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Programmable 4-20mA 2-wire Dewpoint Transmitter

DPT-NS

Instruction Manual

Version 23.01

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1. Safety rules

- Please read these instructions before using.
- Before turning the power on, make sure that the wires have been connected properly.
- Provide working conditions (maximum gas pressure, power supply, humidity, temperature) according to the specification.

2. Characteristics of the device

DPT-NS is a microprocessor electronic device that converts the capacity of the integrated humidity sensor into a standard 4 ... 20 mA current signal. The transmitter is calibrated and configured at the factory, but some of its parameters, mainly physical unit and conversion range, the user can modify adapting them to the requirements of the measurement system. The **DPT-IF-2013U** interface connected to the computer's USB port serves this purpose.

3. Technical data.

Default values are underscored

Dewpoint measurement range (programmable)	-80 ... +20 °Cdp or -112 ... +68 °Fdp or
Relative humidity in % calculated on the basis dewpoint and gas temperature	0.5 ... 49000 ppm(v) or 0 ... 100 %RH
Pressure value entered for the calculation of ppmv	500 ... 40000 hPa
Dewpoint measurement accuracy	± 2 °Cdp
Thermal drift	compensated in operating temperature range
Conversion range (programmable)	10 % ... 100 % of measurement range
Response time (T95)	1 min (dry to wet)
Output signal (programmable)	4 ... 20 mA or 20 ... 4 mA
Linear region of output signal	3.8 ... 20.5 mA
Output signal delay after power on	ca. 5 s
Sensor failure indication (programmable)	23 mA or 3.5 mA
Power supply Vs (from current loop)	8 ... 36 V DC / 24 mA
Maximal load resistance [Ω]	(Vs[V] - 8) / 0.024
Operating temperature range	-40 ... +60 °C
Maximal operating pressure	40 MPa
Housing material / filter	stainless steel / 5 µm stainless steel sintered guard
Ingress protection	IP65
Process connection	external thread 5/8"-18 UNF
Dimensions with connector (diameter x length)	31 x 129 mm
Weight	150 g
Accessories (ordered separately):	1) interface DPT-IF-2013U 2) process connection adapter DPT-G1/2" 3) sampling block DPT-SB

4. Installation

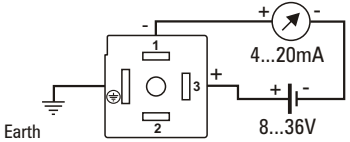
4.1. Cable connection

The connecting cable should be three-core, if the transducer is to be earthed via a connector or two-core if it is earthed through the process connection thread.

The maximum cross section of one wire is 0.75 mm2. The outer diameter of the cable should be between 4.5 and 6.0 mm.

To connect the current loop wires and the ground wire to the transmitter:

1. Loosen the central screw in the cable connector and pull the connector out of the socket.
2. Remove the screw from the hole in the connector.
3. Slide the terminal block out of its housing by prying it with a narrow screwdriver in a place where the gap between it and its housing is widened.
4. Pull the cable through the hole in the connector gland. The external insulation should be removed at a length of about 20 mm, and the insulation of wires at a length of about 5 mm. The ends of the copper wires should be tinned.
5. Connect the wires with the terminal block according to the diagram below:



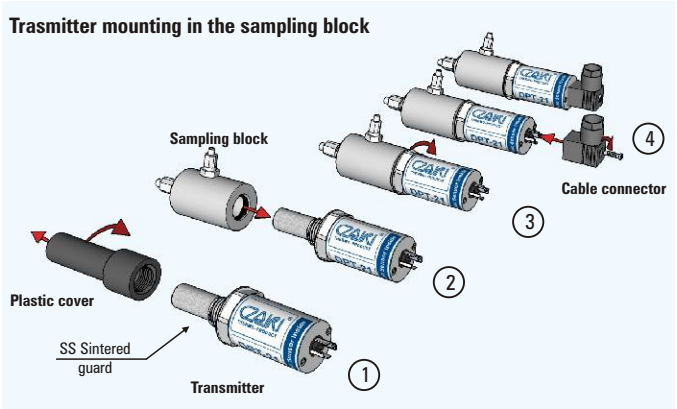
6. Press the terminal block into its housing and tighten connector gland by screwing it on. It is recommended to perform this operation after mounting the transmitter on the object, because the terminal block can be placed in its housing in 4 ways (every 90 °), which allows you to direct cable gland in the chosen direction.

4.2. Transmitter mounting

The transmitter can be mounted via a sampling block (ordered separately), either directly in a pipeline or a duct of a gas, the moisture of which we want to measure.

The recommended gas flow through the sampling block is 0.5÷5 Nl / min.

If installed directly in the pipeline, the gas flow velocity should be within 0÷10 m / s.



To mount the DPT-NS transmitter in the DPT-SB sampling block:

1. Unscrew the plastic cover containing the pellet with moisture absorber. The cover should be kept in order to later secure the transmitter for storage or transport. Do not touch stainless steel sintered guard surface.
2. Slide the detector sintered guard into the hole of the sampling block equipped with appropriate connection sockets. The 18 x 2.5 mm O-ring gasket is supplied complete with a transmitter.
3. Gently screw in the transmitter with your hand and then tighten with a torque of 30 Nm using the wrench. Use a 27 mm flat or ring wrench by attaching it to the hexagonal part of the transmitter.
4. Put the cable connector on the pins of the transmitter socket, keeping in mind the flat gasket between the connector and the metal body. The key to locating the connector is a ground pin wider and longer than the other.

   Tighten the central screw that secures the cable connector.

The same sequence of operations applies when the transmitter is installed in a pipeline. Do not place the transducer close to the bottom of the pipe or knee, as condensed water may cause erroneous indications.

The pipe should have a threaded hole with a flat and smooth surface that allows sealing of the connection.

The transducer process connector has a 5/8 "-18 UNF thread, but you can use a DPT-G1/2" process connection adapter (ordered separately) to adapt the transmitter to a G1/2 "thread.

5. Maintenance

5.1. Calibration

DPT-NS re-calibration is only available in the Czaki Thermo-Product laboratory.

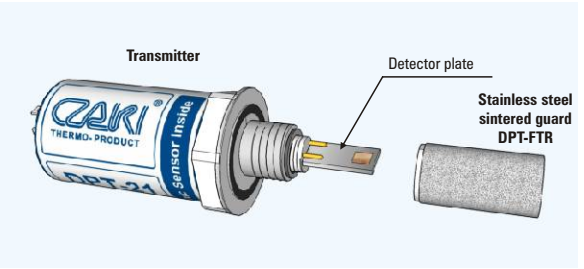
The procedure is the same as for new transducers. The transducer detector is placed in a gas with a given humidity and its electrical capacity is measured. Based on 11 measurements, the detector's characteristics are determined and stored in the transmitter's memory.

5.2. Detector guard replacement

The transmitter is equipped with a detector guard made of sintered stainless steel. Its task is to protect the detector against mechanical damage and dirt. The guard, in which the pores have been clogged with solid particles, should be dismantled for cleaning or replacing with a new one. Use protective gloves when unscrewing and attaching the guard.

Under no circumstances should you touch the detector plate.

The new detector guard can be purchased from Czaki Thermo-Product by ordering a spare part DPT-FTR.



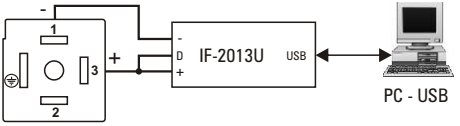
6. Programming

To change the transmitter settings you need:

1. A computer with Windows® installed and equipped with a USB port.
2. The **DPT-IF2013U** interface from Czaki Thermo-Product together with software included containing drivers and **DPT-config** application.

The cables necessary for connecting the interface with the computer and the transducer are supplied complete with the interface.

The wiring diagram is shown in the figure below:



During programming, the transmitter is supplied from the interface with a voltage of approx. 20VDC.

The description of software installation and use of the DPT-config application can be found in the DPT-IF-2013U interface manual.

7. Package contents

1. Complete DPT-NS transmitter
2. Instruction Manual