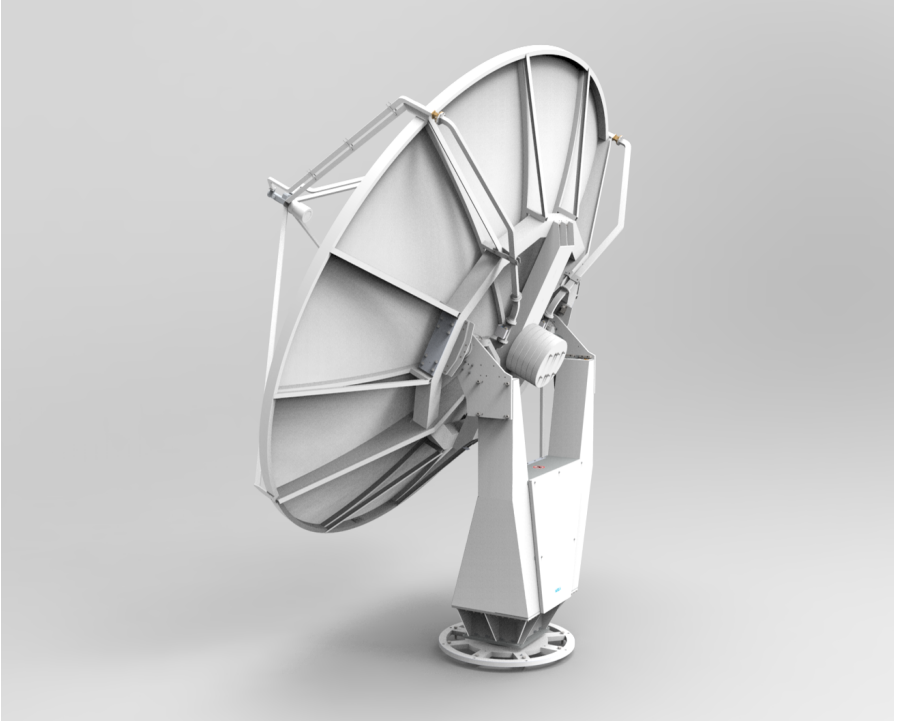
Weather Radar WRM200



Features

- 250 kW magnetron transmitter with low-maintenance solidstate modulator
- Vaisala lightweight, semi-yoke style pedestal
- 1° beamwidth low side lobe antenna
- Modular single cabinet design containing transmitter, receiver, controller, processor, dehydrator, polarization waveguide assembly
- Built around RVP900™ and IRIS™ software
- Remote control and monitoring
- Image rejection > 80 dB (> 100dB with Vaisala waveguide filters)
- Optional built-in automatic dual channel calibration

Vaisala Weather Radar WRM200 is a dual polarization C-band radar that uses a magnetron transmitter.

Dual-polarization

- Precision horizontal and vertical beam matching
- > 35 dB integrated cross-polarization isolation
- Enhanced reflectivity processing in STAR mode.

Dual polarization radars send vertically and horizontally polarized microwaves to measure the parameters needed for analyzing the target shape and improving data quality.

Targets are identified as, for example, rain, hail, or snow using sophisticated data processing techniques.

HydroClass™

Vaisala Hydrometeor Classification (HydroClass) software makes optimal use of dual-channel measurements to detect the types of scatterers present in the atmosphere, such as rain, hail, snow, graupel, and even non-meteorological targets such as insects, chaff, and sea clutter.

The benefit is improved data quality and more accurate warnings for hazardous weather such as hail.

Enhanced Reflectivity

Enhanced reflectivity is a signal processing technique that improves the detection capabilities of a dual polarization radar.

The technique uses echo power estimation to improve the detectivity of weak signals over a long range.

Enhanced reflectivity is exclusive to Vaisala dual polarization radars and RVP900™.

Attenuation Correction

Attenuation by intervening heavy precipitation has been a long-standing problem with C-band weather radars, making S-band radars preferable, especially in tropical environments where heavy rain is common.

However, dual polarization radars perform accurate, real-time attenuation corrections. You can obtain the same precipitation measurement accuracy using WRM200 as with an S-band system that typically costs significantly more.

Technical Data

Transmitter

Transmitter tube	Coaxial magnetron VMC-2033A
Modulator type	Solid state
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

Antenna and Pedestal

Operating temperature	-40 ... +55 °C
Operating humidity	0 ... 95 % non-condensing
Storage temperature	-50 ... +60 °C
Total weight (4.5 m antenna and pedestal)	1530 kg
Operating altitude/Ambient pressure	Up to 3000 m Up to 700 hPA

Antenna

Type	Center-fed parabolic reflector
Reflector diameter	4.5 m
Gain (typical)	45 dB
Beam width	< 1.0°
Peak side lobes at main polarization planes	< -28 dB
Integrated cross-pol isolation	< -36 dB
H/V alignment (squint angle)	< 0.1°
Weight (4.5 m reflector)	620 kg

Pedestal

Type	Semi-yoke elevation over azimuth
Angle span software limits	-2 ... 108°
Maximum scan rate	40 degrees/second
Acceleration	20 degrees/second^2
Position accuracy	< 0.1°
Motors	Brushless AC servo
Weight	910 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`, `KDP`, `LDR`, `LOG`, `PHIH/V`, `PHIDP`, `PMI`, `R`, `RHOHV`, `SNR`, `SQI`, `T`, `V`, `VC`, `W`, `Z`, `ZC`, `ZDR`,`ZDRC`,`Zh`, `Zv`, `Zhv`
Dual PRF velocity de-aliasing	2:3, 3:4, or 4:5 for 2X, 3X, or 4X de-aliasing
High sensitivity `Zhv STAR` mode processing	> 3 dB improvement detection gain
IF digitizing	16 bits, 100 MHz in 5 channels
Number of range bins	Up to 4200
Optional data outputs	`HCLASS, I/Q`
Processing modes	PPP, FFT/DFT, Random Phase 2nd trip filtering/ recovery
Range resolution	N*15 m
Range dealiasing 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	1050 W (max.) / 200 W (typical)
Radar cabinet	2650 W[1)]
Cabinet cooler	1500 W
Phase stability	< 0.5° rms
Maximum RhoHV	> 0.99

1) Includes cabinet cooler power consumption.

Options

Radome	Typical 6.7 m, foam core sandwich, random panel
Automatic calibration	
Forward and reverse transmitted power monitoring	
Wide dynamic range receiver > 115 dB	

Radar Receiver

Type	Dual stage, dual channel IF downconverter and digitizer
Noise figure	< 2 dB
Dynamic range	> 99 dB (2 microsecond 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 x h xd)	600 x 1800 x 1150 mm
Total height	1890 mm[1)]
Weight	380 kg
Cooling	Air-conditioned
Operating temperature range	+10 ... + 40 °C
Recommended operating temperature range	+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 pedestal protection unit and cabinet legs.

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