HUMIDITY AND TEMPERATURE TRANSDUCER

P18 TYPE

APPLICATION

The P18 transducer is a device destined for the continuous measurement and conversion of relative humidity and ambient temperature into a digital way and into a voltage or current standard signal. The transducer programming is possible through the RS-485 interface.
Applied sensor shields (table 1) enable the application of the P18 transducer to operate in various ambient conditions. The transducer is designed to be mounted on a wall.

The P18 transducer realizes following functions:

- calculation of selected physical quantities, (dew-point temperature, absolute humidity),
- conversion of measured quantities into the output signal on the base of the individual linear characteristic,
- memory of maximal and minimal value for each of measured and calculated value,
- programming of the measurement averaging time,
- servicing of RS-485 interface in MODBUS protocol, in the RTU mode.

TECHNICAL DATA

Basic parameters:

- range of relative humidity measurement (RH)	0...100% without condensation[1)]
- basic error of humidity conversion	± 2% for RH = 10...90% ± 3% for the remaining range
- hysteresis for humidity measurement	± 1%
- range of temperature measurement (T)	- 30...85°C
- basic error of temperature conversion	± 0.5% of the range
- calculated quantities	absolute humidity (a) [g/m^3] dew-point temperature (Td) [°C]
- additional errors:	
■ temperature influence	± 25% of the basic error/10°C

RS-485 digital output:

- transmission protocol	MODBUS
- baud rate	4800, 9600, 19200, 38400, 57600 bit/s
- mode	RTU: 8N2, 8E1, 8O1, 8N1
- maximal response time	300 ms

Analog output (depending on version):

- current	4...20 mA
- voltage	0...10 V
- maximal load capacity of the current output	200 Ω
- minimal load capacity of the voltage output	1k Ω

Rated operating conditions:

- supply	9...28 V a.c., 9...36 V d.c.[2)]
- consumption	< 2 VA
- ambient temperature	- 30...23...85°C
- relative air humidity	< 95% (admissible condensation of water vapour)
- rate of air flow	≥ 2 m/s
- preheating time	15 minutes
- protection degree ensured by the housing	IP 65
- weight	125 g
- fixing	on a wall
- working position:	
■ in applications non-exposed to a direct contact with water: any	
■ in applications exposed to a direct contact with water: with the sensor chamber directed towards the ground.	

Electromagnetic compatibility:

- immunity	acc. to EN 61000 -6-2
- emission	acc. to EN 61000 -6-4

Security requirements acc. to EN 61010-1

- installation category	III
- pollution grade	2
- working voltage in relation to earth	50 V

EXTERNAL DIMENSIONS AND FIXING WAY

The P18 transducer is fixed on a wall by means of a screw connection or glue without the loss of IP 65 tightness.

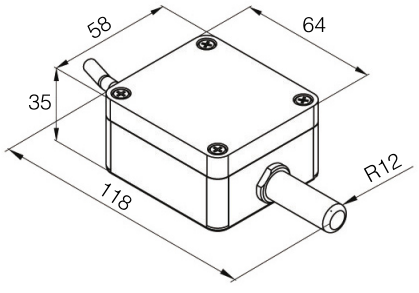

Fig. 1. Overall dimensions of P18 transducer

The transducer housing is made of a self-extinguishing plastics. The transducer has screw connectors placed inside the housing, which enable the connection of external wires of 1 mm^2. cross-section

[1)] in case of water vapour condensation on the sensor surface, the maximal error can increase to 3% RH

[2)] for voltage outputs, the supply 15...36 V d.c. or 15...28 V a.c. is required

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EXTERNAL CONNECTION DIAGRAMS

The P18 transducer has 8 connection terminals, accessible after removing the transducer housing cover.
To connect the interface line, we must use a twisted wire. In case of transducer operation in an environment of high interference, one must apply shielded wires. The shield must be connected to the nearest PE point from the supplier side.

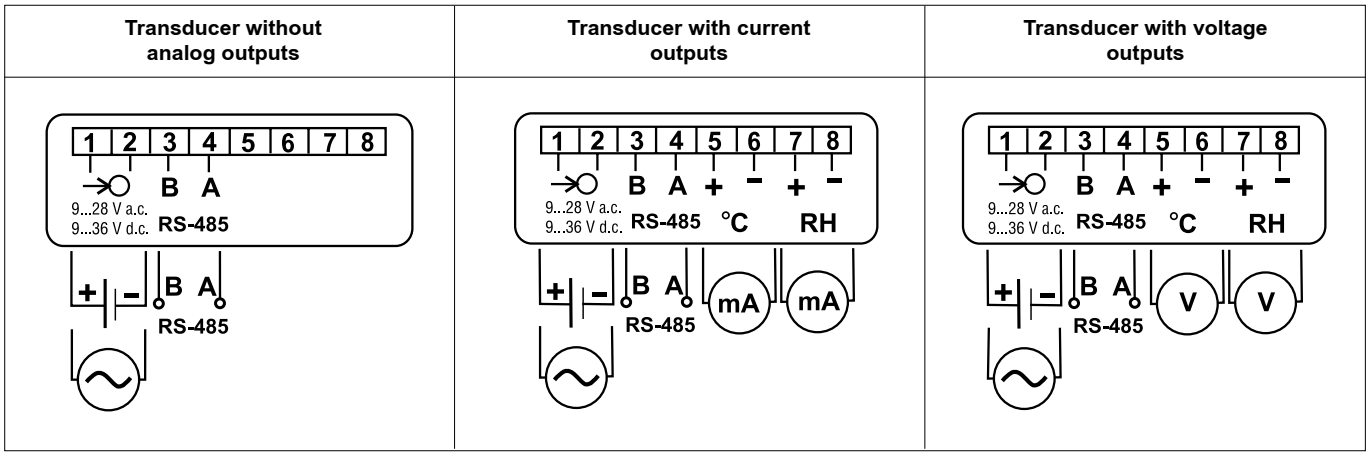

Fig.2. Connection way of electric signals

Sensor protection shields

Table 1

Design	Shield code	Name	Construction	Features	Typical application
	**0874-490-016**	Membrane filter	Casing made of PC membrane of teflon laminated by a film. Pore size:1 µm	Mean filtration effect. Maximal temp.: up to 80°C Response time t10/90: 15 s	Building automation. For application in rooms with low pollution.
	**0874-490-015**	Filter made in teflon	Sintered teflon Pore size 50 µm	High chemical resistance Maximal temp.: up to 180°C Response time t10/90: 14 s	Drying process in chemical applications.
	**0874-490-014**	Filter made of sintered bronze	Sintered bronze Pore size: 60 µm	High mechanical resistance. To co-operate with high pollution. Applied at small air humidity. Response time t10/90: 10 s	Agricultural applications

ORDERING CODES

Table 2

Humidity and temperature transducer P18	X	XX	X
Analog outputs:			
without analog outputs **0**			
current output 4...20 mA..... **1**			
voltage output 0...10 V **2**			
Version:			
standard **00**			
custom-made* ..... **XX**			
Acceptance tests:			
without an additional quality inspection requirements..... **8**			
with an extra quality inspection certificate **7**			
other requirements agreed with the customer* ..... **X**			

*code established by the manufacturer

Example of order:

The code: **P18-1- 00- 8** means
P18 - humidity and temperature transducer
1 - current output: 4...20 mA
00 - standard version
8 - without an additional quality inspection certificate

In case of need, one must order additionally a sensor protection shield acc. to the table 1.
E.g. The shield coded : **0874-490-014** means a filter made of sintered bronze.

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