

Vaisala Radiotheodolite RT20



17 degrees and less than 1.5 m/s above elevation angles of 15 degrees up to an altitude of 20 kilometres. Good accuracy is achieved even at an elevation angle of 12 degrees. This accuracy is a result of the RT20's excellent attenuation of ground reflection, its sophisticated data processing capabilities, and its unique antenna array design.

Automatic tilt compensation for dependable data

Soft ground or snow can cause the mechanical attitude of a radiotheodolite to shift during a sounding, leading to erroneous elevation angle and wind data. The Vaisala Radiotheodolite RT20 compensates for this by means of a tilt sensor that automatically adjust the RT20's mechanical attitude. This feature ensures that correct wind data is collected even in difficult terrain and sounding conditions.

Ready for sounding in under 15 minutes

When disassembled in its rugged carrying cases, the Vaisala Radiotheodolite RT20 can be transported with light vehicles. After arriving onsite, it is quick to assemble. The four interchangeable antenna elements have quick-lock mechanisms - two experienced operators will have the RT20 ready for sounding in under 15 minutes.

Accurate calculation of azimuth and elevation angles

The angle at which the radiosonde signal arrives at the RT20 is calculated by means of phase comparison. This method uses mathematical

The Vaisala Radiotheodolite RT20 is the workhorse, all-weather antenna for automated meteorological data acquisition in support of artillery and other tactical operations.

The Vaisala Radiotheodolite RT20 is easy to assemble, dismantle and transport by truck, trailer or helicopter. It comprises 10 sub-assemblies packed in cases that a team of two can easily carry and - thanks to its high degree of automation - the same two operators can perform a sounding in under 15 minutes from unloading. The basic data set can be coded into several message formats for transmission in tactical communication networks.

The RT20 accurately locates radiosondes during soundings using a modern interferometric technique and light tracking motors. Advanced signal processing ensures data accuracy and reliability. The RT20 meets all the operational needs of defense forces while fulfilling stringent environmental and EMC/EMI requirements.

Accurate wind data even at low elevation angles

The windfinding accuracy of the Vaisala Radiotheodolite RT20 is maintained even at low elevation angles, where ground reflections can cause some theodolite problems.

The typical wind vector error (standard deviation) is less than 1 m/s at elevation angles above

Features/Benefits

- Meteorological profile data for artillery ballistic preparation and numerical weather prediction models
- Independent and passive windfinding

formulas that are applicable regardless of signal strength or variations in radio frequency. Off-axis tracking ensures high accuracy without using conventional servo-motors.

Zero-backlash synchronized encoders measure the mechanical attitude of the RT20 with great accuracy. The mechanical and electronic measurements are combined, and the true azimuth and elevation angles are calculated accurately. This combination of electronic and mechanical measurement ensures reliable operation and uses small servo-motors that consume little power.

Technical data

General

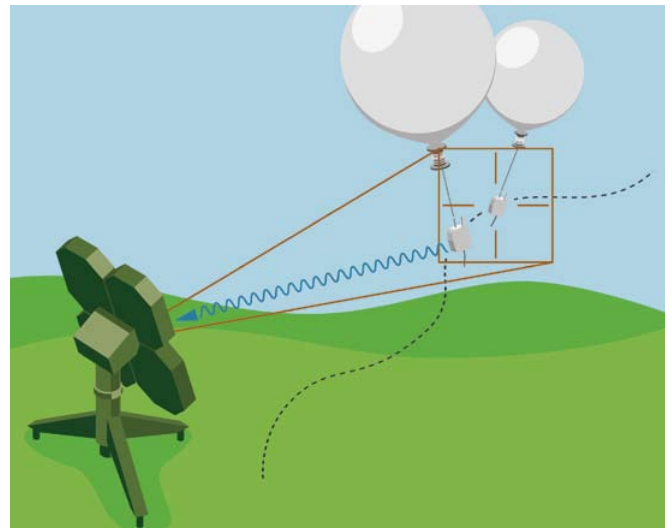
Operating frequency	1600 ... 1700 MHz
Average wind vector accuracy (calculated from METCM messages)	Better than 1 m/s with EL angle >17 °
Distance from antenna to Sounding Processor	Max. 30 + 30 m
Primary power	115/230 VAC or 24 VDC (vehicle battery)
Operating temperature range	-30°C to +55°C (Radiotheodolite)

Antenna

Tracking principle	Phase comparison
Antenna type	Four 24 element arrays
Polarization	Vertical
Gain	Min. 16 dBi
Side lobe attenuation	> 20 dB to the direction of specular ground reflection on flat terrain when El angle > 14 °

AZ-EL Platform

Rotation	Continuous azimuth -5 °C to 95 ° elevation
Drives	DC motors with low backlash reducing gears
Slewing speed	25 °/sec, AZ and EL.
Angular position reading	Synchro decoders, no backlash, 0.02 w° resolution (14 bits)

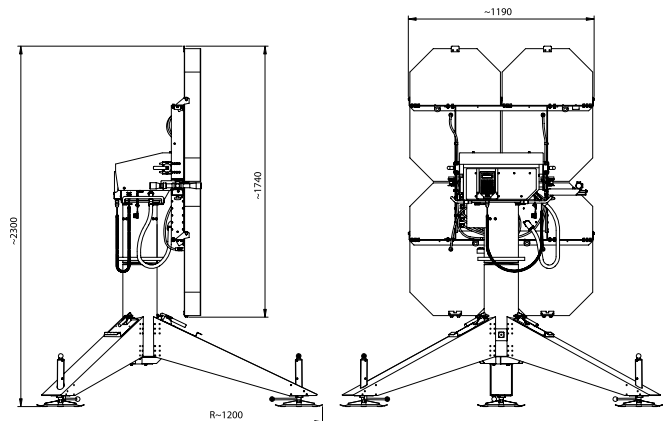


Receiver

Tuning frequency range	1660 ... 1700 MHz
Tuning	Manual with automatic frequency control Automatic search and lock on
Sensitivity	-110 dBm RF input and 12 dB S+N/N
IF bandwidth	300 kHz
Automatic gain control dynamic range	-110 dBm...0 dBm

Dimensions

Height	2300 mm
Foot span diameter	2400 mm
Antenna arrays	
Height	1740 mm
Width	1190 mm
Weight	172 kg



VAISALA

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