



CATALOGUE

Ground-to-Air

Antennas and Antenna Line Products



KATHREIN

Broadcast GmbH

KATHREIN

Who we are and **what** we stand for

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

Kathrein Broadcast GmbH is an international enterprise active in antenna and communications technology. We have over 65 years of experience in developing, producing and marketing antennae and signal processing solutions for future technologies, such as DAB+, DVB-T2, ISDB-T, ATSC or 5G Broadcast. Always being one step ahead in technology has ensured that Kathrein is among the leading companies in the world market.

Kathrein Antenna Systems are known for their well-thought-out engineering, and solutions which are exactly tailored to the customer specifications. The products are of the highest quality, designed for long-term trouble free operation, even in harsh environmental conditions. Radiators and reflectors are made of hot-dip galvanized steel or corrosion-resistant aluminum alloy. The selected materials provide a long product life combined with best RF performance.

More information about Kathrein Broadcast at www.kathrein-bca.com

Catalogue Issue 12/2021

All data published in previous catalogue issues hereby becomes invalid.

We reserve the right to make alterations in accordance with the requirements of our customers, therefore for binding data please check valid data sheets on our homepage: www.kathrein-bca.com

Please also see additional information on inside back cover.



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



Our quality assurance system is certified by SGS according to EN ISO 9001

> Antennas for Communication

Antennas for Communication

> Antennas for Navigation

Antennas for Navigation

> Electrical Accessories

Electrical Accessories

> Mechanical Accessories

Mechanical Accessories

> Projects and Services

Projects and Services

Summary of Types

The articles are listed by type number in numerical order.

Type No.	Page	Type No.	Page
711 ...		800 ...	
711329	34, 35	80010228	32, 33
713 ...		880 ...	
713316B	38, 39	88010002	44, 45
713645	55	88010003	42, 43
715 ...		K51 ...	
715630	36, 37	K512631	601818 16, 17
715986	40, 41	K52 ...	
716 ...		K523031	601029 10, 11
716192	55	K523037	600237 10, 11
716405	42, 43	K523131	600253 8, 9
718 ...		K53 ...	
718215	18, 19	K531831	600906 6, 7
718217	26, 27	K55 ...	
722 ...		K552031	601813 22, 23
722394	40, 41	K552131	600371 20, 21
727 ...		K553131	600410 12, 13
727463	24, 25	K553231	600420 14, 15
729 ...		K61 ...	
729803	24, 25	K61333	601368 55
751 ...		K61334	601369 55
75111120	50, 51	K75 ...	
75111122	50, 51	K751011	600759 28, 29
75111124	50, 51	021 ...	
75111130	50, 51	021097	54
75111132	50, 51	021226	54
75111134	50, 51		
753 ...			
75310465	54		
75310466	54		
759 ...			
759044	55		
791 ...			
791653	48		
792 ...			
792008	49		

Antennas for Ground-to-Air Communication

VHF Band 100–160 MHz | UHF Band 225–400 MHz

Antenna Type	Page
Yagi Antennas	6–7
Panel Antennas	8–11
Dipole Antennas	12–15
Omnidirectional Antennas	16–29

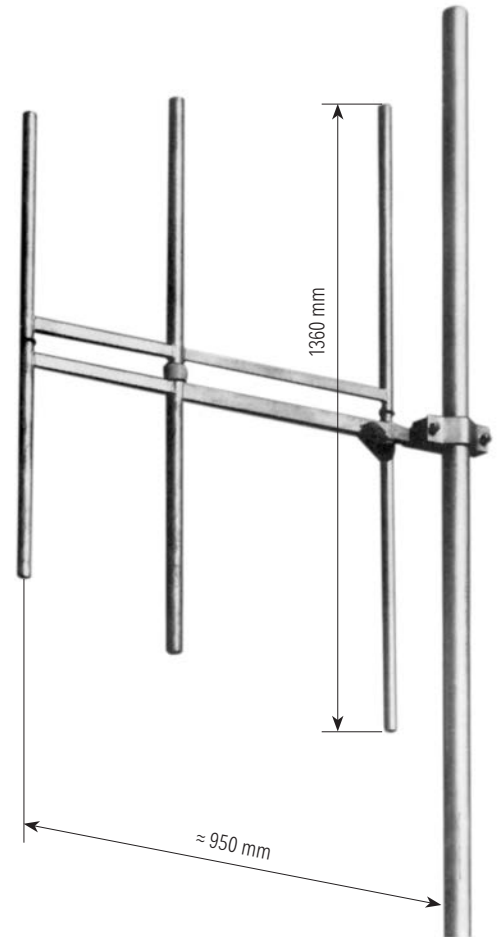
> Yagi Antenna

3-element broadband-yagi

118–144 MHz

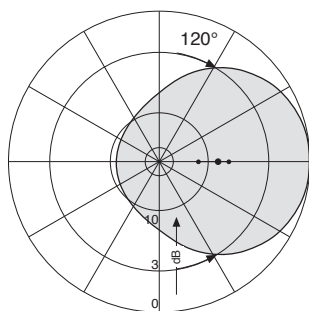
V

Order No.	600906 K531831
Input	N female
Max. power	160 W (at 50 °C ambient temperature)
Frequency range	118–144 MHz
VSWR	< 1.5
Gain	4 dBd
Impedance	50 Ω
Polarization	Vertical
Antenna height	1360 mm
Packing size	1500 × 1150 × 90 mm
Weight	10 kg
Windload	250 N (at 160 km/h)
Max. wind velocity	200 km/h (incl. 1,5 cm radial ice)

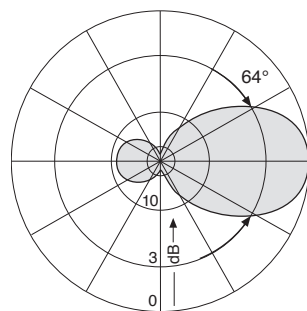


- Material:** Hot-dip galvanized steel.
All screws and nuts: Stainless steel.
- Mounting:** To pipes of 60–115 mm OD by means of hot-dip galvanized steel clamp, supplied.
- Grounding:** The antenna is DC grounded by a cross section of 256 mm² hot-dip galvanized steel.
- Scope of supply:** Antenna including mounting hardware.

Radiation Pattern (at mid-band)

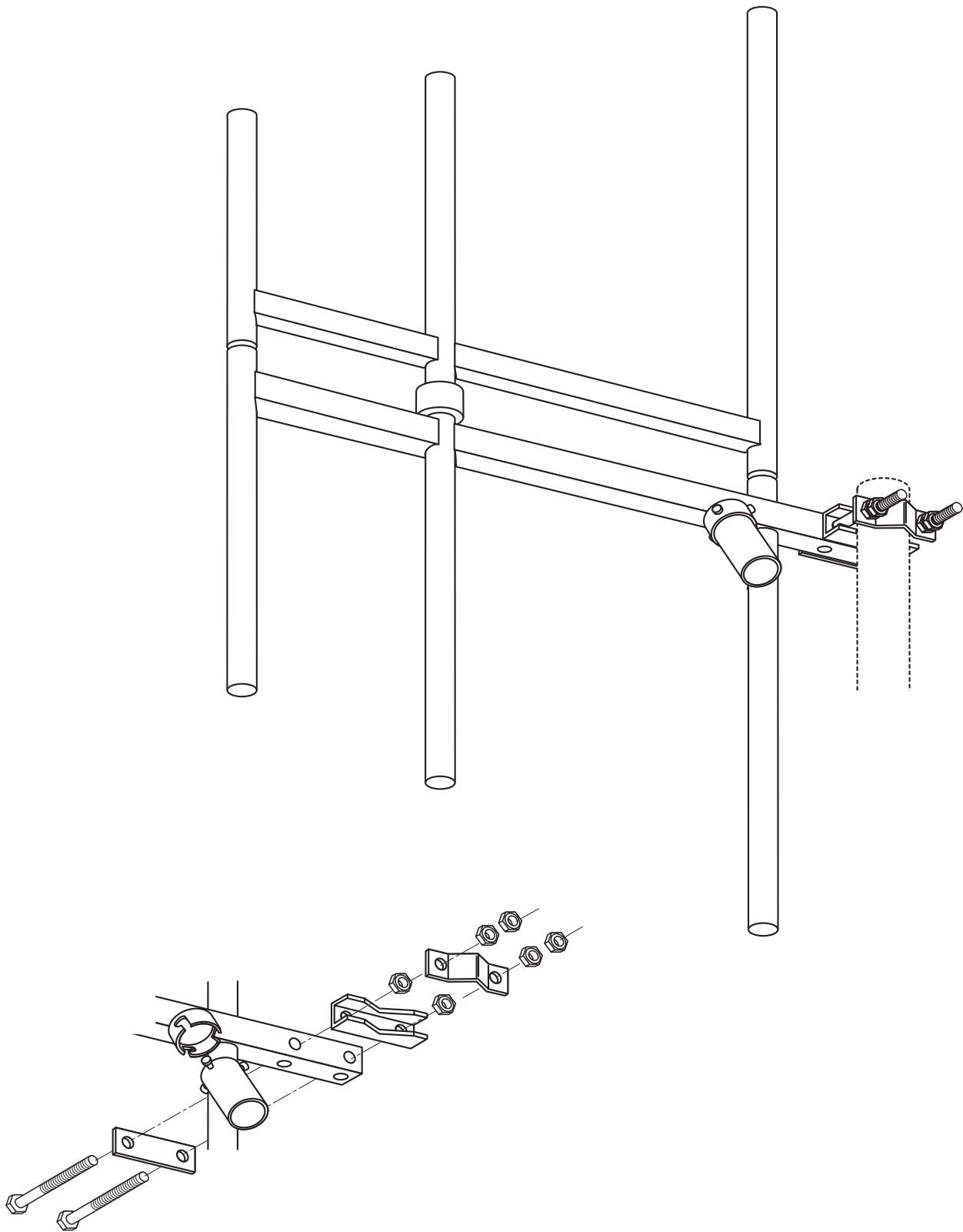


Horizontal Radiation Pattern



Vertical Radiation Pattern

Mounting Instruction



> Panel Antenna

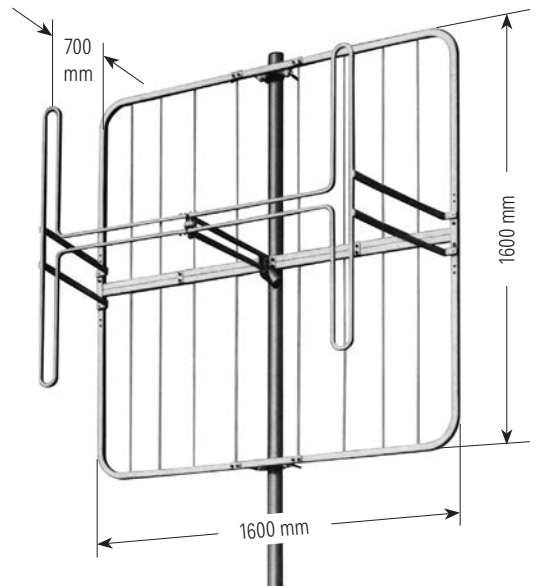
- Broadband Panel Antenna.
- Weather-resistant aluminum.

Order No.	600253 K523131
Input	N female
Max. power input	1550 W (at 35 °C ambient temperature) 880 W (at 50 °C ambient temperature)
Frequency range	108–137 MHz
VSWR	< 1.4
Gain	7 dBd
Impedance	50 Ω
Polarization	Horizontal or vertical
Width/height/depth	1600/1600/700 mm
Packing size	1620 × 850 × 200 mm
Weight	12 kg
Lateral wind load	560 N (at 160 km/h)
Max. wind velocity	200 km/h (w/o ice) 120 km/h (incl. 1,5 cm radial ice)

108–137 MHz

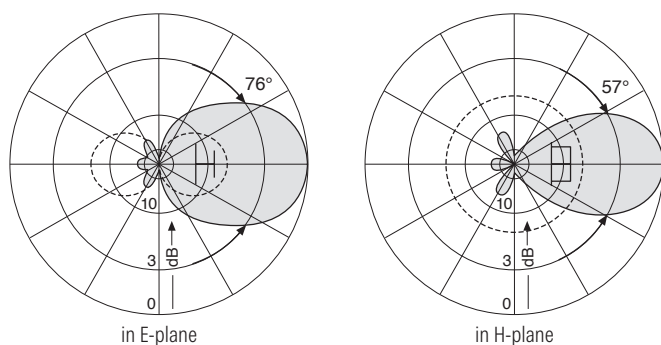
H

V

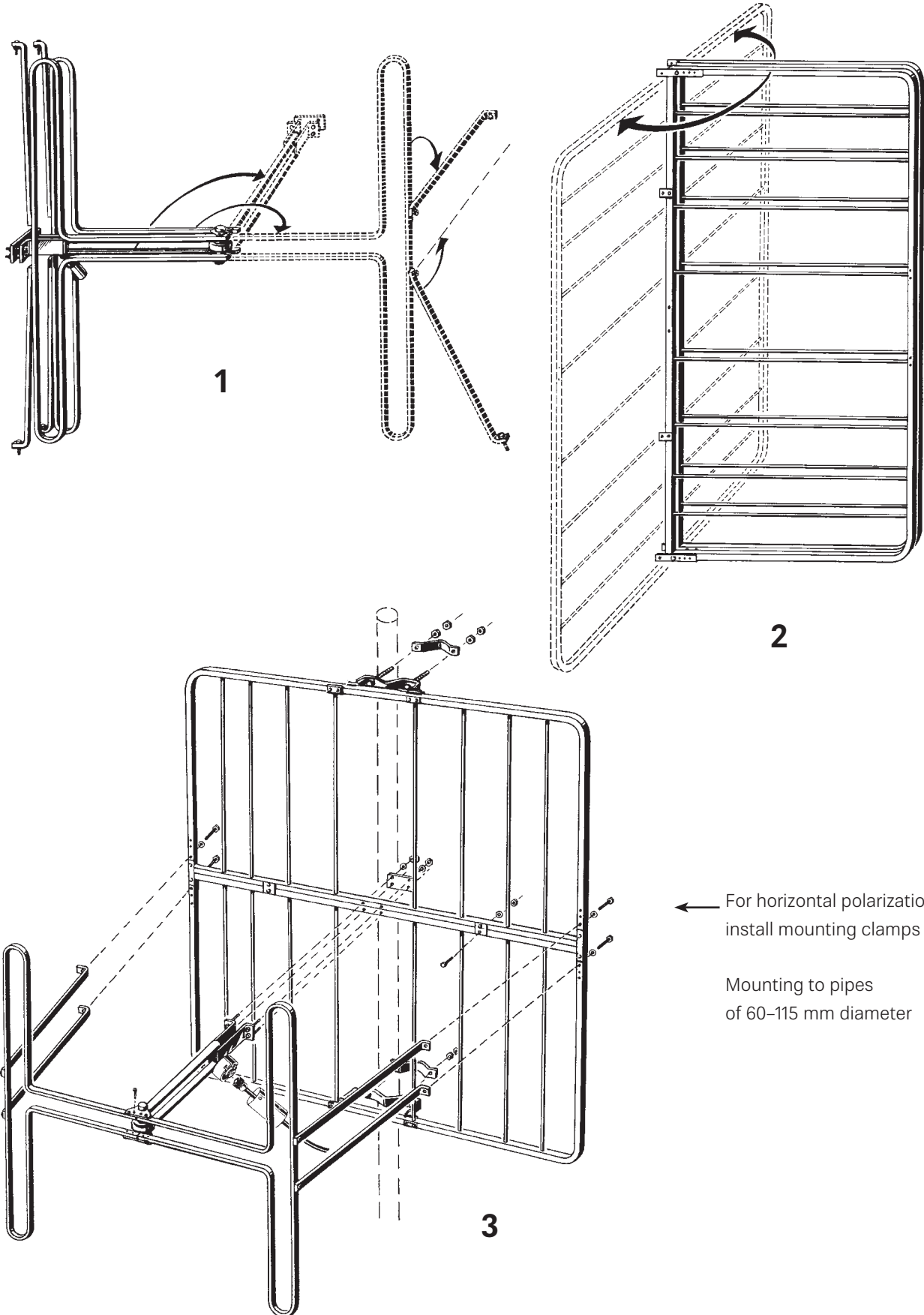


- Material:** Reflector screen and dipoles: Heavy duty aluminum.
Mounting clamps: Hot dip galvanized steel.
All screws and nuts: Stainless steel.
- Mounting:** To masts of 60–115 mm OD.
- Grounding:** All metal parts of the antenna are DC grounded.
- Scope of supply:** Antenna including mounting hardware.

Radiation Pattern (at mid-band)



Mounting Instruction



← For horizontal polarization
install mounting clamps here

Mounting to pipes
of 60–115 mm diameter

Panel Antenna

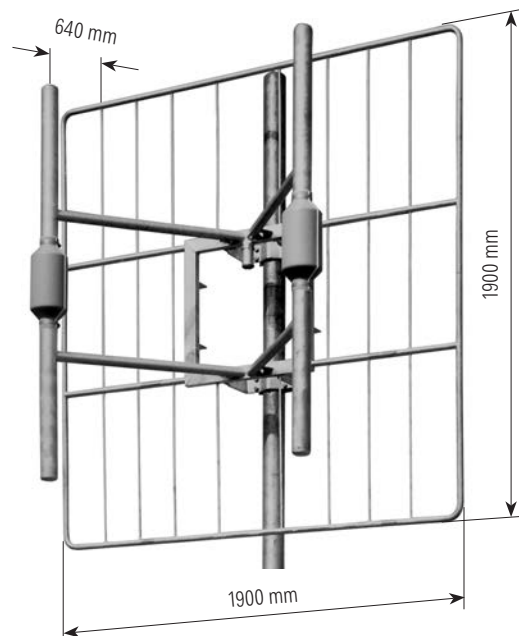
- Heavy duty panel antenna.
- Hot-dip galvanized steel with at least 85 µm zinc layer.

Order No.	601029 K523031	600237 K523037
Input	N female	7-16 female
Max. power	1590 W (at 50 °C ambient temperature)	
Frequency range	100–160 MHz	
VSWR	< 1.3	
Gain	8 dBd	
Impedance	50 Ω	
Polarization	Horizontal or vertical	
Height/width/depth	1900 × 1900 × 640 mm	
Packing size	2000 × 2000 × 850 mm	
Weight	35 kg	
Wind load	1200 N (at 160 km/h)	
Max. wind velocity	200 km/h (incl. 1,5 cm radial ice)	

100–160 MHz

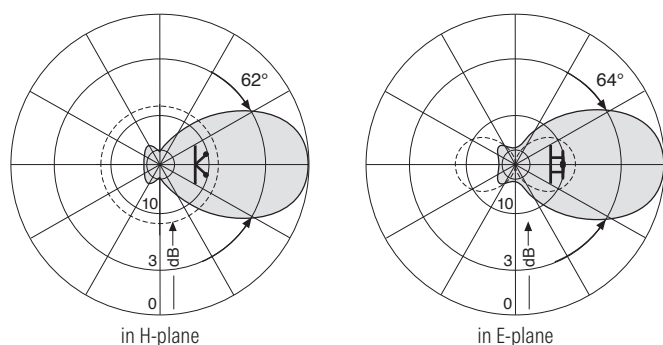
H

V

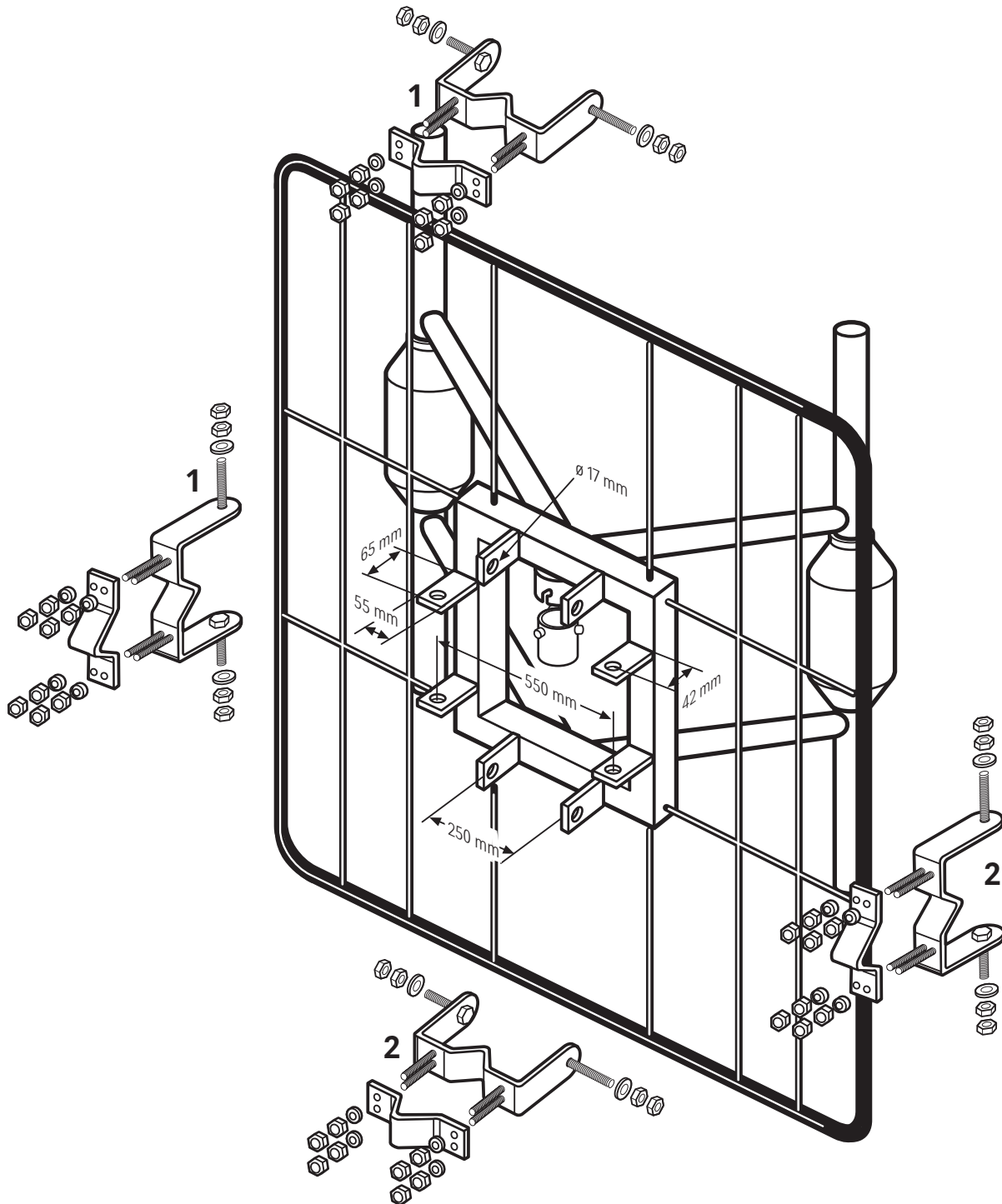


- Material:** Hot-dip galvanized steel.
All screws and nuts: Stainless steel.
- Mounting:** By means of a pair of hot-dip galvanized steel clamps 75310466 to pipes of 60–115 mm OD, or the pair of clamps 75310465 to pipes of 115–200 mm.
- Grounding:** All metal parts of the antenna including the mounting 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.

Radiation Pattern (at mid-band)



Mounting Instruction



1, 2: Pair of clamps 75310466 for pipes of 60–115 mm OD or pair of clamps 75010465 for pipes of 115–200 mm OD

Required metric wrenches: 19 mm and 24 mm

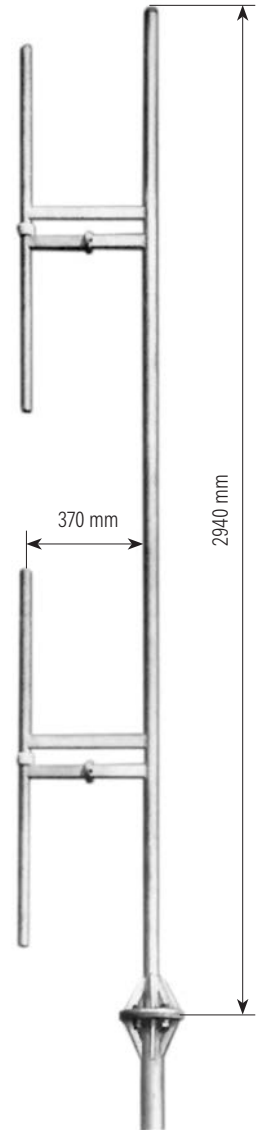
> Dipole Antenna

- Dipole antenna.
- Hot-dip galvanized steel.

118–137 MHz

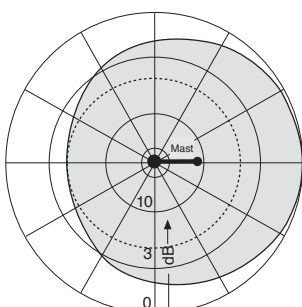
V

Order No.	600410 K553131
Input	N female
Connector position	Bottom, inside flange
Max. power	280 W (at 50 °C ambient temperature)
Frequency range	118–137 MHz
VSWR	< 1.5
Gain	5 dBd
Impedance	50 Ω
Polarization	Vertical
Antenna height	2940 mm
Packing size	3000 × 510 × 200 mm
Weight	20 kg
Wind load	370 N (at 160 km/h)
Max. wind velocity	200 km/h (w/o ice) 150 km/h (incl. 1,5 cm radial ice)

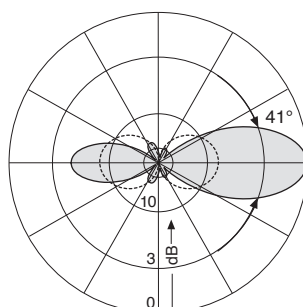


- Material:** Hot-dip galvanized steel.
All screws and nuts: Stainless steel.
- Mounting:** Flange 190 mm OD for mounting on a flanged pipe (see rearside).
- Grounding:** The antenna is DC grounded by a cross-section of 342 mm² hot-dip galvanized steel.
- Scope of supply:** Antenna with neoprene O-ring at the flange, but without mounting hardware.

Radiation Pattern (at mid-band)

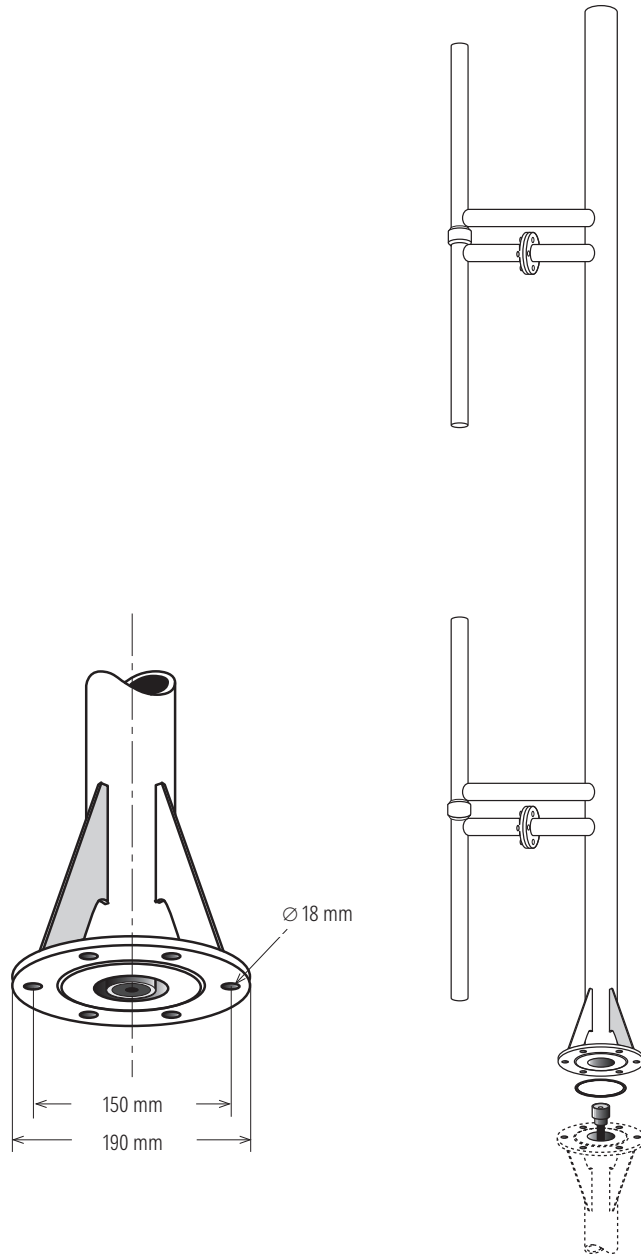


Horizontal Radiation Pattern



Vertical Radiation Pattern

Mounting Instruction



> Dipole Antenna

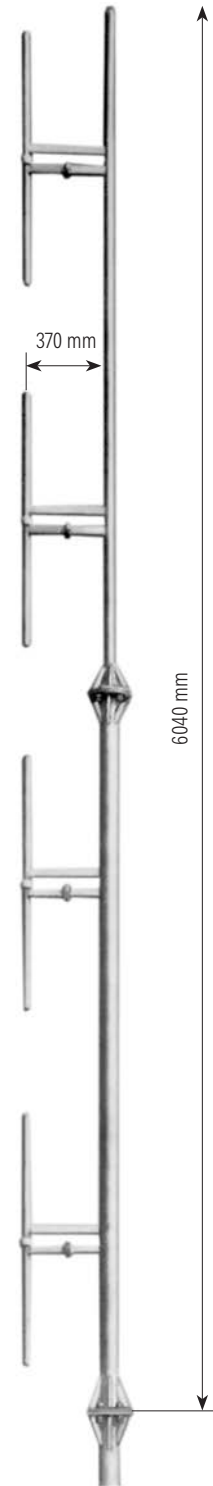
- High gain dipole antenna.
- Hot-dip galvanized steel.

118–144 MHz

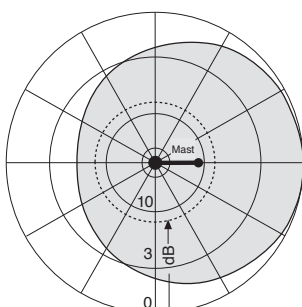
V

Order No.	600420 K553231
Input	N female
Connector position	Bottom inside flange
Max. power	220 W (at 50 °C ambient temperature)
Frequency range	118–144 MHz
VSWR	< 1.5
Gain	8 dBd
Impedance	50 Ω
Polarization	Vertical
Packing size	3600 × 510 × 200 mm and 3000 × 510 × 200 mm
Weight	54 kg
Wind load	950 N (at 160 km/h)
Max. wind velocity	170 km/h (w/o ice) 135 km/h (incl. 1,5 cm radial ice)

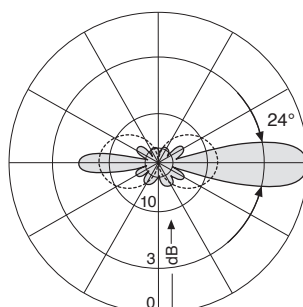
- Material:** Hot-dip galvanized steel.
All screws and nuts: Stainless steel.
- Mounting:** Flange 210 mm OD for mounting on a flanged supporting pipe (see mounting instruction).
- Grounding:** The antenna is DC grounded by a cross-section of 798 mm² hot-dip galvanized steel.
- Scope of supply:** Antenna with neoprene O-ring at the flange, but without mounting hardware.



Radiation Pattern (at mid-band)

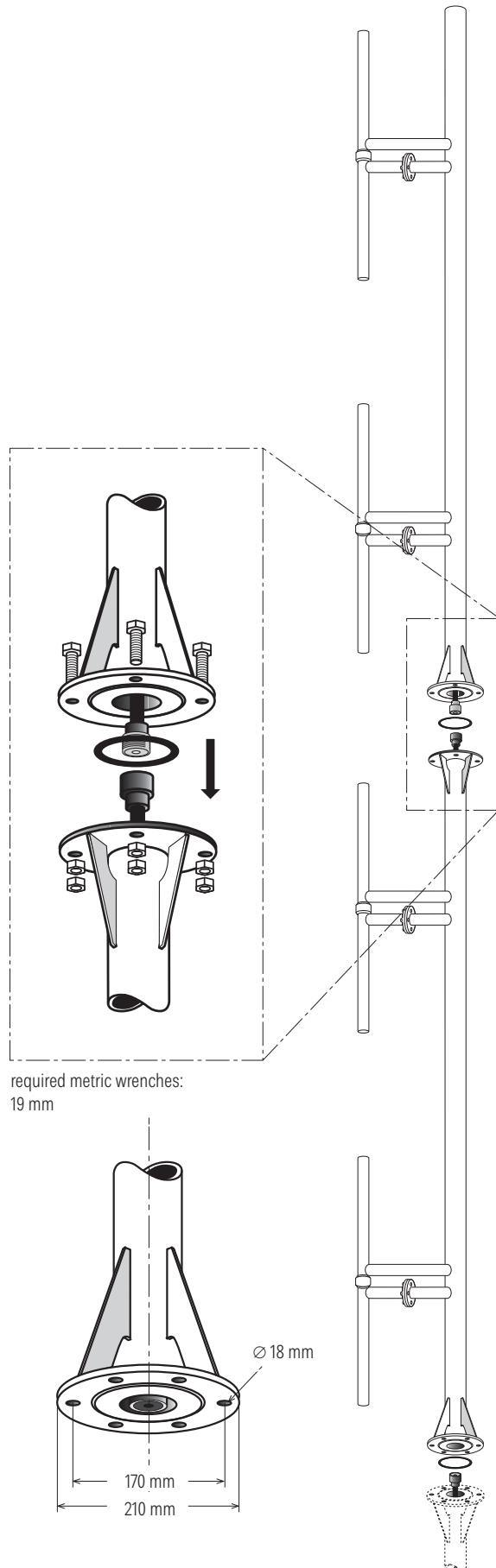


Horizontal Radiation Pattern



Vertical Radiation Pattern

Mounting Instruction



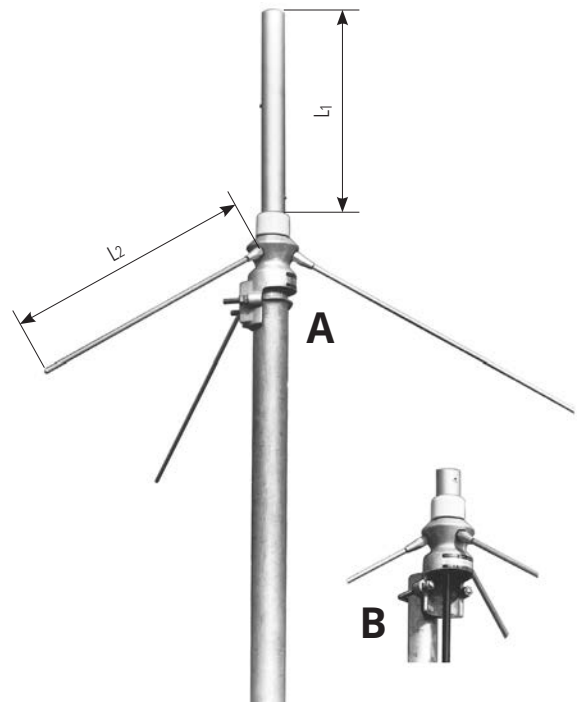
> Omnidirectional Antenna

116–152 MHz

V

Broadband aluminum groundplane-antenna with stainless steel radials.

Order No.	601818 K512631
Input	N female
Connector position	Bottom, in the antenna base
Max. power	120 W (at 50 °C ambient temperature)
Frequency range	116–152 MHz
VSWR	< 1.6 (118–144 MHz), < 2.0 (116–152 MHz)
Gain	0 dBd
Impedance	50 Ω
Polarization	Vertical
Height	L ₁ : 430 mm, L ₂ : 700 mm
Packing size	100 × 85 × 720 mm
Weight	1.5 kg
Wind load	50 N (at 160 km/h)
Max. wind velocity	200 km/h (w/o ice) 135 km/h (incl. 1,5 cm radial ice)



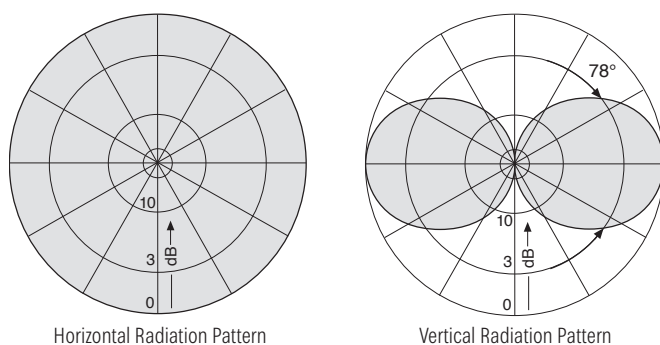
Material: Radiator: Heavy duty alodined aluminum.
 Radials: Stainless steel 8 mm diameter.
 Base: High strength cast aluminum.
 All screws and nuts: Stainless steel.

Mounting: The antenna can be mounted 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).

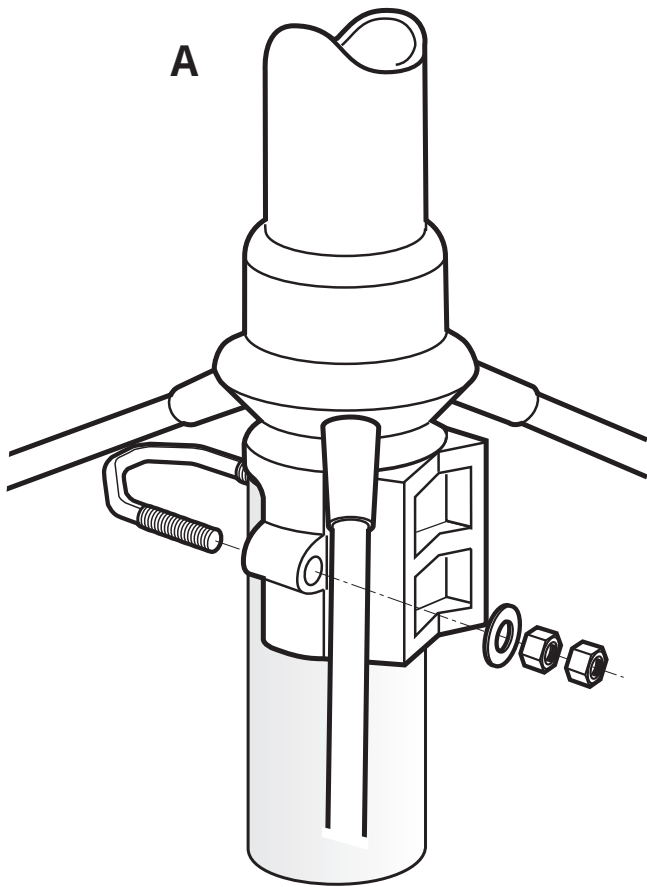
Grounding: The antenna is DC grounded by a cross section of 120 mm² aluminum.

Scopy of supply: Antenna including mounting hardware.

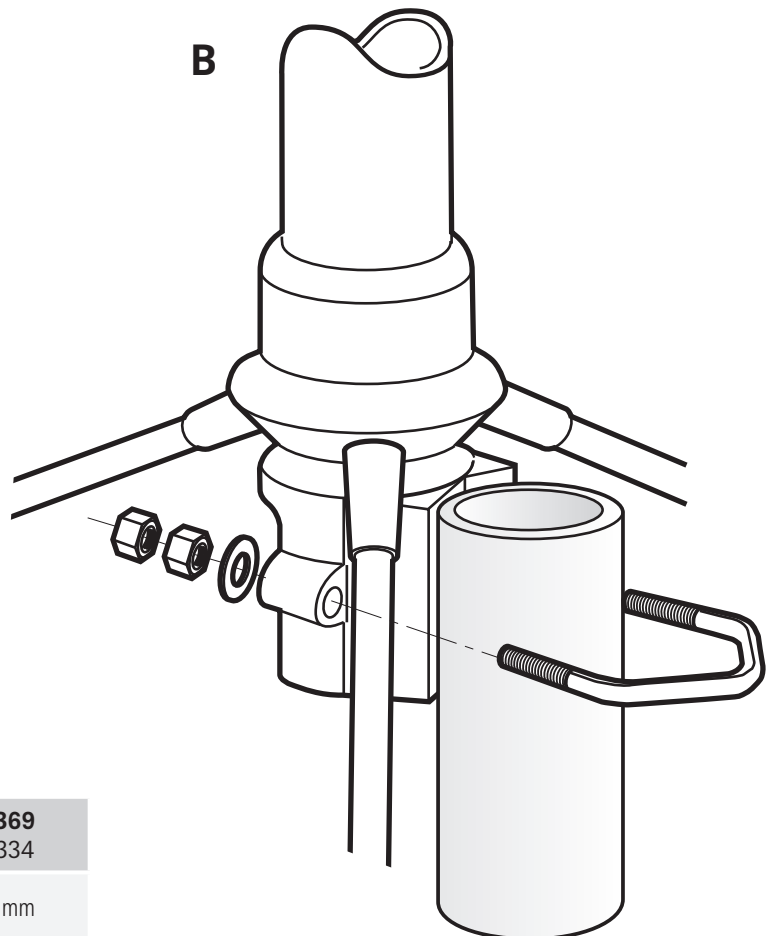
Radiation Pattern (at mid-band)



Mounting Instruction



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:

Order No.	601368 K61333	601369 K61334
Distance between pipe and antenna	500 mm	1000 mm

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

V

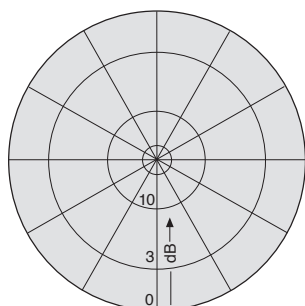
4 dipoles round a mast connected via power splitter.



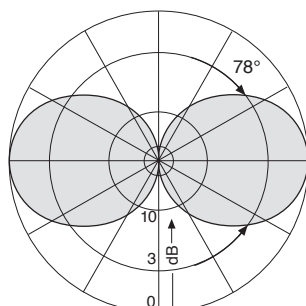
Order No.	718215
Input	7-16 female
Max. power	400 W (at 50 °C ambient temperature)
Frequency range	118–137 MHz
VSWR	< 1.5
Gain	0 dBd
Horizontal radiation pattern: Deviation from circularity	±1.5 dB
Impedance	50 Ω
Polarisation	Vertical
Height	1050 mm
Weight	32 kg
Wind load	2.5 kN (at 180 km/h and 4 cm radial ice)
Max. wind velocity	200 km/h

- Material:** Hot-dip galvanized steel.
- Mounting:** On a pipe mast with a diameter of 406.4 mm, other diameters on request. Please specify exact diameter with order.
- Grounding:** All metal parts of the antenna including the delivered mounting kit are DC grounded.
- Scope of supply:** Antenna incl. power splitter and cables (pipe mast not supplied).

Radiation Pattern (at mid-band)

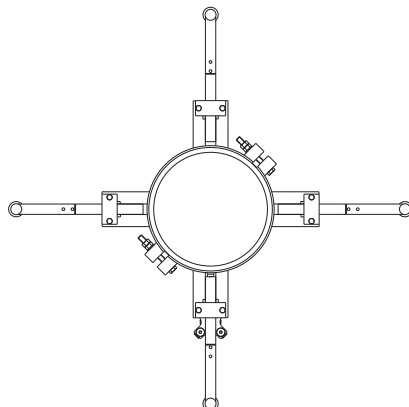
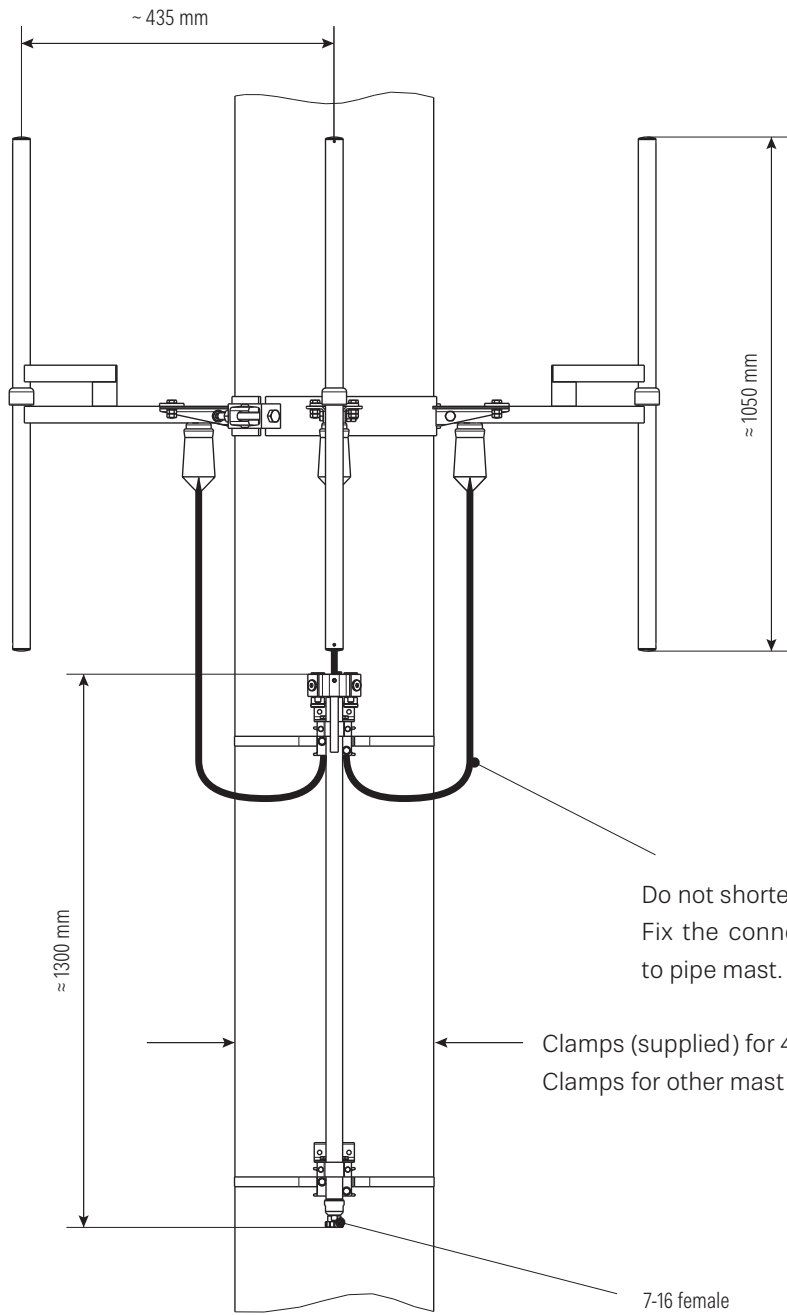


Horizontal Radiation Pattern
(for mast diameter 400 mm)



Vertical Radiation Pattern

Mounting Instruction



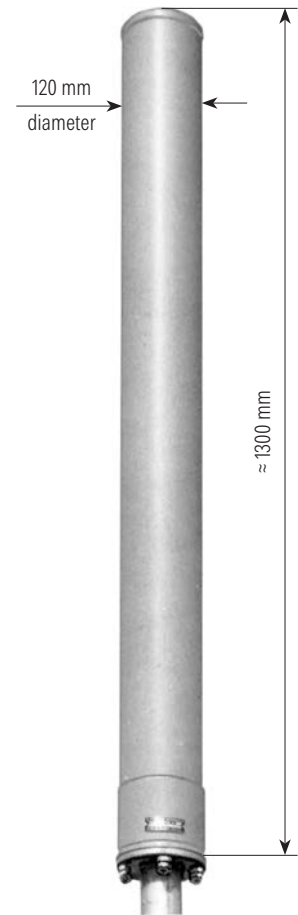
> Omnidirectional Antenna

108-152 MHz

V

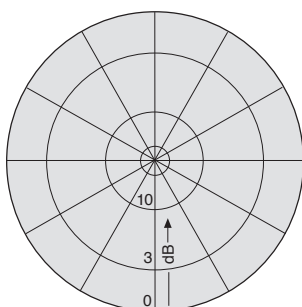
Broadband omnidirectional antenna in fiberglass radome.

Order No.	600371 K552131
Input	N female
Connector position	Bottom, inside flange
Max. power	110 W (at 50 °C ambient temperature)
Frequency range	108-152 MHz
VSWR	< 2.0
Gain	0 dBd
Impedance	50 Ω
Polarization	Vertical
Height	Approx. 1300 mm
Packing size	1400 × 150 × 150 mm
Weight	5.2 kg
Wind load	120 N (at 160 km/h)
Max. wind velocity	250 km/h (incl. 15 cm radial ice)

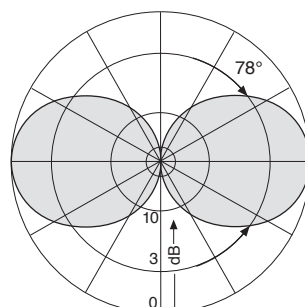


- Material:** Aluminum radiator in fiberglass radome.
Colour: Grey RAL 7001.
Hot-dip galvanized steel bottom.
All screws and nuts: Stainless steel.
- Mounting:** By means of 4 studs M12 to flange 130 mm diameter.
- Grounding:** The antenna is DC grounded by a cross section of 26 mm² aluminum.
- Scope of supply:** Antenna including 1 neoprene O-ring and 4 mounting studs, each with 2 nuts and 1 washer.

Radiation Pattern (at mid-band)

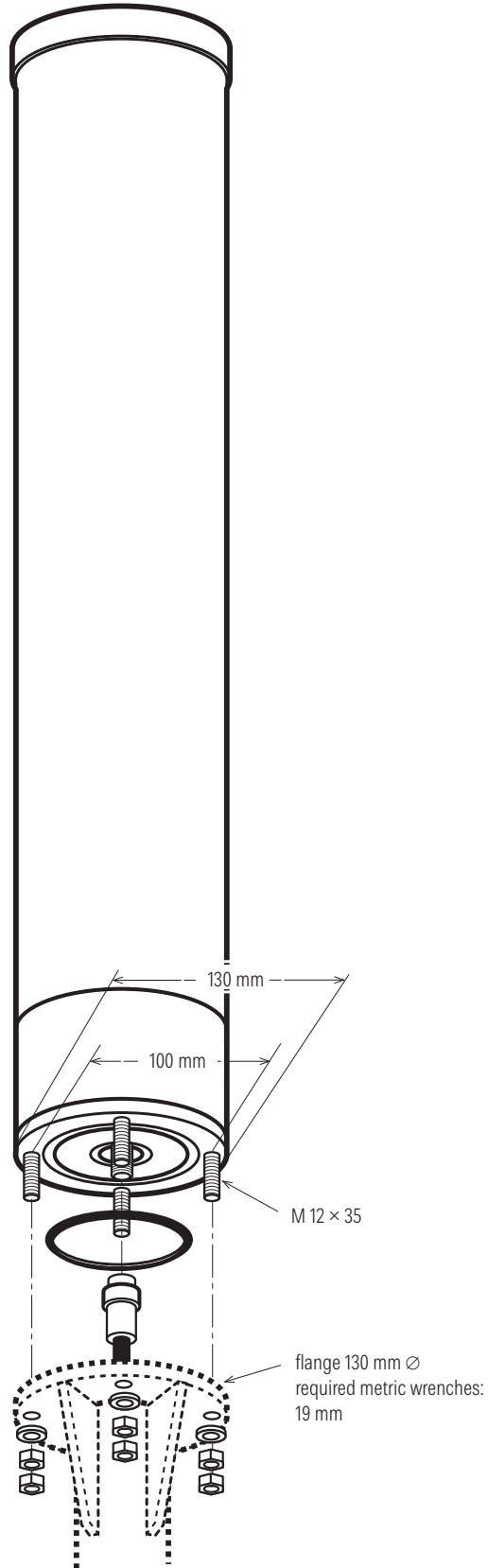


Horizontal Radiation Pattern



Vertical Radiation Pattern

Mounting Instruction



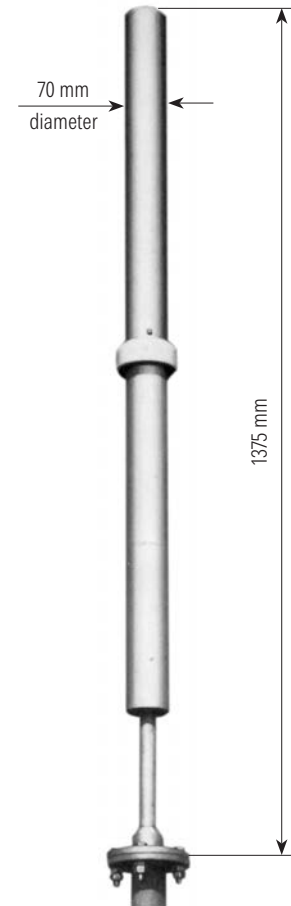
> Omnidirectional Antenna

118–137 MHz

V

- Broadband omnidirectional antenna.
- Hot-dip galvanized steel.

Order No.	601813 K552031
Input	N female
Connector position	Bottom, inside flange
Max. power	1000 W (at 50 °C ambient temperature)
Frequency range	118–137 MHz
VSWR	< 2.0
Gain	0 dBd
Impedance	50 Ω
Polarization	Vertical
Height	1375 mm
Packing size	1390 × 140 × 140 mm
Weight	6.6 kg
Wind load	125 N (at 160 km/h)
Max. wind velocity	200 km/h (incl. 1,5 cm radial ice)



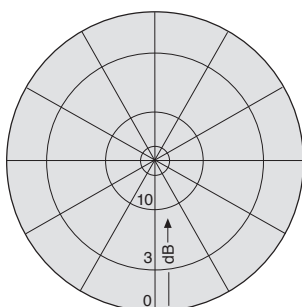
Material: Hot-dip galvanized steel pipes and mounts. All screws and nuts: Stainless steel.

Mounting: Flange 130 mm OD for mounting on a flanged supporting pipe (see mounting instruction).

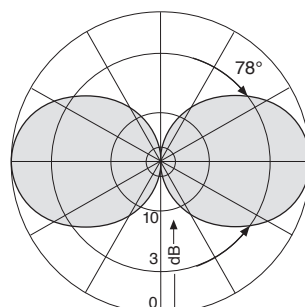
Grounding: The antenna is DC grounded by a cross section of 218 mm² hot-dip galvanized steel.

Scope of supply: Antenna with neoprene O-ring at the flange, but without mounting hardware.

Radiation Pattern (at mid-band)

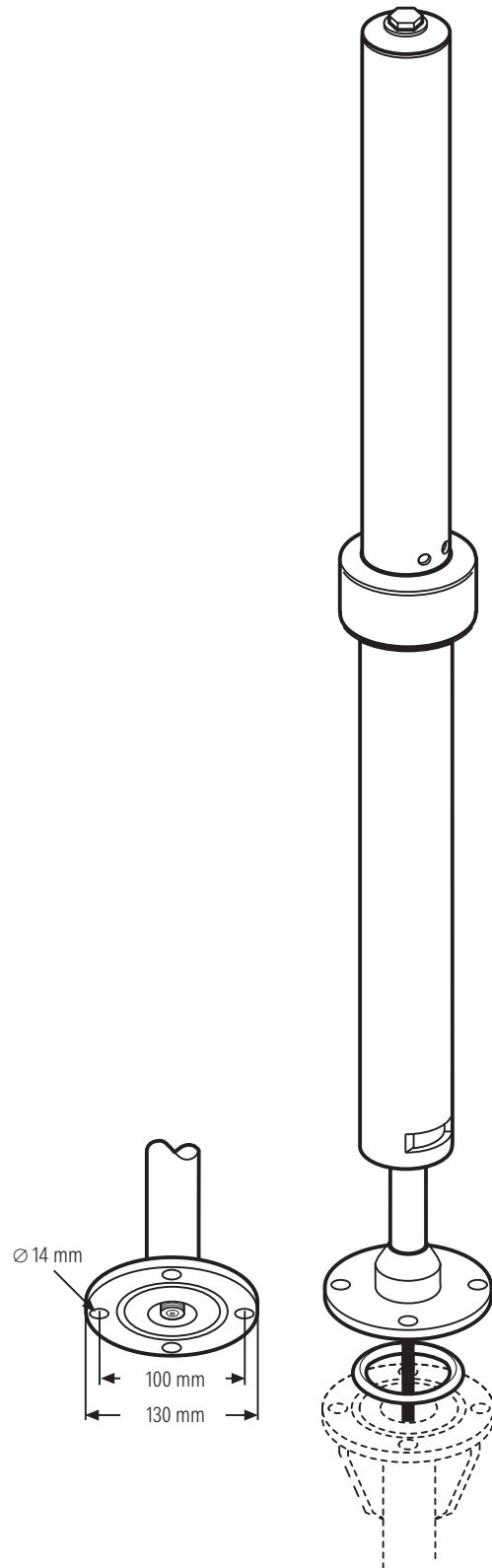


Horizontal Radiation Pattern



Vertical Radiation Pattern

Mounting Instruction



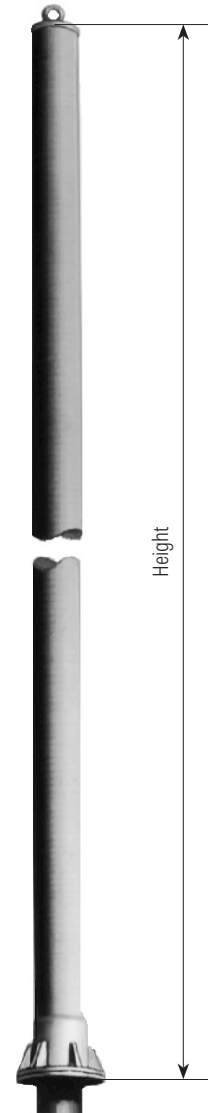
> Omnidirectional Antenna

118–137 MHz

V

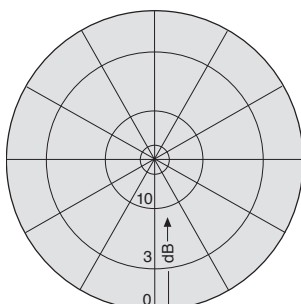
2-element/3-element antenna, consisting of stacked, independently fed dipoles arranged in line.

Order No.	727463	729803
Input	N female	
No. of dipoles	2	3
Connector position	Bottom, inside flange	
Max. power	400 W (at 50 °C ambient temperature)	
Frequency range	118–137 MHz	
VSWR	< 1.8	
Gain	0.5 dBd	
Horizontal radiation pattern	Deviation from circularity ± 0.3 dB for each dipole	
Impedance	50 Ω	
Polarization	Vertical	
Decoupling	> 27 dB between adjacent dipoles	> 25 dB between adjacent dipoles
Radome diameter	120 mm	
Height	4300 mm	6000 mm
Weight	33 kg	54 kg
Wind load	480 N (at 160 km/h)	730 N (at 160 km/h)
Max. wind velocity	200 km/h	

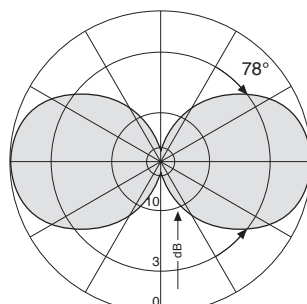


- Material:** Radiator: Hot-dip galvanized steel.
Radome: Fiberglass, colour: Brown (RAL 1019).
Flange: Hot-dip galvanized steel (727463), Aluminum (729803). All screws and nuts: Stainless steel.
- Mounting:** See flange drawings.
- Grounding:** The antenna is DC grounded by a cross section of 110 mm² hot-dip galvanized steel.
- Scope of supply:** Antenna with neoprene O-ring at the flange, but without mounting hardware.

Radiation Pattern (at mid-band)

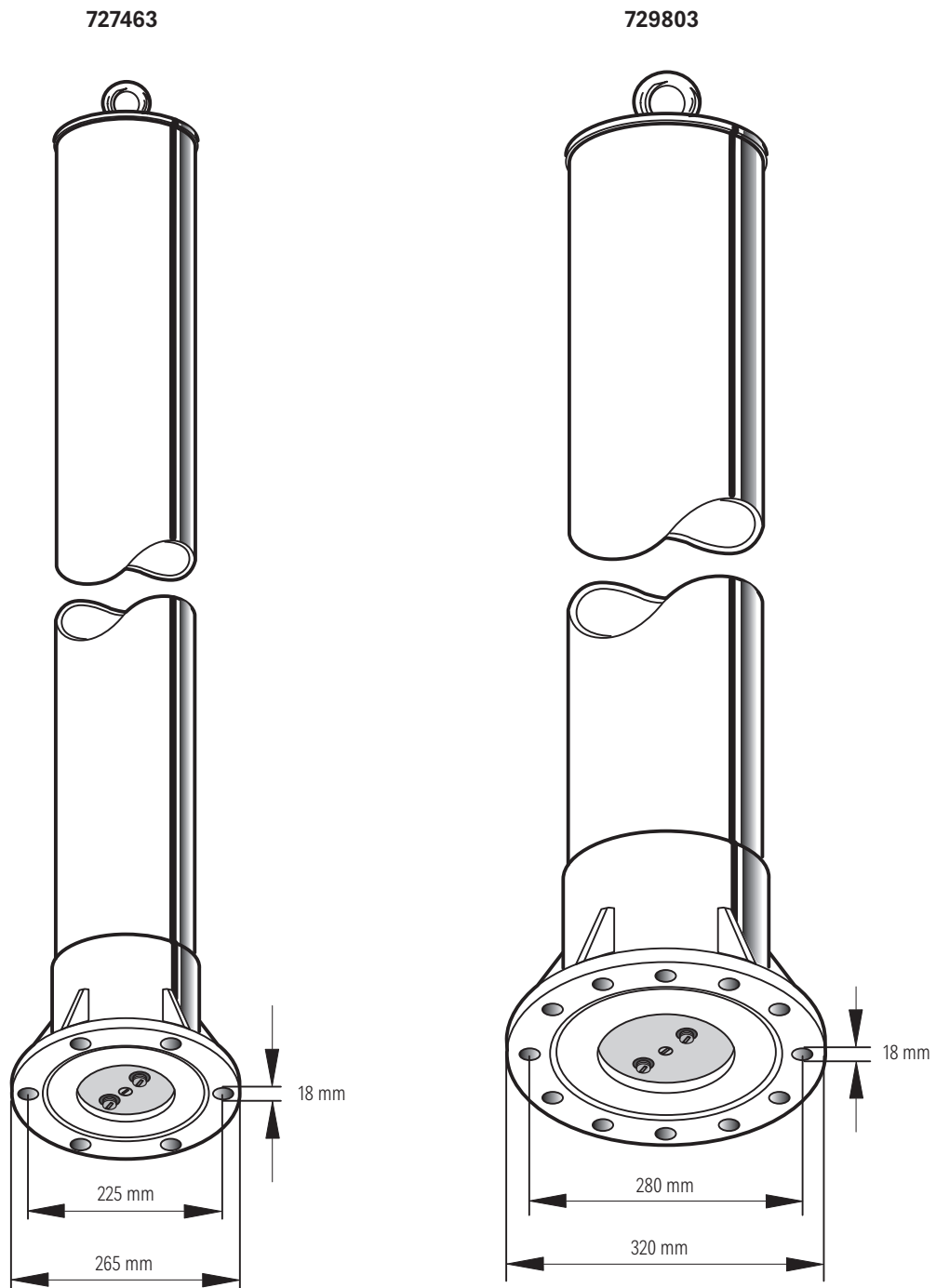


Horizontal Radiation Pattern



Vertical Radiation Pattern

Mounting Instruction



- 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: M16 stainless or hot-dip galvanized steel (min. strength 5.6 accord. DIN 267). Max. torque: 50 Nm (screws should be greased with MoS₂)
- Put a stainless steel washer between aluminum flange and screw head or nut

> Omnidirectional Antenna

225–400 MHz

V

6 dipoles round a mast connected via power splitter.

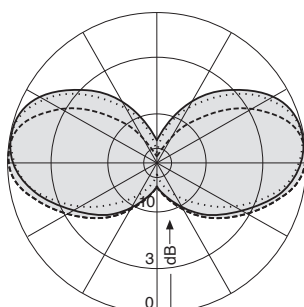
Order No.	718217
Input	7-16 female
Max. power	650 W (at 50 °C ambient temperature)
Frequency range	225–400 MHz
VSWR	< 2.0
Gain	0 dBd
Horizontal radiation pattern: Deviation from circularity	Mast diameter 500 mm: ±1.0 dB (225 MHz) ±1.5 dB (325 MHz) ±3.5 dB (400 MHz)
Impedance	50 Ω
Polarization	Vertical
Weight	40 kg
Wind load	3.5 kN (at 180 km/h and 4 cm radial ice)
Max. wind velocity	200 km/h



- Material:** Hot-dip galvanized steel.
All screws and nuts: Stainless steel.
- Mounting:** On a pipe mast with a diameter of 406.4 mm, other diameters on request.
Please specify exact diameter with order.
- Grounding:** All parts of the antenna including the delivered mounting kit are DC grounded.
- Scope of supply:** Antenna incl. power splitter and cables (pipe mast not supplied).

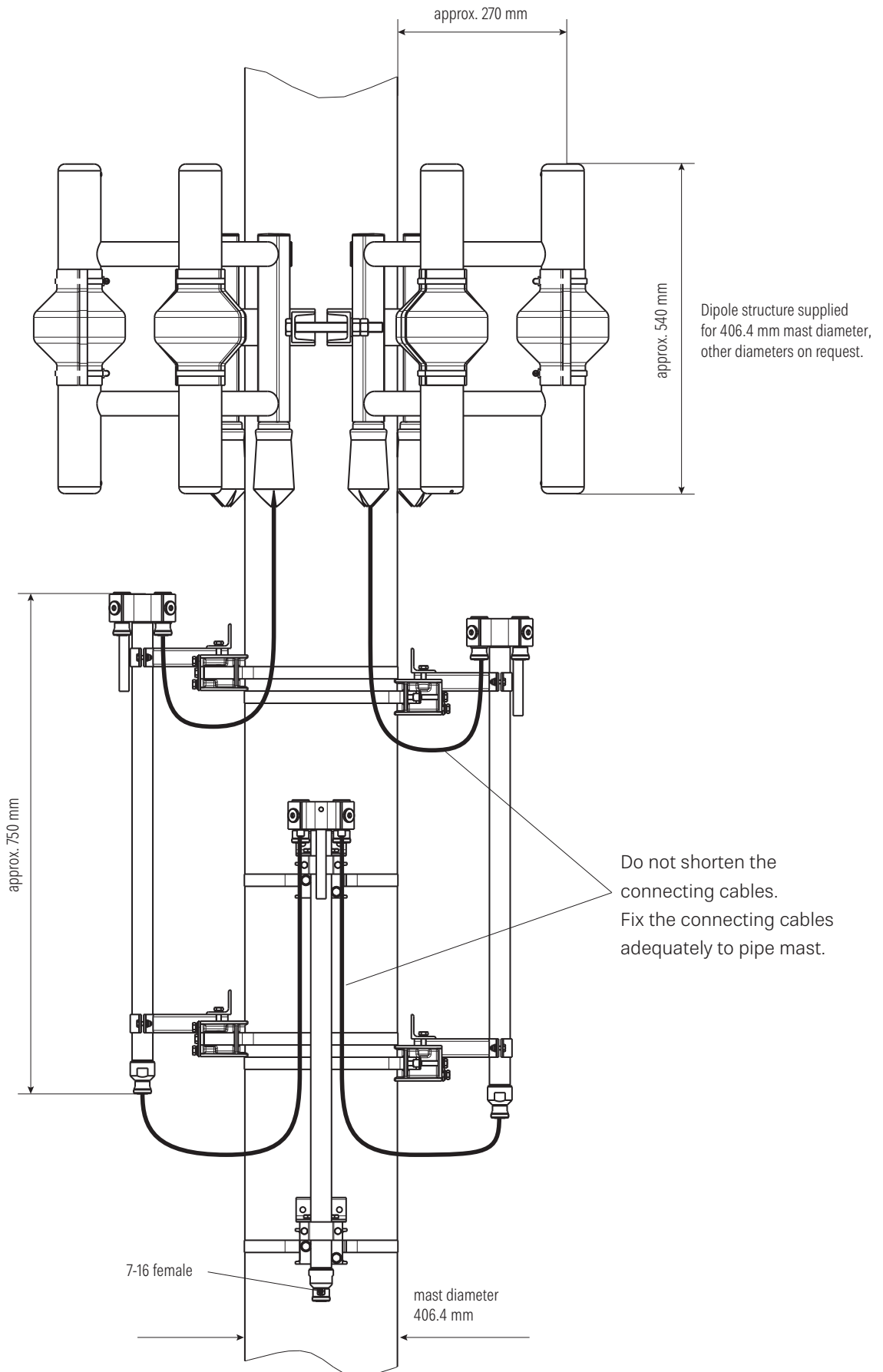
Radiation Pattern

— 225 MHz 310 MHz - - - - 400 MHz



Vertical Radiation Pattern

Mounting Instruction



> Omnidirectional Antenna

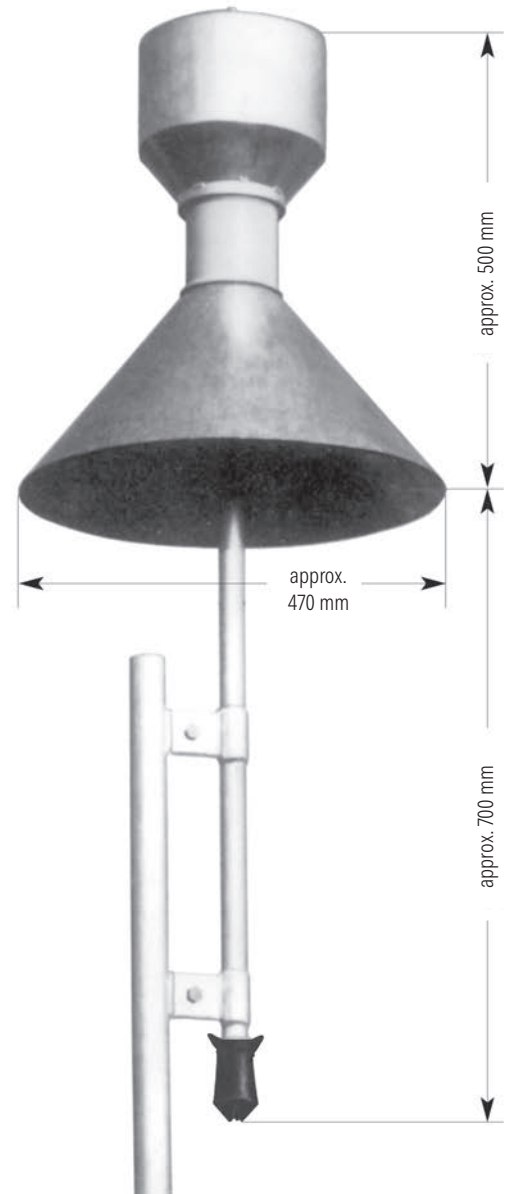
225–400 MHz

V

Omnidirectional broadband antenna.

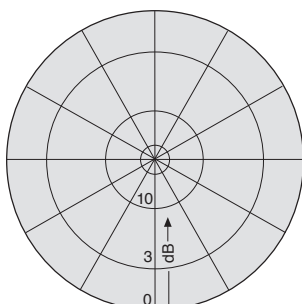
Order No.	600759 K751011
Input	N female
Connector position	At the lower end of the support pipe
Max. Power	290 W (at 50 °C ambient temperature)
Frequency range	225–400 MHz
VSWR	< 1.8
Gain	0.5 dBd
Impedance	50 Ω
Polarization	Vertical
Packing size	1250 × 520 × 520 mm
Weight	9.5 kg
Windload	160 N (at 160 km/h)
Max. wind velocity	200 km/h (incl. 1,5 cm radial ice)

- Material:** Hot-dip galvanized steel.
All screws and nuts: Stainless steel.
- Mounting:** 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 mm² hot-dip galvanized steel.
- Scope of supply:** Antenna without mounting hardware.

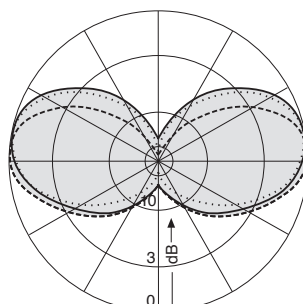


Radiation Pattern

— 225 MHz 310 MHz - - - - 400 MHz

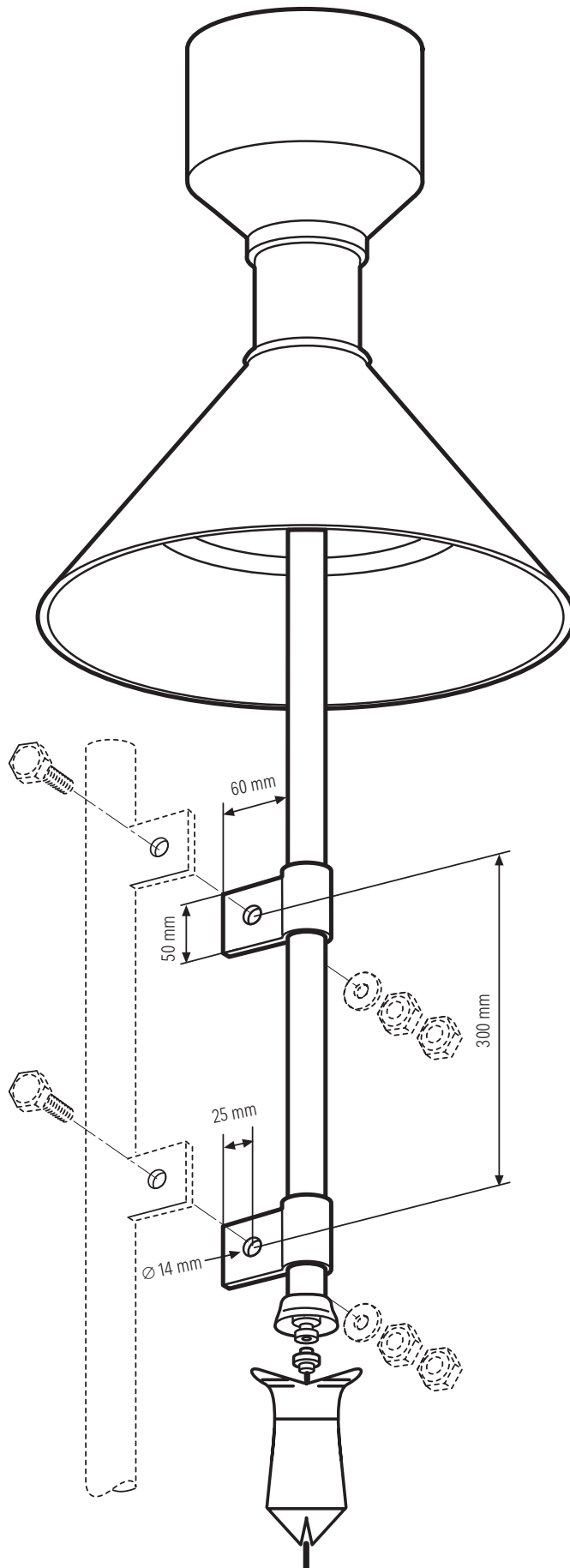


Horizontal Radiation Pattern



Vertical Radiation Pattern

Mounting Instruction



Antennas for Navigation and Monitoring

Antenna Type	Frequency Range	Page
Marker Beacon Antenna	74–76 MHz	32–33
Localizer Monitor Antenna	108–118 MHz	34–35
Glide Path Antennas	328–336 MHz	36–39
DME Antennas	960–1215 MHz	40–43
ADS-B Antennas	1027–1033 MHz 1087–1093 MHz	44–45

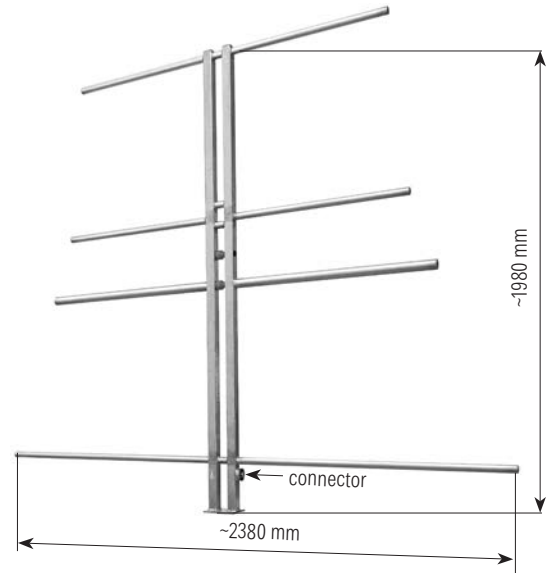
> Yagi Antenna

- 4-element yagi antenna.
- Marker Beacon antenna in upright position.

Order No.	80010228
Input	N female
Connector position	See photo
Max. power	15 W
Frequency range	74–76 MHz
VSWR	< 1.4
Gain	4.9 dBd
Impedance	50 Ω
Polarization	Horizontal
Height/width	1980/2380 mm
Packing size	2424 × 2118 × 182 mm
Weight	22 kg
Windload	590 N (at 160 km/h)
Max. wind velocity	180 km/h

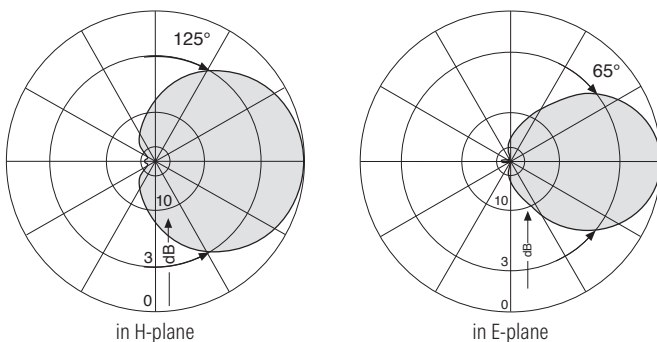
74–76 MHz

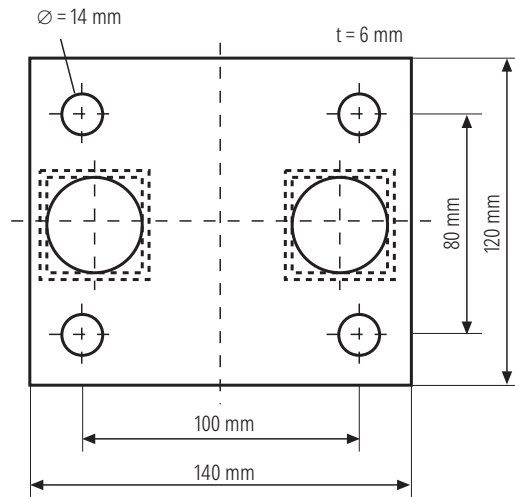
H



- Material:** Hot-dip galvanized steel.
- Mounting:** Using the supplied flange 120 × 140 mm.
- Grounding:** All metal parts of the antenna including the delivered mounting kit are DC grounded.

Radiation Pattern (at mid-band)



Mounting Instruction

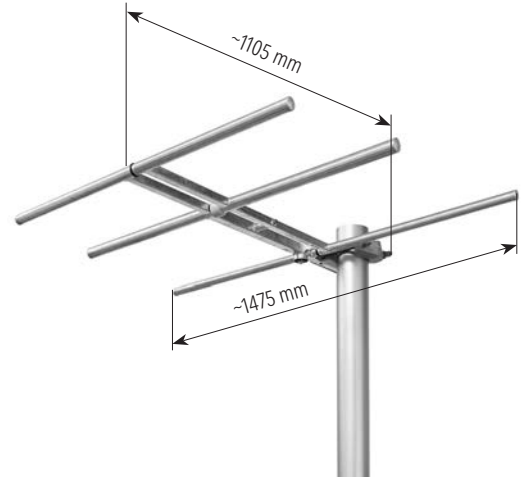
> Yagi Antenna

- 3-element yagi antenna.
- Localizer monitor antenna.

108–118 MHz

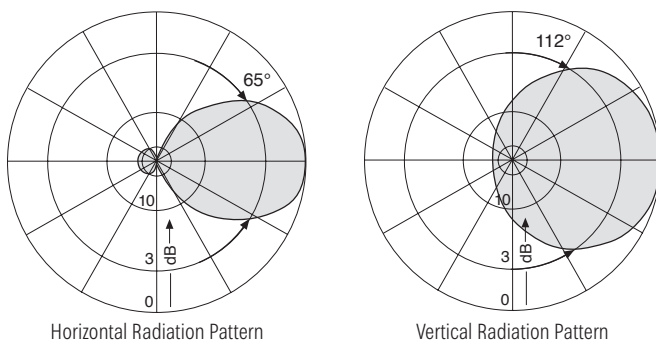
H

Order No.	711329
Input	N female
Max. power	300 W (at 50 °C ambient temperature)
Frequency range	108–118 MHz
VSWR	< 1.3
Gain	5 dBd
Impedance	50 Ω
Polarization	Horizontal
Front-to-back ratio	> 15 dB
Packing size	1525 × 1190 × 92 mm
Weight	10 kg
Wind load	220 N (at 150 km/h)
Max. wind velocity	150 km/h

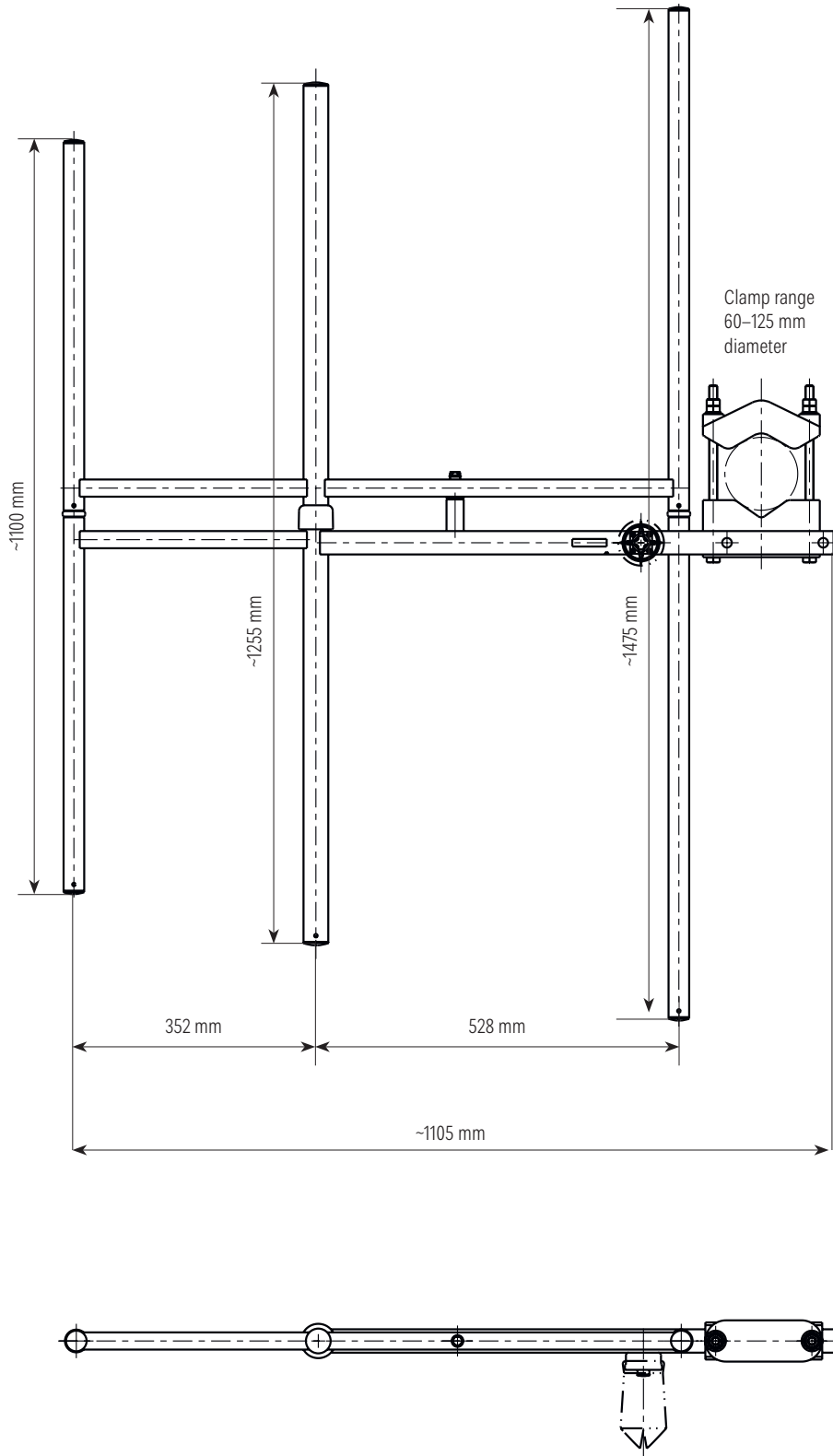


- Material:** Hot-dip galvanized steel.
All screws and nuts: Stainless steel.
- Mounting:** To pipes of 60–125 mm diameter by means of hot-dip galvanized steel clamp, supplied.
- Grounding:** All metal parts of this antenna are DC grounded.

Radiation Pattern (at mid-band)



Mounting Instruction



> Dipole Antenna

328–336 MHz

H

- Half-wave dipole in front of a reflector screen.
- In fiberglass radome.
- Monitor antenna for glide-path signal.

Order No.	715630
Input	N female
Connector position	Rearside
Max. power	60 W (at 50 °C ambient temperature)
Frequency range	328–336 MHz
VSWR	< 1.3
Gain	4 dBd
Impedance	50 Ω
Polarization	Horizontal
Height/width/depth	300/480/135 mm
Weight	4.3 kg
Wind load	140 N (at 160 km/h)
Max. wind velocity	200 km/h (incl. 1,5 cm radial ice)



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.

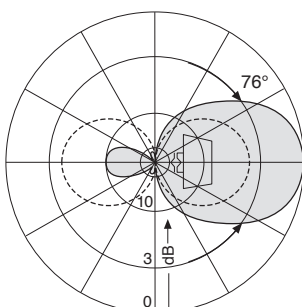
Mounting: To pipes of 60–120 mm OD by means of hot-dip galvanized steel clamp, supplied.

Grounding: The antenna is DC grounded by a cross section of 304 mm² aluminum.

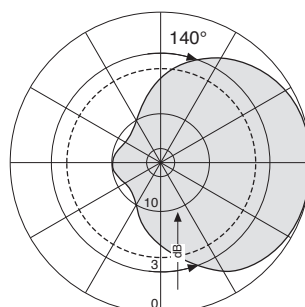
Ice protection: The rugged, impact-resistant fiberglass radome keeps the electrical characteristics, even under heaviest icing, nearly constant.

Scope of supply: Antenna including mounting hardware.

Radiation Pattern (at mid-band)

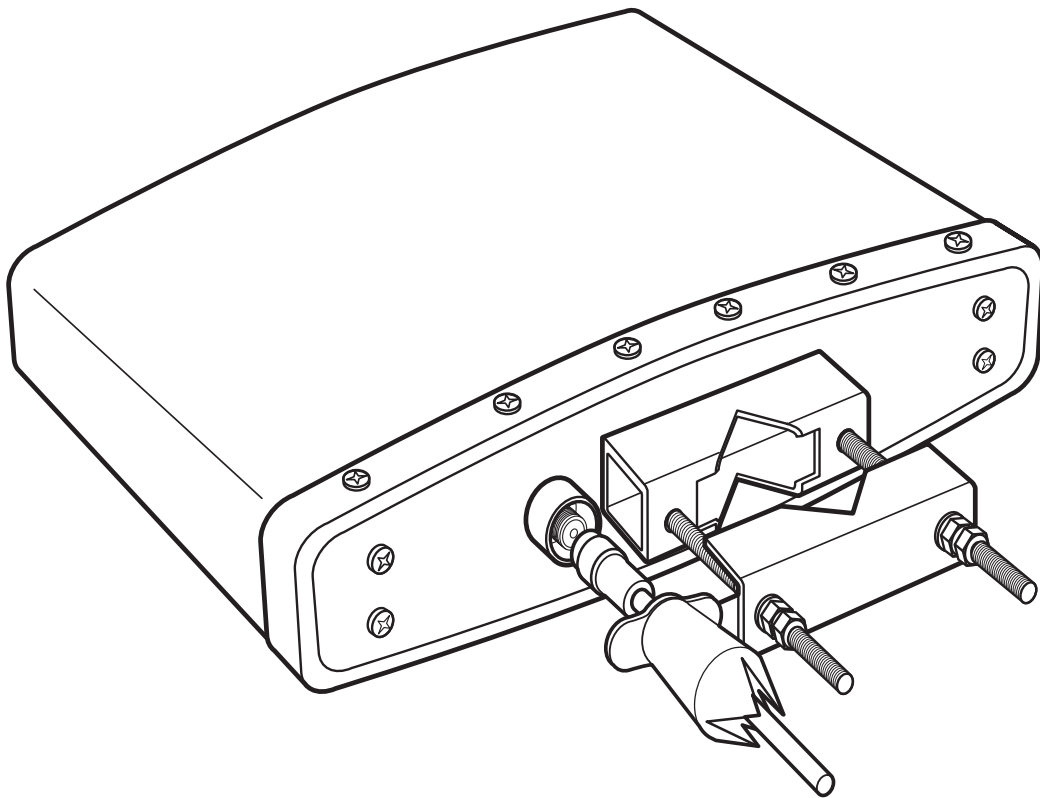


Horizontal Radiation Pattern



Vertical Radiation Pattern

Mounting Instruction



> Panel Antenna

- Glide path antenna.
- 8 dipole panel protected by fiberglass radome.
- Includes radiation monitoring system.

Order No.	713316B
Input	N female
Max. power input (CW)	60 W (at 50 °C ambient temperature)
Frequency range	328–335.5 MHz
VSWR	< 1.1
Gain	12 dBd
Impedance	50 Ω
Polarization	Horizontal
Max. current (DC)	1 A (between inner and outer conductor)
Width/height/depth	2000/500/190 mm
Packing size	2100 × 510 × 260 mm
Weight	19 kg
Wind load (at 160 km/h)	Frontal: 1250 N Rearside: 1750 N Lateral: 80 N
Max. wind velocity	200 km/h (incl. 1.5 cm radial ice)



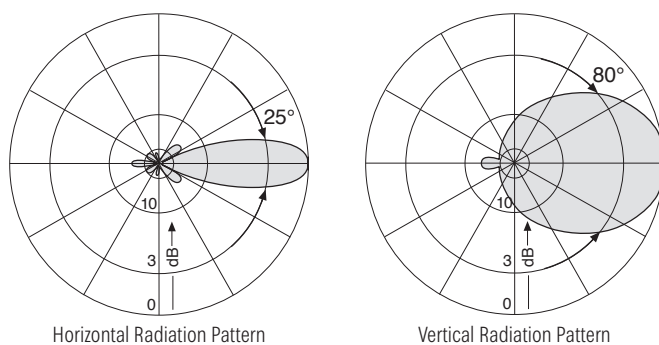
328–335.5 MHz

H

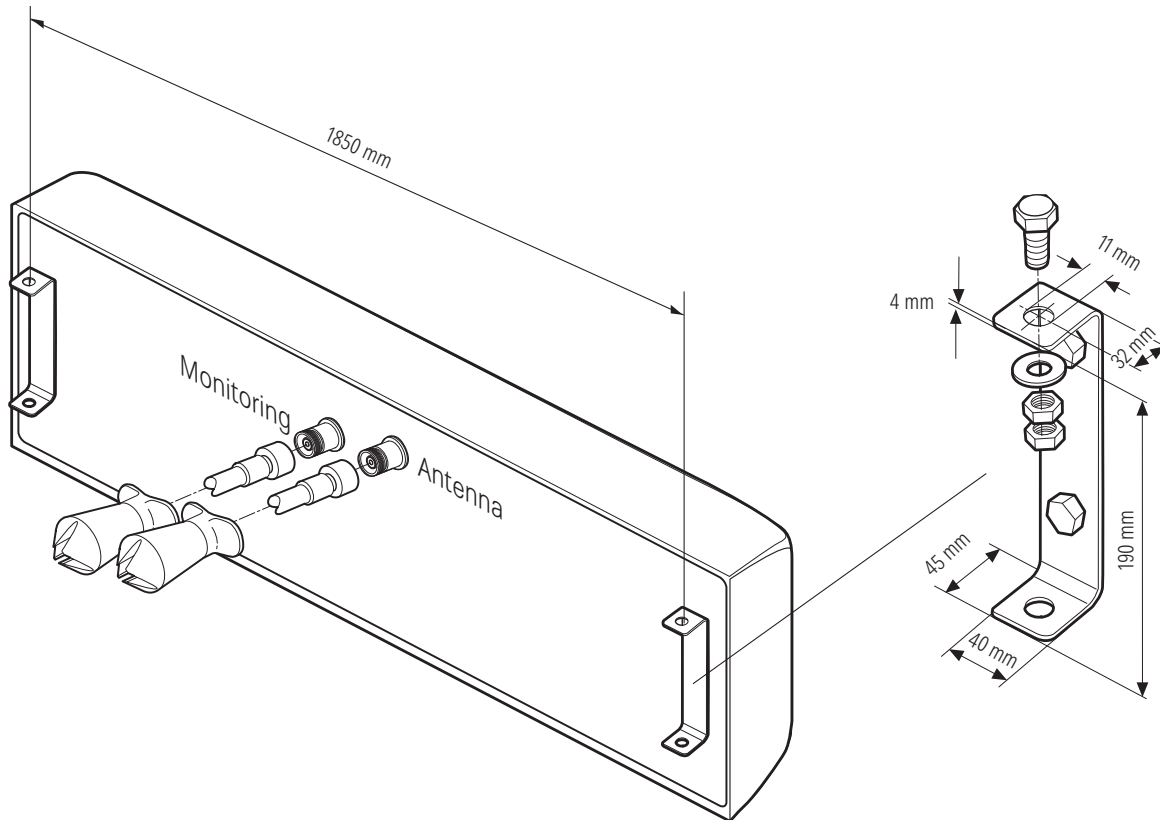
- Material:** Dipole system: Cast aluminum.
Reflector: Weatherproof aluminum.
Radome: Fiberglass (white).
Hot-dip galvanized steel clamps.
All screws and nuts: Stainless steel.
- Mounting:** E.g. by means of hot-dip galvanized steel brackets (optional), to be ordered separately.
- Grounding:** The antenna is DC grounded including the inner conductors.
- Scope of supply:** Antenna with two weather protective rubber caps for the connectors, but without mounting hardware.

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

Radiation Pattern (at mid-band)



Mounting Instruction



> Omnidirectional Antenna

- DME antenna consists of a number of identical, decoupled half-wave dipoles, phase-feeding cables and transformer.
- Two antenna monitor probes integrated.
- Widely immune to damage from lightning.
- Type 715986 includes top mounted LED obstruction light.

Order No.	715986	722394
Obstruction light	Yes	No
Frequency range	960–1215 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 uptilt	3 ±0.5°	
Coupling attenuation	25 ±3 dB (antenna/monitor probes)	
RF peak power	10 kW, modulated as per ICAO recommendation	
Polarization	Vertical	
Temperature range	-40 to +60 °C ambient	
Input	N female	
Connector position	Bottom	
Wind load (at 150 km/h with 1,5 cm radial ice)	370 N	290 N
Max. wind velocity (incl. 1,5 cm radial ice)	200 km/h	241 km/h
Weight	23 kg	20 kg
Radome diameter	86 mm	
Length	3024 mm	2657 mm
Packing size [mm]	3180 × 280 × 300	2780 × 280 × 300

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 mm² brass.

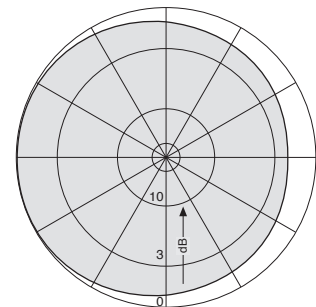
Obstruction light: The antenna 715986 is fitted with a double LED obstruction light. The obstruction light is preconfigured as follows: operation with 1 LED and activated failure detection. In case of a malfunction of the main LED, the second LED will be activated automatically.

960–1215 MHz

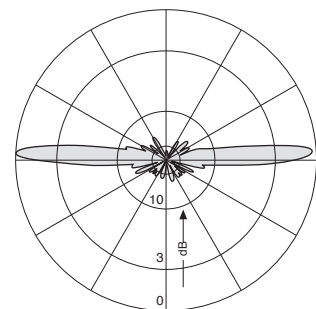
V



Radiation Pattern (at mid-band)



Horizontal Radiation Pattern

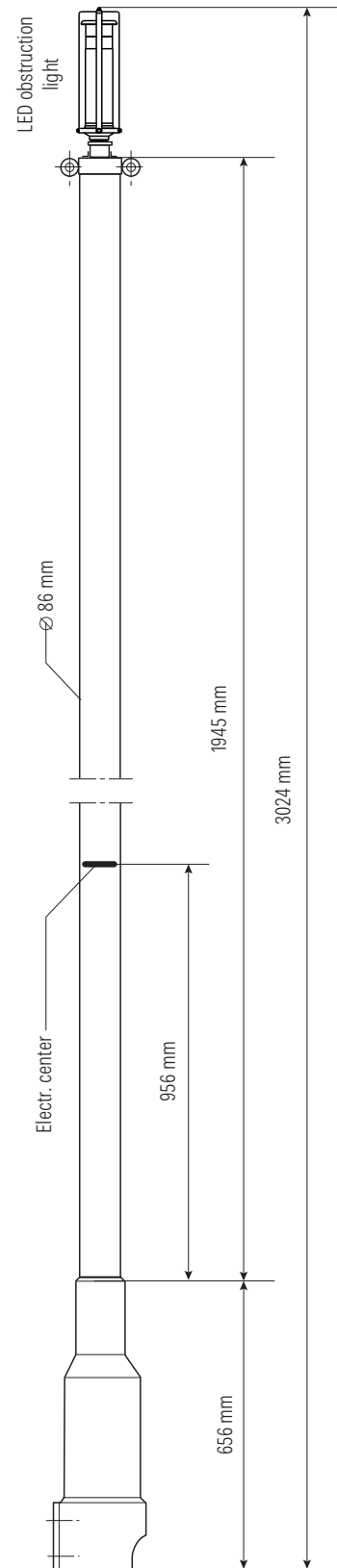
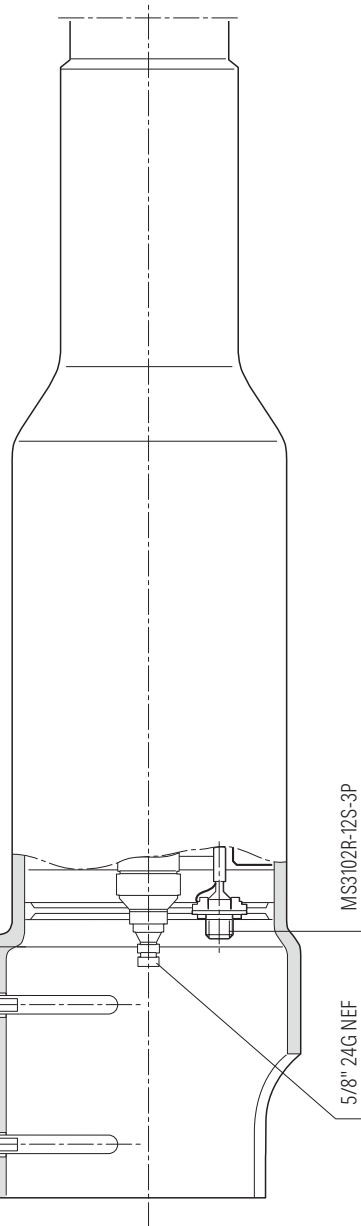
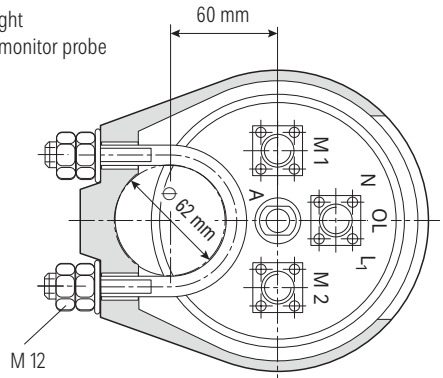


Vertical Radiation Pattern

Obstruction light technical data	
Supply voltage	180–254 V, ~50–60 Hz
Power input	7 W
Average life	~100,000 h

Mounting Instruction

OL: Obstruction light
 M1, M2: Antenna monitor probe
 A: RF input



Installation hints for LED obstruction light:

For connection to electric power supply a shielded cable with a shielding grade of at least 80% and a cross-section of at least $2 \times 1.5 \text{ mm}^2$ is recommended. The cable shouldn't have a protection earth (PE) wire. Due to electrical safety reasons it is mandatory that the light is connected to a residual current device (RCD) with a recommended maximum residual current of 30 mA. Antenna support pipe must be properly grounded.

Cable examples:

LAPP ÖLFLEX® CLASSIC 415 CP 2x1,5
 Helukabel OZ-600-Y-CY 2x1,5 (Art.Nr.: 11546)
 Necessary cable connector:
 1x Amphenol MS3101R-12S-3S

Observance of standards:

DIN VDE 0100
 DIN VDE 0185
 DIN VDE 0855

The installation team must be properly qualified and also be familiar with the relevant national safety regulations! Non observance of following standards may damage or destroy the devices and severe injuries may occur!

> Panel Antenna

960–1215 MHz

V

- DME antenna.
- 4 dipole panel protected by fiberglass radome.
- Includes radiation monitoring system.

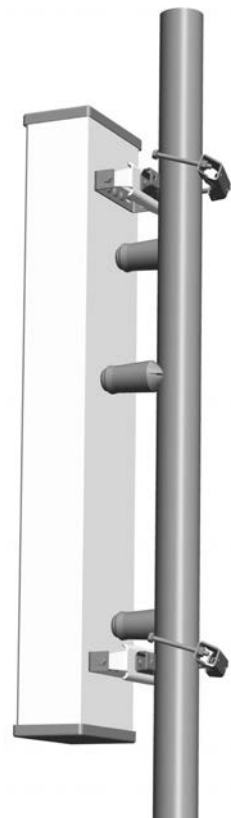
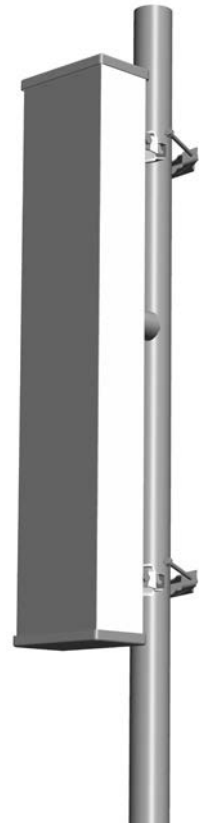
Order No.	716405	88010003
Inputs (antenna and monitoring probes)	N female	
Connector positions	Rearside	
Frequency range	960–1215 MHz	
VSWR	< 1.6	
Gain	14 dBd	
Impedance	50 Ω	
Coupling attenuation (antenna/monitoring probes)	25 ± 3 dB	20 ± 3 dB
Beam tilt	+4° ± 0.5°	
R. F. peak power	10 kW; duty cycle 2%	
Polarization	Vertical	
Temperature range	–40 °C to +60 °C ambient	
Height/width/depth	1305/255/150 mm	
Packing size	1420 × 360 × 250 mm	
Weight	12 kg	
Wind load (at 160 km/h)	Frontal: 675 N, Lateral: 350 N, Rearside: 650 N	
Max. wind velocity	200 km/h (incl. 1,5 cm radial ice)	

Material: Radiators: Brass. Reflector screen: High strength aluminum alloy sheet. Cover: Fiberglass. Clamps: Hot dip galvanized steel. All screws and nuts: Stainless steel

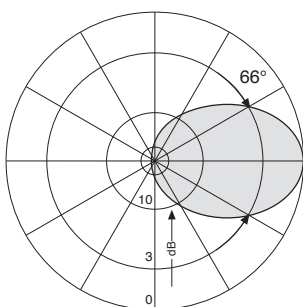
Mounting: To pipes of 42–115 mm OD by means of mounting clamps, supplied.

Grounding: The antenna is DC grounded via mounting clamps. The inner conductors are also DC grounded.

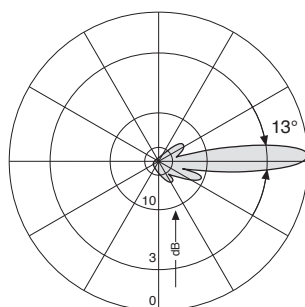
Scope of supply: Antenna including clamps and three weather protective rubber caps for the connectors.



Radiation Pattern (at mid-band)

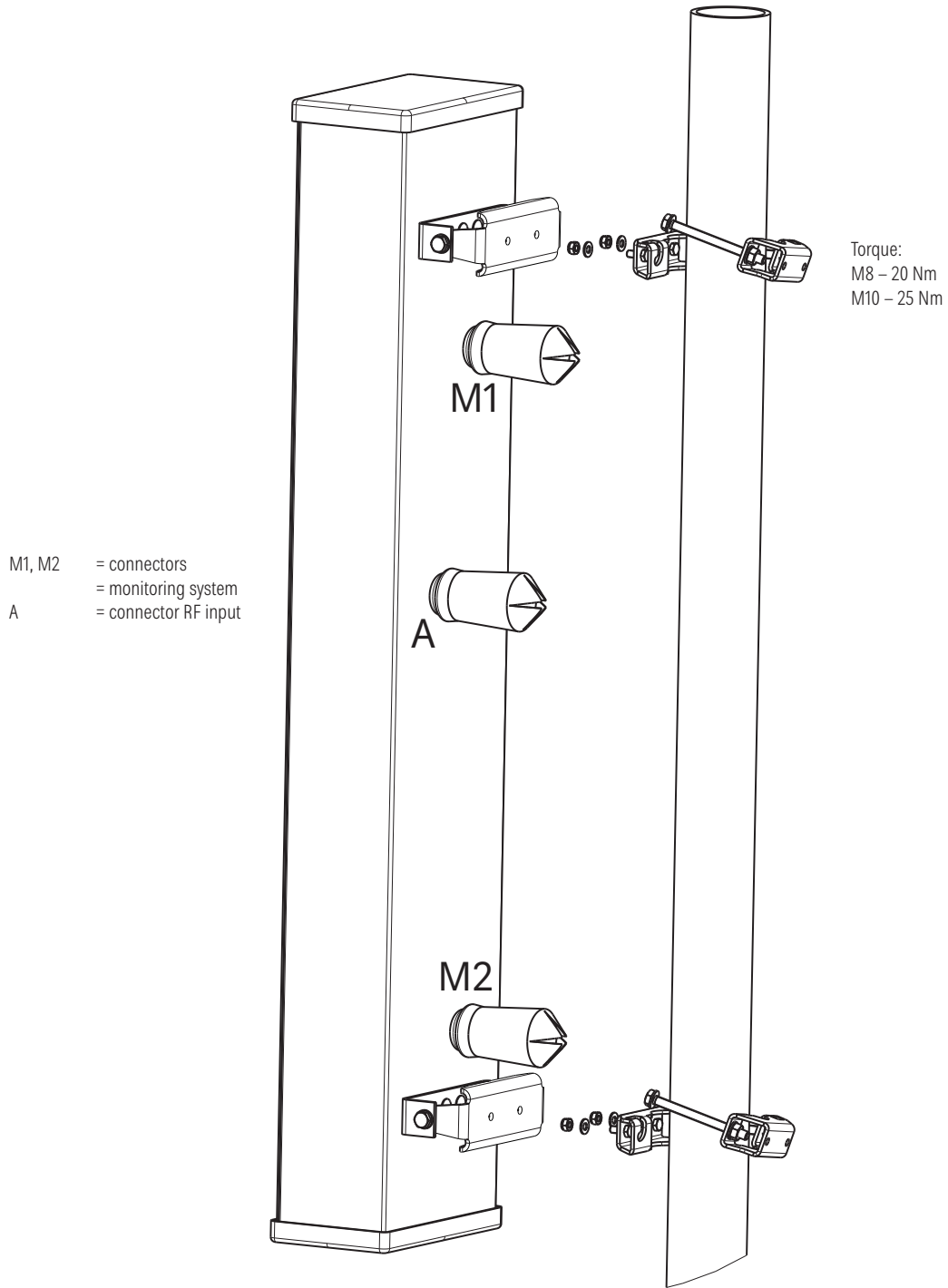


Horizontal Radiation Pattern



Vertical Radiation Pattern

Mounting Instruction



Accessories

Type No.	Description	Remarks	Weight approx.	Units per antenna
738546	1 clamp	Mast: 42–115 mm diameter	1.1 kg	2 (included in the scope of supply)

For other special items consult our customer support: support@kathrein-bca.com

> Omnidirectional Antenna

- ADS-B antenna consists of a number of identical, decoupled half-wave dipoles, phase-feeding cables and transformer.
- Two antenna monitor probes integrated.
- Widely immune to damage from lightning.
- Minimized “cone of silence”.

Order No.	88010002
Input	N female
Connector position	Bottom
Frequency range	1027–1033/1087–1093 MHz
VSWR	< 1.8
Gain	11.5 ±0.5 dBi
Impedance	50 Ω
Horizontal pattern	Omnidirectional: Deviation from omni better ±1.5 dB
Vertical pattern up tilt	2 ±0.5°
Coupling attenuation	25 ±3 dB (antenna/monitor probes)
R. F. peak power	1 kW, modulated as per ICAO recommendation
Polarization	Vertical
Temperature range	-55 to +70 °C ambient
Wind load	380 N (at 150 km/h with 1,5 cm radial ice)
Max. wind velocity	200 km/h 300 km/h when using plastic guy wires (e.g. parafilropes)
Weight	26 kg
Radome diameter	86 mm
Height	3480 mm
Packing size	3580 × 280 × 300 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.

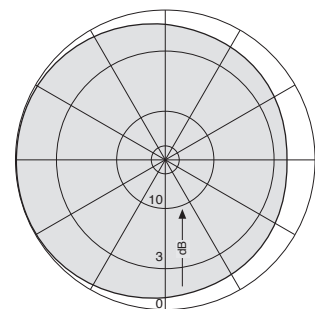
Grounding: The antenna is DC grounded by a cross section of 98 mm² brass.

**1027–1033 MHz
1087–1093 MHz**

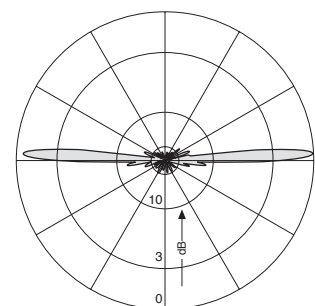
V



Radiation Pattern (at mid-band)

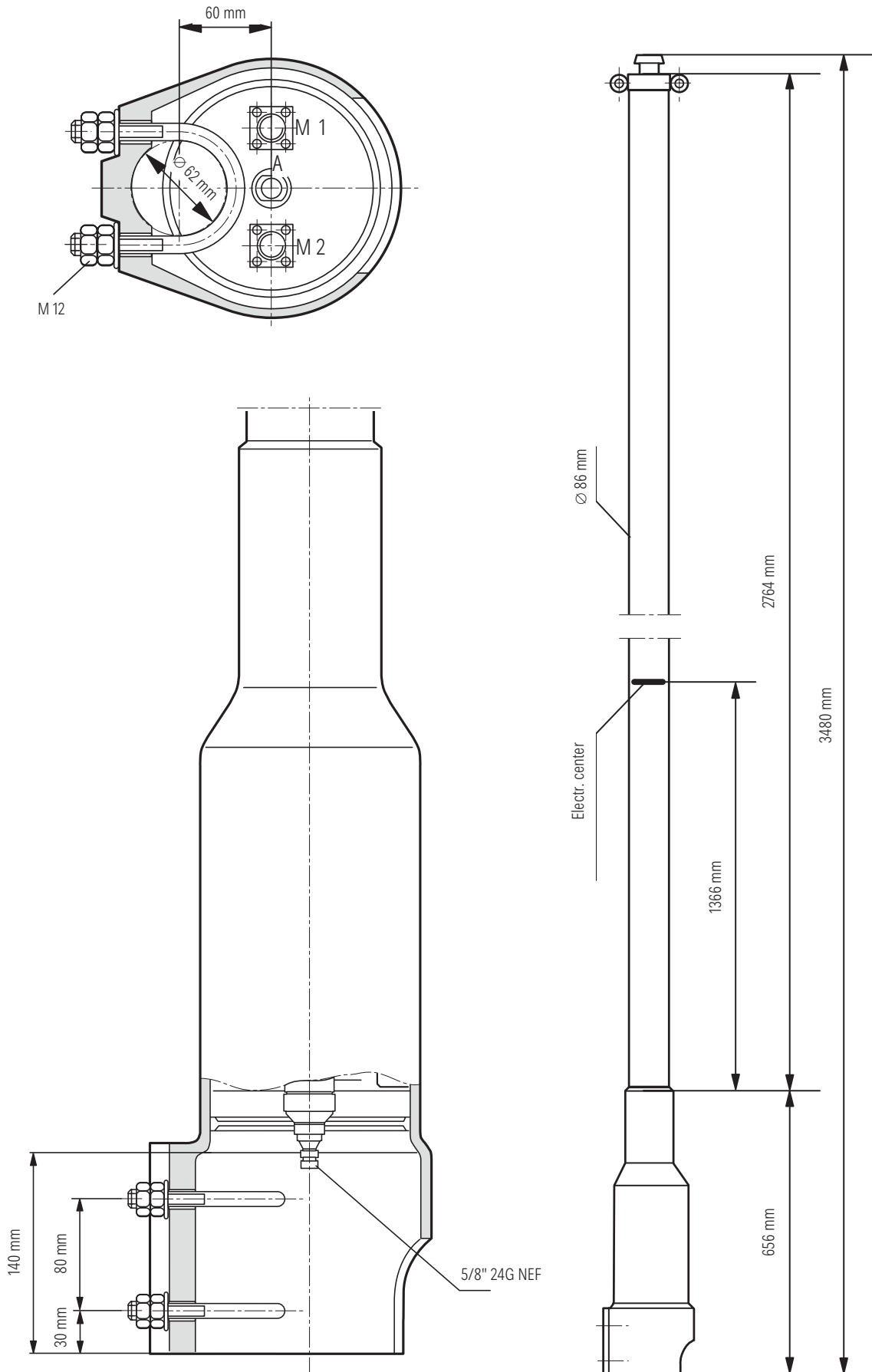


Horizontal Radiation Pattern



Vertical Radiation Pattern

Mounting Instruction



Electrical Accessories

Description	Page
Circulators	48–49
Power Splitters	50–51

> Circulator

118–144 MHz

The circulator can be used:

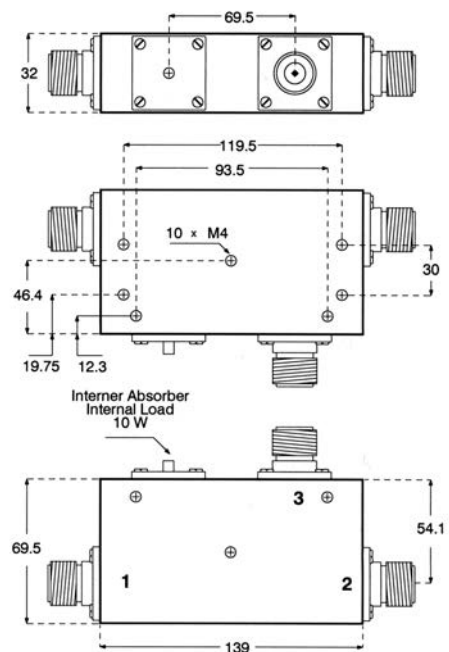
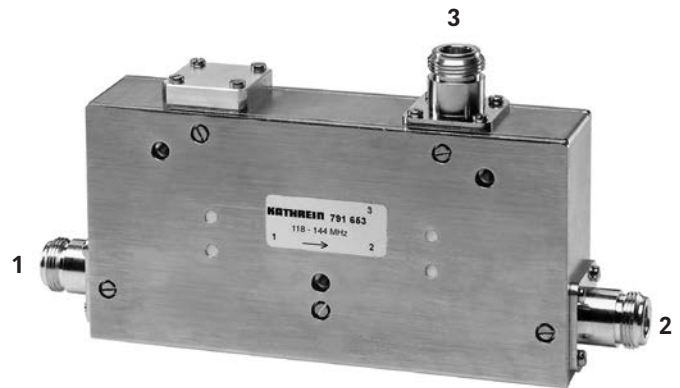
- to increase the coupling attenuation between transmitters, to reduce intermodulation products,
- to prevent adverse effects to unmatched load impedance on amplifier performance.

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

Order No.	791653
Frequency range	118–144 MHz
Insertion loss 1 → 2	< 0.8 dB
Isolation 2 → 1	> 40 dB
VSWR	< 1.25
Impedance	50 Ω
Input power (CW) @25 °C	< 120 W
Temperature range	0 ... +50 °C
Connectors	3 × N female
Material	Brass case, nickel plated
Weight	1.2 kg
Dimensions (w × h × d)	approx. 180 × 32 × 90 mm (incl. connectors)

> Circulator

225–400 MHz

The circulator can be used:

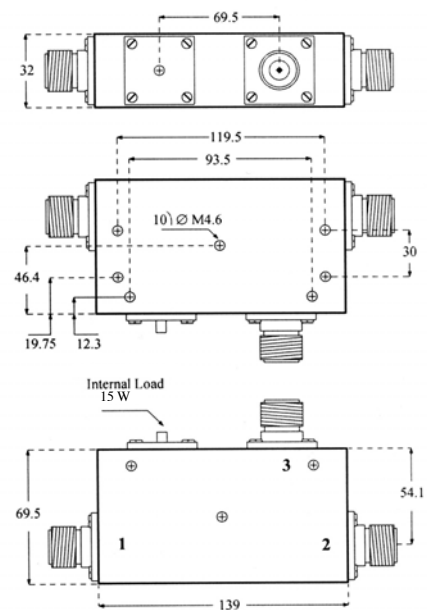
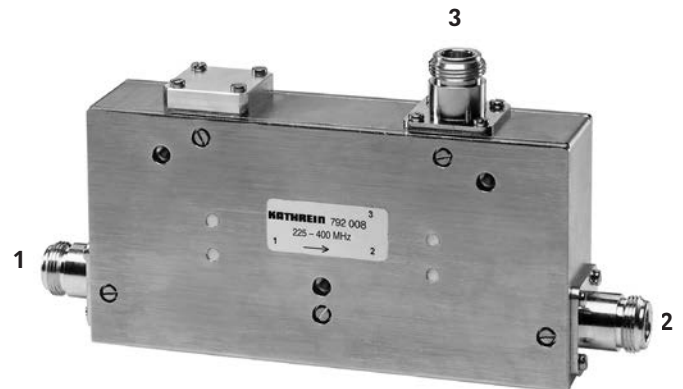
- to increase the coupling attenuation between transmitters, to reduce intermodulation products,
- to prevent adverse effects to unmatched load impedance on amplifier performance.

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

Order No.	792008
Frequency range	225–400 MHz
Insertion loss 1 → 2	< 1.8 dB
Isolation 2 → 1	> 35 dB
VSWR	< 1.4
Impedance	50 Ω
Input power (CW) @25 °C	< 100 W
Temperature range	-10 ... +55 °C
Connectors	3 × N female
Material	Brass case, nickel plated
Weight	Approx. 1.4 kg
Dimensions (w × h × d)	approx. 180 × 32 × 90 mm (incl. connectors)

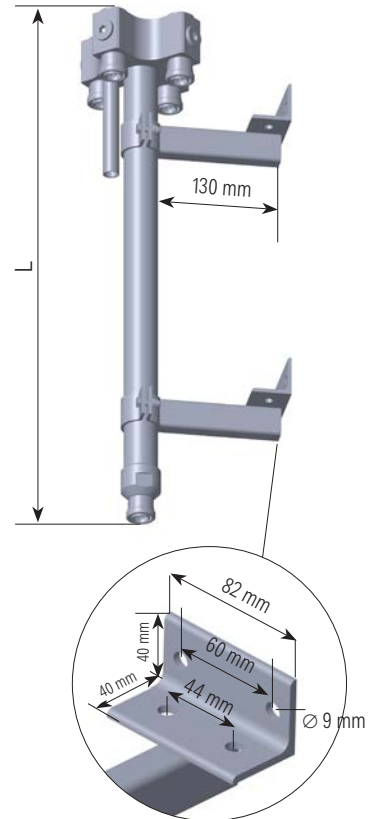
> Power Splitter

100–156 MHz

225–400 MHz

Power Splitters for low-loss connection of several antennas:

Frequency range MHz	For connecting ... antennas	Length L approx. mm	Max. power Watt	Type No. for female connection (equipment and antenna side)
			7-16	7-16
100–156	2	1135	2000	75111120
	3	1135	2000	75111122
	4	1135	2000	75111124
225–400	2	830	1500	75111130
	3	830	1500	75111132
	4	830	1500	75111134



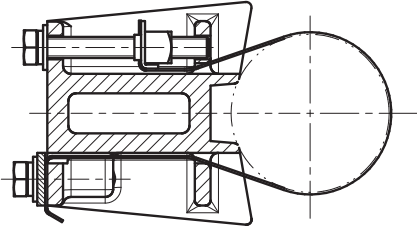
- Impedance:** 50 Ω
- Input and output:** 7-16 female connector
- VSWR:** < 1.15
- Insertion loss:** < 0.05 dB (of the transformation line)
- Material:** Outer conductor: Brass with protective grey paint.
Inner conductor: Brass or aluminum.
- Mounting:** On flat surfaces using the standard mounting equipment supplied (Bracket arm, 130 mm). To tubes of 30–340 mm diameter by means of 2 tension band clamps Type No. 759044 (please order separately).
- Pressurization:** The pressurization-tight transformer housing has a ventilation tube to balance out excess pressure. For pressurized operation (typically at 300 mbar) this ventilation tube must be closed with the supplied sealing screw.
IP 65 (closed ventiation tube for pressurized operation)
IP 53 (opened ventiation tube for non-pressurized operation)



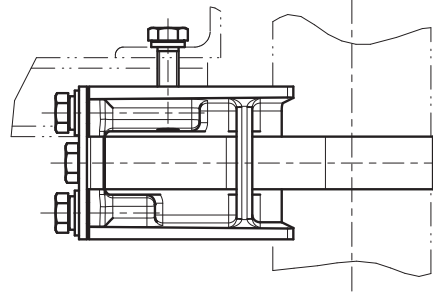
Optional mounting accessory:
Tension band clamp

Mounting Instruction

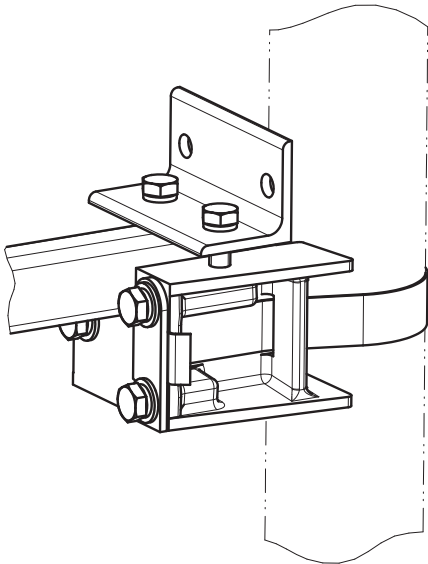
1. Tension band clamp, top view



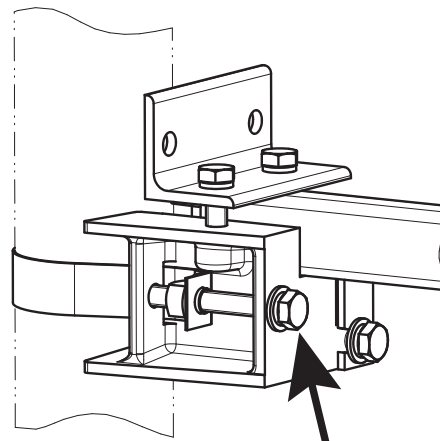
2. Tension band clamp, side view



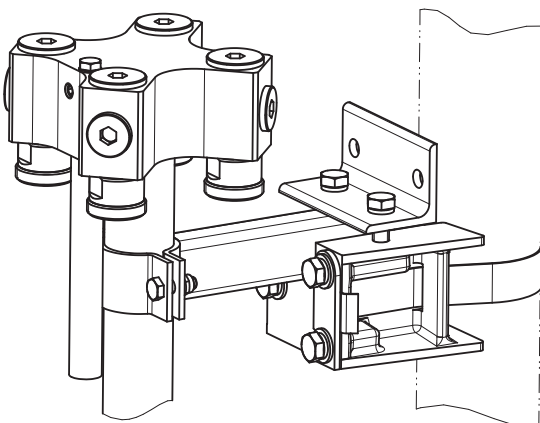
3. Wrap the tension band around the mast, bend it and lock it.



4. Tighten the tension band by the bolt marked.



5. Fix the splitter via the brackets supplied to the tension band clamp as shown.



Mechanical Accessories

Description	Page
Mounting Hardware for VHF Antennas and further accessories	54
Stand-off Brackets	55
Mounting Hardware for Power Splitters	55

> Mounting Hardware and Accessories for Antennas

Components for mounting VHF antennas to tube masts

Pair of clamps for one VHF panel

Order No.	Old type number*	Suitable for tube mast of mm \varnothing	Weight kg
75310466	K61120	60–115	3.4
75310465	K61130	115–210	4.5

* Number only for reference, do not use for ordering!

Material: Hot-dip galvanized steel.
Stainless steel bolts and nuts are supplied.



Further Accessories:

Weather protection caps

Order No.	Description
021097	straight
021226	elbow

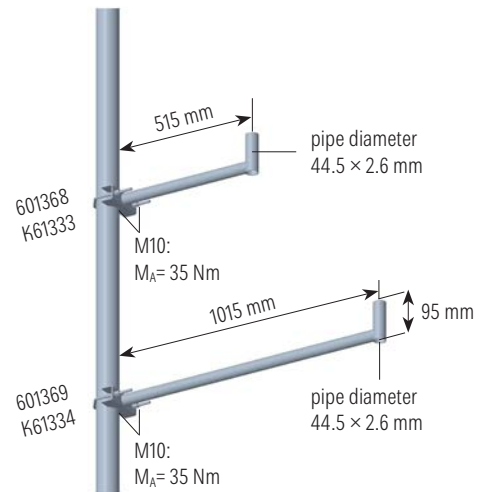


> Stand-off brackets

When mounted to the tip of a mast, the antennas described in this catalogue radiate horizontally in a circular fashion. However, they can also be mounted laterally to a mast by using an extension bracket. Depending on the spacing and the mast diameter, various types of radiation patterns can be achieved.

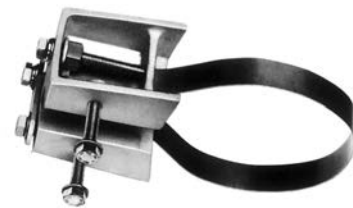
Bracket with fixed spacing

Type No.	601368 K61333	716192	601369 K61334	713645
Weight	2 kg	7 kg	3.2 kg	8.5 kg
Distance A:	500 mm		1000 mm	
Suitable for antennas with a maximum wind load of	215 N (at 150 km/h)		85 N (at 150 km/h)	
Suitable for antennas with mounting kit to pipe masts of 20–54 mm diameter				
Attachment by means of mounting kit (supplied) to pipes of diameter:	55 mm– 105 mm	105 mm– 265 mm	55 mm– 105 mm	105 mm– 265 mm
Material	Hot-dip galvanized steel.			
Wind load	36 N (at 150 km/h)		60 N (at 150 km/h)	



> Mounting Hardware for Power Splitters

Components for mounting power splitters to tube masts



Tension band for mounting medium power splitters

Order No.	Suitable for tube mast of mm Ø	Weight kg
759044	30–340	0.65

Stainless steel bolts and nuts are supplied.

Projects and Services

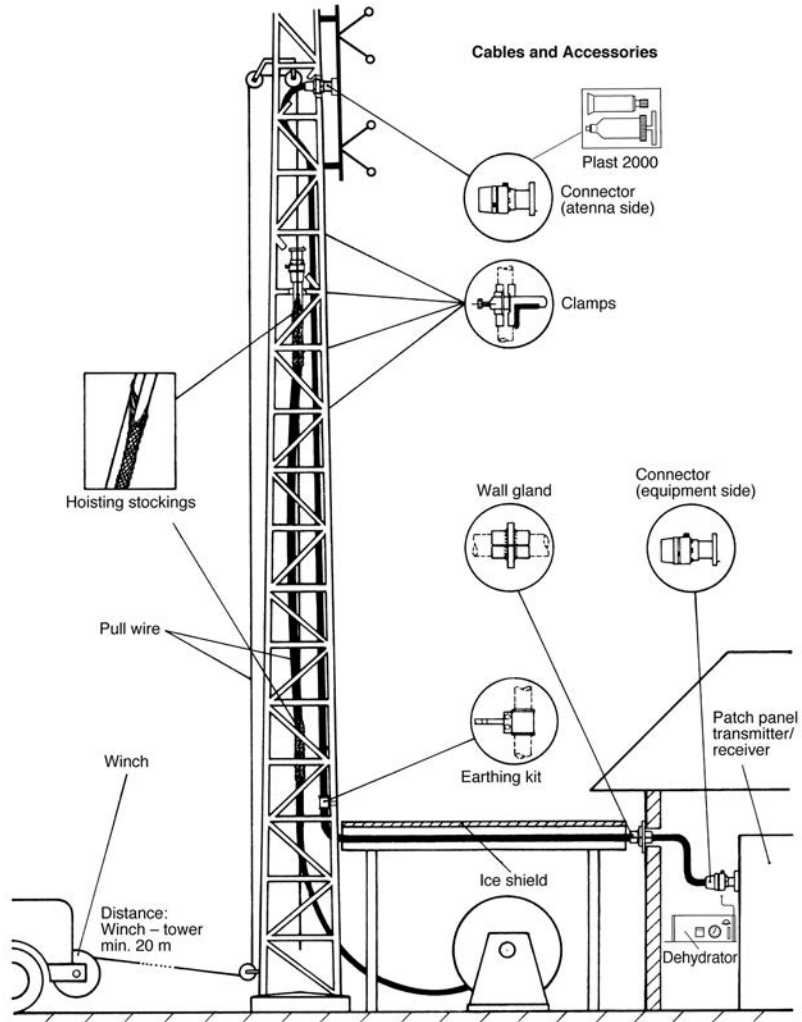
Type	Page
Coaxial Cables and Accessories	58
Service Portfolio	59

> Coaxial Cables and Accessories

- KATHREIN supplies products of high quality brands.
- Branch cables completely configured, phase-adjusted and fully tested.
- Feeder cables incl. accessories up to 6 1/8".
- Fire retardant jacket available.
- Air or foam dielectric cables.



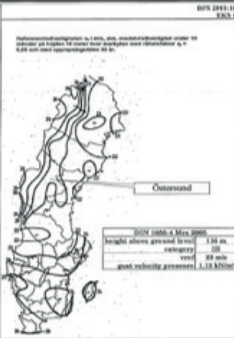
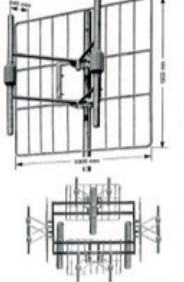
Photos: RFS



Service Portfolio

Kathrein also offers full turnkey-projects for Ground-to-Air Antenna Systems, e.g. consisting of:

- Site Survey
- System Planning
- Customized Engineering
- Fixation Design
- Hardware Delivery
- Installation and Commissioning

<p>GENERAL</p> <p>The following calculation is based on the antenna fastening. A sufficient load bearing capacity of the supporting structure is presumed.</p> <p>Site Ostersund, Sweden 475 m above sea level</p> <p>Antenna 4 panels K52 30 31, 2 bays with 4 panels each height over ground: 115,025 m</p> <p>Carrier Stave of C100</p> <p>Supporting structure 327 m triangular galvanized steel mast, side 2400 mm</p> <p>Material 8355 20x3 (St 52-3) DIN EN 10025 hot dip galvanized bolts: hot dip galvanized, stainless steel</p> <p>Standards BFS 2011:10 EK3:8 (Windmap Sweden) DIN 1055-4 2000: Wind loads DIN EN 1993-1-1 Eurocode 3: Design of steel structures</p> <p>Load specified none</p> <p>Analysis assumptions for comparison wind: 2.2 m/s (BFS 2011:10 EK3:8) q = 1.13 kN/m² (DIN 1055-4 2005)</p> <p>s.l.s. 2.0 kN/m² (-57 m/s), no ice s.l.s. 0.56 kN/m² (30 m/s) and 3 cm ice radial with 600 kg/m² live load 1 kN; no wind, no ice</p> <p>LOADS summary (including carrier and antenna)</p> <p>wind load at 50 m/s, no ice: 6.9 kN wind load at 30 m/s, 3 cm radial ice: 4.4 kN wind area (A_{ref}) no ice: 4.4 m² wind area (A_{ref}) 3 cm radial ice: 8.1 m² weight: 430 kg weight of 3 cm ice: 800 kg</p>		
		
<p>KATHREIN KATHREIN WERKE AG • Antennen-Systeme Postfach 100 444 • 83004 Rosenheim • Tel. 08031184-0</p> <p>DESIGN CALCULATION Ostersund Sweden</p> <p>page 3 753 10375</p>		



Please note

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

The mechanical design is based on the environmental conditions as stipulated in ETS 300 019-1-4.

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

Extraordinary operating conditions, such as heavy icing or exceptional dynamic stress (e.g. strain caused by oscillating support structures), may result in the breakage of an antenna or even cause it to fall to the ground. Cylindrical bodies can show crosswind response, which can cause the supporting structure to oscillate and to be damaged. Prismatic bodies, even with non-circular cross-section can show crosswind response, which can cause the supporting structure to oscillate (see EN 1991-1-4 or EN 1993-3-1). Fatigue calculations are required for structures having cylindrical parts. So a fatigue analysis must be carried out by a stress engineer for the supporting structure (mast) with the antenna.

These facts must be considered during the site planning process.

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

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

The limits for the coupling torque of RF-connectors, recommended by the connector manufacturers must be obeyed.

Our quality assurance system applies to the entire company and is certified according to EN ISO 9001.

The maximum wind velocities listed should be understood in the sense of working values according to DIN and EN standards. These values include a safety factor (1.5) below the ultimate limit state (elastic limit or permanent deformation). For these wind velocities we guarantee the mechanical safety and the electrical integrity of our antennas.

We confirm that the products shown in this catalogue are CE conform with respect to RoHS compliance.

MTBF Statement: Traditionally, passive components like antennas cannot be well calculated due to the lack of a sufficient number of components in the MTBF library. Unfortunately, this constraint results in a very inaccurate calculation. Thus, such results are technically questionable and unrealistic.

In essence, antennas are made out of mechanical parts that do not show any failure rates. Only available failure rates can be calculated into an MTBF value. Consequently such components cannot be listed in any MTBF library.

If ever calculations require concrete figures, a typical lifetime of > 15 years can be assumed.

We reserve the right to make alterations in accordance with the requirements of our customers, please also check: www.kathrein-bca.com

KATHREIN Broadcast GmbH
Ing.-Anton-Kathrein-Straße 2
83101 Rohrdorf
Germany

Phone +49 (0) 8031 6193-100
www.kathrein-bca.com | support@kathrein-bca.com

KATHREIN