

# FA 410

Humidity measuring instruments for **measurement of the pressure dew point and the atmospheric dew point** in different applications:

- compressed air plants (refrigerating/adsorption dryers)
- granulate dryers
- medical gases
- non-corrosive gases, e. g. nitrogen



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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 > 50 bar with standard version. With special versions up to 350 bar.

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 410. Standing air leads to long measuring times.

**DESCRIPTION**

The FA 410 dew point sensor enables a reliable and long-term stable monitoring of the dew point in industrial applications from -80 to +20 °C dew point. The FA 410 features improved stability.

When mounting FA 410 into compressed air systems the pressure dew point (dew point under pressure) up to 50 bar (in the special version up to 350 bar) is measured directly. When mounting FA 410 in atmospheric conditions (ambient pressure) or in the flow off sector (relaxed air) of compressed air systems the atmospheric dew point is measured.

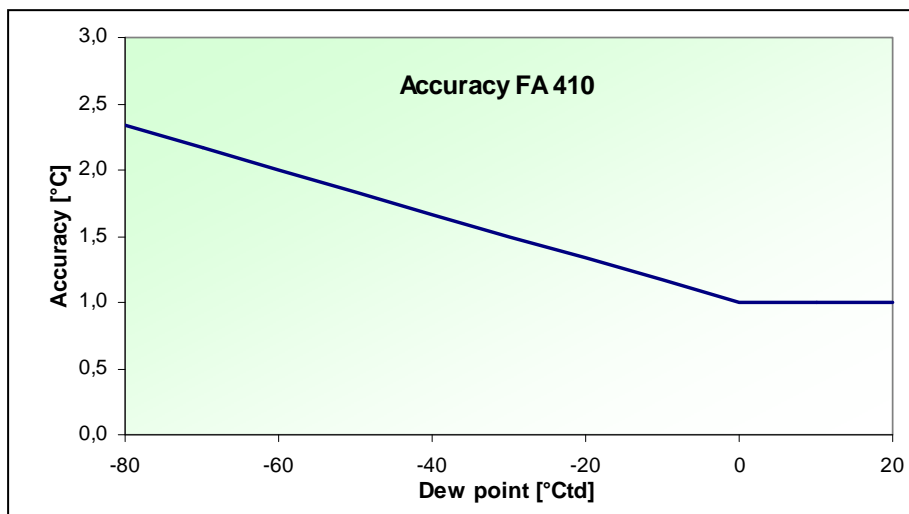
**Advantages:**

- Dew point sensor for very low dew points down to -80 °Ctd
- Extremely long-term stable due to internal automatic calibration
- 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  $\pm 2$  °Ctd
- Calibration on location and testing with CS control and calibration set (PC connection set)

**Programming via SFA Software.**

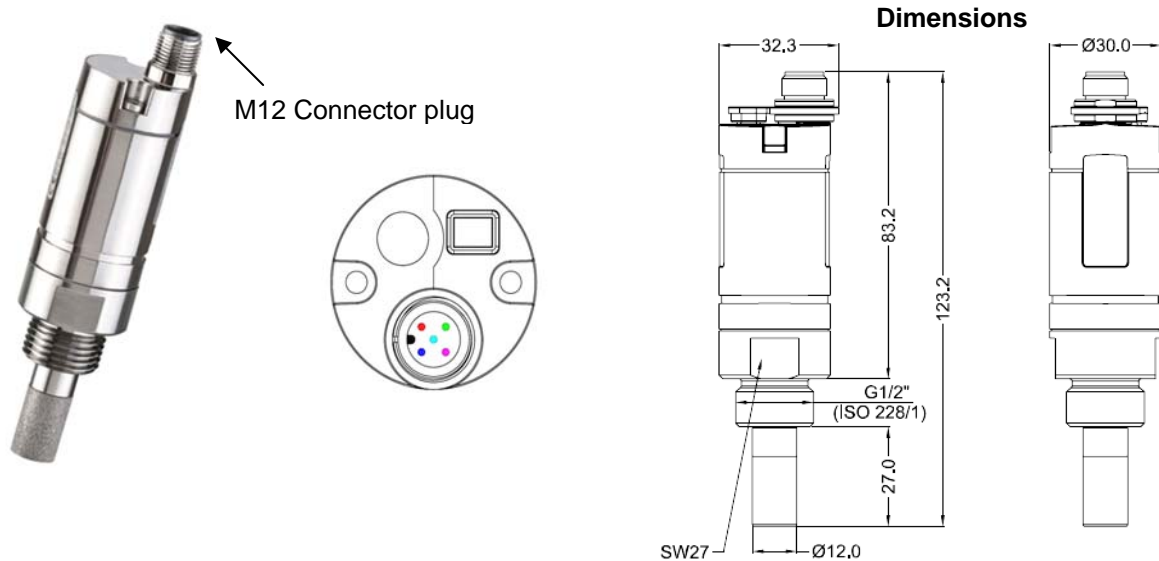
- Analogue output 4...20 mA scalable
- Calibration and adjustment including issuing of certificates
- Switching between °Ctd, % RH, g/m<sup>3</sup> and so on
- Read-out of service data

Measuring range	-80...20 °Ctd pressure dew point resp. dew point in °Ctd 0...100 % RH -30...70 °C
Type 0699.0410, FA 410	-80...20 °Ctd $\triangleq$ 4...20 mA
Type 0699.0412, FA 410	-20...50 °Ctd $\triangleq$ 4...20 mA
Accuracy:	typical $\pm 2$ °Ctd of -80...-40 °Ctd $\pm 1.5$ °Ctd of -40...0 °Ctd $\pm 1$ °Ctd of 0...20 °Ctd



Pressure range:	-1...50 bar standard
Power supply:	16..30 VDC
Output:	4...20 mA 3-wire technology
Protection class:	IP 65
EMV:	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 t95:	< 30 seconds (descending) < 10 seconds (ascending)

**DIAGRAM OF INSTRUMENT**

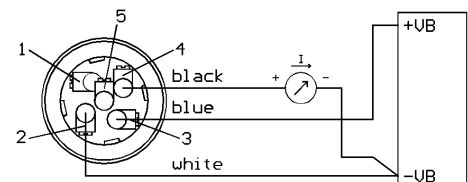
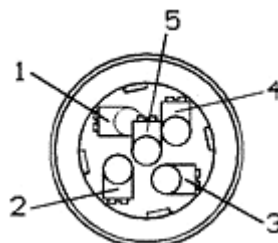


		Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
FA 410	<b>Connector plug</b>	SDI	-VB	+VB	+I	NC
	<b>Connection cable</b> 0554.0104 (5 m) 0554.0105 (10 m)	brown	white	blue	black	

SDI	Digital signal (internal data transfer)
-VB	Negative supply voltage
+VB	Positive supply voltage 16...30 VDC smoothed
+I	Positive 4...20 mA signal
NC	Not connected

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.

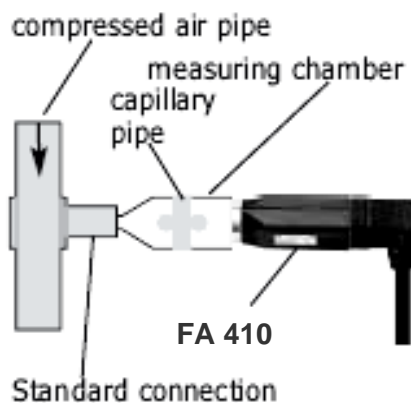
**M12 connector plug**



Connector plug

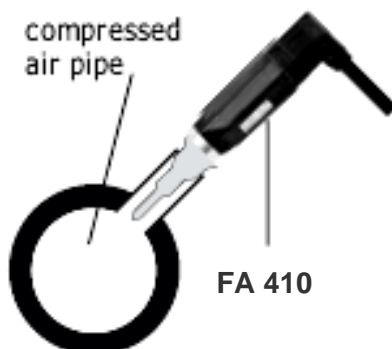
Please note: CS recommends the indirect installation with measuring chamber

**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.

**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 410 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 410 is 12 months for the instrument 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>
0699.0410	FA 410 dew point sensor (-80...20 °Ctd)
0699.0412	FA 410 dew point sensor (-20...50 °Ctd)
0553.0104	Connection cable, length: 5 m
0553.0105	Connection cable, length:10 m
0699.3390	Standard measuring chamber for compressed air up to 16 bar
0699.3590	High-pressure measuring chamber up to 350 bar *
0699.3690	Measuring chamber for atmospheric dew point
0699.3790	Measuring chamber for respiratory air bottles up to 350 bar *
0699.4004	Special scaling, output in g/kg, % RH, mg/m <sup>3</sup> , ppm (V/V), g/m <sup>3</sup>
0699.3396	Precision calibration at -40 °Ctd incl. ISO certificate
3200.0003	Precision calibration at 0 °Ctd and 10 °Ctd incl. ISO certificate
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
0699.4003	* special version FA 410 for 350 bar

**Sales office SOUTH**

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