

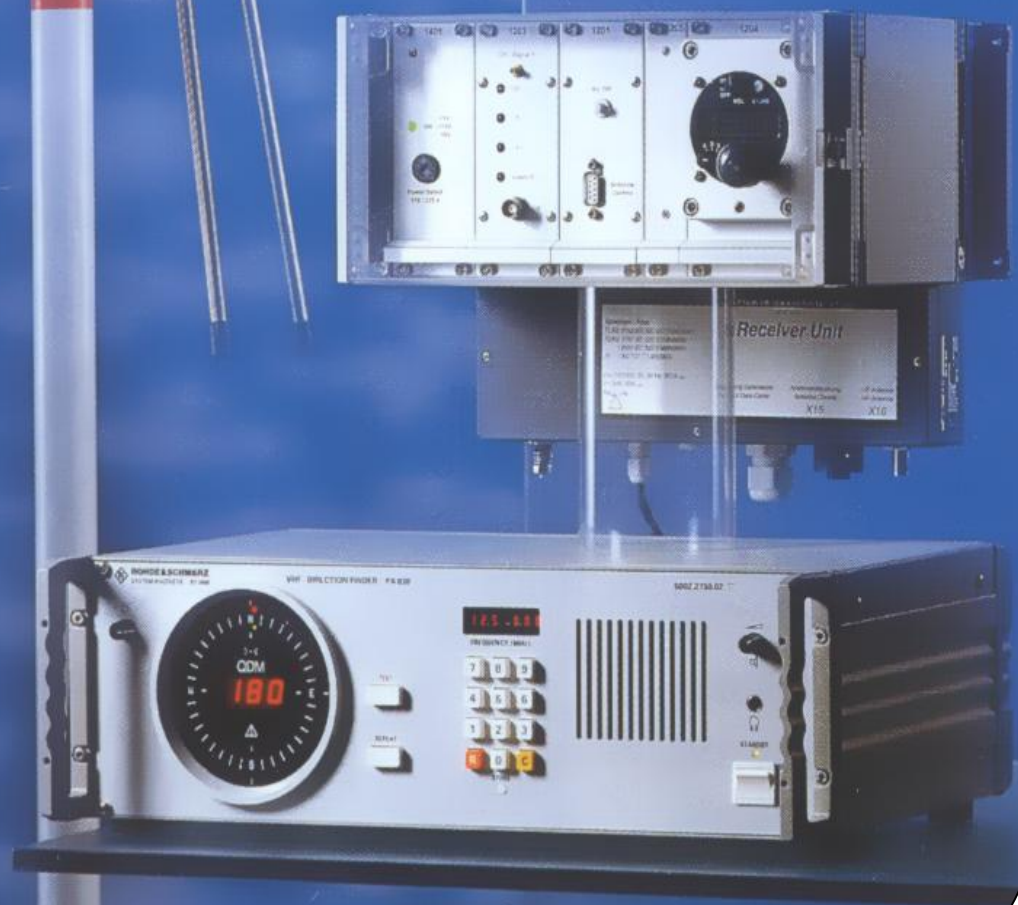
Product Information

RT-1000.C

RHO

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THETA



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Note:

The manufacturer reserves the right on making modifications of the product described herein at any time and without previous information.

1 General Information

The RT-1000 direction finder system is designed specifically for ATC and VTS applications and complies with ICAO and DFS (Deutsche Flugsicherung) requirements. The RT-1000 is used as an ATC navigation aid that allows controllers on the ground to transmit QDMs to the pilot or verify position reports received from aircraft. Bearing information can also be integrated into a radar screen, which makes it possible to immediately assign radio messages to the right targets on the radar display.

The RT-1000 is also suitable for stationary VTS applications.

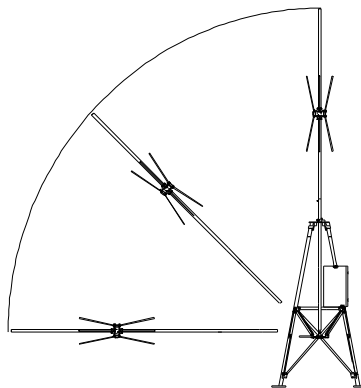
1.1 Characteristics

- High-precision Doppler direction finder
- Extremely high rotation frequency for fast signal processing
- Compact antenna system for simple installation
- Antenna location independent of controller workstation
- No infrastructure required for remote operation
- Maintenance-friendly modular construction
- RS-232 interface to permit system integration
- Frequency range:
 - Aviation band: 118.000 ... 136.975 MHz
 - Marine band: 156.000 ... 174.000 MHz
- Various scanning modes
- Two or more simultaneous channels optionally available

1.2 Description of the System

1.2.1 Antenna Mast (Option)

The special Mast RTA 1306 is recommended for the antenna system. The mast has a fixture which makes it possible to tilt the antenna down to working level to facilitate assembly and maintenance of the antenna. The integrated rotating stand makes it possible to rotate the antenna in 10° steps to effectively check the direction finding system. In addition, there is a weatherproof housing for the receiver unit.



1.2.2 Flexible System Configuration

All known radio direction finding methods are based on the utilization of the electromagnetic wave field generated by the transmitter to be found. Good results are only possible if this wave field at the direction finding position is largely undisturbed. Regrettably, incoming wave fields are distorted significantly in the tower area due to reflections and shadows from surrounding buildings. Even large and costly antenna systems can only solve these problems, resulting from physical facts, unsatisfactorily.

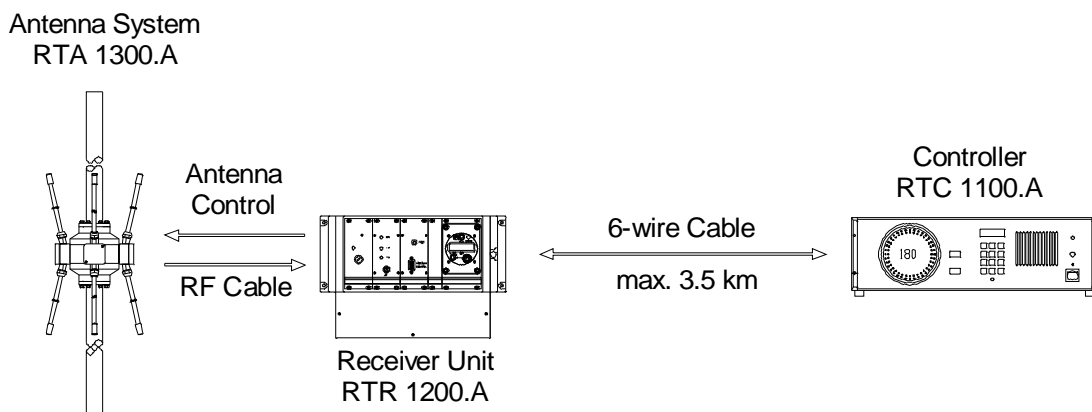
With "remote operation" the direction finder system RT 1000 realizes a concept permitting an antenna position to be chosen, which is almost totally independent from the controller's position. Hence, the antenna with its weatherproof receiver unit may be installed at a location within the airport area which is optimal for direction finding. The connection to the controller is made through a 6-wire line. Expensive equipment and costly infrastructures are eliminated in contrast to usual direction finding systems.

The Direction Finder System RT 1000 realizes an equipment family which can be utilized in a flexible manner. Apart from the advantage of being service-friendly, the consequent modular design makes it possible to have several system components variously equipped, so that the optimum system configuration is available with a minimum of equipment, depending on the application. There are four major variants for the traffic direction finding area.

Configuration C

The system operates in "remote mode". The direction finding antenna is installed remotely from the controller, at a location favourable for direction finding. Receiver, demodulator and antenna control module are integrated in the receiver unit located at the antenna position. They are connected to the controller by means of a 6-wire line.

Application: For applications, where the evaluation position does not provide for satisfactory direction finding conditions.



2 Technical Data

2.1 Electric Characteristics

Frequency range air band ¹⁾ :	118 to 136.975 MHz
Frequency range marine band ¹⁾ :	156 to 174.000 MHz
Operating channels air band:	760; 10 preselected
Channel pattern:	25 kHz
Bearable kinds of modulation:	A3E, F3E, A2X (ELT modulation)
System accuracy ²⁾ :	±2° RMS (with antenna) ±1° RMS (on request)
Sensitivity ³⁾ :	≤2 µV / m (without antenna amplifier)
Polarisation:	vertical
Polarisation error:	≤1° (with field vector rotation up to 45°)
Garbling cone:	approx. 35° referred to the vertical
Power supply:	AC: 115 / 230 V ±15 %; 47 to 63 Hz DC: 24 V -10 % / +20 %; automatic switch-over to DC voltage in case of AC mains failure
Power consumption:	Controller unit: max. 15 VA Receiver unit max. 10 VA
Temperature ranges:	Operating temperature: Antenna -40° to +80° C Receiver unit -40° to +60° C Controller unit -20° to +55° C Storage temperature: -40° to +60° C
Interfaces:	serial V.24 (RS-232-C) parallel

Bearing display:	A:	
	Digital Resolution	3 digits with 7-segment LED indicator 1°
	Bearing reference	QDR
	Updating rate	approx. one indication / s
	B:	
	Dual compass dial Resolution	2 concentrical circles of LED points 10°
	Bearing reference	QDR
	Updating rate:	
	Outer circle	approx. one indication / s
	Inner circle	47 indications / s
Bearing display response time:	≤ 0.3 s	
Monitoring:	Built-in speaker	
	Modulation mode	A3E
	Monitor output	approx. 500 mW 4 to 8 Ω
	Line output	600 Ω, balanced, 0 dBm, m = 0.6
Ground transmitter suppression:	with external contact to ground	

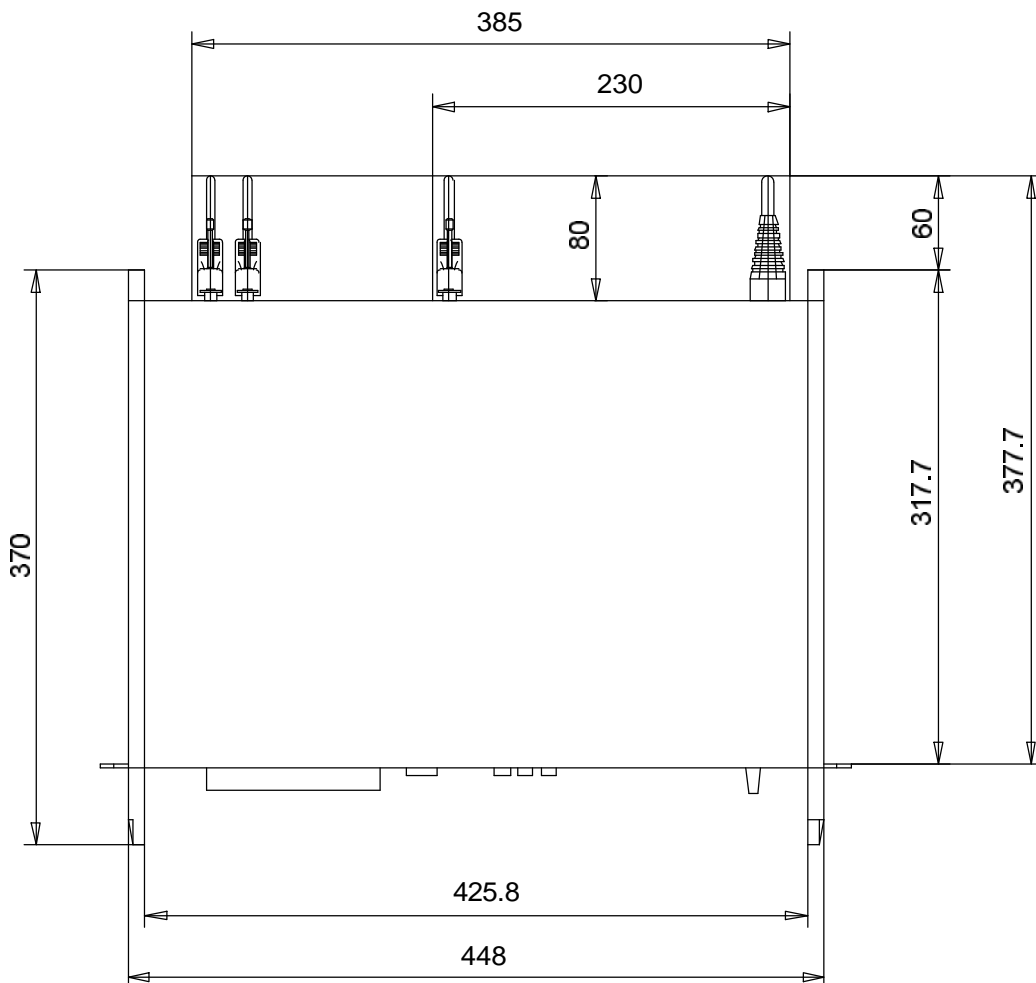
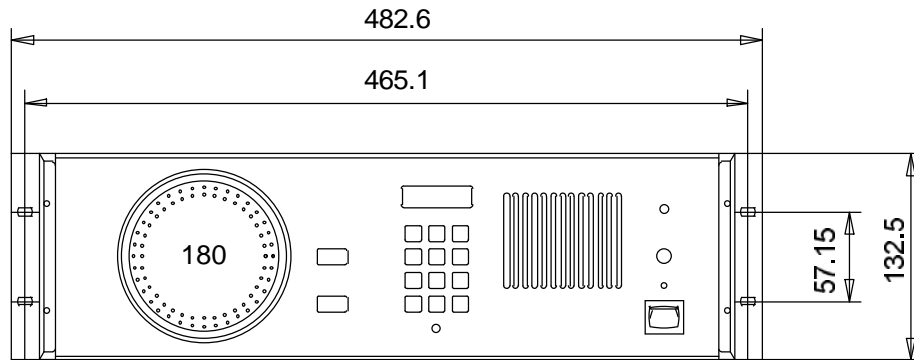
Notes:

- 1) *Not for configuration B (dependent on the type of receiver).*
- 2) *For undistorted wave reception and sufficient field strength. Measurement is made at constant frequency by changing the angle of incidence; in order to exclude site errors, angle variation is done by rotating the DF antenna on a rotator.*
- 3) *System sensitivity for ±1° bearing fluctuations (cable attenuation of less than 2 dB between antenna and the receiver, received signal vertically polarised).*

2.2 Mechanical Characteristics

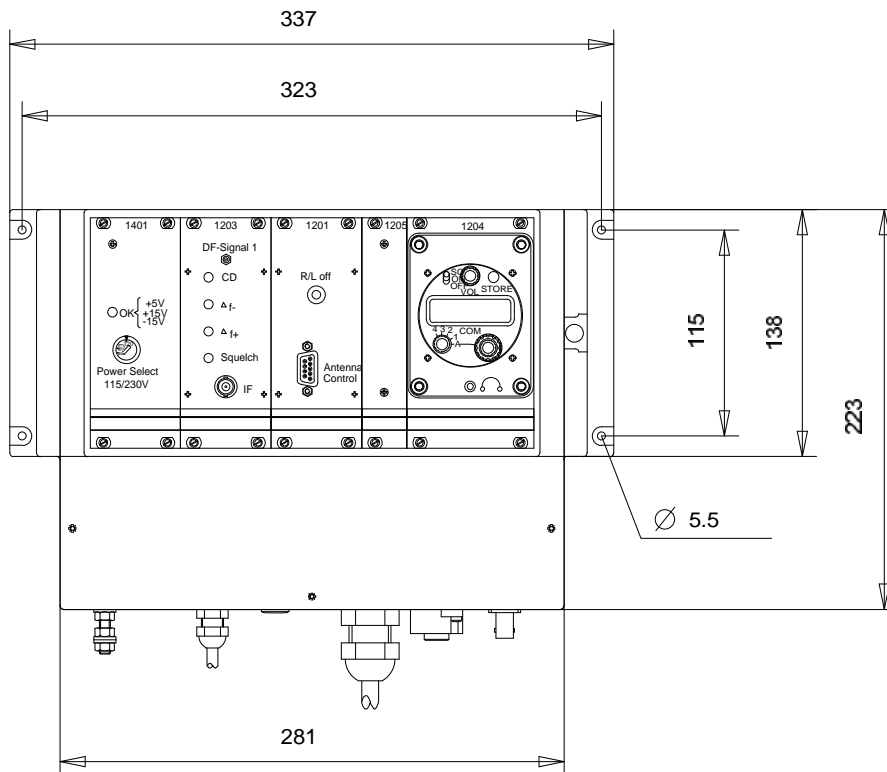
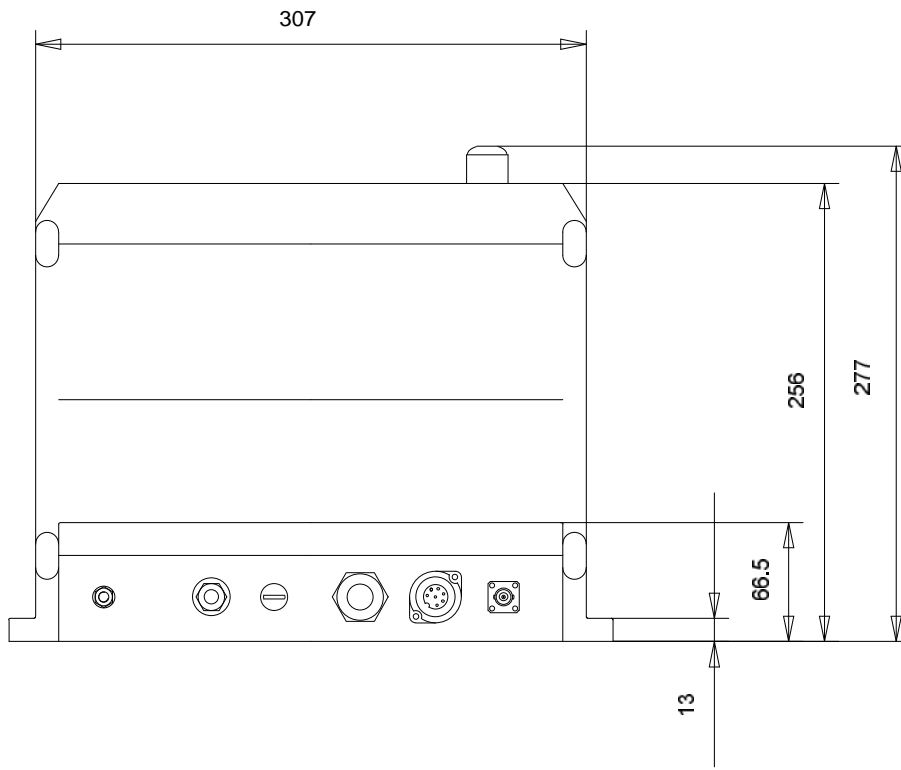
2.2.1 Controller

Casing:	19"-desk-top model 3 UH
Weight:	7.2 kg
Dimensions (H x W x D):	132.5 x 448 x 370 mm



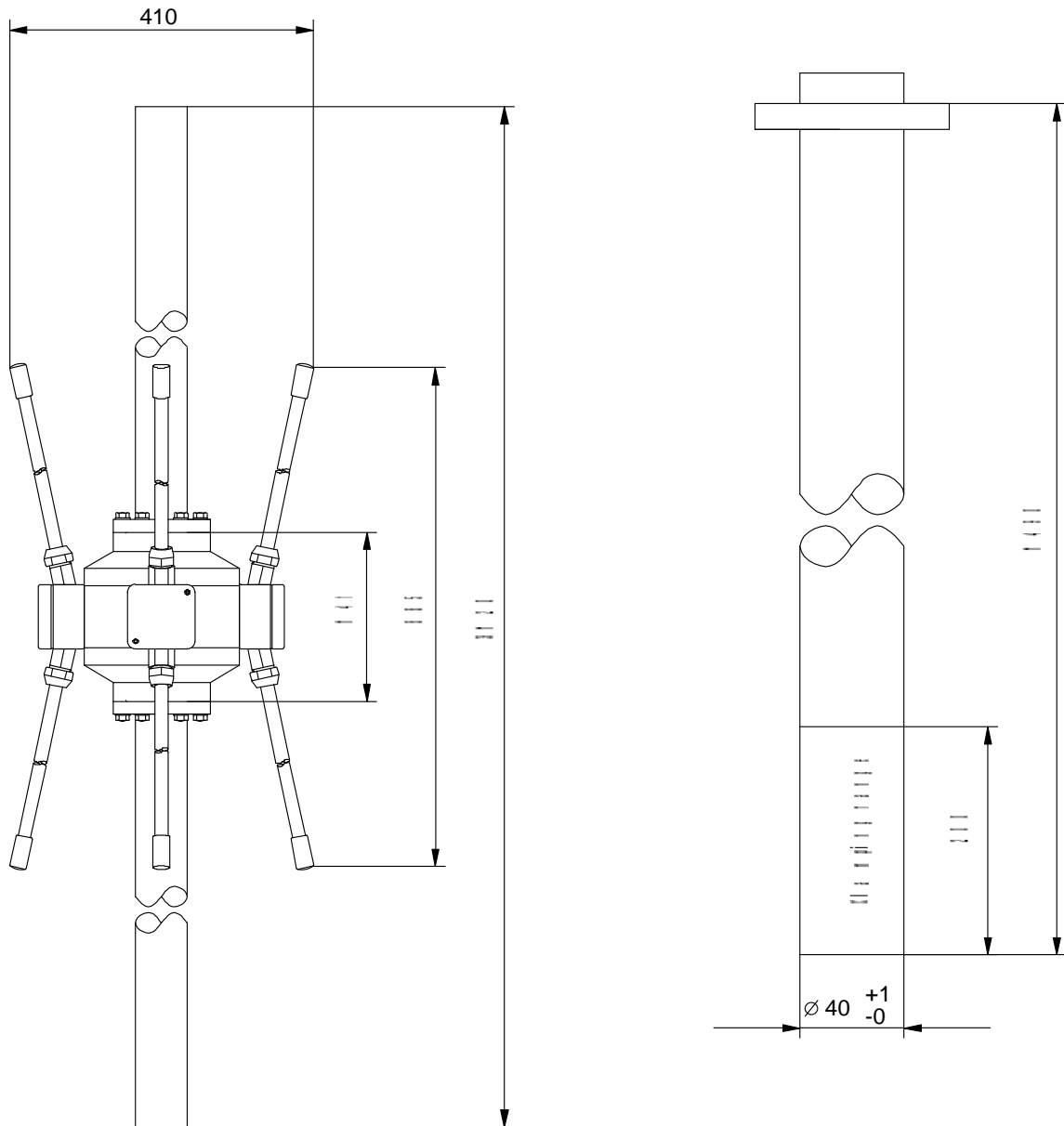
2.2.2 Receiver unit

Casing:	Non-metallic cabinet for wall mounting (IP 65)
Weight:	6.5 kg
Dimensions (H x W x D):	250 x 340 x 285 mm



2.2.3 Antenna System

Dimensions (Diameter x H)	400 x 1120 mm 400 x 3400 mm (with lightning rod and mast)
Weight:	3.6 kg
Lateral thrust due to wind with constant wind speed:	150 km / h approx. 135 N 180 km / h approx. 195 N (data with lightning rod and mast)



3 Supplied accessories

- Set of antenna cables
- AC cable
- Operating instructions
- Adapter for rack installation of controller
- Interface connector
- Antenna rod
- Lightning rod

4 Options

- Special antenna mast
- Mast extension
- Hazard light
- Dummy antenna
- Service kit
- Service manual
- Slave display
- Set of cables
- Antenna amplifier
- DC heating for receiver unit