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VAISALA

Present Weather and Visibility Sensors PWD10, PWD12, PWD20, and PWD22

Features

All models:

- Accurate and traceable measurement of prevailing visibility
- Compact and lightweight
- Easy to install

Additionally PWD12 and PWD22 models:

- Indicate the cause of reduced visibility
- Identify precipitation type
- Measure the intensity and accumulation of precipitation
- Estimate snow accumulation

Vaisala PWD series of present weather detectors and visibility sensors provide you off-the-shelf accuracy and reliability. They are a sensor family that grows with your needs.

Thousands of Vaisala present weather and visibility sensors are installed around the world, working reliably and accurately in diverse applications and climates. In Vaisala PWD series, you find the mix you require of visibility measurement range (MOR), characterization of reduced visibility, precipitation type identification, precipitation accumulation/intensity measurement, and report formats (WMO, NWS code tables).

Proven Measurement Principles for Present Weather

PWD12 and PWD22 identify precipitation type by accurately estimating the water content of precipitation with a capacitive device (Vaisala RAINCAP® sensor element) and combining this information with optical forward scatter and temperature measurements. These three independent measurements are processed through sophisticated algorithms in order to produce an accurate evaluation of the weather type according to the WMO and NWS code tables.

Accurate Visibility Measurement

Calibrated with reference to a highly accurate transmissometer, Vaisala PWD series sensors use the proven forward-scatter measurement principle to measure meteorological optical range (MOR). The visibility sensor is well-protected against contamination: the optical components point downwards and hoods protect the lenses against precipitation, spray, and dust. This weather-proof design of PWD sensors provides accurate measurement results and reduces the need for maintenance. The optional hood heaters are recommended for wintry conditions to prevent ice and snow accumulation.

Easy Installation

PWD sensors are less than one meter long. All are compact, light-weight, come with a cable and connector for easy installation, and can be mounted in many ways on any existing mast.

PWD Sensor Applications

Vaisala Present Weather Detector PWD22

Economical Visibility Measurement for Road Weather Applications

With a measurement range of 10 ... 2000 meters, PWD10 offers economical and reliable visibility measurement for road weather applications. PWD10 is recommended for road weather systems that alert drivers to e.g. reduced visibility.

PWD12 is ideal for road weather applications.

For Sophisticated Road Weather Applications

PWD12 provides accurate visibility and present weather measurement in the road environment, where low visibility is a serious safety hazard and significantly reduces traffic flow rates. With a visibility measurement range of 10 ... 2000 meters, Vaisala Present Weather Detector PWD12 is ideal for road weather applications. PWD12 also indicates the cause of reduced visibility to give you a full picture of weather conditions. Its ability to detect precipitation and identify precipitation type gives the road authority valuable information for the short-range planning of road maintenance operations.

Wherever Visibility Measurement Is Needed

With a measurement range of 10 ... 20 000 meters, PWD20 offers long-range visibility measurement for diverse applications covering harbors, coastal areas, heliports, windmill parks – indeed, any locations or areas where visibility measurement is necessary.

PWD sensors can be used in planning road maintenance.

For Meteorological and Aviation Applications

With a visibility measurement range of 10 ... 20 000 meters, PWD22 is a two-in-one forward scatter visibility and present weather sensor. PWD22 is recommended for automatic weather stations, especially low-power ones that are used for general meteorological and aviation applications.

PWD22's ability to detect freezing precipitation makes it possible to issue warnings when the weather presents safety hazards for road and air traffic.

PWD22 is equipped with two Vaisala RAINCAP® sensor elements to improve detection sensitivity during light precipitation events – even light drizzle is detected. PWD22 also reports present weather in WMO METAR code format so it is easily integrated with AWOS systems.

PWD22 is recommended for automatic weather observation systems (AWOS).

Technical Data

PWD10 Measurement Performance

Operating principle	Forward scatter measurement with 45° scattering angle
Observation range of MOR	10 ... 2000 m (32 ... 6500 ft)
Accuracy	±10 % at 10 ... 2000 m (32 ... 6500 ft)

PWD12 Measurement Performance

Operating principle	Forward scatter measurement with 45° scattering angle
Observation range of MOR	10 ... 2000 m (32 ... 6500 ft)
Accuracy	±10 % at 10 ... 2000 m (32 ... 6500 ft)
Weather type identification	4 different types of precipitation (rain, drizzle, mixed rain/snow, snow) Precipitation (unknown type) Fog (mist), haze (smoke, sand) or clear
Weather type reporting	WMO 4680 (SYNOP) and NWS code tables; 39 different codes supported from WMO 4680 code table
Precipitation detection sensitivity	0.05 mm/h (0.0020 in/h) or less, within 10 minutes
Precipitation intensity measurement	0.00 ... 999.99 mm/h (0.00 ... 39.37 in/h)
Precipitation amount measurement	0.00 ... 99.99 mm (0.00 ... 3.94 in)
Amount of new snow	0.00 ... 999 mm (0.00 ... 39.33 in)

PWD20 Measurement Performance

Operating principle	Forward scatter measurement with 45° scattering angle
Observation range of MOR	10 ... 20 000 m (32 ... 65 600 ft)
Accuracy	±10 % at 10 ... 10 000 m (32 ... 32 800 ft) ±15 % at 10 ... 20 km (2.6 ... 12 mi)

PWD22 Measurement Performance

Operating principle	Forward scatter measurement with 45° scattering angle
Observation range of MOR	10 ... 20 000 m (32 ... 65 600 ft)
Accuracy	±10 % at 10 ... 10 000 m (32 ... 32 800 ft) ±15 % at 10 ... 20 km (2.6 ... 12 mi)
Weather type identification	7 different types of precipitation (rain, freezing rain, drizzle, freezing drizzle, mixed rain/snow, snow, ice pellets) Precipitation (unknown type) Fog (mist), haze (smoke, sand) or clear
Weather type reporting	WMO 4680 (SYNOP), 4678 (METAR) and NWS code tables; 49 different codes supported from WMO 4680 code table
Precipitation detection sensitivity	0.05 mm/h (0.0020 in/h) or less, within 10 minutes
Precipitation intensity measurement	0.00 ... 999.99 mm/h (0.00 ... 39.37 in/h)
Precipitation amount measurement	0.00 ... 99.99 mm (0.00 ... 3.94 in)
Amount of new snow	0.00 ... 999 mm (0.00 ... 39.33 in)

Inputs and Outputs

Power supply	12 ... 50 VDC (electronics) 24 VAC or 24 VDC for heater option
Average power consumption	PWD10/20/50: 3 W (peak 10 W) PWD12/22/52: 3 W (peak 10 W) With optional luminance sensor: 5 W With optional hood heaters: 65 W
Outputs	Serial data line may be used either as RS-232 or RS-485 (2-wire) level signals 3 relay controls (open collector) Analog output current: 0 ... 1 mA or 4 ... 20 mA 8-m power/data cable standard. The PWD end is equipped with connector.
Auxiliary data	Low visibility alarms in the data messages. 3 adjustable alarm limits to set the 3 relay controls. Hardware status (fail/warning) in the data messages. Third relay control output can also be driven by hardware status.

Operating Environment

Operating temperature	PWD12: −40 ... +60 °C (−40 ... +140 °F) PWD10/20/22/50/52: −40 ... +60 °C (−40 ... +140 °F)
Operating humidity	0 ... 100 %RH

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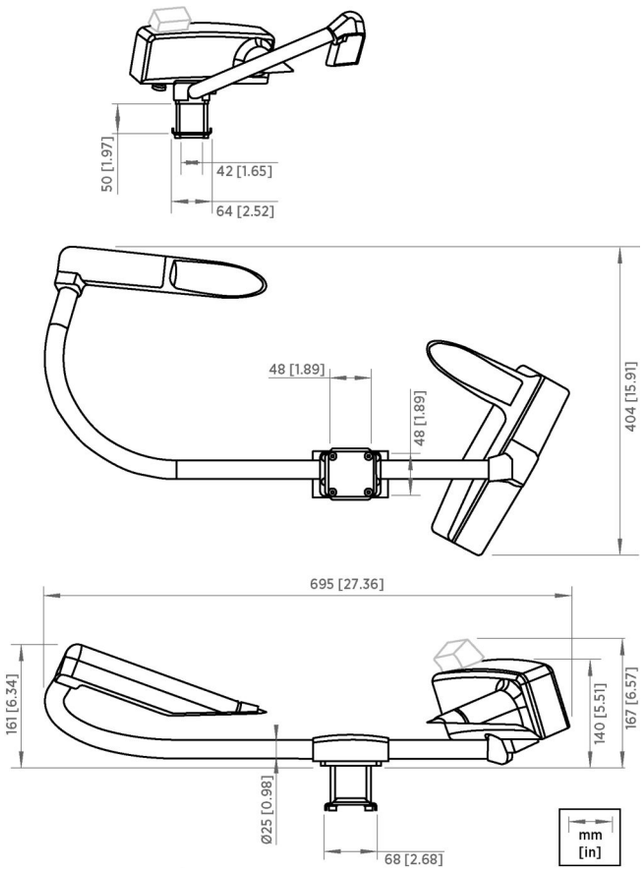
Technical Data

Mechanical Specifications

IP rating	IP66
Weight	3 kg (6.61 lb)
Dimensions (H × W × L)	PWD10/20/50: 140 × 404 × 695 mm (5.51 × 15.91 × 27.36 in) PWD12/22/52: 167 × 404 × 695 mm (6.57 × 15.91 × 27.36 in)



Dimensions

Compliance

EMC Compliance	
Radiated emissions	CISPR 16-1 CISPR 16-2
Radiated susceptibility	IEC 61000-4-3, 10 V/m
Conducted emissions	CISPR 16-1 CISPR 16-2
Conducted susceptibility	IEC 61000-4-6
EFT immunity	IEC 61000-4-4
ESD immunity	IEC 61000-4-2
Surge	IEC 61000-4-5

Spare Parts and Accessories

Pole mast
Interface unit with power supplies: 115/230 VAC
Luminance sensor PWL111
Hood heaters for harsh winter conditions
Support arm for mast installations
Pole clamp kit for mast top installations
Calibration set PWA12
Maintenance cable 16385ZZ
Maritime insulator

CE

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