

The PWD series is a sensor family that can be easily and economically upgraded to meet growing measurement needs.



Ritva Siikamäki, MA
Editor-in-Chief
Vaisala Helsinki
Finland

New product family of **Present Weather Detectors and Visibility Sensors**

Vaisala has launched two new visibility sensors, the PWD10 and PWD20, to complement the Vaisala PWD-series of Present Weather and Visibility Sensors. The versatile PWD Series is designed to meet the visibility and present weather measurement needs of road authorities, aviation authorities and meteorological organizations. Offering proven technology and flexible upgrade possibilities, new measurement capabilities can be added to the PWD sensors to meet growing measurement needs.

The Vaisala PWD-series provides road authorities, aviation authorities and meteorological organizations with the features they require: a visibility measurement range (MOR), characterization of reduced visibility, precipitation type identification, precipitation accumulation/intensity measurement, and report formats (WMO, NWS code tables). The Vaisala Visibility Sensors PWD10 and PWD20 are new models, complementing the PWD-series offering that also comprises the Present Weather Detectors PWD12 and PWD22. Please see table 1 for details on the models and their applications.

Proven measurement technology

The Vaisala Present Weather Detectors PWD12 and PWD22 identify precipitation type by assessing the water content of the

precipitation with a capacitive device - the Vaisala RAINCAP® sensor element. This information is then combined with optical forward scatter and temperature measurements. These three independent measurements are processed through sophisticated algorithms to produce an accurate evaluation of the weather type according to the WMO and NWS code tables.

Calibrated accuracy and innovative design

Vaisala PWD-series sensors are all calibrated with reference to a highly accurate transmissometer, and employ the proven forward-scatter measurement principle to measure Meteorological Optical Range (MOR). The visibility sensor's design offers protection against contamination: the optical components point downwards, and the hoods protect the lenses against precipitation, spray and dust. The weather-proof design of the PWD sensors translates into accurate measurement results in all conditions, while reducing the need for maintenance to a minimum. Optional hood heaters are recommended for wintry conditions to prevent ice and snow accumulation.

Easy installation and expandability

All PWD sensors are compact and light-weight. They come with a cable and connector for easy installation, and can be mounted in many ways on any existing mast. The measurement capabilities of the Vaisala PWD-series sensors can be easily and economically upgraded to meet measurement needs that grow over time.

Road weather applications

The Vaisala Visibility Sensor PWD10 offers economical and reliable visibility measurement for road weather applications. In the road environment low visibility is a serious safety hazard and significantly reduces traffic flow.

Providing a measurement range of 10 – 2,000 meters (32 – 6500 ft), the PWD10 is, for example, recommended for road weather systems which alert drivers to reduced visibility.

For advanced road weather applications, the Vaisala Present Weather Detector PWD12 provides accurate visibility and present weather measurement in the road environment. Besides measuring visibility the PWD12 also indicates the cause of reduced visibility, by identifying precipitation type and intensity. In other words, the PWD provides a more complete picture of the weather conditions, which is valuable information for road authorities in the short-range planning of road maintenance operations.

Long-range visibility measurement

The Vaisala Visibility Sensor PWD20 offers a longer measurement range than the PWD10, extending it to 10 – 20,000 meters (32 – 65,600 ft). The long-range visibility measurement is useful in diverse applications, covering harbors, coastal areas, heliports and windmill parks where visibility measurement is necessary. The PWD22 sensor also incorporates long-range visibility measurement capability.

Meteorological applications

The Vaisala Present Weather Detector PWD22 is a combined forward scatter visibility and present weather sensor that provides a visibility measurement range of 10 – 20,000 meters (32 – 65,600 ft). The PWD22 is recommended for



Vaisala Present Weather Detector PWD22.

automatic weather stations, especially low-power AWSs, that are used for general meteorological and aviation applications. Its capability of detecting freezing precipitation and reporting present weather in WMO METAR code format makes it a valuable addition to AWOS systems.

Tactical applications

The special Vaisala Present Weather Sensor PWD11A used in TACMET stations will be replaced with the new PWD22M model, painted green. The software and mechanical interfaces of the PWD22M are entirely compatible with the PWD11A and it fits the PWD11A slot in the TACMET Carry Case. The PWD22M will gradually replace the PWD11A.

PWD12, PWD22 vs. PWD11, PWD21

In comparison with the former models, PWD11 and PWD21, the new PWD12 and PWD22 offer considerably more installation flexibility and can be fitted with optional heaters in wintry conditions. A luminance sensor option is available for use in Automated Weather Observing Sys-

tems (AWOSs) and the new models have lower power consumption than the former ones. Additionally, detection sensitivity in light precipitation has been improved in the PWD22, which is equipped with two RAINCAP® sensor elements. It is now easier to integrate PWD series products with simple data collection systems, since the new PWD10 and PWD20 visibility sensors also incorporate new analog outputs beside the standard serial line interfaces.

Road weather systems will be equipped with the PWD12 instead of the former PWD11 model. The new present weather detector model PWD22 will replace the current PWD21 model in other applications. The software and mechanical interfaces of the PWD12 and PWD22 are compatible with the older PWD11 and PWD21 models. With the new PWD-series, Vaisala reinforces its position as the world's leading provider of optical sensors. The existing line of Vaisala visibility and present weather sensors – the FS11, FD12P, FD12 and MITRAS Transmissometer – will continue to be manufactured. ●

Table 1. PWD Series products and their main applications

| Product type | | Main applications, main features |
|--------------------------|-------|---|
| Visibility sensor | PWD10 | Road weather systems, accurate visibility measurement up to 2 km |
| | PWD20 | Meteorological and aviation weather, offers long-range visibility measurement up to 20 km |
| Present weather detector | PWD12 | Demanding road weather applications, short-term planning of maintenance operations, combined visibility and precipitation type sensor |
| | PWD22 | General meteorological applications, Automatic Weather Stations, capacity to detect freezing conditions supports warnings for safety hazards, combined visibility and precipitation type sensor |