

## МЕТЕОРОЛОГИЧЕСКИЕ РАДАРЫ

WRK 100, 200

## ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

По вопросам продаж и поддержки обращайтесь:

Архангельск (8182)63-90-72	Калининград (4012)72-03-81	Новосибирск (383)227-86-73	Сочи (862)225-72-31
Астана +7(7172)727-132	Калуга (4842)92-23-67	Омск (3812) 21-46-40	Ставрополь (8652)20-65-13
Астрахань (8512) 99-46-04	Кемерово (3842)65-04-62	Орел (4862)44-53-42	Сургут (3462) 77-98-35
Барнаул (3852) 73-04-60	Киров (8332)68-02-04	Оренбург (3532)37-68-04	Тверь (4822)63-31-35
Белгород (4722)40-23-64	Краснодар (861)203-40-90	Пенза (8412)22-31-16	Томск (3822)98-41-53
Брянск (4832)59-03-52	Красноярск (391)204-63-61	Пермь (342)205-81-47	Тула (4872)74-02-29
Владивосток (423)249-28-31	Курск (4712)77-13-04	Ростов-на-Дону (863)308-18-15	Тюмень (3452)66-21-18
Волгоград (844)278-03-48	Липецк (4742)52-20-81	Рязань (4912)46-61-64	Ульяновск (8422)24-23-59
Вологда (8172)26-41-59	Магнитогорск (3519)55-03-13	Самара (846)206-03-16	Уфа (347)229-48-12
Воронеж (473)204-51-73	Москва (495)268-04-70	Санкт-Петербург (812)309-46-40	Хабаровск (4212) 92-98-04
Екатеринбург (343)384-55-89	Мурманск (8152)59-64-93	Саратов (845)249-38-78	Челябинск (351)202-03-61
Иваново (4932)77-34-06	Набережные Челны (8552)20-53-41	Севастополь (8692) 22-31-93	Череповец (8202)49-02-64
Ижевск (3412)26-03-58	Нижегород (831)429-08-12	Симферополь (3652) 67-13-56	Ярославль (4852)69-52-93
Казань (843)206-01-48	Новокузнецк (3843)20-46-81	Смоленск (4812)29-41-54	

# Vaisala Weather Radar WRK100



## Features/Benefits

- 250 kW Klystron transmitter with low-maintenance solid-state modulator
- Vaisala's light-weight, semi-yoke-style pedestal
- 1 degree beamwidth low side lobe antenna
- Modular double-cabinet design
- Built around Vaisala Sigmet RVP900 signal processor
- Wide dynamic range digital IF receiver
- Dynamic range >99 dB (2  $\mu$ s pulse). Optional wide dynamic range >115 dB
- Image rejection >80 dB (>100dB with Vaisala WG filters).
- Integral flat screen display for local maintenance
- Remote control/monitoring
- Improved interference filtering
- Feed forward control loop to allow extremely fast and precise antenna movement
- Options:
  - Built-in automatic calibration
  - Dual polarization upgrade ready

## High-Performance and Reliability

The WRK100 is Vaisala's single polarization C-band klystron Doppler Weather Radar. The modular system design consists of a high-performance antenna and pedestal and a double 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 harshest environments. The benefit is high-data quality and availability for critical weather service operation.

Like all Vaisala Weather Radars, the WRK100 incorporates the advanced Vaisala Sigmet family of signal and data processing products. Vaisala 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. Vaisala Sigmet software provides comprehensive radar product generation, display and forecasting features. Integration to other Vaisala systems such as lightning detection networks, rain gauge, LLWAS and surface weather is available.

## Engineered for Remote Operation

For most customers, unattended remote operation is essential. The WRK100'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 the radar site. The 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 WRK100 upgradeable in the future. For example, the system can be purchased as dual-pol ready, or upgraded in the field to dual polarization.

# Technical Data

## Transmitter

Type	Klystron VKC8387
Operating 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, 1.0, 2.0, max 5.0 $\mu$ s
PRF	250 to 2125 Hz
Modulator	Solid State
Phase stability	$\leq$ 0.1 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 <sup>2</sup>
Position accuracy	0.1 deg
Weight	900 kg (total with antenna 1520 kg)
Motors	Brushless AC servo

## RF-to-IF Receiver

Type	Dual stage IF downconverter
Dynamic range	>99 dB ( 2 $\mu$ s pulse )
Optional wide dynamic range	>115 dB
IF frequency	442/60 MHz
Image rejection	>80 dB (>100dB with Vaisala WG filters)
Phase stability	0.1 deg rms
Tuning range	5.5 - 5.7 GHz
Noise figure	< 2 dB

## Radar Controller

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

## Digital IF Receiver and Signal Processor RVP900

Type	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 phase coding
Clutter filters	fixed, adaptive or GMAP to >55 dB clutter cancellation

## System Specifications

### PHYSICAL DIMENSIONS

Cabinet (w x h x d)	1400 x 1800 x 1300 mm
Cooling	Air-conditioned and forced air
Weight	977 kg
Total height	1890 mm

### CABINET ENVIRONMENT

Operating	+5 °C to +40 °C, 0 to 95 %RH, non-condensing
Recommended	+15 °C to +25 °C
Storage	-50 °C to +50 °C without oil -10 °C to +50 °C with oil

### ANTENNA/PEDESTAL ENVIRONMENT

Operating	-40 °C to +55 °C, 0 to 95 %RH, non-condensing
Storage	-50 °C to +50 °C

### INPUT POWER

Voltage	230/400 VAC +10 %, 50-60 Hz $\pm$ 5 %
---------	---------------------------------------

### POWER CONSUMPTION

Cabinet	max. 8720 W with UPS max. 7850 W without UPS
Antenna/pedestal	1050 W (max.), 200 W (typical)

## Options

Dual pol ready	Factory prepared antenna and pedestal for dual pol
Radome	6.7 m, foam core sandwich, random panel
Automatic calibration	
Forward and reverse transmitted power monitoring	

# Vaisala Weather Radar WRK200



## Features/Benefits

- Vaisala's light-weight, semi-yoke-style pedestal
- 1 degree beamwidth low side lobe antenna
- High sensitivity mode processing to recover sensitivity loss in STAR mode
- >35 dB integrated cross-polarization isolation
- Image rejection >80 dB (>100dB with Vaisala WG filters).
- Dynamic range > 99 dB (2 $\mu$ s pulse)
- Feed forward control loop to allow extremely fast and precise antenna movement
- Dual channel digital IF receiver
- Precision horizontal and vertical beam matching
- Built around Vaisala Sigmnet RVP900 signal processor
- Integral flat screen display for local maintenance
- Remote control/monitoring
- Rainfall estimation based on KDP
- Accurate attenuation correction
- 250 kW klystron transmitter with low-maintenance solid-state modulator
- Option: Built-in dual channel receiver calibration

## Dual Polarization Adds New Dimension

The Vaisala Weather Radar WRK200 is a dual polarization C-band Klystron Doppler Weather Radar. The radar operates in either Simultaneous Transmit and Receive of H and V (STAR) mode or Linear Depolarization Mode (LDR) mode, during which H alone is transmitted and both are received. STAR mode enables use of the high sensitivity power estimator increasing detectability by up to 10 dB versus the competition. The polarization variables, depending on the mode, are ZDR, RHOHV, PHIDP, KDP and LDR. However, the goal of polarization radar is not only to produce and display these outputs; it is also to expand the capabilities of the radar for the operational forecaster.

The WRK200 provides the following benefits:

- Hydrometeor identification
- Attenuation correction

- Data quality improvement
- Improved rainfall estimates, based on KDP

## 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, the radar performs accurate, real-time attenuation corrections. The benefit is that you can obtain the same precipitation measurement accuracy using the WRK200 as with an S-band system that costs typically two or three times more.

## More Accurate Precipitation Measurement

Eliminating non-meteorological targets and correcting attenuation can substantially improve precipitation measurement. However, the WRK200

goes further by providing KDP-based measurement of the precipitation rate. Unlike the reflectivity (Z), KDP is directly proportional to the precipitation rate, independent of the radar calibration and unbiased by intervening clutter or partial beam blockage. This makes the KDP very robust in measuring moderate and heavy rain.

# Technical Data

## System Performance

Modes	STAR or LDR
Phase stability	<0.1 deg rms
Maximum RhoHV	>0.99

## Transmitter

Type	Klystron VKC8387
Operating 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, 1.0, 2.0, max 5.0 $\mu$ s
PRF	250 to 2125 Hz
Modulator	Solid state

## 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 isolation	$\leq$ -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	> 99 dB ( 2 $\mu$ s pulse ) >115 dB option
IF frequency	442/60 MHz
Image rejection	>80 dB (>100dB with Vaisala WG filters)
Phase stability	0.1 deg rms
Tuning range	5.5 - 5.7 GHz
Noise figure	< 2 dB

## Radar Controller

Type	Vaisala Sigmet RCP8 with IRIS/Radar
Scan modes	PPI, RHI, Volume, Sector, Manual
Local display	Real time, ascope, BITE, products

## Digital IF Receiver and Signal Processor RVP900

Type	Vaisala Sigmet RVP900
IF digitizing	16 bits, 100 MHz in 5 channels
Range resolution	N*15 m
Number of range bins	Up to 4200
Velocity dealiasing	Dual PRF 2x, 3x, 4x
Range dealiasing	by phase coding
Clutter filters	fixed, adaptive or GMAP to >55 dB clutter cancellation
High sensitivity STAR mode processing:	>3 dB detection gain

## System Specifications

### PHYSICAL DIMENSIONS

Cabinet (w x h x d)	1400 x 1800 x 1300 mm
Cooling:	Air-conditioned and forced air
Weight	992 kg
Total height	1890 mm

### CABINET ENVIRONMENT

Operating	+5 °C to +40 °C, 0 to 95 %RH, non condensing
Recommended	+15 °C to +25 °C
Storage	-50 °C to +50 °C without oil -10 ° to +50 °C with oil

### ANTENNA/PEDESTAL ENVIRONMENT

Operating	-40 °C to +55 °C, 0 to 95 %RH, non condensing
Storage	-50 °C to +60 °C

### INPUT POWER

Voltage	230/400 VAC $\pm$ 10 %, 50 - 60 Hz $\pm$ 5 %
---------	--

### POWER CONSUMPTION

Cabinet	8720W max. with UPS 7850W max. without UPS
Antenna/pedestal	1050 W (max), 200 W (typical)

## Options

Radome	6.7 m, foam core sandwich, random panel
Automatic calibration	
Forward and reverse transmitted power monitoring	

## По вопросам продаж и поддержки обращайтесь:

Архангельск (8182)63-90-72  
Астана +7(7172)727-132  
Астрахань (8512) 99-46-04  
Барнаул (3852) 73-04-60  
Белгород (4722)40-23-64  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Волгоград (844)278-03-48  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89  
Иваново (4932)77-34-06  
Ижевск (3412)26-03-58  
Казань (843)206-01-48

Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Липецк (4742)52-20-81  
Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
Новокузнецк (3843)20-46-81

Новосибирск (383)227-86-73  
Омск (3812) 21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16  
Пермь (342)205-81-47  
Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692) 22-31-93  
Симферополь (3652) 67-13-56  
Смоленск (4812)29-41-54

Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Сургут (3462) 77-98-35  
Тверь (4822)63-31-35  
Томск (3822)98-41-53  
Тула (4872)74-02-29  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Уфа (347)229-48-12  
Хабаровск (4212) 92-98-04  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Ярославль (4852)69-52-93

сайт: [vsa.nt-rt.ru](http://vsa.nt-rt.ru) || эл. почта: [vgs@nt-rt.ru](mailto:vgs@nt-rt.ru)