

# Vaisala Weather Sensor FD12P



Field-proven visibility, precipitation  
and present weather measurement

# The Flexible Weather Sensor

The Vaisala Weather Sensor FD12P is an economical, multi-variable weather sensor used to carry out weather observation duties that normally require a human observer and an assortment of special instruments.



The Vaisala Weather Sensor FD12P can be substituted for a range of weather observation instruments that are expensive and difficult to maintain. It automates many time-consuming weather observation and reporting duties by means of:

- An optical forward-scatter sensor that senses fog and also distinguishes between precipitation types
- An analog capacitive surface sensor that “feels” the amount of water falling on it
- A temperature sensor
- A special algorithm, running in the microprocessor, that calculates accurate present weather and visibility values using data collected from all the sensors

The FD12P approximates the human senses of sight and touch as closely as possible in order to generate accurate visibility, precipitation and present weather values. Frozen and liquid precipitation is distinguished

according to the ratio of the optical measurement value vs. the amount of water measured on the capacitive precipitation sensor.

## For many applications

Typical applications for the Vaisala Weather Sensor FD12P are present weather identification and visibility measurement at airports and remote weather stations. The FD12P is ideal for fully automated weather observation, but can also be used to support human observers at semi-automatic stations. The FD12P outputs the WMO present weather codes (code table 4680) required for automatic SYNOP messages. For aviation applications, the WMO code table 4678 for METAR messages is also supported.

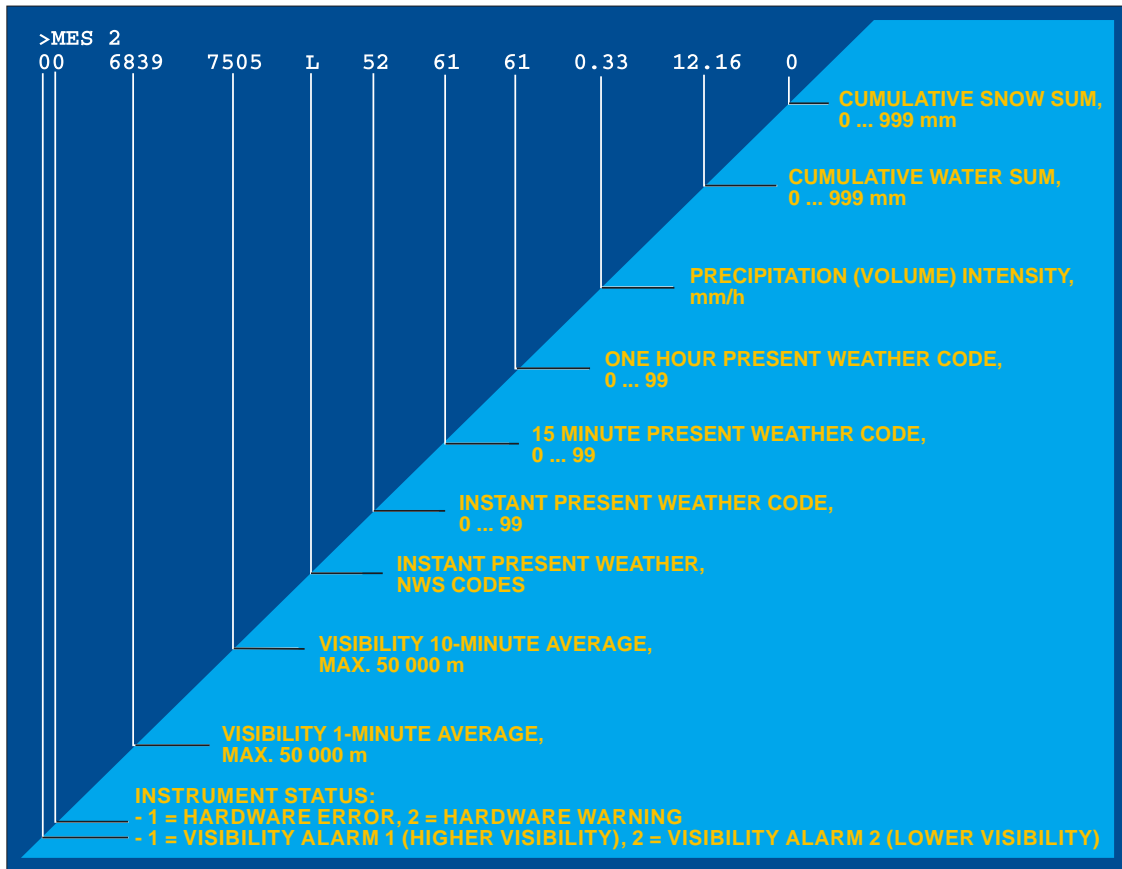
## Simple and effective design

The FD12P's simple and effective design comprises a transmitter, a receiver, a controller and a capacitive precipitation detector.

An ambient temperature sensor ensures that precipitation type is assessed reliably. The mechanical design of the FD12P is well thought-out: sample air volumes are not disturbed; the anodized aluminum construction is weather-proof thanks to its head-down design; the factory mountings ensure easy installation and onsite adjustment. The FD12P can be mounted in a variety of ways so suitable locations are easily found.

## Weather Sensor FD12P features

- Measures visibility up to 50 km
- Detects precipitation type and intensity
- Calculates precipitation accumulation
- Calculates water equivalent of frozen precipitation
- Calculates snow accumulation
- Reports over 50 SYNOP codes
- Reports present weather in SYNOP, METAR and NWS code formats



The Vaisala Weather Sensor FD12P outputs data in seven standard message formats. Pictured here: a message commonly used for automatic weather stations.

### Distinguishes accurately between precipitation types

The Vaisala Weather Sensor FD12P reliably detects a wide range of precipitation types. By analyzing the combined measurements, the FD12P can also distinguish between fog, mist and haze.

In international field tests, the FD12P's ability to detect light precipitation has proven exceptional.

### Accurate visibility measurement

The Vaisala forward scatter technology implemented in the Vaisala Weather Sensor FD12P has demonstrated unparalleled accuracy in international comparisons. The

excellent accuracy of the optical sensor has been achieved with a well thought-out electro-optical design and sophisticated signal analysis. The FD12P automatically compensates for visibility measurement during precipitation. Accuracy is maintained in all weather conditions.

### Minimizing maintenance

All the hardware used in the Vaisala Weather Sensor FD12P, from the electronic components to the optical surfaces, has stood the test of time in the field. "Housekeeping" sensors detect the presence of contaminating particles on the optical pathways. Internal diagnostics test the electronics at regular intervals.



The surface of the capacitive precipitation sensor "feels" the amount of water that falls on it. When frozen precipitation collects on the surface it is heated in a carefully controlled manner. The resulting water is measured to find the water equivalent of the frozen precipitation.

# Technical Information

## Present weather

Detects	11 different precipitation types
Measures	Precipitation intensity
Reports	52 codes from WMO code table 4680 and 4678 and NWS codes

## Visibility measurement

MOR measurement range	10 ... 50 000 m
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## Instrument consistency

Visibility measurement consistency	±4 %
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## Precipitation measurement

Precipitation detection	above 0.05 mm/h, within 10 minutes
Precipitation intensity	range 0.00 ... 999 mm/h

## Electrical

Power supply	115/230 V ±20 %, 50/60 Hz
Power consumption	35 W + 100 W heating
I/O connections	RS-232, RS-485

## Environmental

Operating temperature	-40...+55 °C
Operating humidity	Up to 100 % RH

## Mechanical

Height	230 cm
Width	160 cm
Weight	35 kg

## Accessories

FD12MODEM	Fixed line modem, 300 baud
FDA13	Calibration set
LM21 FD	Background luminance sensor
TERMBOX-1200	Surge protector device for mains and signal lines

Also available: the Vaisala Visibility Meter FD12, a forward-scatter weather sensor that measures visibility without the present weather measurement features provided by the Vaisala Weather Sensor FD12P. Contact your Vaisala representative for more information.



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