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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.

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.

Features

- 250 KW magnetron transmitter with low-maintenance solid-state 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 RVP8, 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
- Option: Dual polarization upgrade ready
- Option: Low-loss radome

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 over 27 years 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

Type:	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

Type:	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

Type:	Semi yoke elevation over azimuth
Elevation Range:	-2 to 108 degrees
Maximum Scan Rate:	40 deg/sec
Acceleration:	20 deg/sec^2
Position Accuracy:	0.1 deg
Weight:	900 kg (total with antenna 1520 kg)
Motors:	Brushless Ac servo

RF-to-IF Receiver

Type:	Dual stage, dual channel IF downconverter
Dynamic Range:	> 95 dB
IF Frequency:	442/60 MHz
Image Rejection:	>50 dB
Tuning Range:	5.5 - 5.7 GHz
Noise Figure:	< 2 dB

Digital IF Receiver and Signal Processor

Type:	VAISALA SIGMET RVP8
Dynamic Range (2.0 microsec):	>95 dB (option 110 dB)
IF Digitizing:	14 bits, 72 MHz in 3 channels
Range resolution:	N*25 m
Number of range bins:	Up to 3096
Velocity dealiasing:	Dual PRF 2x, 3x, 4x
Range dealiasing:	by random phase

Radar Controller

Type:	VAISALA SIGMET RCP8 with IRIS/Radar
Scan modes:	PPI, RHI, Volume, Sector, Manual
Local Display:	Real time, ascope, BITE, products

System specifications

PHYSICAL DIMENSIONS	
Cabinet (w x h x d):	600 x 1800 x 1150 mm
Cooling:	Air-conditioned
Weight:	365kg
Total height:	1890 mm
ENVIRONMENT	
Cabinet	
Operating:	+10° to +40° C, 0 to 95% R.H., non condensing
Recommended:	+15° to +25° C
Storage:	-50° to +50° C
ANTENNA/PEDESTAL	
Operating:	-40° 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	
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.

Radome
Typical: 6.7 m, foam core sandwich, random panel

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For more information, visit www.vaisala.com or contact us at sales@vaisala.com

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