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## 2-wire transmitter

for pH Type 202701/10

for redox Type 202701/20

### General application

The 2-wire transmitter is intended for linking a pH or redox combination electrode with plug connection to indicators/controllers with an active 4–20 mA input. On the output side the 2-wire transmitters have a connection for supply and standard signal. Zero and slope of pH combination electrodes are adjusted at the indicator/controller. No calibration is required for redox electrodes.

The 2-wire transmitter is screwed directly on to the electrode head of the combination electrodes.

This circuit arrangement largely prevents interference from dirt, humidity, or electrical fields from live conductors. A conventional coaxial cable or a 2 wire cable with screen is sufficient as connection between the transmitter and the indicator. This permits trouble-free transmission over larger distances between the transmitter and the indicator.

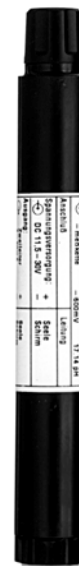
An isolated supply is recommended when operating the transmitters with a PLC.

#### Type 202701 for pH

The 2-wire transmitter converts the high-impedance signal of the pH electrode (up to 1000 MΩ) into a standard 4–20 mA signal.

#### Type 202702 for redox

The 2-wire transmitter converts the signal of the redox electrode into a standard 4–20 mA signal.



### Technical data

#### Type 202701/10 pH

##### Input

The high-impedance voltage signal of the pH electrode in the range +600 to –600 mV is converted to a standard 4–20 mA signal (not isolated).

#### Type 202701/20 redox

##### Input

The voltage signal of the redox electrode in the range of –1000 mV to +1000 mV is converted to a standard 4–20 mA signal (not isolated).

#### General

##### Case

PVC

##### Weight

0.2 kg max.

##### Electrical connection input

coaxial connector suitable for most commercially available electrode connector heads

##### Electrical connection Output

21: coaxial screw-plug connection suitable for cable socket N

32: Harting plug (Harax M12)

83: M12 plug (4 pole)

##### Supply $U_B$

11.5 to 30 V DC  
 nominally 24 V DC

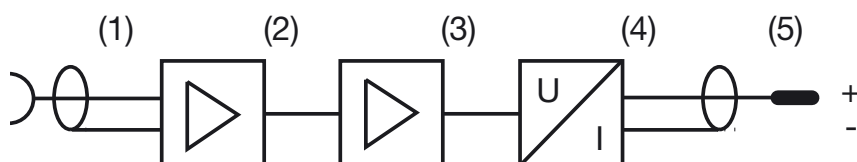
##### Max. current uptake

40 mA approx.

##### Supply voltage error

0.02 %max. of span per Volt deviation from 24 V DC

### Block diagram



### Operation

The combination electrode is connected to the cable socket N (1). The input voltage is passed to the amplifier (2). Stage (3) determines the start and end of the signal assignment. Stage (4) converts the voltage into a proportional 4–20 mA current. The connector (5) connects the 2-wire transmitter to the next instruments.

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**Output signal**

max. burden  $\frac{U_B - 11.5V}{0.02A}$

**Deviation of characteristic**

2.5% max. referred to span

**Ambient temperature error**

0.2% max. per 10°C referred to span

**Burden error**

0.02% max. of span per 100 Ohm burden

**Permitted ambient temperature**

-5 to +55°C

**Protection**

IP 65 to EN 60 529

**CE symbol**

EN 50 081 Part 1

EN 50 082 Part 2

**Dimensions**

diameter 20 mm approx.

length 145 mm approx.

**Connections**

**N cable socket**

**Coaxial plug**

outer sleeve -

inner pin +

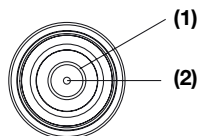
The current 4 – 20 mA in the output circuit provides the supply to the 2-wire transmitter (4mA) and the output signal (4 – 20 mA). 4 ... 20 mA).

**Coaxial cable**

screen -

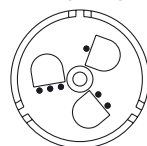
inner conductor +

**Plug**



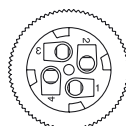
(1) = outer sleeve = -  
 (2) = inner pin = +

**Harting plug**



• = +  
 •• = -  
 ••• = NC

**M12 plug**



1 = +  
 2 = -  
 3 = -  
 4 = +

**Supply units suitable for the 2-wire transmitter:**

e.g. supply units to Data Sheet 40.9750, if no isolation is required, or supply units to Data Sheet 95.6055 when isolation is necessary.

**Order details**

**(1) Basic type**

202701 2-wire transmitter

**(2) Basic type extension**

10 pH  
 20 redox

**(3) Electrical connection - input**

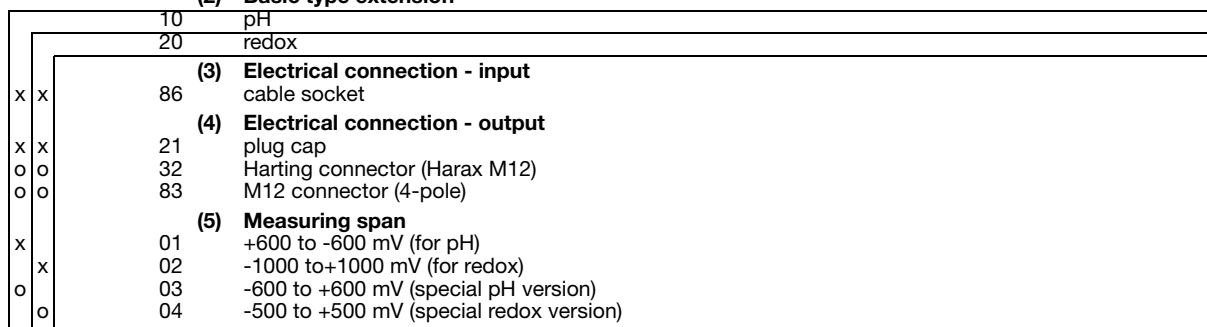
86 cable socket

**(4) Electrical connection - output**

21 plug cap  
 32 Harting connector (Harax M12)  
 83 M12 connector (4-pole)

**(5) Measuring span**

01 +600 to -600 mV (for pH)  
 02 -1000 to +1000 mV (for redox)  
 03 -600 to +600 mV (special pH version)  
 04 -500 to +500 mV (special redox version)



(1) (2) (3) (4) (5)

**Order code** [ ] / [ ] - [ ] - [ ] - [ ]

**Order example** 202701 / 10 - 86 - 21 - 01

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**Stock versions** (shipment: 3 working days after receipt of order)

Type	Description	Sales No.
202701/10-86-21-01	pH	20/00332272
202701/20-86-21-02	Redox	20/00335049

**Production versions** (shipment: 10 working days after receipt of order)

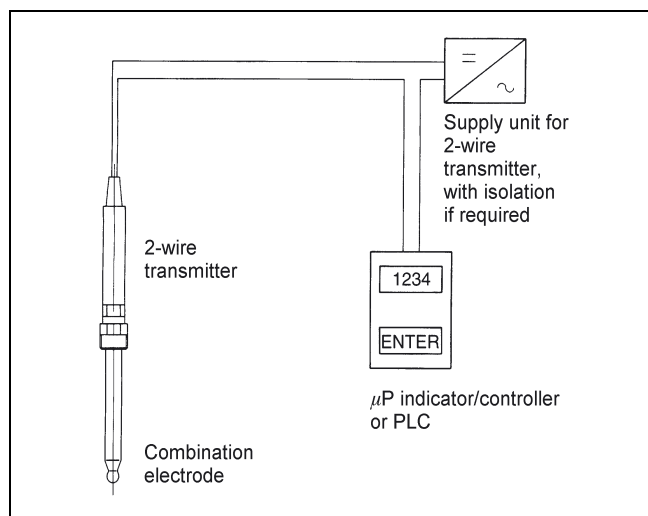
Type	Description	Sales No.
202701/10-86-83-01	pH, M12 connector	20/00409877
202701/10-86-83-03	pH, M12 connector, -600 to +600mV	20/00415579

**Accessories** (shipment: 10 working days after receipt of order)

Type	Description	Sales No.
N cable socket (only for connection 21) Type 2991-00-0 / Ø 5mm		20/00409877
Adapter for checking the signal output of the 2-wire transmitter	matching only to electrical connection 21	20/00332273

**Example 1:**

Possible arrangement of a complete measurement circuit:



**Example 2:**

Possible arrangement of a complete measurement circuit for determining electrode parameters, with adapter and multimeter:

