



### Features

- 250 kW klystron transmitter with low-maintenance solid-state modulator
- Vaisala lightweight, semi-yoke style pedestal
- 1° beamwidth low side lobe antenna
- Feed forward control loop to allow extremely fast and precise antenna movement
- Built around RVP900™ and IRIS™ software
- Remote control and monitoring
- Image rejection > 80 dB (> 100 dB with Vaisala waveguide filters)
- Dynamic range > 99 dB (2 μs pulse)
- Optional built-in automatic dual-channel calibration

Vaisala Weather Radar WRK200 is a dual-polarization C-band radar that uses a coherent klystron transmitter.

### Dual-polarization

- Precision horizontal and vertical beam matching
- > 35 dB integrated cross-polarization isolation
- Dual-channel digital IF receiver

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.

### 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™.

### 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.

### Attenuation Correction

Attenuation by intervening heavy precipitation has been a long-standing concern with weather radars, especially in tropical environments where heavy rain is common.

Dual-polarization radars meet this challenge by performing accurate, real-time attenuation corrections.

# Technical Data

## Transmitter

Transmitter tube	Klystron VKC8387
Frequency range	5.6 ... 5.65 GHz
Peak power	250 kW
Average power	max. 550 W
Duty cycle	0.0022
Pulse widths	Typical 0.5, 0.8, 1.0, 2.0, max. 5.0 $\mu$ s
Pulse repetition frequency	250 ... 2125 Hz
Modulator	Solid state
Phase stability	<0.1 degrms

## Antenna and Pedestal

Total weight (4.5 m antenna and pedestal)	1530 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
Integrated cross-pol isolation	< -35 dB
Cross-pol isolation at main polarization planes	< -36 dB
H/V alignment (squint angle)	< 0.1°
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 <sup>2</sup>
Position accuracy	< 0.1°
Motors	Brushless AC servo
Weight	910 kg

## Signal processing

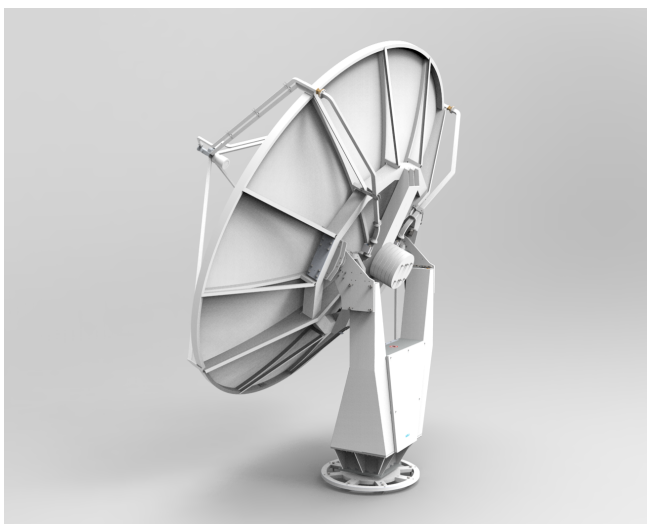
Signal processor	Vaisala RVP900
Azimuth averaging	2 ... 1024 pulses
Clutter filters	IIR, fixed, and adaptive width GMAP > 55 dB rejection
Data outputs (8 and 16 bit)	Ah/v, Azdr, CCOR, CSP, CSR, dBT, dBZ, dBZt, KDP, LDR, LOG, PHIH/V, PHIDP, PMI, R, RHOHV, SNR, SQI, T, V, VC, W, Z, ZC, ZDR,ZDRc,Zh, Zv, 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 8168 per channel
Optional data outputs	HCLASS, I/Q
Processing modes	PPP, FFT/DFT, Random Phase 2nd trip filtering/recovery
Range resolution	N*22 m
Range de-aliasing by random phase	

## System specifications

Input power	Voltage: 3-phase 230/400 VAC $\pm$ 10 % 50- 60 Hz $\pm$ 5 % Site mains supply fuses: min 25 A
Pedestal	1050 W (max.) / 200 W (typical)
Radar cabinet	Max. 8720 W with UPS Max. 7850 without UPS
Phase stability	< 0.1° rms
Maximum RhoHV	> 0.99

## 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 $\mu$ s 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)	1400 × 1800 × 1300 mm
Total height	1890 mm <sup>1)</sup>
Weight	977 kg
Cooling	Equipment rack: air-conditioned Transmitter: forced air
Operating temperature	+5 ... +40 °C +15 ... +25 °C recommended
Operating humidity	0 ... 95 %RH, non-condensing
Storage temperature	-50...+50 °C without oil -10 ... +50 °C with oil
Operating altitude/ Ambient pressure	Up to 3000 m Up to 700 hPA

<sup>1)</sup> The total height includes the cabinet protection unit and cabinet legs.

