

# FD12P Weather Sensor



# FD12P Weather Sensor - All in One

FD12P is a cost-effective, multi-variable sensor that carries out tasks normally requiring a human observer and multiple instruments. FD12P Weather Sensor

- measures visibility up to 50 km
- detects type of precipitation
- detects intensity of precipitation
- calculates accumulation of precipitation
- calculates water equivalent of frozen precipitation
- calculates snow accumulation
- reports 50 SYNOP codes
- reports NWS codes for Present Weather

The unique Weather Sensor offers a new solution for the automation of various weather sensing and reporting stations. It can substitute many instruments that are expensive and hard to maintain.

FD12P does this by combining the best of many worlds:

- an optical forward-scatter sensor that not only sees fog but also distinguishes precipitation particles
- an analog capacitive surface sensor that feels the amount of water falling on it
- a built-in temperature sensor
- an Artificial Intelligence type algorithm running in the built-in microprocessor for making accurate Present Weather, Visibility and Precipitation Intensity judgements from the combined data of all sensors.

The humanlike "see and feel" detection method of FD12P guarantees reliable estimates. Distinguishing between frozen and liquid precipitation is based

on the ratio of optical measurement to the amount of water on the capacitive sensor. Controlled heating of the sensing surfaces turns frozen particles into liquid. Thus, a measurement of liquid water equivalent is obtained.

*The capacitive surface sensor feels the amount of water that falls on it.*

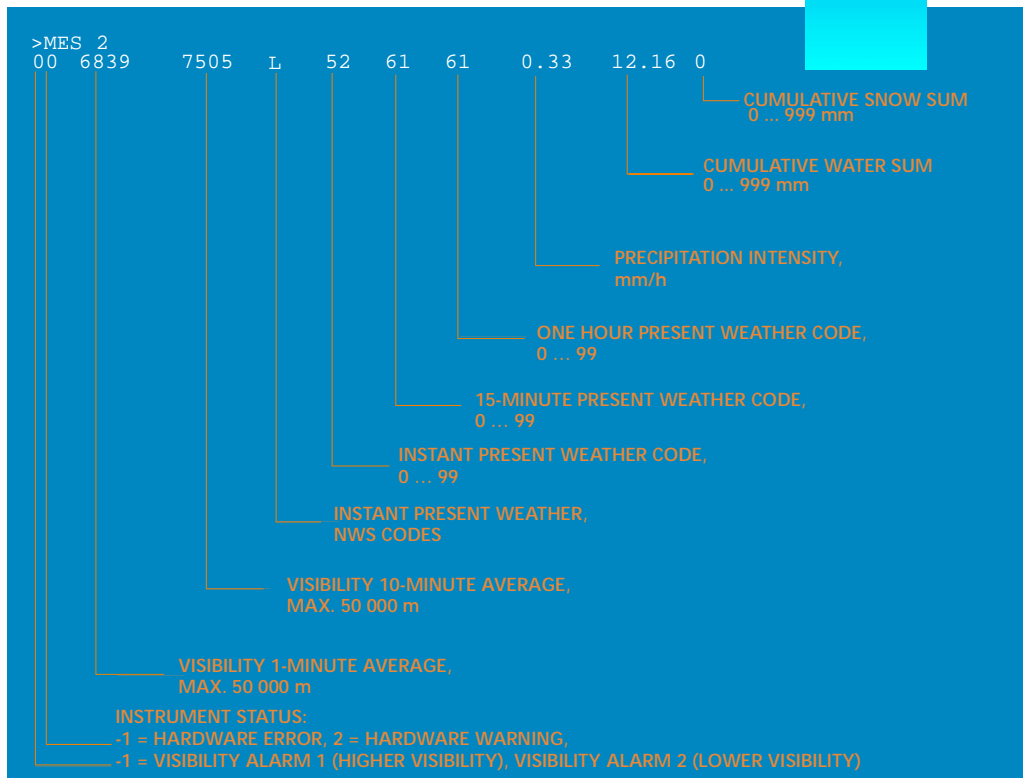
## MULTIPLE APPLICATIONS

Typical applications of FD12P are present weather identification and visibility measurement at airports and remote weather stations. Road authorities can also greatly benefit from the weather information provided by the sensor. FD12P is ideal for fully automated weather observations but can also be used as an observer's aid at semi-automatic stations. The sensor outputs WMO's Present Weather codes (code table 4680) required for automatic SYNOP messages.

## COMPACT CONSTRUCTION

FD12P consists of a transmitter, a receiver, a controller, and a capacitive rain detector. An ambient temperature sensor is included to increase the reliability of precipitation type assessment. The careful mechanical design means minimum disturbance to the sample volume of air. Anodized aluminium surfaces together with simple construction make the instrument weather-proof. The compact construction and factory set mountings ensure easy installation and eliminate problems with start-up adjustments. A variety of mounting possibilities help in planning the final location of equipment.





*FD12P has six standard formats for data message output. The figure shows a typical compact message used for automatic weather stations.*



#### MINIMAL MAINTENANCE

All hardware from electronic components to optics is field-proven. Additional 'housekeeping' sensors are integrated into the instrument for built-in testing and detection of optical path disturbance (contamination, blocking). Built-in testing also covers electronic operation.

#### HIGH PERFORMANCE

The unique operating principle of FD12P ensures reliable detection of a wide range of precipitation types. By analyzing the combined measurements, the sensor can also distinguish between fog, mist, and haze.

FD12P exceeds the performance of other present weather sensors, especially in light precipitation.

#### VISIBILITY MEASUREMENT ACCURACY

Vaisala's forward scatter technology has demonstrated unparalleled accuracy in international comparisons. The high precision of the sensor has been achieved with careful electro-optical design and sophisticated signal analysis. FD12P compensates visibility measurement automatically during precipitation. Consistent accuracy is guaranteed in all weather conditions.

# Technical Information



## PRESENT WEATHER

Detects	11 different precipitation types
Measures	Precipitation intensity
Reports	50 codes from WMO code table 4680 12 NWS codes (C, P, L, ..., ZR) with intensity identification (+, -)

## 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, accuracy ±30 % (0.5 ... 20 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

15440FD	Horizontal extender for installation on mast or wall
16616ZZ	Extension cables
FD12MODEM	Fixed line modem, 300 baud
FDA12	Visibility calibration set

NOTE: Visibility and precipitation may be local. The FD12P measures these variables only in its immediate vicinity.

Also available: Vaisala's FD12 Visibility Meter FD12 is a forward-scatter visibility measuring instrument without the Present Weather (P) features. For more information, please contact Vaisala.



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