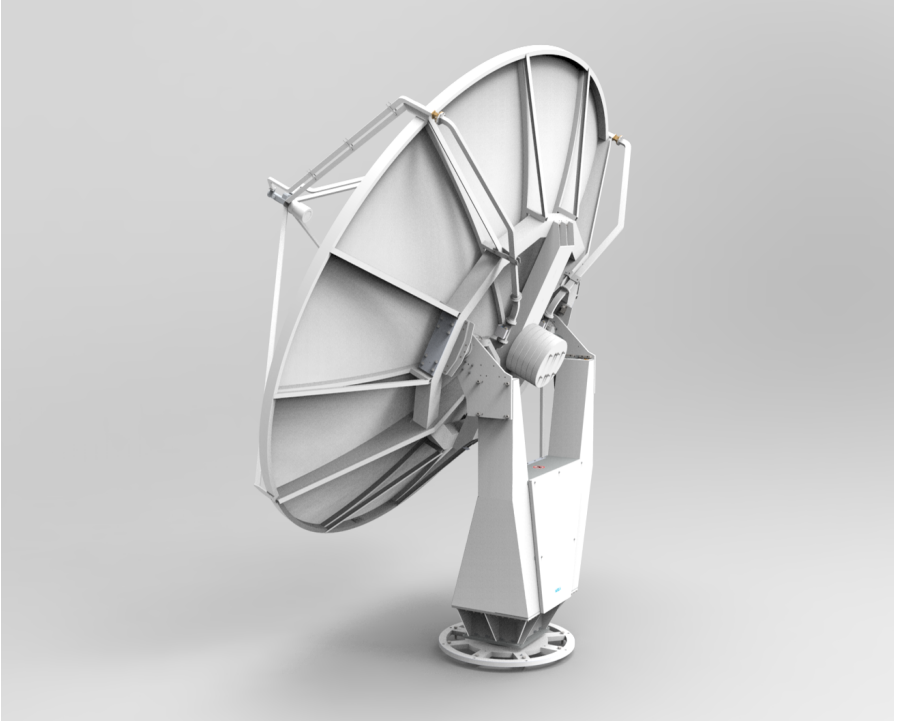
Weather Radar WRM100



Features

- 250 kW magnetron transmitter with low-maintenance solid-state modulator
- Vaisala lightweight, semi-yoke style pedestal
- 1° beamwidth low side lobe antenna
- Built around RVP900™ and IRIS™ software
- Image rejection > 80 dB (> 100 dB with Vaisala waveguide filters)
- Built-in automatic calibration (optional)
- Fully programmable scanning
- Dynamic range > 99 dB (2 µs pulse)
- Wide dynamic range digital IF receiver (optional)

Vaisala Weather Radar WRM100 is a single-polarization C-band radar that uses a magnetron transmitter.

Modular System Design

The modular system design consists of a high performance antenna/pedestal and a single cabinet that contains the transmitter, receiver, power supplies, dehydrator, processor, and polarization waveguide assembly.

The components have been engineered and tested for long life and low maintenance in even the most harsh environments.

Remote Operation

Comprehensive remote control, BITE, and active monitoring features allow radar maintenance to be coordinated from a central facility to reduce repair time and ensure data availability.

The detailed level of fault reporting allows maintenance personnel to accurately assess any problem before traveling to radar sites.

Upgrade Options

WRM100 can be upgraded to dual-polarization. The upgrade options are:

- Dual-polarization waveguide structures installed in the factory but taken into use later with software installations carried out at the site.
- On-site upgrade, including software upgrades and the installing dual-polarization waveguide structures.

Technical Data

Transmitter

Transmitter tube	Coaxial magnetron VMC-2033A
Modulator type	Solid-state, utilizing IGBT technology
Frequency range	5.5 ... 5.7 GHz
Peak power	250 kW
Pulse widths	0.5, 0.8, 1.0, or 2.0 µs.
Duty cycle	0.12 %
Phase stability	< 0.5° rms
Pulse Repetition Frequency	50 ... 2400 Hz
Average Power	300 W, 0.0012 duty cycle
Modes	STAR or LDR
Dimensions (W × H × D)	483 × 622 × 920 mm
Weight	76 kg (typical configuration)

Antenna and Pedestal

Total weight (4.5 m antenna and pedestal)	1520 kg

Antenna

Type	Center-fed parabolic reflector
Reflector diameter	4.5 m
Gain (typical)	45 dB
Beam width	< 1.0°
Difference between H and V beam widths	< 0.1° (<0.2 dB difference in gain)
Peak sidelobes at main polarization planes	< -29 dB
Cross-pol isolation at main polarization planes	< -36 dB
Weight (reflector with counterweight plate)	620 kg

Pedestal

Type	Semi-yoke elevation over azimuth
Angle span software limits	-2 ... 108°
Maximum scan rate (azimuth and elevation)	40 degrees/second (6.67 rpm)
Acceleration	20 degrees/second[2]
Position accuracy	< 0.1°
Motors	Brushless AC servo
Weight	900 kg

Signal processing

Signal processor	Vaisala RVP900
Azimuth averaging	2 ... 1024 pulses
Clutter filters	IIR, fixed, and adaptive width GMAP > 50 dB rejection
Data outputs (8 and 16 bit)	`Ah/v`, `Azdr`, `CCOR`, `CSP`, `CSR`, `dBT`, `dBZ`, `dBZt`, `LOG`, `R`, `SNR`, `SQI`, `T`, `V`, `VC`, `W`, `Z`, `ZC`,`Zh`, `Zv`
Dual PRF velocity de-aliasing	2:3, 3:4, or 4:5 for 2X, 3X, or 4X de-aliasing
High sensitivity `Rhv` `STAR`mode processing	> 3 dB improvement detection gain
IF digitizing	16 bits, 100 MHz in 5 channels
Number of range bins	Up to 8168 per channel
Optional data outputs	`I/Q`
Processing modes	PPP, FFT/DFT, Random Phase 2nd trip filtering/ recovery
Range resolution	N*15 m
Range de-aliasing by random phase	

System Specifications

Input power	Voltage: 3-phase 230/400 VAC ± 10 % 50-60 Hz ± 5 % Site mains supply fuses: min 16 A
Pedestal	Max. 1050 W Typical 200 W
Radar cabinet[1)]	Max. 2500 W Typical 2000 W [2)]
Phase stability	< 0.5° rms
Maximum RhoHV	> 0.99

1) Includes cabinet cooler power consumption.
2) Ambient temperature +22 °C, RH 50 %.

Options

Radome	Typical 6.7 m, foam core sandwich, random panel
Dual pol ready	Factory prepared antenna and pedestal for dual polarization.
Automatic calibration	
Forward and reverse transmitted power monitoring	
Wide dynamic range receiver > 115 dB	

Radar Receiver

Type	Dual-stage downconverter and digitizer
Noise figure	< 2 dB
Dynamic range	> 99 dB (2 µs pulse) (option > 115 dB)
Image rejection	> 80 dB > 100 dB with waveguide filters
Tuning range	5.5 ... 5.7 GHz
1st intermediate frequency	442 MHz
2nd intermediate frequency	60 MHz

Radar Controller

Type	Vaisala RCP8 with IRIS Radar
Scan modes	PPI, RHI, Volume, Sector, Manual, Rapid Scan
Local display	Real time, Ascope, BITE, products

Radar Cabinet

Dimensions (W × H × D)	600 × 1800 × 1150 mm
Total height	1890 mm[1)]
Weight	380 kg
Cooling	Air-conditioned
Operating temperature	+10 ... + 40 °C
Recommended operating temperature	+15 ... + 25 °C
Operating humidity	0 ... 95 % RH, non-condensing
Storage temperature	-50 ... +50 °C
Operating altitude/ Ambient pressure	Up to 3000 m Up to 700 hPA

1) The total height includes the cabinet protection unit and cabinet legs.

CE

VAISALA

www.vaisala.com

Published by Vaisala | B210697EN-G © Vaisala Oyj 2020