VAISALA

Vaisala Sensors

for Vaisala MAWS101/201 Automatic Weather Stations

Covering every key parameter
of surface weather observation

From the World's Leading Provider of Meteorological Sensors.

The accurate measurement begins with sensors. Vaisala offers this basic set of sensors with field proven reliability and accuracy.

Vaisala Relative Humidity and Temperature Sensor QMH101

The Vaisala Relative Humidity and Temperature Sensor QMH101 is based on Vaisala's field-proven HMP45D probe and comes with a special cable and connector. For humidity measurements, the Vaisala HUMICAP® sensor is highly accurate and offers excellent long-term stability in a wide range of environments. Temperature measurements are made with the accurate PT-100 sensor, IEC 751, 1/3 Class B. Field calibration is easy with one or two references. Replacement is easy: the probe head containing the electronics is removed quickly from the probe body, the replacement is installed and measurement continues. Meanwhile, the other probe head is calibrated.

The probe is installed in a naturally aspirated shield made of injection-moulded, UV-stabilized plastic. The shield has a multiplate design providing the necessary shielding from solar radiation and precipitation.

Vaisala Combined Wind Sensor QMW101 & QMW110

The Vaisala Combined Wind Sensor monitors both wind speed and direction with excellent linearity and fast response. A single compact sensor, it is ideal for low-power applications. Wind direction is detected using an axial symmetric rotating potentiometer with two slides, which provides full coverage from 0 to 360°. Wind speed is converted into pulses using a dual reed relay. The materials are carefully selected for optimum performance in both light winds and severe weather conditions accompanied by extreme winds. The Vaisala Combined Wind Sensor QMW101 consists of the wind sensor (WMS302) and a 1m cable with connectors. The Vaisala Combined Wind Sensor QMW110 has the same sensor with a 10m cable and connectors.

Vaisala Pressure Sensor PMT16A

The Vaisala Pressure Sensor PMT16A is a silicon capacitive pressure sensor that offers excellent accuracy, repeatability, and long-term stability over a wide range of operating temperatures. The fine adjustment and calibration of the sensor are handled according to electronic working standards which are traceable to international standards. The PMT16A is located on the CPU board. Made of silicon, it is also ideal for portable applications.

Vaisala Precipitation sensors QMR101 & QMR102

The Vaisala Precipitation Sensor QMR101 is an economical and accurate rain gauge, made of plastic, which is immune to frost and highly resistant to UV-radiation. The QMR101 has a self-emptying tipping spoon of 0.2 millimeters capacity. Due to its small size, light weight and rugged design, it is especially suitable for portable applications and temporary installations. The QMR101 is installed on the sensor cross-arm by means of a cable and connector, also supplied.

The Vaisala Precipitation Sensor QMR102 is an aerodynamic rain gauge that minimizes the effects of wind-derived airflow that can reduce the amount of captured precipitation. The instrument is made of UV-radiation resistant plastic for extra durability. The collected rain is measured in a field-proven tipping bucket mechanism with a capacity of 0.2 millimeters. The QMR102 is installed either on the ground or on a stand with total height of 1.5 m with the sensor. It comes with a 10-meter cable and connector.

Vaisala Pyranometers QMS101 and QMS102

The Vaisala Pyranometer QMS101 is an economical sensor for measuring global solar radiation. The QMS101 uses a photodiode detector for creating a voltage output that is proportional to the incoming radiation. Due to the unique design of the diffusor, its sensitivity is proportional to the cosine of the angle of incidence of the radiation, which ensures accurate and consistent measurements. The QMS101 comes with a cable and connector, and is easily installed on the sensor cross-arm.

The Vaisala Pyranometer QMS102 is an ISO-classified second class pyranometer. The precision optical glass dome acts as a filter, with a spectral bandpass that permits the full solar spectrum to pass through to the sensor. The sensor is a high-quality blackened thermopile with a flat spectral response. When the sensor is heated by incoming solar radiation, it produces a signal in the microvolt range. Each QMS102 and QMS102 are provided with a calibration certificate that contains the calibration factor.

Vaisala Net Radiation Sensor QMN101

The Vaisala Net Radiation Sensor QMN101 is designed for the routine measurement of net radiation, that is, the balance between incoming and outgoing radiation. The sensor consists of two teflon-coated, weather-resistant black conical absorbers and is based on a thermopile. The voltage output is proportional to the net radiation. The QMN101 is virtually maintenance-free.

Vaisala Soil/Water Temperature Probe QMT103 and QMT110

The Vaisala Soil/Water Temperature Probe QMT103 is particularly well-suited for the precision measurement of ground and soil temperatures. All the materials used in its manufacture have been carefully selected to withstand various types of environmental stress and a wide range of temperatures.

The measurement accuracy and stability of the temperature probe are based on a Pt-100 type sensor element, which is specified to a level of precision of 1/4 DIN 43760B. The probe includes a 5-meter cable with a black, weather-resistant polyurethane (PUR) sheath which withstands both abrasive wear and extreme temperatures. A 5-pin watertight connector is molded to the other end of the cable for quick installation and replacement. The Vaisala Soil/Water Temperature Probe QMT110 model has a 10-m cable with connector.

Vaisala Soil Temperature Probe QMT107

The QMT107 probe is designed for the measurement of soil temperature and temperature profiles as a function of depth. Temperature measurement is based on resistive platinum sensors (Pt-100).

There are seven temperature sensors located inside the probe. The sensors are positioned according to WMO instructions to +5 cm, ±0 cm, -5 cm, -10 cm, -20 cm, -50 cm, and -100 cm levels, where ±0 cm corresponds to the ground level mark of the probe.

The probe is constructed of glass fiber tube filled with epoxy, which makes the design watertight and provides low thermal conductivity. This ensures maximum accuracy as the sensor itself consumes very little power, thus causing almost no self-heating.

The QMT107 probe takes only one differential channel in the MAWS AWS Logger. Each temperature sensor is multiplexed in turns to the input of the logger. This task is automatically handled by the MAWS measuring algorithm.

For installing the QMT107 there is a special auger tool (QMT-AUGER) available.

Technical Information

Vaisala Relative Humidity and Temperature Sensor QMH101

Range	
Temperature	-40 ... +60 °C
Relative humidity	0 ... 100 %
Performance (accuracy)	
Temperature	< ± 0.3 °C (DIN ???)
Relative humidity	± 2 %, 0 ... 90 %, ± 3 %, 90 ... 100 %

Vaisala Combined Wind Sensors QMW101 and QMW110

Anemometer	
Measurement range	0.5 ... 60 m/s
Performance (accuracy)	+ 0.3 m/s (< 10 m/s), < 2 % (> 10 m/s)
Threshold	0.5 m/s
Distance constant	2 m
Wind vane	
Measurement range	0 ... 360°
Performance (accuracy)	< ± 3°
Threshold	< 1.0 m/s
Delay distance	1.0
Operating temperature range	-40 ... +55 °C
Dimensions	265(h) × 360(w) mm
Weight	360 g
Cable length	QMW101 - 1 m, QMW110 - 10 m

Vaisala Pressure Sensor PMT16A

Performance (accuracy)	< ± 0.3 hPA, incl. one year drift (with factory calibration)
Pressure range	600 ... 1100 hPa
Temperature range	-40 °... +60 °C (operating)

Vaisala Precipitation Sensor QMR101

Funnel diameter	159.6 mm
Orifice	200 cm2
Sensitivity	0.2 mm
Capacity	144 mm/h
Performance (accuracy depends on weather)	
< 24 mm/h	< ± 5 %
< 120 mm/h	< ± 10 %
Cable	incl.
Weight	380 g

Vaisala Precipitation sensor QMR102

Funnel diameter	254 mm
Orifice	500 cm2
Sensitivity	0.2 mm
Capacity	140 mm/h
Performance (accuracy) - weather dependent	
< 24 mm/h	< ± 1 %
< 140 mm/h	< ± 5 %
Cable	10 m long with connector
Weight	1.0 kg

Vaisala Pyranometers QMS101 and QMS102

	QMS101	QMS102
Sensitivity	100 µV/W/m² (nominal)	10 ... 35 µV/W/m²
Spectral range	0.4 ... 1.1 micron	0.35 ... 1.1 micron
Response time	< 1 second	18 seconds (95 %)
Range	2000 W/m²	2000 W/m²
Temperature dependence	+ 0.15 %/°C	6 % (-10 ... +40 °C)
Non-stability	< +2 % per year	< 1 % per year
Non-linearity	< 1 % up to 1000 W/m²	+ 2.5 % up to 1000 W/m²
Operating temperature	-30 ... +70 °C	-40 ... +80 °C

Vaisala Net Radiation Sensor QMN101

Sensitivity (nominal)	10 µV/W/m2
Spectral range	0.2 ... 100 micron
Response time (1/e)	20 s nominal
Range	-2000 ... + 2000 W /m2
Stability	< ± 2 % per year
Non-linearity	< 1 % up to 2000 W/m2
Operating temperature	-30 ... +70 °C

Vaisala Soil/Water Temperature Probes QMT103 and QMT110

Sensor Type	Pt-100 type RTD element
Performance	Better than +0.08 °C at 0 °C, conforms to 1/4 DIN 43760B
Sensitivity	0.385 ohm/°C (DIN 43760)
Dimensions	Ø 6 mm, length 150 mm
Material	Stainless steel, AISI 316
Environmental	Watertight from 0.1 to 4 bar
Cable	PUR black, 5 × 0.5 mm2 Cu
Length	QMT103 - 5 m, QMT110 - 10 m
Ingress protection	IP68 (connector)

Vaisala Soil Temperature Probe QMT107

Measurement range	-40 ... +60°C
Output signal	Four-wire connection
Temperature sensor	7 X Pt-100 IEC 751 1/3 Class B
Temperature reference	100R00 0.01% 5 ppm resistor
Accuracy, when zero-point calibration has been activated	±0.3 °C
Storage temperature range	-40 ... +80 °C
Supply voltage VCC	6 ... 30 VDC
Settling time	<10 ms
Power consumption	<1.5 mA
Weight (gross/net)	875 g / 640 g
Cable length	1 m
Housing material	Glass fiber tube/epoxy fill
Housing classification (electronics)	IP 68 (NEMA 4)
Dimensions	1200 (h) X 20 (ø) mm

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VAISALA
Reliable.

Vaisala Oyj
P.O. Box 26
FIN-00421 Helsinki
Finland
Tel. +358 9 894 91
Fax +358 9 8949 2227

For other Vaisala locations visit us at:
www.vaisala.com

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