

## FA 300-2 Ex

Stationary humidity  
measuring instrument for  
**measuring pressure  
dew-point and  
atmospheric dewpoint**  
for explosive areas.





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## **INTRODUCTION**

Dear CS-customer,

You have made the right decision by choosing a measuring instrument from 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:** Don't exceed pressure range.

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

Adjustment or calibrations should be carried out by qualified  
measurement and control engineering staff from CS INSTRUMENTS GmbH.

**DESCRIPTION**

**FA 300-2 Ex** is a 4-20 mA loop powered instrument, that generates a current flow according to the measured humidity or dewpoint.

Ex factory, various measurement values can be assigned to the analogue output such as: dewpoint, relative humidity, absolute humidity in mg/m<sup>3</sup>, g/m<sup>3</sup> and g/kg, ppm V/V. The scaling of the analogue output is adjustable as required.

**Manufacturer:**

Fa. CS INSTRUMENTS GmbH  
Am Oxer 28c  
D-24955 Harrislee  
www.cs-instruments.com

**Typ discription:**

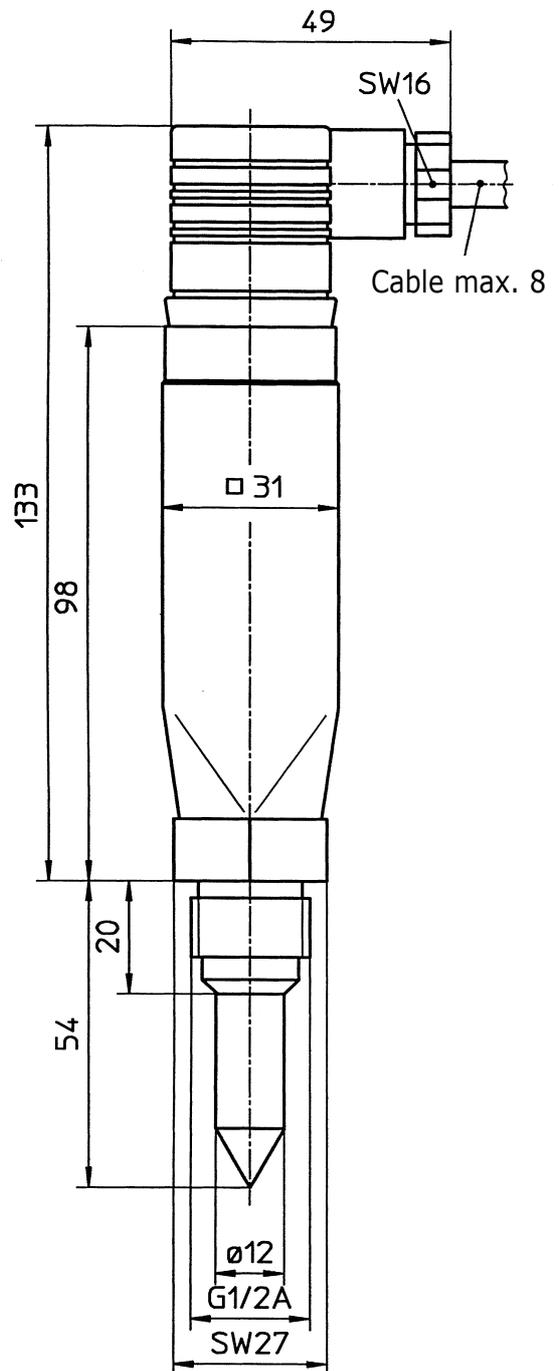
Typ	Protection class
FA 300-2 Ex	<b>Ex ia IIC T4</b>

**Protection class/ Marking:**

- FA 300-2 Ex: Intrinsic Safe
- Marking  $\langle Ex \rangle$  **II 2 G Ex ia IIC T4**  
According to EN 60079-0:2004  
and DIN EN 50020/8:2003

**Dimensions in mm**

**FA 300-2 Ex**



**Technical data FA 300-2 Ex**

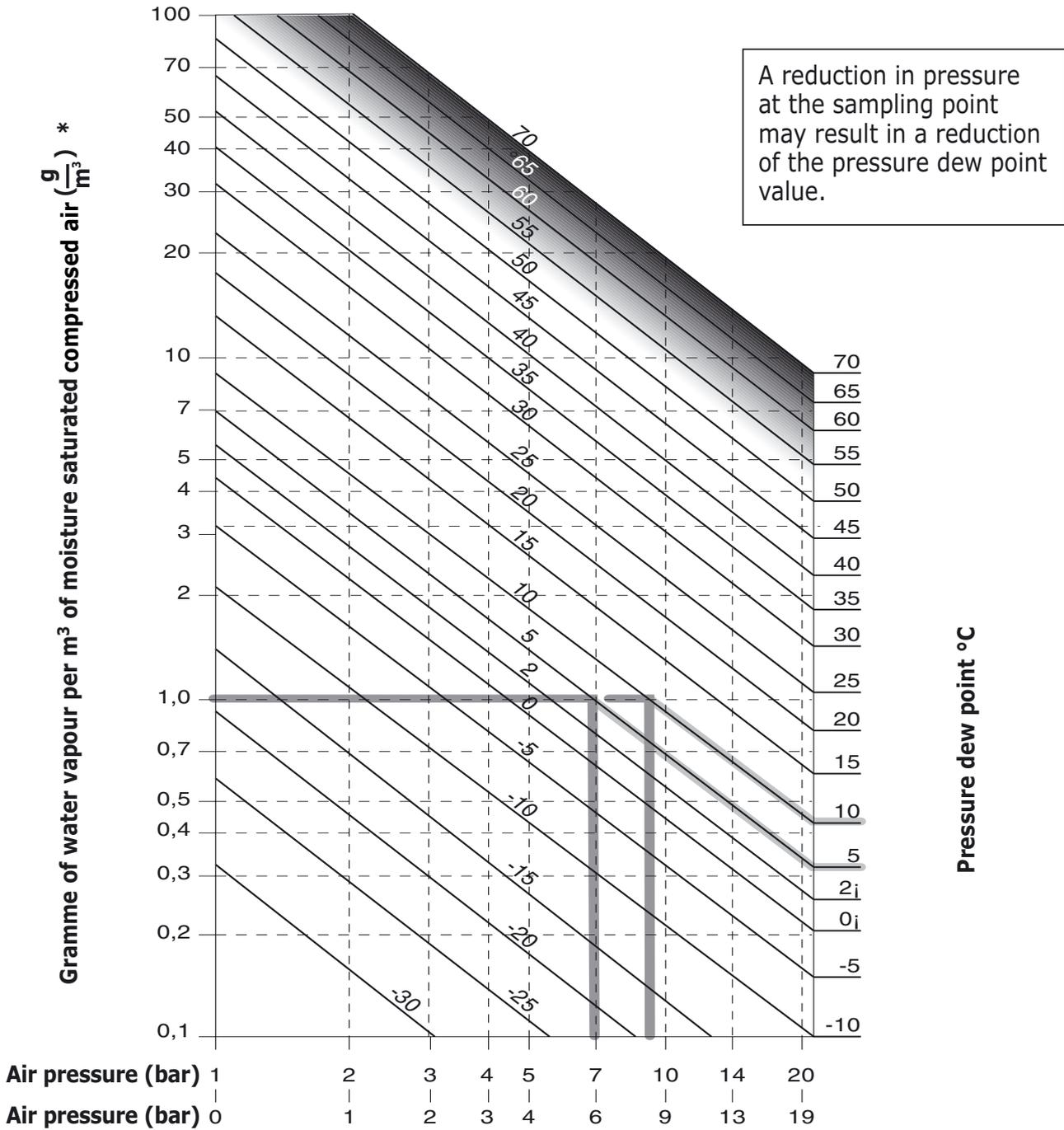
Measuring range:	pressure dewpoint in °C <sub>td</sub>
FA 300-2 Ex	-80 to +20 °C <sub>td</sub> $\triangleq$ 4 to 20 mA
Pressure range:	-1 to 300 bar
Power supply:	24 VDC (10 to 30 V DC)
Accuracy:	$\pm 0,5$ °C <sub>td</sub> (-10 to +50 °C <sub>td</sub> ) typical $\pm 2$ °C <sub>td</sub> at -40 °C <sub>td</sub>
Output:	4 to 20 mA in 2-wire technology
Protection class:	IP65
CE conformity to:	DIN EN 61326
Operating temperature:	-20 to +70 °C
Storage temperature:	-40 to +80 °C
Load for analogue output:	$\leq 500$ Ohm
Screw in thread:	G 1/2" stainless steel
Material of housing:	polycarbonate
Sensor protection:	sinter filter 50 $\mu$ m stainless steel
max. working resistance of analogue signal:	500 R at 24 VDC
max. Input Voltage U <sub>i</sub> :	30 V
max. Input current I <sub>i</sub> :	100 mA
max. Input power P <sub>i</sub> :	1 W
max. effective inner capacity C <sub>i</sub> :	17 nF
max. effective inner inductance L <sub>i</sub> :	Neglectable

The provided EG pattern approval certificate ZELM 05 ATEX 2291:2009 is to be considered.



# DEW POINT DIAGRAM FOR COMPRESSED AIR

The diagram provides information on the change in pressure dew point when there is a drop in pressure. Example: a drop in pressure from 8 bar to 6 bar working positive pressure is shown. In this case the pressure dew point drops from 10 °C to 5 °C.



\* with reference to 0 bar, 20°C



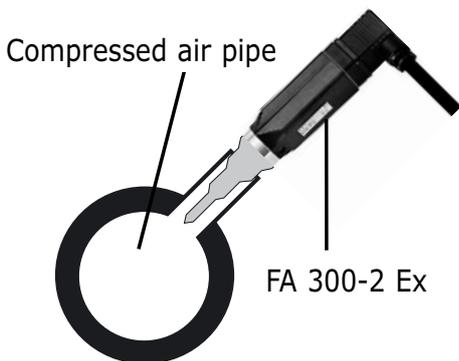
To enable accurate measurements in the low dew point range ( $-30$  to  $-80$  °C<sub>td</sub>), the measuring temperature of the gas should, if possible, be that of room temperature ( $20$  to  $35$  °C). With resin driers, for example, or other applications, the temperature of the measuring gas is often higher, e.g.  $70$ ° to  $120$ °C.

In this case we recommend installing a "cooling tunnel" of impermeable material in front of the screw-on measuring chamber.

A Teflon pipe or a copper pipe would be ideally suitable for this purpose, as the hot gas is cooled to ambient temperature over the length of the pipe, approx.  $2$  to  $5$  m.

Please do not use ordinary plastic tubes!

The dew point temperature in °C<sub>td</sub> does not change when cooled as it is an absolute humidity value, which, like other measured variables e.g. g/m<sup>3</sup>, is independent of temperature.



### **Directly in the compressed air system**

Screw in probe with G ½ " thread pressure-tight in the centre or in the compressed air pipe where the measurement is to take place. Ensure that the measurement is carried out close to the compressed air flow. U-bend pipes or non-flowing compressed air result in very slow reaction times for the moisture reading. Installation is recommended following drying of the compressed air and all bypass pipes or for critical compressed air users.

### **Measurable gases:**

In general humidity can be measured in all non-corrosive active gases. For corrosive gases please query with CS INSTRUMENTS GmbH.

**Consideration:** When installing the instrument in areas of gas group IIC ensure, that there are no sparks even in uncommon hazardous incidents.

## Requirements for installation in hazardous area

### Zone 1

Humidity/Dew point transmitter FA 300-2 Ex is only allowed to be connected to an intrinsic safe circuit, in which an electrically isolated supply and signal circuit in the power supply is preferred. Equipment without electrical isolation according to EN 50020 must not be used, if a potential equalization occurs along the wire. The related requirements according to EN 60079-14 have to be met.

$$U_0 = 30 \text{ V max.}$$

$$I_0 = 100 \text{ mA max.}$$

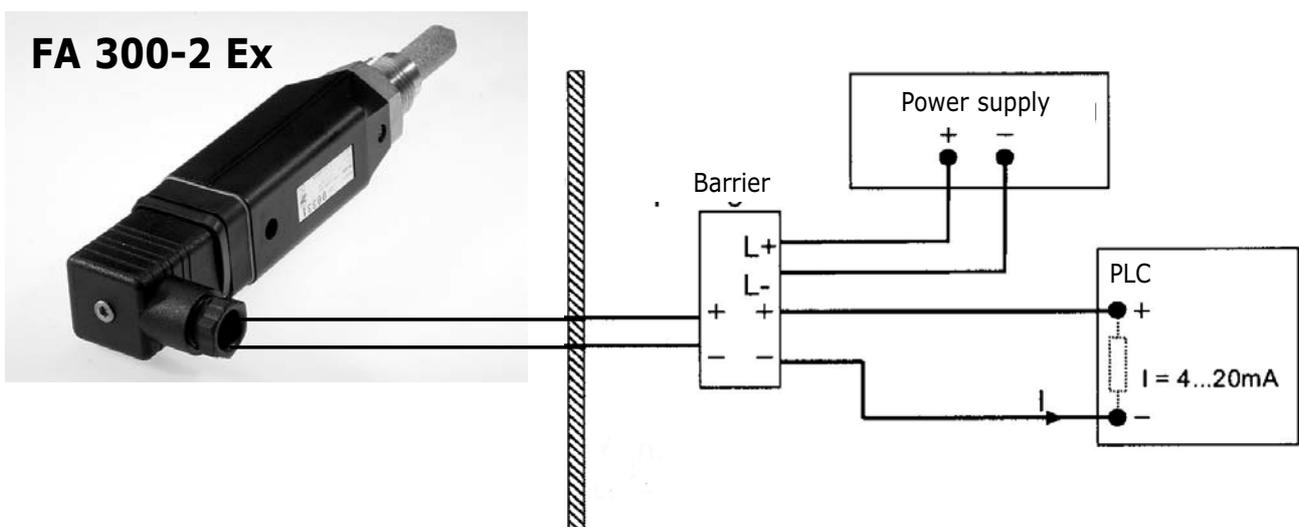
$$P_0 = 1 \text{ W max.}$$

The maximum effective inner capacity is 17 nF, the maximum effective inner inductance is negligible.

## Connection of transmitter to ATEX certified supply

Explosive area

non explosive area





**From the manufacturer**

According to DIN ISO certification of the measuring instruments, we recommend regular calibration, and if necessary, adjustment of instrument by the manufacturer. The calibration cycles should fit your internal scheme. We recommend a yearly cycle. If requested, we can carry out calibration on your premises.

**CONNECTION**

**Connection: Basic instruments FA 300-2 Ex**



4 to 20 mA analogue output  
in 2-wire technology



**Opening the plug:**

for opening the plug for connection  
light levering with a flat screw driver.

**Connection:**

1. internal use
2. - Vb (earth 0 V)
3. + Vb (supply 24 V DC, 10...30 V DC)
4. NC

max. cable cross section: 1,5 mm<sup>2</sup>

cable diameter: PG9

Output: 4 to 20 mA in 2-wire technology



<b>Order data</b>	<b>Order No.</b>
FA 300-2 Ex pressure dewpoint measuring instrument (-80 to +20°C <sub>td</sub> )	0699.3070
Special scaling analog output in g/kg, %rF, mg/m <sup>3</sup>	0699.4004
Precision calibration at -40°C <sub>td</sub> incl. certificate	0699.3396
Intrinsically safe power supply, safety barriers	0554.3071



Dear Customer

Thank you for your confidence in CS INSTRUMENTS GmbH which you have shown by purchasing this measuring instrument. You have made the right choice by choosing a quality product. If you have reason for complaint we will 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 .

The warranty time for the **FA 300-2 Ex** is 12 months for the instrument, 6 months for accessory parts. 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 packaging 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. Include your telephone number should we need to contact you.

Our **CUSTOMER SERVICE** puts the customer first.



- **Consultation**
- **Sales**
- **Customer Service**
- **Trainings**

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