

# FA 415/416

The CS **dew point sensor FA 415** with 2-wire technology 4...20 mA enables a reliable and long-term stable monitoring of the dew point in industrial applications

The model **FA 416** is a **dew point switch** for dew point difference monitoring which sets off an alarm if the dew point difference (ambient temperature minus dew point temperature) is below an adjusted threshold value. As an alternative this sensor can also be programmed for the monitoring of a dew point level (e. g. +6 °C for refrigerating dryers) or of the relative humidity. An alarm activates the internal semiconductor relays of the sensor and the illuminating diode changes from green to red.

## FA 415

The ideal dew point sensor for the monitoring of refrigerating dryers with analogue output 4..20 mA



## FA 416

For reliable alarm message in case of condensate accumulation with alarm relay and LED



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**INTRODUCTION**

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Dear CS customer,

You have made the right decision by choosing a measuring instrument of CS Instruments GmbH. Thousands of customers buy our high standard products every year. There are a few good reasons for doing so:

- Cost-performance ratio. Reliable quality at a fair price.
- We have the ideal solutions for your measuring tasks based on our expert experience gained over 20 years.
- Our high quality standard.
- Of course, our instruments carry the CE symbol required by the EU.
- Calibration certificates, trainings, consultation and calibration on location.
- Our after sales-service, we do not leave you out in the cold.

Our service guarantees fast help.

 Measuring instrument conforms with **DIN EN 61326**

**Please read prior to operation!**



**Warning:** Do not exceed a pressure range of > 16 bar with standard version.

Observe measuring ranges of sensor! The probes are damaged if they are overheated.

Observe max. storage and transport temperature as well as max. operating temperature (e. g. protect measuring instrument from direct sunlight).

Warranty claims no longer apply if the instrument is opened, in the case of inexpert handling or use of force.

Adjustments or calibrations should be carried out by qualified measurement and control engineering staff only.

Important: Before installation briefly bleed the compressed air in order to remove condensate and particles. This prevents soiling of FA 415/416. Standing air leads to long measuring times.

## **DESCRIPTION**

The FA 415/416 dew point sensor enables a reliable and long-term stable monitoring of the dew point in industrial applications from -20...50 °C dew point. The FA 415/416 features improved stability.

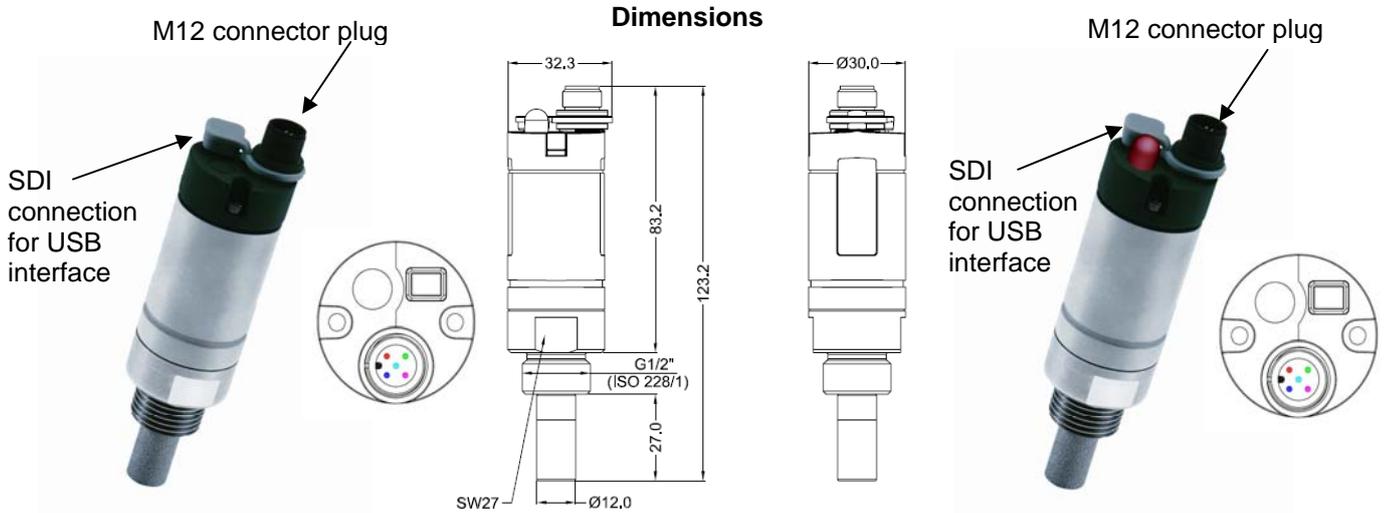
### **Advantages:**

- Extremely long-term stable
- IP 65 housing grants a reliable protection in extreme industrial conditions
- Very fast response time
- Installable in the dryer by means of G 1/2" thread
- High accuracy of  $\pm 1...2$  °Ctd
- Calibration on location and testing with CS control and calibration set (PC connection set)

### **Programming via SFA Software**

- Analogue output 4...20 mA scalable
- Calibration and adjustment including issuing of certificates
- Read-out of service data

**DIAGRAM OF INSTRUMENT**



		Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
FA 415	<b>Connector plug</b>	SDI	-VB	+VB	NC	NC
	<b>Connection cable</b> 0554.0104 (5 m) 0554.0105 (10 m)	brown	white	blue	NC	NC
FA 416	<b>Connector plug</b>	SDI	-VB	+VB	REL	REL
	<b>Connection cable</b> 0554.0104 (5 m) 0554.0105 (10 m)	NC	white	blue	black	grey

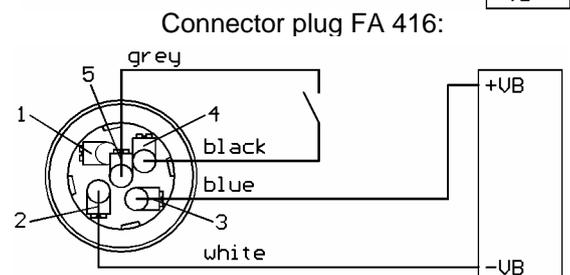
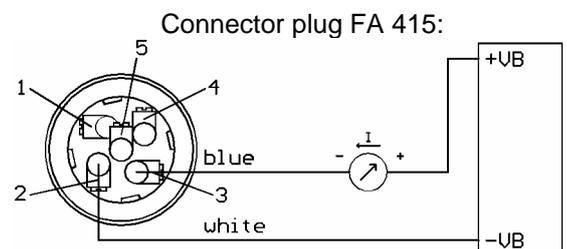
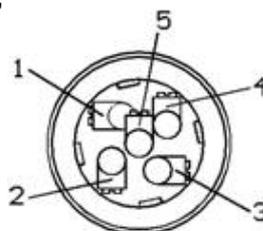
SDI	Digital signal (internal data transfer)
-VB	Negative supply voltage
+VB	Positive supply voltage 10...30 VDC smoothed
REL	Relay output
NC	Not connected

FA 416: Relay NO (60 V, 0.5 A)  
Relay opens in case of alarm and power failure

If no connection cable (0553.0104, 0553.0105) is ordered the sensor will be supplied with a M12 connector plug. The user can connect the supply and signal cables as indicated in the connection diagram.

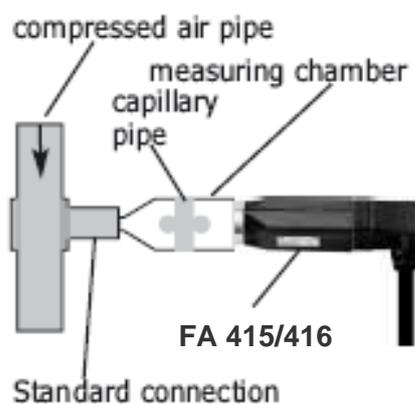


**M12 connector plug**



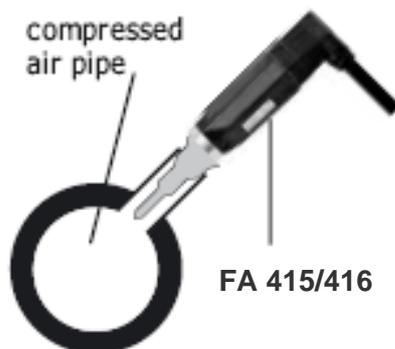
Please note: CS recommends the indirect installation with measuring chamber

**Advantage:** Easy mounting and dismounting of the probe without interruption of the line. Quick response time due to quick coupling. Optimum sensor protection.



#### Indirectly in the compressed air system

Connect probe with measuring chamber to the compressed air pipe by means of a quick coupling. In case of compressed air containing oil and dirt particles a pre-filter should be installed in front of the measuring chamber. Compressed air flows continuously (at 7 bar approx. 1 l/min expanded) in the capillary pipe of the measuring chamber. The reaction times for the humidity reading are shorter than in case of a direct mounting.



#### Directly in the compressed air system

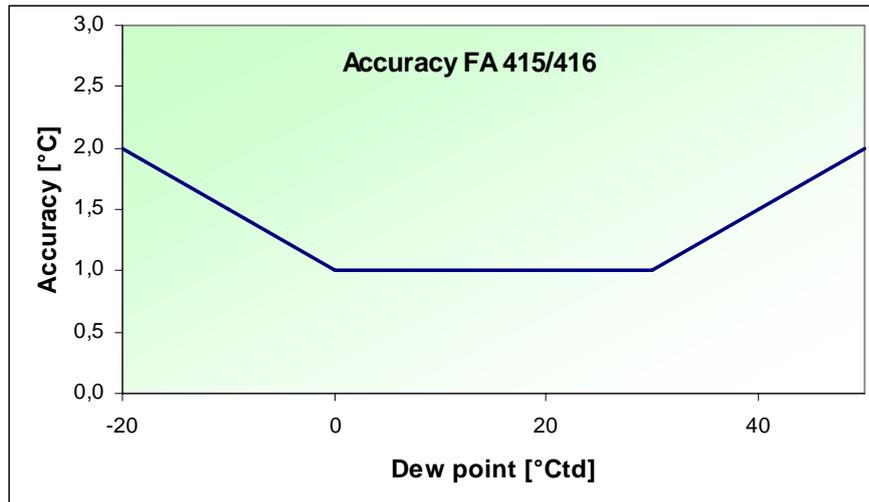
Screw in probe with G 1/2" thread pressure-tight in the center or at the top of the compressed air pipe. Take care that measurement is effected close to the compressed air flow. U-bend pipes or non-flowing compressed air result in very slow reaction times for the moisture reading.

#### Measurable gases

In general, humidity can be measured in all non-corrosive gases. In case of measurements in corrosive gases please consult CS Instruments GmbH.

Measuring range: -20...50 °Ctd pressure dew point resp. dew point in °Ctd  
 0...100 %RH  
 -30...70 °C ambient temperature

Accuracy: 1 to 2 °Ctd dew point (see diagram)



Pressure range: -1...16 bar standard

Power supply: 10...30 VDC

Output: 4...20 mA  $\triangleq$  -20...50 °Ctd 2-wire technology in case of FA 415  
 resp. relay 60 V, 0.5 A in case of FA 416

Protection class: IP 65

EMC: DIN EN 61326

Operating temperature: -30...70 °C (ideal 0...50 °C)

Storage temperature: -40...80 °C

Load for analogue output: < 500 Ohm

Screw-in thread: G 1/2" stainless steel

Material of housing: zinc alloy, PC, ABS

Sensor protection: sinter filter 50  $\mu$ m stainless steel

Connection: M12, 5-pole

Response time  $t_{95}$ : < 30 seconds (descending)  
 < 10 seconds (ascending)

FA 416 alarm LED: The illuminating diode changes from green to red in case of alarm  
 FA 416: Relay switches if the dew point difference (ambient temperature minus dew point temperature) is below an adjusted threshold value. Alternative threshold values dew point resp. % RH. Threshold values have been adjusted on our premises resp. are freely adjustable by means of the CS Basissoft software.

**From the manufacturer**

According to DIN ISO certification of the measuring instruments we recommend regular calibration and, if necessary, adjustment of the instrument by the manufacturer. The calibration cycles should fit your internal scheme. In the course of the DIN ISO certification we recommend for FA 415/416 a calibration cycle of one year. If requested we can carry out the calibration on your premises.

**WARRANTY**

If you have reason for complaint we will of course repair any faults free of charge if it can be proven that they are manufacturing faults. The fault should be reported immediately after it has been found and within the warranty time guaranteed by us. Excluded from this warranty is damage caused by improper use and non-adherence to the instruction manual.

The warranty is also cancelled once the measuring instrument has been opened provided this is not described in the instruction manual for maintenance purposes. This is also the case if the serial number has been changed, damaged or removed.

The warranty time for FA 415/416 is 12 months for the instruments and 6 months for accessories if no other terms are agreed upon. Warranty services do not extend the warranty time.

If in addition to the warranty service necessary repairs, adjustments or similar are carried out, the warranty services are free of charge but there is a charge for other services such as transport and packing costs. Other claims, especially those for damage occurring outside the instrument are not included unless responsibility is legally binding.

**After-sales service after the warranty time has elapsed**

We are, of course, there for you after the warranty time has elapsed. In the case of function faults please send us your measuring instrument with a brief description of the defect. Please also indicate your telephone number so that we can contact you if necessary.

**ORDERING DETAILS**

<i>Order no.</i>	<i>Description</i>
0699.0415	FA 415 dew point sensor (-20...50 °Ctd)
0699.0416	FA 416 condensate switch (-20...50 °Ctd)
0600.0416	All-in-one set for reigrigerating dryers with alarm
0600.0415	All-in-one set for reigrigerating dryers with analogue output
0699.3390	Standard measuring chamber for compressed air up to 16 bar
0699.3690	Measuring chamber for atmospheric dew point
0554.2005	CS Service Software for VA/FA 400 sensors incl. PC connection set, USB connection and interface adapter to the sensor as well as CS Soft Professional software for data recording
0554.0002	Control and calibration set 11.3 % RH
0554.0004	Control and calibration set 33 % RH
0554.0005	Control and calibration set 75.3 % RH
0553.0104	Connection cable for FA 415/416, length: 5 m
0553.0105	Connection cable for FA 415/416, length: 10 m
3200.0003	Precision calibration at 0 °Ctd and 10 °Ctd incl. ISO certificate
0699.3396	Precision calibration at -40 °Ctd incl. ISO certificate

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