

DWOR

2000



AZIMUT

Azimuthal Doppler Radio Beacon

DVOR 2000

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Function

The Radio Beacon is designed to generate and send out radio signals which provide measuring of the azimuthal angle of an aircraft equipped with VOR avionics. The Radio Beacon is used in airports and on flight lanes of civil aircrafts.

Principle of Operation and Signal Format

The DVOR 2000 Radio Beacon has the signal format of VOR avionics and conforms to the requirements applied to this equipment as set forth in "Appendix 10 to Convention on International Civil Aviation (ICAO)". The Radio Beacon can be used in package with distance measuring DME/N Radio Beacon as well as independently.

Radio Beacon Structure

The Radio Beacon consists of the hardware system (a rack containing the apparatus), the aerial assembly, two control aerials and the RCE 2000 remote control device. The signal generating, operating and control equipment of the Radio Beacon is contained in a rack equipped with a heat controlling system. The aerial assembly consists of one central and 48 radial radiating elements arranged along a circumference with a diameter of 13.5 meters. The radiating elements of the aerial assembly are situated on a reflective unit with a diameter of 30 meters.





Operation

The Beacon can be operated using a local control panel or the RCE 2000 remote control device which can be located up to 10 km away. Changes in the state of the hardware and in the Radio Beacon functionality are followed by light indication and audio alarm.

The RCE 2000 equipment provides access to the information regarding the state of the Radio Beacon functionality when necessary through the local Ethernet network using the TCP/IP protocol or through the ATN network in accordance with the CCITT X.25 protocol.

Control

The built-in control system provides finding and tracing of faults to the precision of a plug-in module (card) as well as automatic control over all the main parameters of the Radio Beacon. The Radio Beacon performance and the state of the hardware are shown on the coloured display in graphic mode. In the course of operation all the changes in the state of the equipment and all the actions of the personnel are recorded and stored on the remote control equipment for 30 days.

Back-Up

All the main units constituting the Radio Beacon are backed up, namely the signal generator, the transmitter, the control device, the control aerials, the power supply units and the control module.

One set of the main Radio Beacon units is placed in a rack (a cabinet). A similar rack with additional devices intended for switching over between the sets is used as a standby set. In the course of operation control over functionality of the main and standby set is ensured. Switching over to the standby set takes place automatically upon a signal from the control device.

Power Supply

The power supply for the Radio Beacon is provided by the main and reserve electric network 380/220 V and 50 Hz. The Radio Beacon can operate from storage batteries for 30 minutes. The Radio Beacon operates in uninterruptible twenty-four-hour mode and does not need permanent presence of the personnel.

Construction and Element Base

The construction of the rack and the modules is designed according to the IEC 297 standard (Euromechanics). Unitized modules, cards, and units as well as state-of-the-art elemental base and surface-mounting technology are applied in the hardware of the Radio Beacon.

Main Technical Specifications of DVOR 2000

Coverage:	
· in the horizontal plane	360°
· in the vertical plane	40°
· in the range (in conditions of direct visibility), at least	340 km (at the flight altitude of 12 000 m) 240 km (at the flight altitude of 6000 m)
Inaccuracy in data regarding azimuth	±1°
Frequency range	108.000 MHz to 117.950 MHz
Signal parameters (reference phase, alternating phase, detection, radiotelephone communication)	As required by ICAO

Control Over Output Parameters

Control over the main parameters (azimuth and signal strength)	As required by ICAO
Azimuth measurement range	0° to 360°
Azimuth measurements inaccuracy	±0.2°

Dimensions

Hardware (width×length×height)	2.5×4.5×2.7 m
Aerial assembly (diameter)	13.5 m
Aerial assembly reflective unit (diameter)	30 m

Power Supply

Main and reserve network	3~380/220 (+10%; -15%) V, 50 Hz
Power consumption, at most:	
· of the main equipment	2 kVA
· when the thermoregulation system is on	8 kVA
Operational time from UPS (storage battery), at least	30 minutes

Operating Conditions

Equipment outside of the container:	
· environment temperature	-50 °C to +50 °C
· precipitation effect (rain intensity), at most	3 mm/min
· wind force effect (wind speed), at most	50 m/s
Equipment inside of the container	-40 °C to +50 °C

Reliability

MTBF, at least	30 000 hours
Life cycle	15 years