

# Vaisala Weather Radar WRM200

## Dual polarization adds new dimension

The WRM200 is Vaisala's new dual polarization C-band magnetron Doppler Weather Radar. The radar

### 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
- >35 dB integrated cross-polarization isolation
- Precision horizontal and vertical beam matching
- Modular single cabinet design containing transmitter, receiver, controller, processor, dehydrator, polarization waveguide assembly
- Built around Sigmet RVP8, RCP8, IRIS
- Dual channel digital IF receiver
- Built-in automatic dual channel calibration
- Fully programmable scanning
- Comprehensive BITE
- Integral flat screen display for local maintenance
- Remote control/monitoring
- HydroClass™ for real-time target identification (hail, graupel, rain, snow, wet snow, non-met)
- Accurate attenuation correction
- Rainfall estimation based on KDP
- Option: Low-loss, random-panel radome

operates in either STAR mode (simultaneous transmit and receive of H and V) or LDR mode (linear depolarization mode, during which H alone is transmitted and both are received). The polarization variables, depending on the mode, are ZDR, RHOHV, PHIDP, KDP and LDR.

However, the goal of a polarization radar is not only to produce and display these outputs; rather it is to expand the capabilities of the radar for the operational forecaster.

The WRM200 provides the following benefits:

- Hydrometeor identification
- Attenuation correction
- Data quality improvement
- Improved rainfall estimates

## HydroClass™ - Seeing much more

HydroClass™ software uses polarization measurements in a proven fuzzy logic algorithm to classify targets into categories. i.e. hail, graupel, rain, snow, wet snow or non-meteorological targets (such as sea clutter, birds, insects, wind turbines, interference, or military chaff) While traditional Doppler clutter filtering can remove stationary targets, HydroClass™ can also remove moving non-meteorological targets like sea clutter. The benefit is improved data quality and more accurate warnings for hazardous weather such as hail.

## S-band performance at a C-band price

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, with dual polarization, a radar performs accurate, real-time attenuation corrections. The benefit is that you can obtain the same precipitation measurement accuracy using the WRM200 as with an S-band system that typically costs two or three times more.

## Experience, innovation and dependability

Vaisala Sigmet Product line has over 27 years of experience in providing signal and data processing systems for dual polarization applications, and delivers more dual polarization processing systems than any other manufacturer. Vaisala and Sigmet, as a part of Vaisala, continue developing the dual polarization applications with respected consultants in the research community.

# 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 $\mu$ s
PRF:	200 to 2400 Hz
Modulator:	Solid State
Modes:	STAR or LDR
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
Integrated Cross-Pol:	<-35 dB
H/V Alignment (squint angle):	<0.1 degrees
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 <sup>2</sup>
Position Accuracy:	0.1 deg
Weight:	910 kg (total with antenna 1530 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
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:	380kg
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 $\pm$ 10 %, 50-60 Hz $\pm$ 5 %
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### 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

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



# VAISALA

For more information, visit  
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