# VAISALA

## Vaisala Weather Radar WRM100

### High performance and reliability

The WRM100 is Vaisala's single polarization C-band magnetron Doppler weather radar. This is the most widely used type of weather radar because of its low initial and lifecycle costs. With modern digital receiver and processing techniques, the performance of magnetron systems now rivals costlier Klystron systems.

#### **Features**

- 250 KW magnetron transmitter with low-maintenance solidstate modulator
- Vaisala's lightweight, semi-yoke style pedestal
- 1 degree beamwidth low side lobe antenna
- Modular single cabinet design containing transmitter, receiver, controller, processor, dehydrator
- Built around Sigmet RVP900, RCP8 and IRIS software
- Wide dynamic range digital IF receiver
- Built-in automatic calibration
- Fully programmable scanning
- Comprehensive BITE
- Integral flat screen display for local maintenance
- Remote control/monitoring
- Image rejection >80 dB (>100dB with Vaisala WG filters).
- Dynamic range > 99 dB ( 2 µs pulse). Optional wide dynamic range > 115 dB

The modular system design consists of a high performance antenna/ pedestal and a single cabinet that contains the transmitter, receiver, power supplies, dehydrator and processor. The various components have been engineered and tested for long life and low maintenance in even the most harsh environments. The benefit is high data quality and availability for critical weather service operation.

Like all Vaisala Weather Radars, the WRM100 is built around Sigmet's advanced family of signal and data processing products. Sigmet processors are the world standard, used in radar networks such as the US NEXRAD. Environment Canada, Spanish INM and at various international airports for TDWR wind shear detection applications. Seamless interface into Sigmet's IRIS product line provides comprehensive radar product generation, display and forecasting features. Integration into other Vaisala systems such as lightning detection networks, rain gauges, LLWAS and surface weather is also available.

### Engineered for remote operation

For most customers, unattended remote operation is essential. The WRM100's comprehensive remote control, BITE and active monitoring features allow radar maintenance to be coordinated from a central facility. The detailed level of fault reporting allows maintenance personnel to accurately assess any problem before traveling to radar sites. The obvious benefit is reduced MTTR and higher data availability.



### Investment protection for the future

The service life of a modern weather radar system can be over 15 years, during which time there will be major technology advances. Vaisala's modular approach and use of accepted open interface standards is designed to make the WRM100 upgradeable. For example, the system can be purchased as dual polarization ready, or upgraded in the field to dual polarization. Sigmet has three decades of experience in providing compatible signal and data processing upgrades for weather radar systems.

A weather radar is typically the single largest investment that a weather service will make. In some cases it may require several years to fully implement a modern weather radar network. Vaisala has over 70 years' experience in supporting and servicing our customers and products for the long term.

### **Technical data**

#### Transmitter

Туре	Coaxial magnetron
Operating frequency range	5.5 - 5.7 GHz
Peak power	250 kW
Average power	max 300 W
Duty cycle	0.12 %
Pulse widths	0.5, 0.8, 1.0, 2.0
PRF	200 to 2400 Hz
Modulator	Solid State
Phase stability	<0.5 deg rms

#### Antenna

Туре	Center-fed parabolic reflector
Diameter	4.5 m
Gain (typical)	45 dB
Beam width	<1 degree
Peak side lobe (typical)	-28 dB
Peak on horizontal axis (typical)	-33 dB
Polarization	Linear Horizontal
Weight	620 kg

#### Pedestal

Туре	Semi yoke elevation over azimuth
Elevation range	-2 to 108 degrees
Maximum scan rate	40 deg/sec
Acceleration	20 deg/sec <sup>2</sup>
Position accuracy	0.1 deg
Weight	900 kg (total with antenna 1520 kg)
Motors	Brushless Ac servo

#### **RF-to-IF** receiver

Туре	Dual stage, dual channel IF downconverter
Dynamic range	> 99 dB ( 2 µs pulse )
Optional wide dynamic	range > 115 dB
IF frequency	442/60 MHz
Image rejection	> 80 dB (> 100dB with Vaisala WG filters)
Tuning range	5.5 - 5.7 GHz
Noise figure	< 2 dB

#### **Digital receiver and signal processor RVP900**

Туре	VAISALA SIGMET RVP900
IF digitizing	16 bits, 100 MHz in 5 channels
Range resolution	N*15 m
Number of range bins	Up to 4050
Velocity dealiasing	Dual PRF 2x, 3x, 4x
Range dealiasing	by random phase
Clutter filters	fixed, adaptive or GMAP
	to >55 dB clutter cancellation



#### **Radar controller**

Туре	VAISALA SIGMET RCP8 with IRIS/Radar
Scan modes	PPI, RHI, Volume, Sector, Manual
Local display	Real time, ascope, BITE, products
System specificat	ions
PHYSICAL DIMENSIONS	
Cabinet (w x h x d)	600 x 1800 x 1150 mm
Cooling	Air-conditioned
Weight	365 kg
Total height	1890 mm
CABINET ENVIRONMEN	IT
Operating +10	° to +40 °C,0 to 95% R.H., non condensing
Recommended	+15 ° to +25 °C
Storage	-50 ° to +50 °C
ANTENNA/PEDESTAL ENVIRONMENT	
Operating -40	$^\circ$ to +55 °C,0 to 95 %R.H., non condensing
Storage	-50 ° to +60 °C
INPUT POWER	
Voltage	230/400 VAC ±10 %,50 - 60 Hz ±5 %
POWER CONSUMPTION	l
Cabinet	2650 W
Antenna/Pedestal	1050 W (max), 200 W (typical)
UPS	
Size (w x h x d)	305 x 817 x 702 mm
Weight	165 kg
Uptime	Not less than 30 min

### **Options**

Dual pol ready

Factory prepared antenna and pedestal for dual pol.

Typical 6.7 m, foam core sandwich, random panel Radome Automatic calibration

Forward and reverse transmitted power monitoring



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