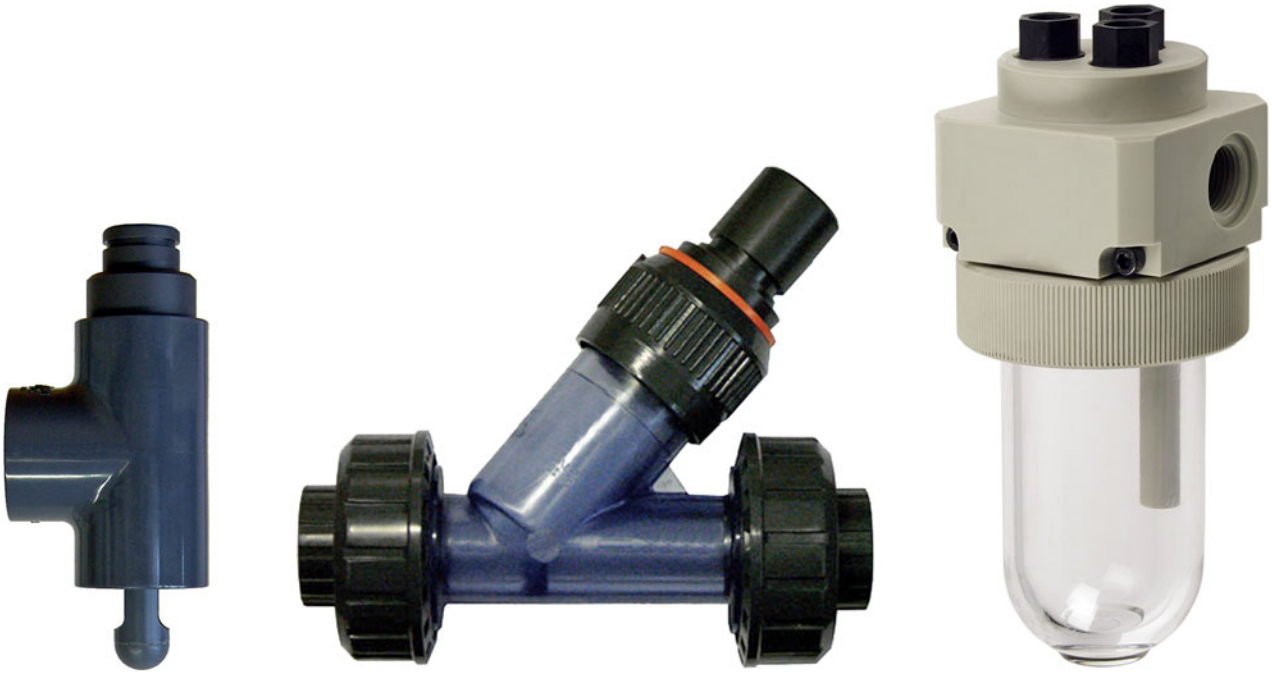
Flow Fittings

for Electrochemical Sensors



B 202810.0

Operating Manual

JUMO

2014-05-14/00431662

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1.1 Safety information

General information

This manual contains information that must be observed in the interest of your own safety and to avoid damage to assets. This information is supported by symbols which are used in this manual as indicated.

Please read this manual before commissioning the device. Keep the manual in a place accessible to all users at all times.

If difficulties occur during commissioning please refrain from carrying out any manipulations that could jeopardize your warranty rights.

Warning symbols

CAUTION!
This symbol in connection with the signal word indicates that **damage to assets or data loss** will occur if the respective precautionary measures are not taken.

Note symbols

NOTE!
This symbol refers to **important information** about the product, its handling, or additional use.

1 Introduction

1.2 Description

Flow fittings serve to accommodate electrochemical measured value transducers (e.g. pH and Redox combination electrodes, glass conductivity sensors, compensation thermometer, etc.) with Pg13.5 screw-in thread and an insertion length of 120 mm. Fitting types for 1 to 3 measured value transducers are available.

The fittings are directly installed in feed pipes for material under measurement or in the bypass. They protect the installed sensors against breakage and their special design type ensures correct flow to the sensor, preventing measuring errors.

Various fastening variants and materials are available. Other versions and materials can be offered on request.

CAUTION!
In the case of systems that are subject to pressurization and thermostress, the user must be sure to select the corresponding version of the fittings and the measured value transducers.

When planning the piping, the following aspects are to be considered:

- Fittings must be easily accessible in order to enable regular maintenance/cleaning of the measured value transducers and/or the fitting
- Bypass measurements are recommended as the preferred option; it should be possible to remove sensors using shut-off valves
- When the plant is idle, the pH and Redox electrodes must not become dry for an extended period of time – it must be ensured that the structure includes residual liquid in the fitting
- In the case of systems that are subject to pressurization and thermostress, the user must be sure to select the corresponding version of the fittings and the measured value transducers
- The system designer must check the suitability of the materials (e.g. chemical compatibility) – prior to use in chemical media in particular, the resistance of the fittings and their materials must be checked and a leak test must be performed

Additional fittings

Fitting type	Data sheet
Flow fittings	202810
Immersion fittings	202820
Quick-change fittings	202822
Process fittings	202825

CAUTION!
The mounting, startup, and maintenance must only be performed by expert personnel.

CAUTION!
Only original spare parts may be used for the fittings.

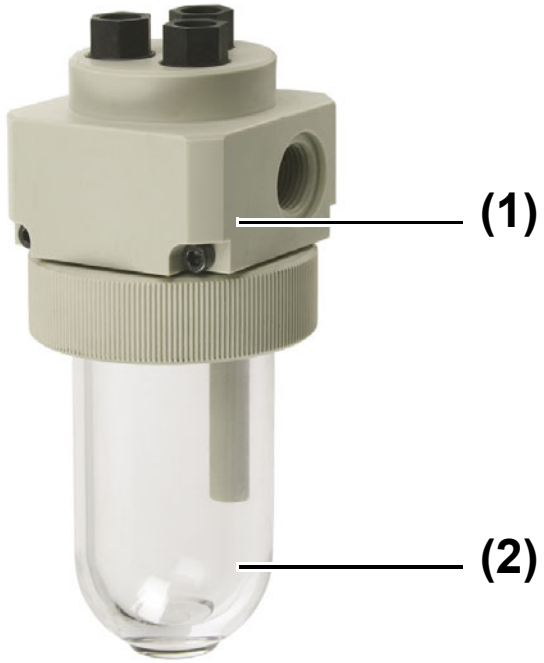
2.1 Flow fitting for max. 3 measured value transducers

Fitting type 202810/03... is suitable for the insertion of 1 to 3 measured value transducers with Pg13.5 thread and an insertion length of 120 mm.

The extra code "ground electrode" enables the discharge of undesired electrical and electrostatic voltage potentials, which occur in complex plants and can distort the measured values.

Fittings with a measuring vessel made from polypropylene (PP) are deployed in cases where the transparent material PC (standard) is not suitable, e.g. processes with sharp (sudden) fluctuations in temperature.

Type 202810/03-104-87-80/000



(1) Case
(2) Measuring vessel

2 Identifying the device version

2.1.1 Order details

	(1)	**Basic type**
202810/03		Flow fitting for max. 3 measured value transducers with Pg13.5 thread
	(2)	**Process connection**
104		Screw connection G 1/2
	(3)	**Material**
87		Polypropylene (PP)
	(4)	**Measuring cup material**
080		Polycarbonate (PC)
087		Polypropylene (PP)
	(5)	**Extra codes**
000		Without
055		Ground electrode

	(1)		**(2)**		**(3)**		**(4)**		**(5)**
Order code		-		-		-		/	
Order example	202810/03	-	104	-	87	-	080	/	000

2.1.2 Accessories

Article	**Part no.**
Replacement vessel made from polycarbonate (PC) incl. O-ring	00417498
Replacement vessel made from polypropylene (PP) incl. O-ring for versions with build year from September 2005	00463367
Replacement vessel made from polypropylene (PP) incl. O-ring for versions with build year up to August 2005	00417499
KCl storage vessel, pressure-resistant, for wall mounting; for inserting an electrolyte bridge or when using KCl-filled electrodes	00060254
Fixing bracket for wall mounting, stainless steel 1.4571	00455706

NOTE!
For more information on inserting an electrolyte bridge or using KCl-filled electrodes, see Chapter 3.6 "Accessories", page 19.

2.2 Flow fitting for 1 measured value transducer

Fitting type 202810/01... is suitable for the insertion of 1 measured value transducer with Pg13.5 thread and an insertion length of 120 mm.

Angled seat version, type 202810/01-970-86

T-piece version, type 202810/01-968-86

2 Identifying the device version

2.2.1 Order details

	(1)	**Basic type**
202810/01		Flow fitting for 1 measured value transducer
	(2)	**Process connection**
965		Angled seat DN 20
966		Angled seat DN 25
967		T-piece DN 32
968		T-piece DN 40
969		T-piece DN 50
970		Angled seat DN 20 with screwed butt joint
971		Angled seat DN 25 with screwed butt joint
	(3)	**Material**
86		Polyvinyl chloride (PVC)

	(1)		**(2)**		**(3)**
Order code		-		-	
Order example	202810/01	-	970	-	86

2.2.2 Accessories

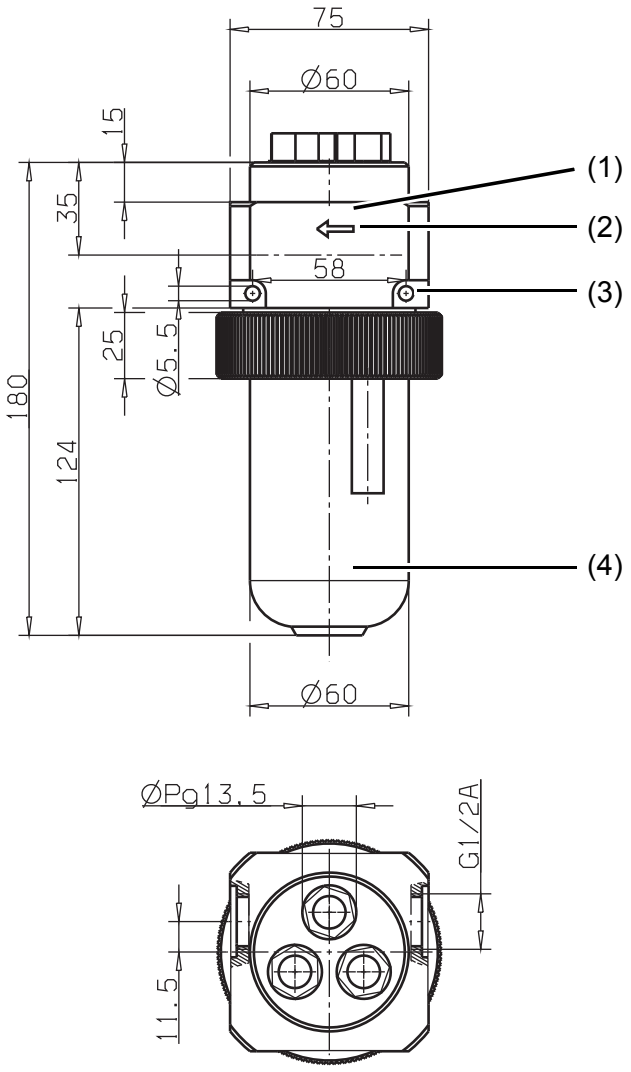
Article	**Part no.**
KCl storage vessel, pressure-resistant, for wall mounting; for inserting an electrolyte bridge or when using KCl-filled electrodes	00060254

NOTE!
For more information on inserting an electrolyte bridge or using KCl-filled electrodes, see Chapter 3.6 "Accessories", page 19.

3.1 Dimensions

3.1.1 Flow fitting for max. 3 measured value transducers

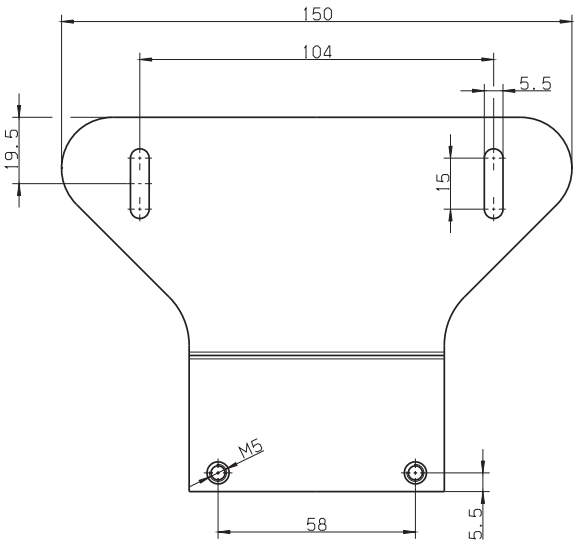
Type 202810/03-104-87-80/000



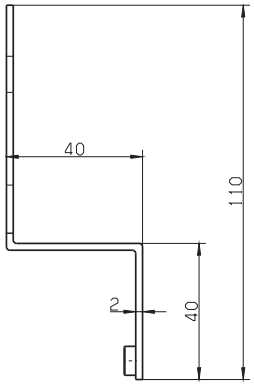
(1) Case
(2) Flow direction
(3) Fastening hole
(4) Measuring vessel

3 Mounting

Fixing bracket, stainless steel 1.4571 (part no. 00455706)

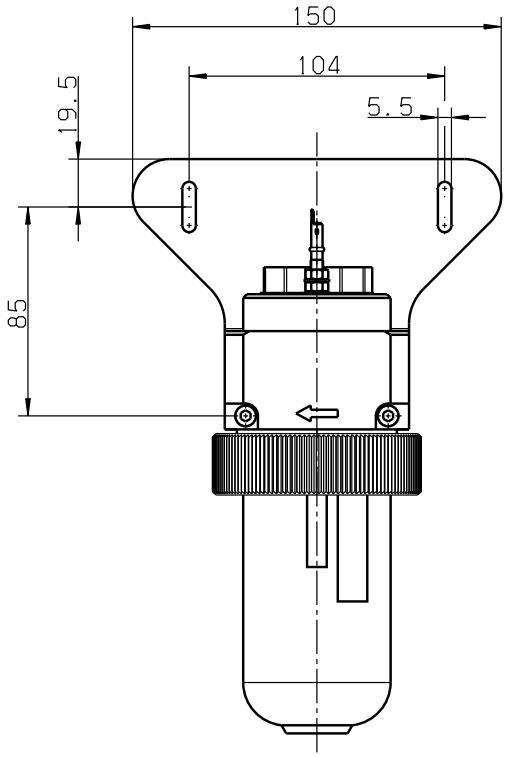


Front view

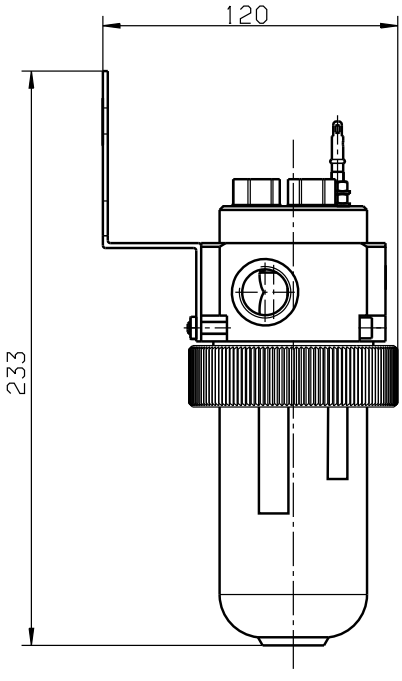


Side view

Flow fitting, mounted on fixing bracket



Front view

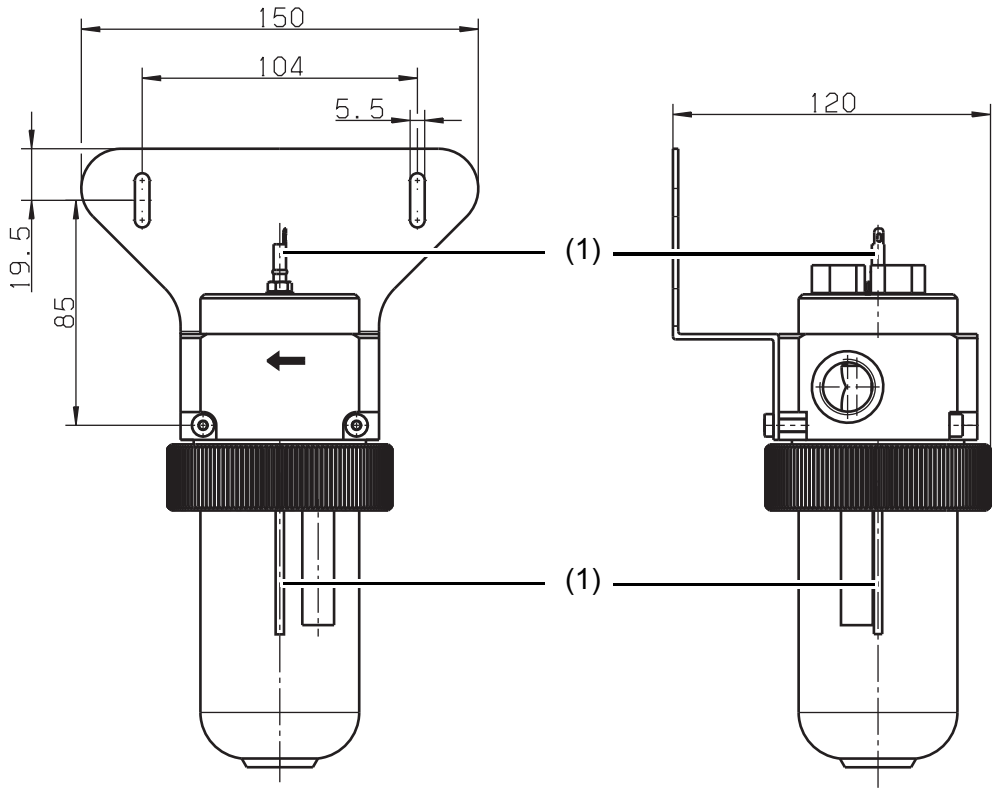


Side view

Ground electrode

The ground electrode (extra code 055) enables equipotential bonding.

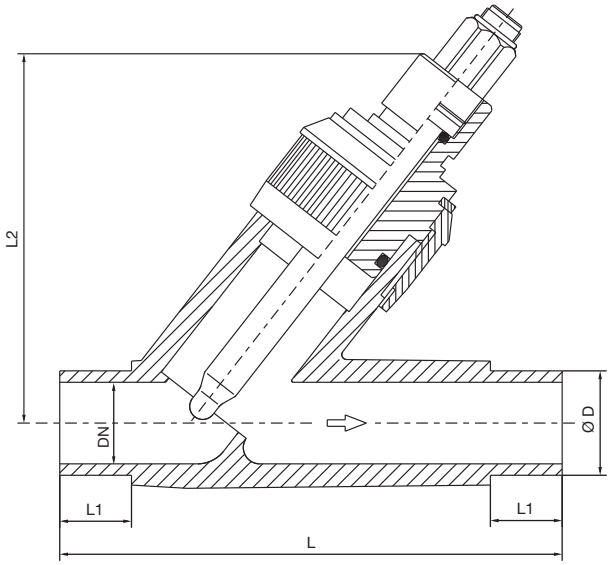
The ground electrode can only be mounted at the factory!



(1) Ground electrode

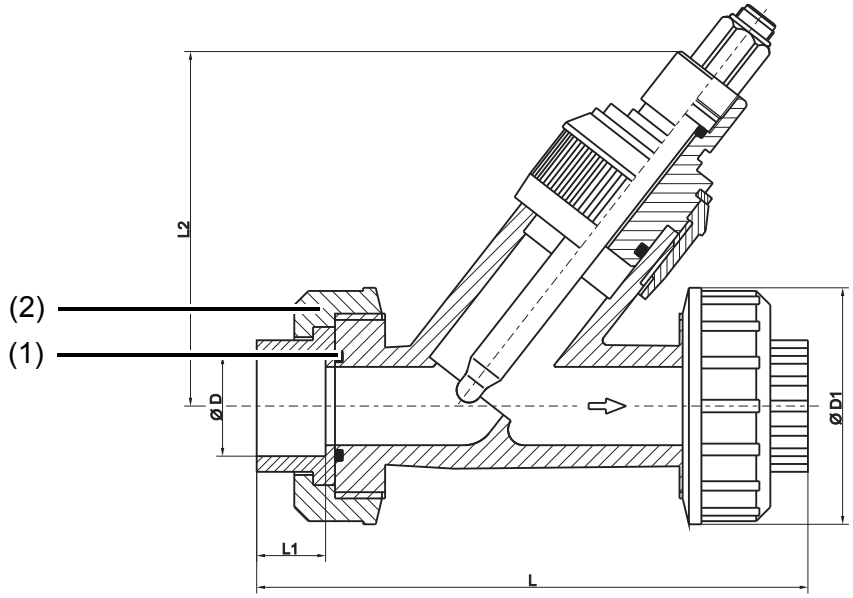
3.1.2 Flow fitting for 1 measured value transducer

Angled seat version



Type	DN	Ø D in mm	L in mm	L_1 in mm	L_2 in mm
202810/01-965-86	20	25	144	19	110
202810/01-966-86	25	32	154	22	115

Angled seat version with screwed butt joint

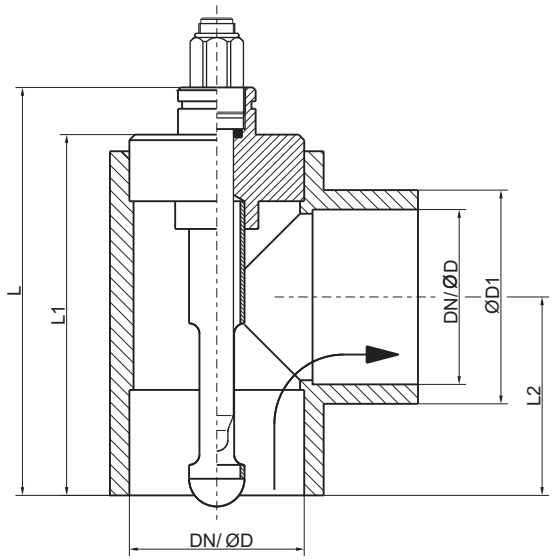


(1) O-ring
(2) Screw connection

Type	DN	Ø D in mm	Ø D_1 in mm	L in mm	L_1 in mm	L_2 in mm
202810/01-970-86	20	25	66	158	19	110
202810/01-971-86	25	32	75	176	22	115

T-piece version

Vertical installation position



Type	DN	Ø D in mm	D_1 in mm	L in mm	L_1 in mm	L_2 in mm
202810/01-967-86	32	40	51	129	112	47
202810/01-968-86	40	50	62	137	120	59
202810/01-969-86	50	63	77	147	130	72

3.2 General information on mounting the flow fittings

- Ensure correct installation position
- For service and maintenance work, the installation location must be easily accessible; therefore, avoid installing in inaccessible locations

⇨ Chapter 4 "Technical data", page 21

3.3 General information on mounting electrodes in flow fittings

- Ensure correct installation position
- Screw the electrode into the fitting with the Pg thread, tightening only until the electrode is securely positioned; do not exceed the maximum tightening torque (max. tightening torque for pH electrodes 3.0 Nm)

⇨ Chapter 4 "Technical data", page 21

CAUTION!
The electrode must always be inserted vertically from above into the flow fitting – never from below.

3 Mounting

CAUTION!
Electrochemical sensors are sensitive products.
Observe the respective specific features of the sensors (such as temperatures, pressure, etc.; see technical data), avoiding pressure surges and temperature fluctuations where possible.
It is therefore recommended that the sensor is not installed in the main stream of a plant.
In the case of installation in a bypass, you must provide shut-off valves in order for the sensor to be dry when it is removed for maintenance/cleaning.

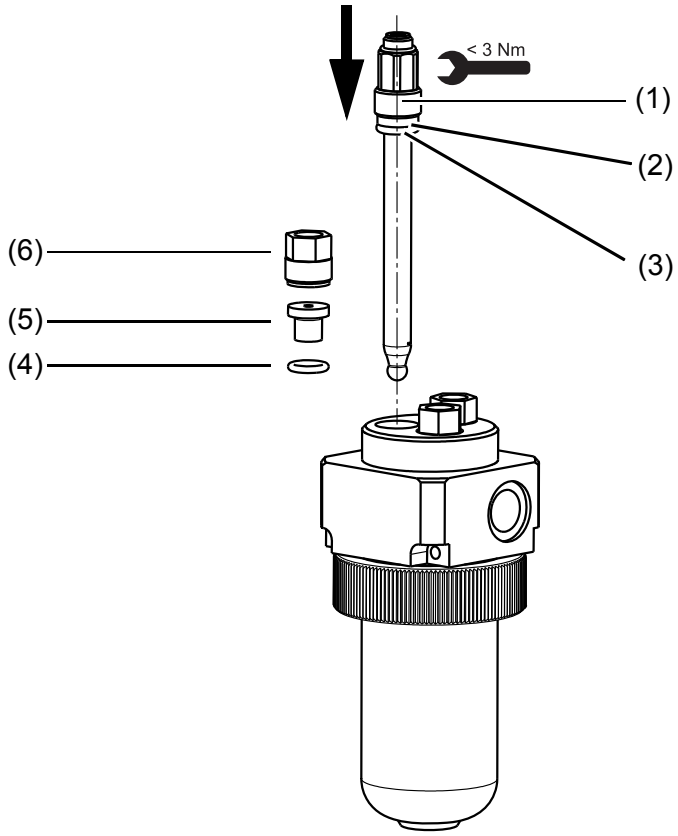
CAUTION!
Ensure that the thread and the O-rings are clean, otherwise liquid can penetrate the fitting.
When inserting a glass electrode, note that the glass membranes may break easily in the event of improper handling.

NOTE!
An impedance converter (see data sheet 202995) can be mounted between the pH electrode and the cable socket N.

NOTE!
Observe the following important information when mounting:
The fitting must be mounted in the correct installation position and operated in the correct flow direction.
PVC fittings must be mounted in the piping system using the correct adhesive.
PVC fittings with screwed butt joint must not be mounted with pipe wrenches, as the union nuts are then overtightened and may rupture.

3.4 Flow fitting for max. 3 measured value transducers

Type 202810/03...



(1) Electrode
(2) Washer
(3) O-ring
(4) Seal
(5) Plug
(6) Screw connection

Step	Activity
1	Filler plug: loosen screw connection (6). Remove plug (5) and seal (4).
2	Screw electrode (1) into the fitting **vertically from above** (max. tightening torque 3 Nm).

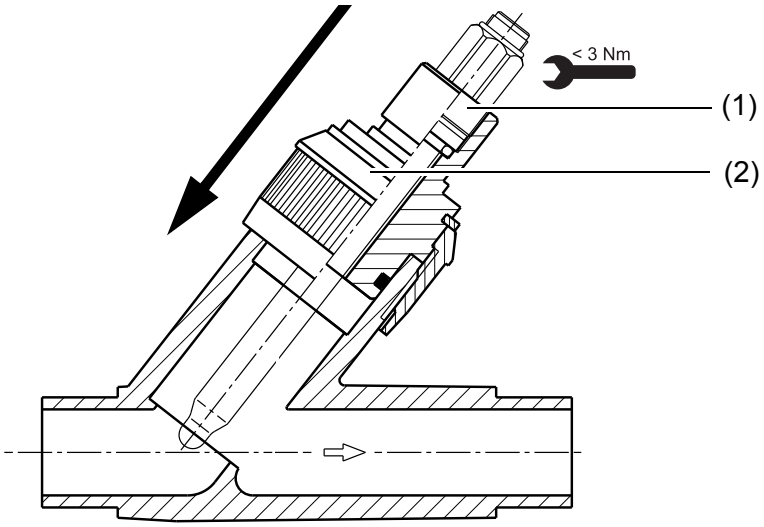
CAUTION!
Washer (2) and O-ring (3) must be present on the electrode shaft.

Operation

CAUTION!
For pressure resistance, see technical data.

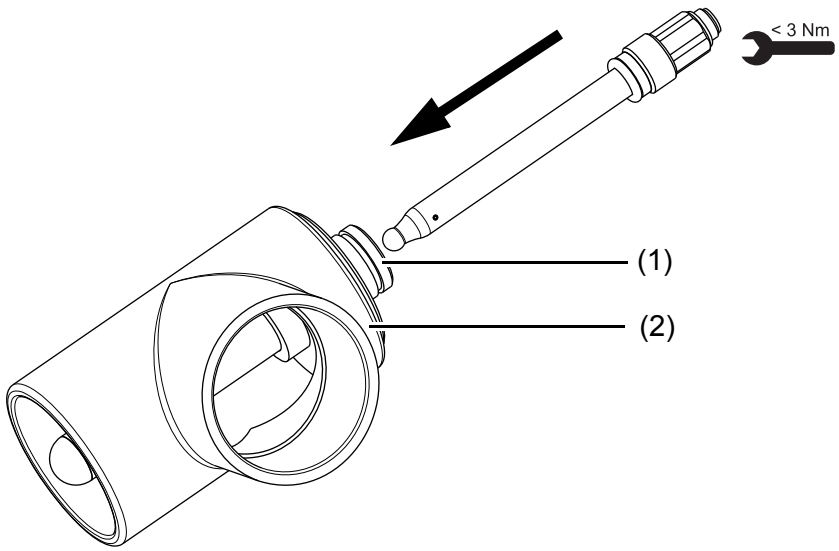
3.5 Flow fitting for 1 measured value transducer

Angled seat version, type 202810/01...



(1) Electrode holder
(2) Case

T-piece version, type 202810/01...



(1) Electrode holder
(2) Case

Step	Activity
1	Remove sealing washer.
2	Screw electrode into electrode holder (1) of the case (2) **from above** (max. tightening torque 3 Nm).

CAUTION!
Washer (2) and O-ring (3) must be present on the electrode shaft (see drawing in Chapter 3.4 "Flow fitting for max. 3 measured value transducers", page 17).

Operation

CAUTION!
For pressure resistance, see technical data.

3.6 Accessories

KCl storage vessel

The KCl storage vessel is intended for the mounting or use of an electrolyte bridge in cases where the material under measurement contains substances that affect the measurement or may chemically attack the reference electrodes.

The storage vessel (part no. 00060254) is pressure-resistant and has a compressed-air connection and a fixing bracket made from stainless steel 1.4571 (part no. 00455706) for wall mounting.

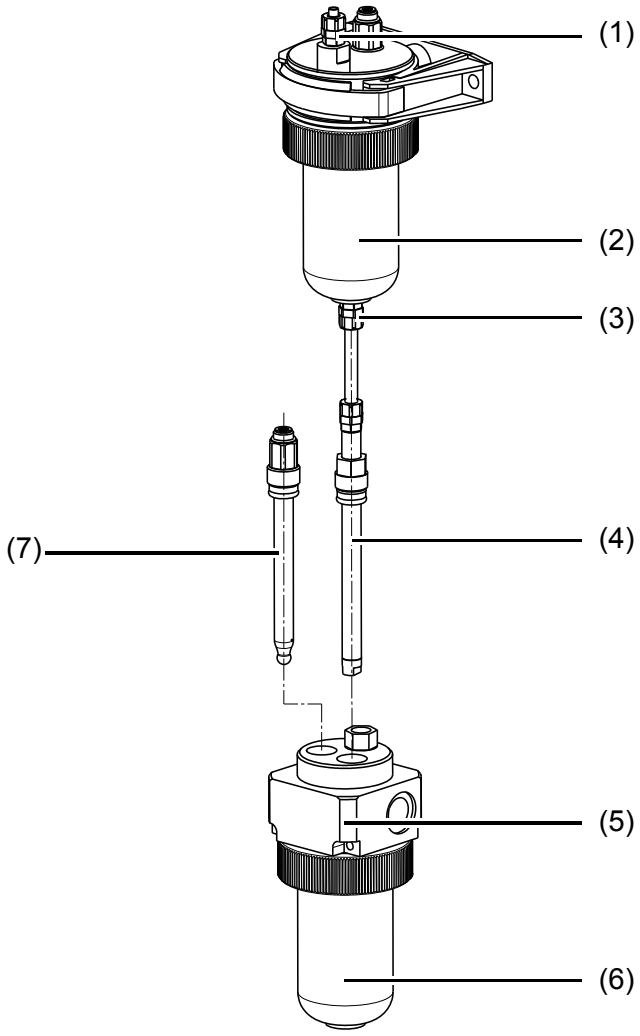
The KCl storage vessel can be impinged with up to 6 bar via the compressed-air connection.

Mounting an electrolyte bridge

For an electrolyte bridge, two separated electrodes (glass electrode [7] and reference electrode [1]) are required. The connection between the reference electrode (1) and the measurement medium (6) is established via a diaphragm tube (4),

⇨ see illustration below.

NOTE!
The connection between the diaphragm tube and the KCl storage vessel must be free of air bubbles.
Any air bubbles are to be removed by tapping the hose or diaphragm tube.



(1) Reference electrode
(2) KCl storage vessel
(3) Plastic screw connection; outlet
(4) Diaphragm tube
(5) Flow fitting
(6) Measurement medium
(7) Glass electrode

Step	Activity
1	Fit the flow fitting (5) in the pipeline.
2	Mount the KCl storage vessel (2) on the wall, vertical installation position.
3	Insert the glass electrode (7) into the flow fitting (5).
4	Screw the reference electrode (1) into the KCl storage vessel (2).
5	Connect both vessels to one another via the diaphragm tube (4) and fill the storage vessel with KCl.

4.1 Flow fitting for max. 3 measured value transducers

Type 202810/03...

Materials	Case: polypropylene (PP) Measuring vessel: polycarbonate (PC) or polypropylene (PP) Seals: FPM
Admissible temperature[a, b]	0 to 90 °C
Pressure resistance[a, b]	1 bar at 90 °C, 6 bar at 25 °C
Electrode holder	Pg13.5 screw connection for 1 to 3 measured value transducers (filler plugs provided)
Process connection	G 1/2 A
Installation position	Vertical, with electrode holder pointing upward
Protection type	IP65 EN 60529
Weight	Approx. 400 g

[a] Please also observe the maximum operating data of the sensor in use.

[b] The data is based on the medium of water.

4.2 Flow fitting for 1 measured value transducer

Type 202810/01...

Materials	Flow body: PVC Electrode holder: PVC
Admissible temperature[a, b]	0 to 60 °C
Pressure resistance[a,b]	PN 10 for T-piece: 10 bar at 0 to 20 °C, 3 bar at 60 °C PN 10 for angled seat DN 20/25: 10 bar at 0 to 20 °C, 2.75 bar at 60 °C PN 16 for angled seat with screw connection DN 20/25: 16 bar at 0 to 20 °C, 4.25 bar at 60 °C
Electrode holder	Pg13.5 screw connection for 1 measured value transducer
Process connection	Bonded sockets
Installation position	Angled seat fitting: inserted vertically into the pipeline, with the case pointing upward
	T-piece: horizontal to pipeline, with the electrode holder pointing upward
Protection type	IP65 EN 60529
Weight	approx. 340 g

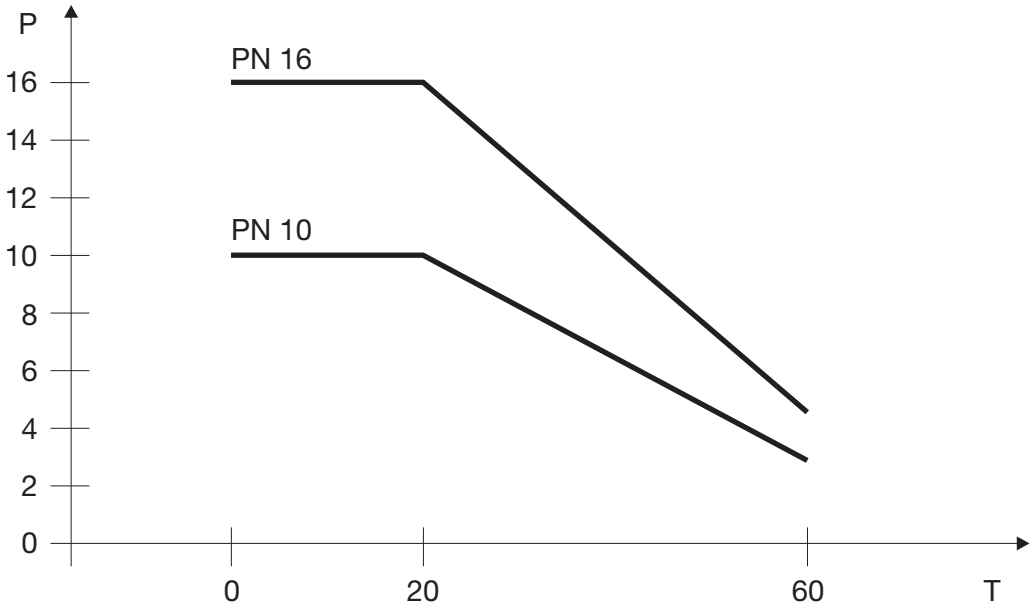
[a] Please also observe the maximum operating data of the sensor in use.

[b] The data is based on the medium of water.

NOTE!
With regard to the illustrations of the stipulated installation positions, see Chapter 3.4 "Flow fitting for max. 3 measured value transducers", page 17, and Chapter 3.5 "Flow fitting for 1 measured value transducer", page 18.

4 Technical data

Temperature/pressure diagram for T-piece and angled seat fitting



T Temperature in °C

P Admissible pressure in bar

The data is based on the medium of water.

NOTE!
If the temperature increases, the nominal pressure should be reduced.

5.1 Maintenance

NOTE!
The maintenance must only be performed by expert personnel.

NOTE!
The fittings must be cleaned regularly. The cleaning interval and cleaning agent are determined by the type and level of pollution.
The use of concentrated aggressive chemical cleaning agents and solvents is generally not recommended. If these agents are used for cleaning purposes, however, then the material compatibility must be checked in advance.
The case can be opened for cleaning/maintenance purposes through the screw connection. Each time the screw connection is opened, the O-rings – depending on the measurement medium – are to be lubricated with a suitable lubricant, e.g. Vaseline, and the sealing surfaces are to be checked for damage.

CAUTION!
In order to clean and calibrate the measured value transducers, the fitting must be pressureless.
Take suitable measures to prevent dry running of the line (shut-off valve or similar).

5 Maintenance and malfunction

5.2 Malfunction

NOTE!
Damaged sealing surfaces or O-rings can lead to liquid escaping from the fitting. In this case, the fitting must be shut off immediately and maintenance must be performed.

If...	**Then...**
If the flow through the fitting is poor or insufficient,	avoid sharply fluctuating or jerky pressure changes and air bubbles.
If the fitting is not sealed,	check that all moving parts have been screwed at least hand-tight, that all seals have been inserted and are undamaged, that the plant pressure is not too high and that there are no visible cracks in the fitting case.
If the potential for wear and tear depends on the exposure to chemicals,	regularly check the seals and replace these as necessary, and pay attention to material changes (brittleness of the plastic, etc.) as these restrict the max. admissible pressure and temperature range.

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