > 38 dB                            |
| VSWR                 | < 1.3                              |
| Impedance            | 50 Ω                               |
| Input power          | < 100 W                            |
| Return power         | < 25 W                             |
| Temperatur range     | – 20 ... + 60 °C                   |
| Connectors           | N female                           |
| Installation         | With 2 screws (max. 4 mm diameter) |
| Weight               | 1.6 kg                             |
| Packing size         | 241 x 202 x 115 mm                 |

**Decoupling unit, 100 Watt**  
**225 – 400 MHz**  
**792 246**



# Hybrid Transmitter Combiner

## 118 – 138 MHz

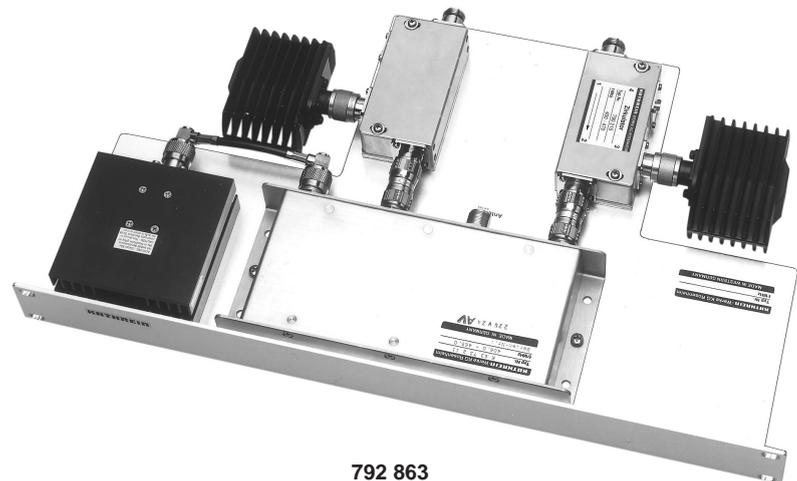
The hybrid transmitter combiner allows two or more transmitters to be combined to a common output.

### 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 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 possibility occurring total reflection at the output.



792 863

### Custom versions:

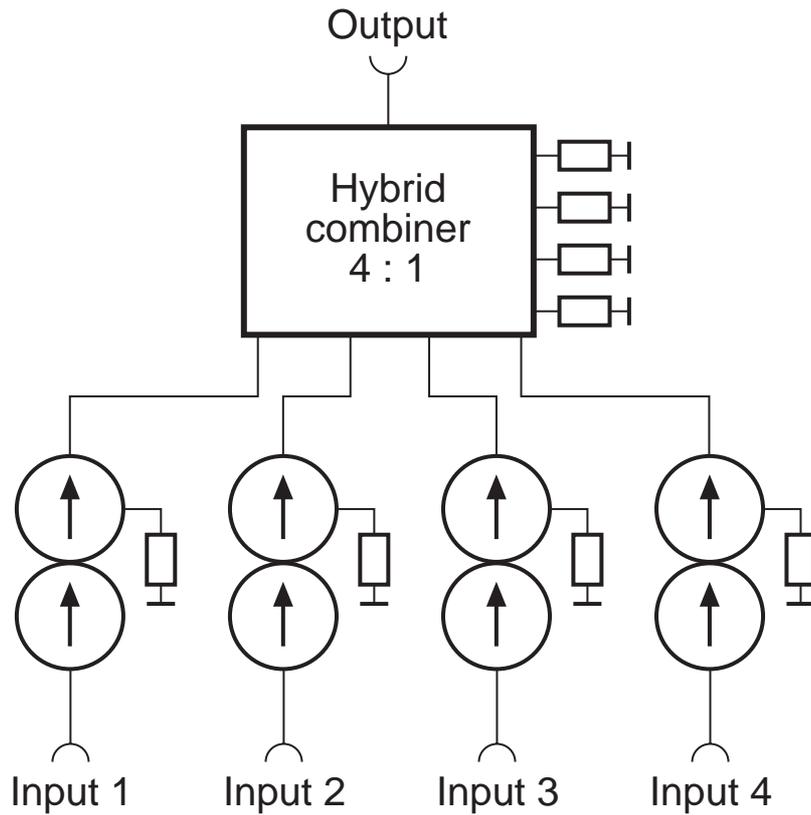
Custom versions are available on request:

- with single circulator instead of dual circulator, if lower isolation is sufficient,
- with a band-pass filter at the output,
- for higher power.

### Technical Data

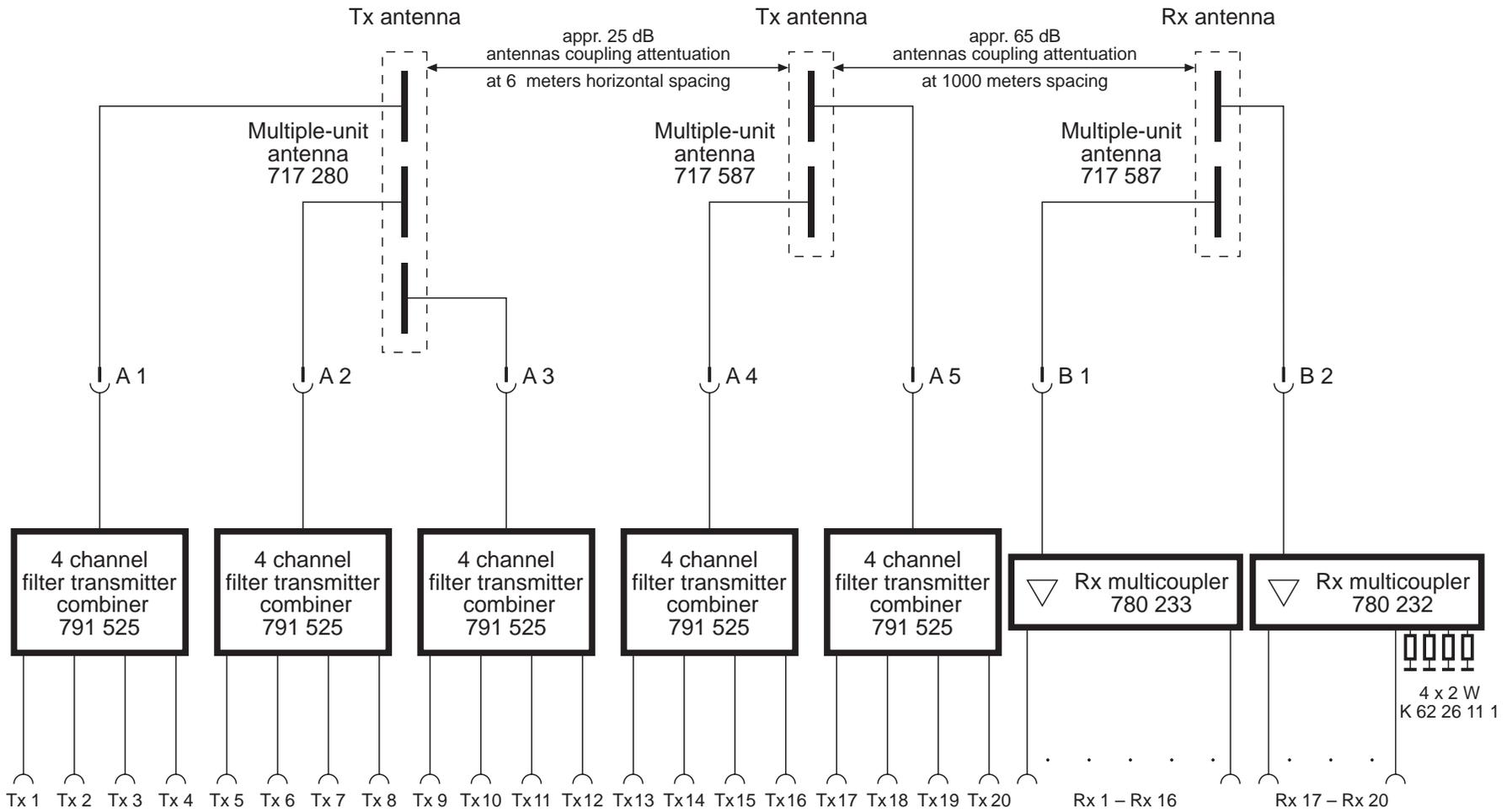
| Type No.               | Inputs | Insertion loss | Dimensions                   |               | Input power per input |
|------------------------|--------|----------------|------------------------------|---------------|-----------------------|
|                        |        |                | 19" drawer height            | plug-in depth |                       |
| 792 863                | 2      | < 4.1 dB       | 1 hu* = 45 mm                | 320 mm        | 25 W                  |
| 792 864                | 2      | < 4.1 dB       | 3 hu* = 133 mm               | 350 mm        | 50 W                  |
| 792 865                | 2      | < 4.1 dB       | 4 hu* = 177 mm               | 450 mm        | 100 W                 |
| 792 866                | 3      | < 6.3 dB       | 3 hu* = 133 mm               | 350 mm        | 25 W                  |
| 792 867                | 3      | < 6.3 dB       | 3 hu* = 133 mm               | 450 mm        | 50 W                  |
| 792 868                | 3      | < 6.3 dB       | 4 hu* = 177 mm               | 450 mm        | 100 W                 |
| 792 869                | 4      | < 7.5 dB       | 3 hu* = 133 mm               | 350 mm        | 25 W                  |
| 792 870                | 4      | < 7.5 dB       | 3 hu* = 133 mm               | 450 mm        | 50 W                  |
| 792 871                | 4      | < 7.5 dB       | 4 hu* = 177 mm               | 550 mm        | 100 W                 |
| Frequency range        |        |                | 118 – 138 MHz                |               |                       |
| Min. frequency spacing |        |                | 0 MHz                        |               |                       |
| Isolation              |        |                | > 65 dB                      |               |                       |
| VSWR                   |        |                | < 1.25                       |               |                       |
| Impedance              |        |                | 50 Ω                         |               |                       |
| Connectors             |        |                | N female                     |               |                       |
| Colour                 |        |                | Front panel: grey (RAL 7032) |               |                       |

\* hu = height unit



**Hybrid transmitter combiner 792 869, 792 870, 792 871**

# Tx/Rx Combiner 20 channels VHF Example



Input power: < 100 W

Insertion loss: Tx → A: < 3.5 dB  
B → Rx: > 1.5 dB gain

Isolation: Tx ↔ Tx: > 60 dB  
Tx ↔ Rx: > 65 dB  
Rx ↔ Rx: > 25 dB

Frequency range: 118 ... 137 MHz

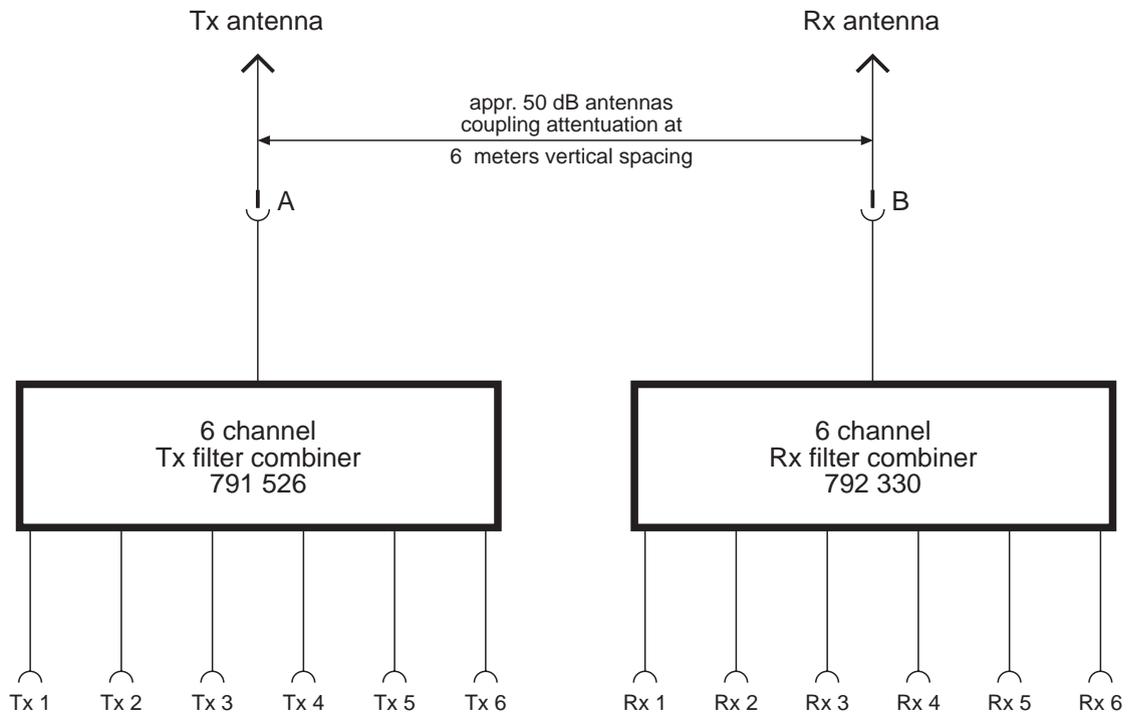
Note: Rx site is located 1000 meters from Tx site.



# Combiner System

## 6 channels VHF

### Example



Frequency range: 118 ... 137 MHz

Input power: < 100 W

Insertion loss: Tx → A: < 3.5 dB  
B → Rx: < 2.5 dB

Isolation: Tx ↔ Tx: > 60 dB  
Tx ↔ Rx: > 65 dB  
Rx ↔ Rx: > 18 dB

