

JUMO GmbH & Co. KG
 Delivery address: Mackenrodtstraße 14,
 36039 Fulda, Germany
 Postal address: 36035 Fulda, Germany
 Phone: +49 661 6003-0
 Fax: +49 661 6003-607
 e-mail: mail@jumo.net
 Internet: www.jumo.net

JUMO Instrument Co. Ltd.
 JUMO House
 Temple Bank, Riverway
 Harlow, Essex CM 20 2TT, UK
 Phone: +44 1279 635533
 Fax: +44 1279 635262
 e-mail: sales@jumo.co.uk
 Internet: www.jumo.co.uk

JUMO Process Control, Inc.
 8 Technology Boulevard
 Canastota, NY 13032, USA
 Phone: 315-697-JUMO
 1-800-554-JUMO
 Fax: 315-697-5867
 e-mail: info@jumo.us
 Internet: www.jumo.us



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.

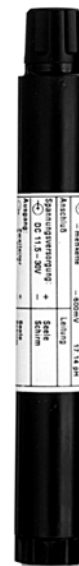
An isolated supply is recommended when operating the transmitters with a PLC.

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

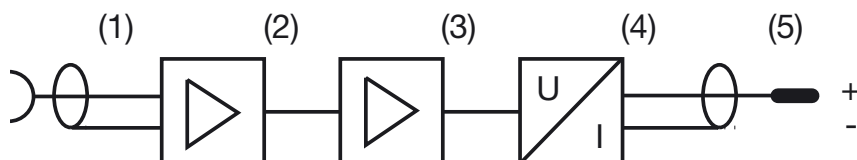
Max. current uptake

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

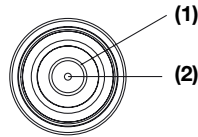
outer sleeve -
 inner pin +

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

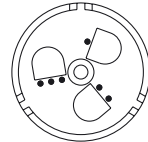
screen -
 inner conductor +

Plug



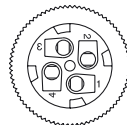
(1) = outer sleeve = -
 (2) = inner pin = +

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**

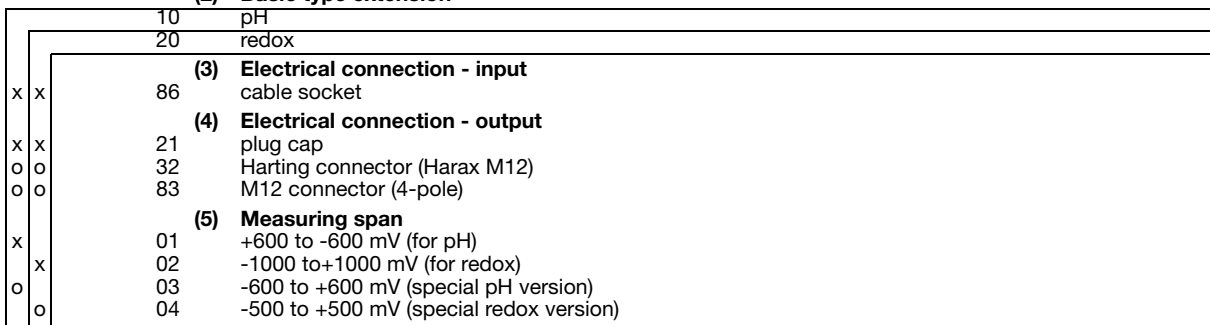
86 cable socket

(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)



Order code (1) / (2) - (3) - (4) - (5)

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)

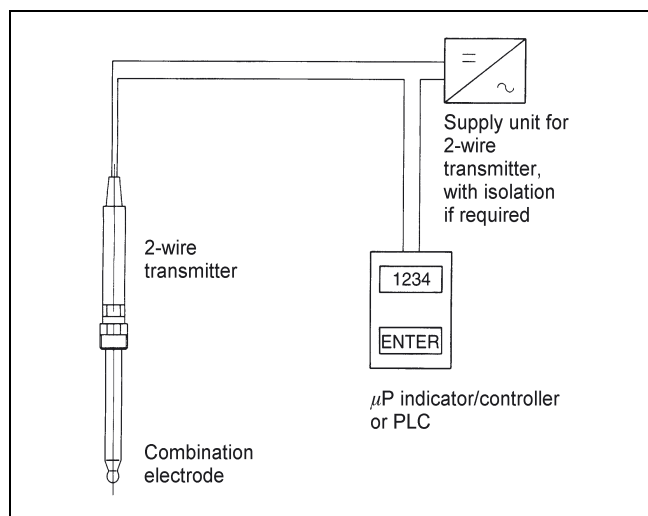
Type	Description	Sales No.
202701/10-86-83-01	pH, M12 connector	20/00409877
202701/10-86-83-03	pH, M12 connector, -600 to +600mV	20/00415579

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:

