

Vaisala Radiosonde RS92-SGP



Benefits

- World's highest level of PTU measurement performance
- Code correlating GPS technology for continuous wind data availability
- Stable transmission complies with ETSI standard EN 302 054

Proven PTU measurement performance

The all-digital Vaisala Radiosonde RS92-SGP offers the world's highest level of PTU measurement performance: the sum of the excellent individual performance of the Vaisala pressure, temperature and humidity sensors employed.

Code correlating GPS

The Vaisala Radiosonde RS92-SGP has a reliable code correlating GPS receiver. This receiver has a very fast search engine which ensures that all satellites in view are tracked. The GPS signal filtering and amplifying produce an excellent signal-to-noise ratio: the RS92-SGP is largely immune to radar or other sources of RF interference. If a malfunction occurs, an independent watchdog function instantly resets the radiosonde to minimize the tracking gap. The result: you receive continuous wind data with high resolution – from radiosonde release to bursting height.

Fully digital data transmission

The Vaisala Radiosonde RS92-SGP's fully digital data transmission offers

important advantages over analog data transmission. Data availability during a sounding is excellent and telemetry errors are always detected. The digital transmitter also consumes less power than an analog transmitter and more channels are available in the meteorological frequency band.

Complies with ETSI standard for 400 MHz band

The RS92-SGP is fully compliant with the European ETSI standard for digital radiosondes operating in the 400 MHz band, EN 302 054. This standard aims to regulate usage of the 400 MHz meteorological band in order to universally improve meteorological data availability.

Vaisala ground check set GC25

Ground checking of the Vaisala Radiosonde RS92-SGP is done with the Vaisala Ground Check Set GC25 and the sounding system. The sounding system reads the calibration coefficient automatically via a telemetry link. The GC25 is used to recondition the humidity sensor, removing any chemical contaminants and ensuring excellent humidity measurement accuracy. Setting the transmitter frequency is a simple matter of scrolling in the display to the correct frequency.

CAL-4 calibrated

The RS92-SGP's PTU sensors are calibrated in the CAL-4 calibration machine. Designed by Vaisala and built in-house, CAL-4 is the world's most advanced calibration machine for the mass production of PTU sensors.

Technical Data

Meteorological sensors

TEMPERATURE SENSOR	TYPE: CAPACITIVE WIRE
Measurement range	+60 °C to -90 °C
Response time (63.2%, 6 m/s flow)	
1000 hPa	< 0.4 s
100 hPa	< 1 s
10 hPa	< 2.5 s
Resolution	0.1 °C
Accuracy	
Total uncertainty in sounding*	0.5 °C
Repeatability in calibration**	0.15 °C
Reproducibility in sounding***	
1080 - 100 hPa	0.2 °C
100 - 20 hPa	0.3 °C
20 - 3 hPa	0.5 °C

HUMIDITY SENSOR	TYPE: THIN-FILM CAPACITOR, HEATED TWIN SENSOR
Measurement range	0 to 100 %RH
Resolution	1 %RH
Response time	
6 m/s, 1000 hPa, +20 °C	< 0.5 s
6 m/s, 1000 hPa, -40 °C	< 20 s
Accuracy	
Total uncertainty in sounding*	5 %RH
Repeatability in calibration**	2 %RH
Reproducibility in sounding***	2 %RH

PRESSURE SENSOR	TYPE: SILICON
Measurement range	1080 hPa to 3 hPa
Resolution	0.1 hPa
Accuracy	
Total uncertainty in sounding*	
1080 - 100 hPa	1 hPa
100 - 3 hPa	0.6 hPa
Repeatability in calibration**	
1080 - 100 hPa	0.4 hPa
100 - 3 hPa	0.3 hPa
Reproducibility in sounding***	
1080 - 100 hPa	0.5 hPa
100 - 3 hPa	0.3 hPa

Dimensions and Weight

Dimensions	220 x 80 x 75 mm
Weight with lithium battery (RS92-SGPL)	Typically 160 g ¹
Weight with alkaline (dry-cell) batteries (RS92-SGPD, RS92-SGPA)	Typically 280 - 290 g ¹

¹ Weight does not include rigging, unwinder, parachute etc.

Battery

Order codes with different battery types	
RS92-SGPD	alkaline (dry-cell), 9 V nominal
RS92-SGPL	lithium, 9V nominal
RS92-SGPA	dry-cell for AUTOSONDE, 9 V nominal
Operating time	135 min

Telemetry

Transmitter type	Synthesized
Frequency band	403 MHz
Tuning range	400.15 - 405.99 MHz
Frequency stability, 90 % probability	± 2 kHz
Deviation, peak-to-peak	4.8 kHz
Emission bandwidth	According to EN 302 054
Output power (high-power mode)	60 mW min
Modulation	GFSK
Data downlink	2400 bit/s, digital
Measurement cycle	1 s

Code correlating GPS receiver (SA Off, PDOP<4)

Number of channels	12
Positioning uncertainty, horizontal	10 m
Positioning uncertainty, vertical	20 m
Velocity measurement uncertainty***	0.15 m/s
Directional measurement uncertainty****	2 degrees

* 2-sigma (k=2) confidence level (95.5 %), cumulative uncertainty including:

- Repeatability
 - Long-term stability
 - Effects due to measurement conditions
 - Dynamic effect (such as response time)
 - Effects due to measurement electronics
- For humidity T > -60 °C
For pressure T < 35 °C

** Standard deviation of differences between two successive repeated calibrations, k=2 confidence level

*** Standard deviation of differences in twin soundings

**** Standard deviation of differences in twin soundings, wind speed above 3 m/s

Note: The pressure, temperature and humidity performance specifications given above are valid only when the Vaisala Ground Check Set GC25 is used to perform the ground check, including reconditioning of the humidity sensor.

Note: Selective Availability (SA) was switched off 1st May, 2000.

Position Dilution of Precision (PDOP) describes the effect of current GPS satellite geometry on radiosonde wind-finding accuracy.

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