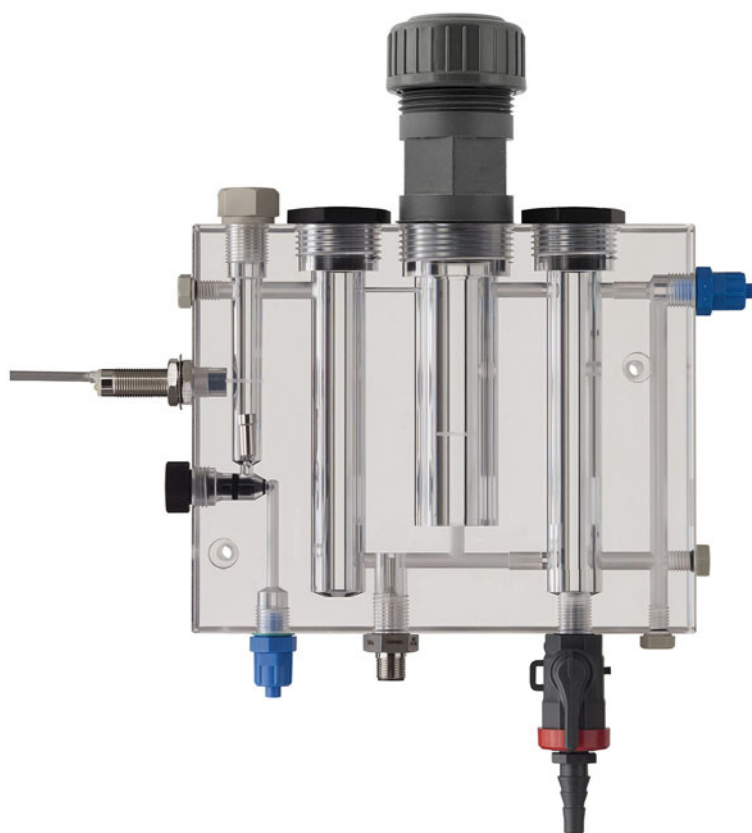


Combination fitting

For holding electrochemical sensors

Type 202811/10



Operating Manual



20281110T90Z001K000

V4.00/EN/00690734/2020-07-16

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1.1 Safety information

1.1.1 General Information

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

Please read this manual before starting up the device. Store this manual in a place that is accessible to all users at all times.

If difficulties occur during startup, please do not intervene in any way that could jeopardize your warranty rights!

1.1.2 Warning symbols



WARNING!

This symbol in connection with the signal word indicates that **personal injury** may occur if the respective precautionary measures are not carried out.

NOTICE!

This note in connection with the signal word indicates that **material damage or data loss** will occur if the respective precautionary measures are not taken.

1.1.3 Note symbols



NOTE!

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



REFERENCE!

This symbol refers to **additional information** in other sections, chapters, or other manuals.



DISPOSAL!

At the end of its service life, the device and any batteries present do not belong in the trash! Please ensure that they are **disposed of** properly and in an **environmentally friendly** manner.

1.1.4 Intended use

The compact combination fitting can hold several electrochemical sensors and is typically used for disinfection monitoring of drinking and swimming pool water as well as slightly polluted process and cooling water.

1 Introduction

1.2 Acceptance of goods, storage, and transport

1.2.1 Checking the delivery

- Ensure that the packaging and contents are not damaged
- Check the scope of delivery for completeness against the delivery documents and order details
- Inform the supplier immediately if there is any damage
- Keep damaged parts for clarification with the supplier

1.2.2 Important information about storage and transport

- Store the device in a dry, clean environment
- Observe the admissible environmental influences (⇒chapter 8 "Technical data", Page 24)
- Protect the device from shock during transport
- The original packaging provides optimum protection for storage and transport

1.2.3 Returning goods

- If repairs are needed, return the device in clean condition, and ensure that it is complete (Cleaning ⇒chapter 7.2 "Cleaning", Page 22).
- Please use the original packaging when returning the device

Covering letter with declaration of decontamination

Please include the completed covering letter for repair when returning goods. Remember to state the following:

- Description of the application
- Description of the error that has occurred

The covering letter can be found on the Internet at the following address:
<http://productreturn.jumo.info>

1.2.4 Disposal

Disposing of the device



DISPOSAL!

Devices and/or replaced parts should not be placed in the refuse bin at the end of their service life as they consist of materials that can be recycled by specialist recycling plants.

Dispose of the device and the packaging material in a responsible and environmentally-friendly manner.

For this purpose, observe the country-specific laws and regulations for waste treatment and disposal.

Disposing of the packaging material

All packaging material is recyclable.

2.1 General information

The combination fitting type 202811/10... is intended to hold several electrochemical sensors. Typical use includes disinfection monitoring of drinking and bathwater as well as slightly polluted process and cooling water. With its compact design type, the fitting allows for a space-saving combination of several sensors and is usually used in a bypass or downstream of a tap on the main line. The sensors are easily visible through the fitting's crystal-clear design and can be visually inspected for pollutants.

In the maximum version, 2 sensors with Pg 13.5 thread (e.g. for pH value and Redox), 1 membrane-covered sensor Ø 25 mm for disinfection check (e.g. for free chlorine, chlorine dioxide) as well as a temperature probe with M14 x 1.5 thread. Furthermore, in the measuring water inflow, there is flow monitor according to the floating body principle with an inductive proximity switch. This acts to monitor a sufficient and constant inflow of the membrane-covered sensor. A ground pin can also be installed to discharge any electrostatic charges.

The water flows in and out of the fitting through plug-in connections for hoses with an inner diameter of Ø 6 mm. The flow velocity can be adjusted as required using the needle valve.

Thanks to the adept arrangement of the sensors and flow channels, bubble-free operation of the sensors is virtually possible. The accumulation of air that can lead to distorted measured values is prevented. Unnecessary slots can be blocked before startup by the blanking plugs contained in the scope of delivery.

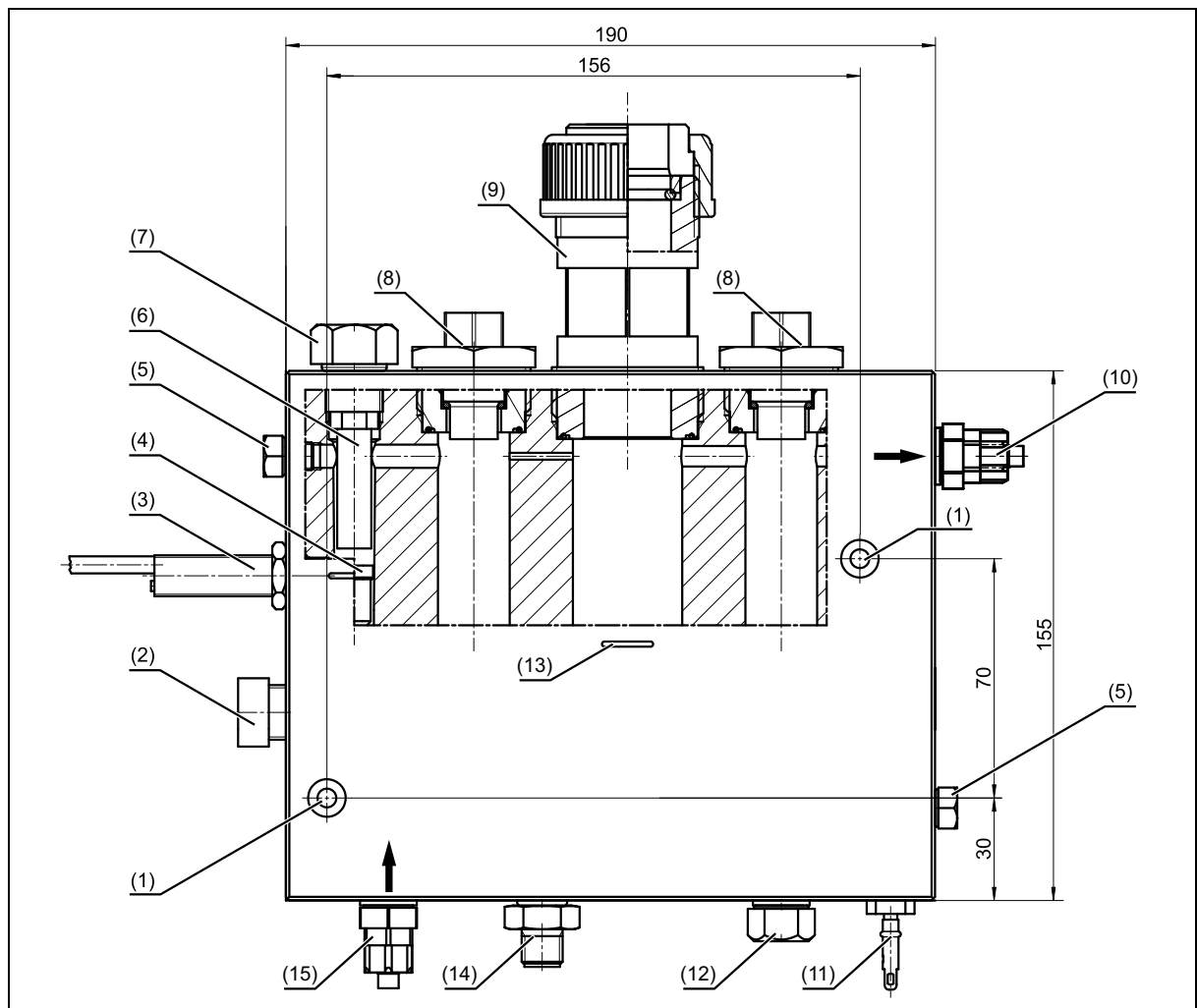
In order to facilitate sampling for calibration (for free chlorine, for instance), it is possible to extend the combination fitting with a mini ball valve.

Typically, the full set of features for a drinking or bathwater measuring point consists of pH and Redox sensors (Pg 13.5, insertion length 120 mm), membrane-covered sensors for free chlorine, temperature probe, ground pin, and flow monitor.

Flow monitor, temperature probe, and ground pin can be obtained with the fitting when placing the order (see chapter 3.2 "Order details", Page 10) and easily fitted by the user. The electrochemical sensors (e.g. pH, Redox, free chlorine) must be ordered separately.

2 Description

2.2 Design and details



- (1) Mounting hole for M5 fastening screws
- (2) Valve insert for flow control
- (3) Inductive proximity sensor^a(Flow monitoring), M12 x 1 thread
- (4) Floating body of the flow monitor
- (5) M8 sealing screw
- (6) Extension for M8 sealing screw
- (7) G 3/8 sealing screw
- (8) Mount sealed with dummy plug for pH/Redox sensor with Pg 13.5 thread
- (9) Mount for membrane-covered sensor with 25 mm diameter
- (10) Hose connection for measuring water outflow, connection to G 1/4 fitting, for 6 × 8 tube (inner dia. 6 mm, outer dia. 8 mm)
- (11) M8^a ground rod
- (12) G 1/4 sealing screw (opening for optional mini ball valve for sampling)
- (13) Indicator for sensor immersion depth
- (14) Temperature probe^a
- (15) Threaded hose connection for measuring water inflow, G 1/4 connection on fitting side, for 6 × 8 hose (inner dia. 6 mm, outer dia. 8 mm)

^a Optional

2.3 Use in a measuring/control system

A complete measuring/control system for disinfection monitoring usually comprises the following components:

- Sensors for disinfectant, pH, Redox and temperature
- Electrical cables and connections
- Flow fittings (combination fitting in this case) and connections
- Measuring and/or control device
- Metering device



NOTE!

This operating manual primarily describes the operation of the combination fitting. Please observe the corresponding operating manuals for the other components mentioned above!



NOTE!

Please observe the respective specifications for the sensors used!

3 Identifying the device version

3.1 Nameplate

Position

The nameplate is affixed on the front of the combination fitting.

JUMO GmbH & Co. KG
Fulda, Germany
www.jumo.net
Kombiarmatur pH/Rd,T und Chlor
Typ: 202811/10-1003-10-308-055
VARTN: 00607325
F-Nr: 023600130101823001

Contents

The nameplate contains important information. This includes:

Description	Designation on the nameplate	Example
Device type	Type	202811/10-1003-10-308-055
Fabrication number	F-Nr	023600130101823001

Device type (Typ)

Compare the specifications on the nameplate with your order documents. The supplied device version can be identified using the order code in chapter 3.2 "Order details", Page 10.

Fabrication number (F-Nr)

The fabrication number provides information such as the **production date** (year/week). The production date is the digits at positions 12 through 15 (from the left).

Example: F no. = 02360013010**1823**001. The device was produced in the year **2018** and in week **23**.

3.2 Order details

(1) Basic type	
202811/10	Combination fitting for three sensors
(2) Placement 1	
0000	Without temperature probe
1003	Integrated Pt100 temperature probe, M12 electrical connection (4-pole)
(3) Placement 2	
00	Without flow monitor
10	With flow monitor, 2 m fixed cable connection with tinned wire ends
(4) Process connection	
308	G 1/4 screw connection with connection for 6×8 hose (inner dia. 6 mm, outer dia. 8 mm)
(5) Extra codes	
000	None
055	Ground pin

Order code	(1)	-	(2)	-	(3)	-	(4)	/	(5)
Order example	202811/10	-	1003	-	10	-	308	/	055

3 Identifying the device version

3.3 Scope of delivery

Pre-installed combination fitting type 202811/10 in the ordered version

Operating manual for type 202811/10

The following components, which are included in the scope of delivery depending on the ordered version, must be installed by the user before startup (⇒"Design and details ", Page 8):

- (3) : Inductive proximity sensor
- (6) : Extension for sealing screw (7)
- (10) : Hose connection for measuring water outflow
- (11) : Ground pin
- (12) : Sealing screw for opening the optional mini ball valve
- (14) : Temperature probe or sealing screw
- (15) : Hose connection for measuring water inflow

3.4 Accessories

Connecting cables for temperature probe

Designation	Part no.
PVC connecting cable, length 2 m, with 4-pole M12 cable socket (straight)	00404585
PVC connecting cable, length 5 m, with 5-pole M12 cable socket (straight)	00337625

Miscellaneous

Designation	Part no.
Sealing set with 9 replacement seals, for type 202811/10...	00618085
Mini ball valve made from PVC for sampling, for type 202811/10...	00402210

4 Mounting

4.1 Important information

- Only install the fitting in a vertical position
- Preferably operate the fitting in the bypass. Using this solution it is possible to seal off the process without an interruption, e.g. to perform maintenance work
- Use a dirt filter in the fitting's inflow in order to prevent deposits and the membrane of the membrane-covered sensor from blocking.

NOTICE!

Escaping process water

Overpressure in the fitting can push out the membrane-covered sensor.

- ▶ Observe the specifications for pressure and temperature of the fitting (⇒chapter 8 "Technical data", Page 24) and the sensors. If necessary, use a pressure regulator upstream of the measuring water inflow.
-

NOTICE!

Damage to the membrane-covered sensor in the fitting

Overpressure in the fitting can damage the membrane-covered sensor.

- ▶ Observe the specifications for pressure and temperature of the sensors. If necessary, use a pressure regulator upstream of the measuring water inflow.
-

4.2 Installation types

4.2.1 Operation in the bypass

The measurement medium flow through the fitting (4) in the bypass is achieved by installing an orifice plate (7) or a throttle valve in the main pipeline (1).

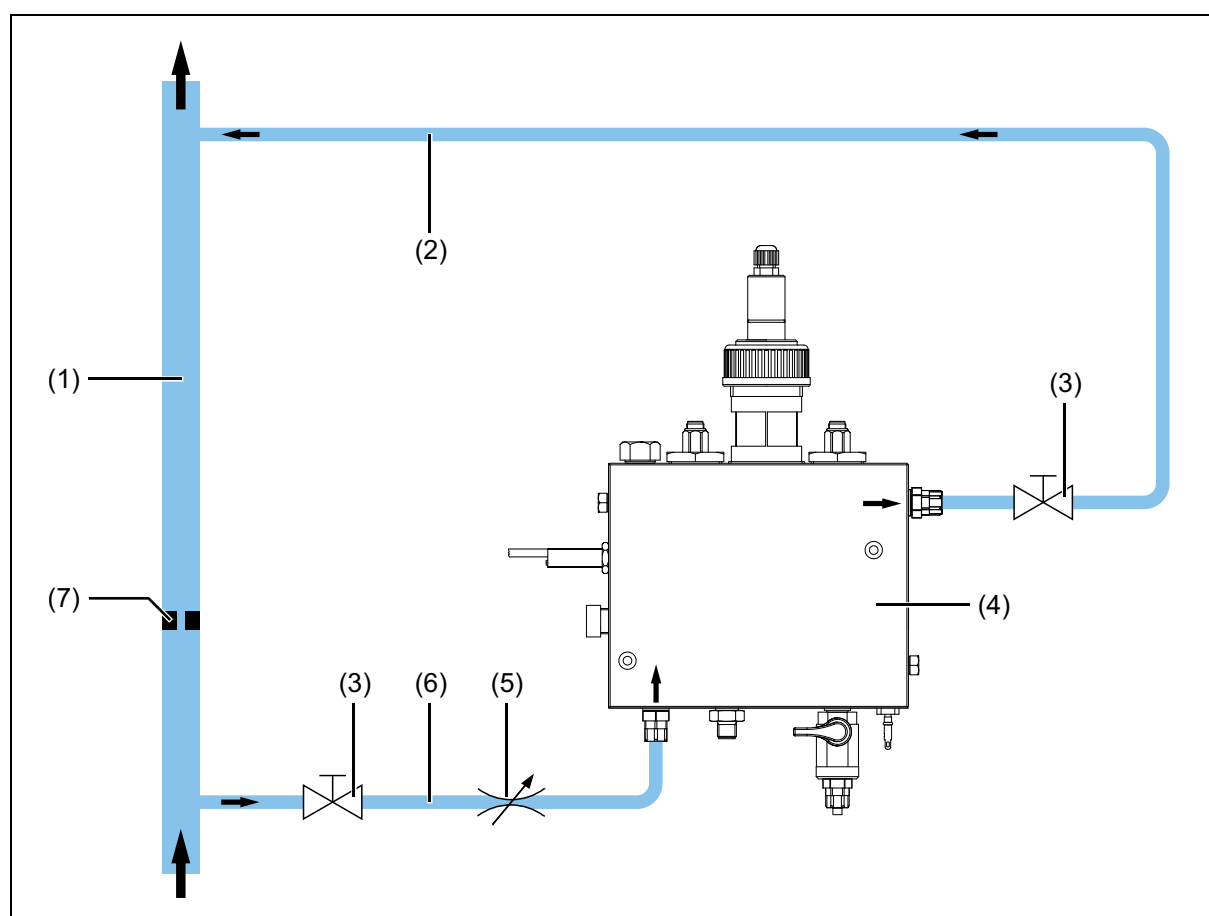
This results in a lower pressure in the measurement water outflow (2) than in the measurement water inflow (6).

The graphic below shows a **principal representation** with the required components¹.



NOTE!

A pressure regulator (5) is required if the operating pressure is higher than the maximum permissible pressure of the installed sensors.



- (1) Main pipeline
- (2) Bypass (measurement water outflow)
- (3) Shut-off valve
- (4) Combination fitting 202811/10
- (5) Pressure regulator
- (6) Bypass (measurement water inflow)
- (7) Orifice plate

¹ The planner is responsible for designing the required components.

4 Mounting

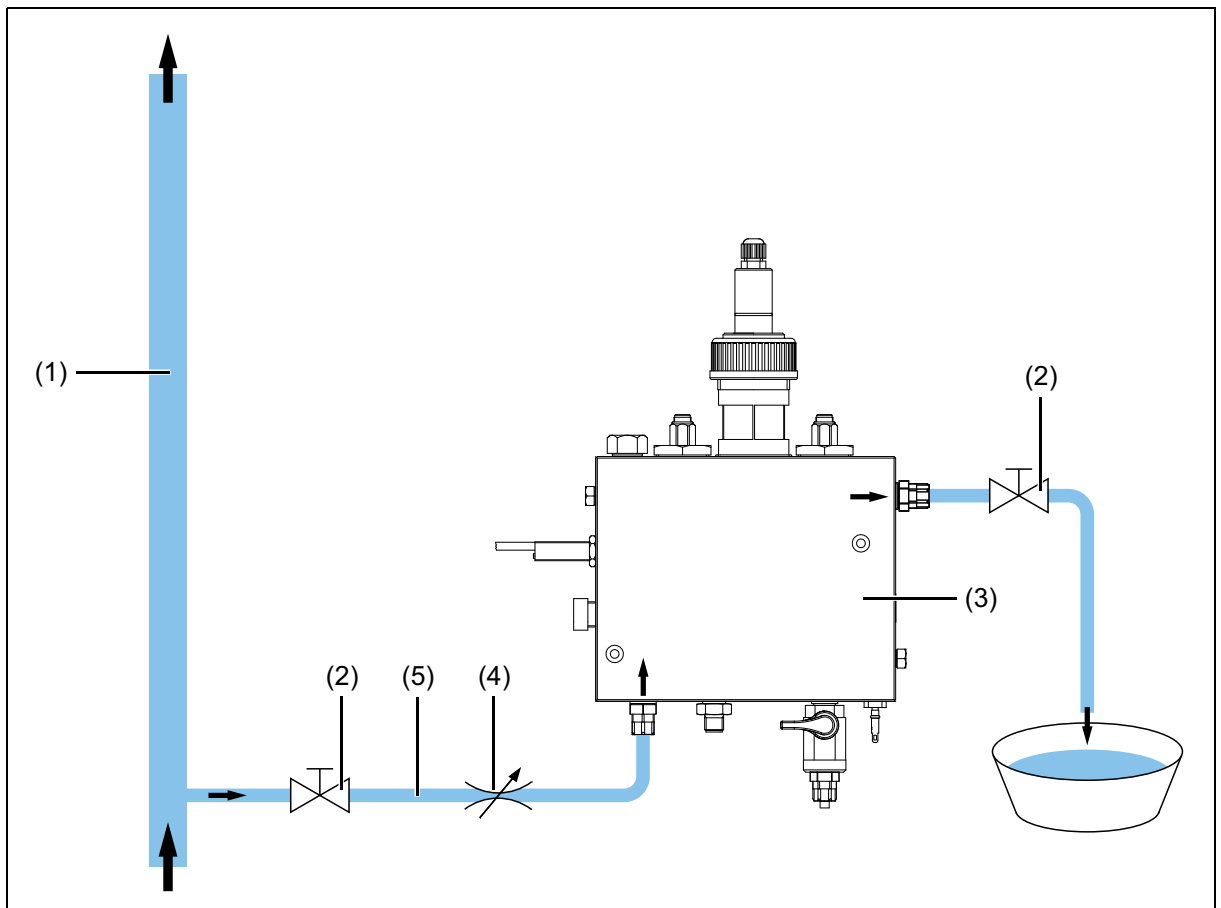
4.2.2 Operation in tap line with open outflow

The graphic below shows a **principal representation** with the required components¹



NOTE!

A pressure regulator (4) is required if the operating pressure is higher than the maximum permissible pressure of the installed sensors.



- (1) Main pipeline
- (2) Shut-off valve
- (3) Combination fitting 202811/10
- (4) Pressure regulator
- (5) Measurement water inflow

¹ The planner is responsible for designing the required components.

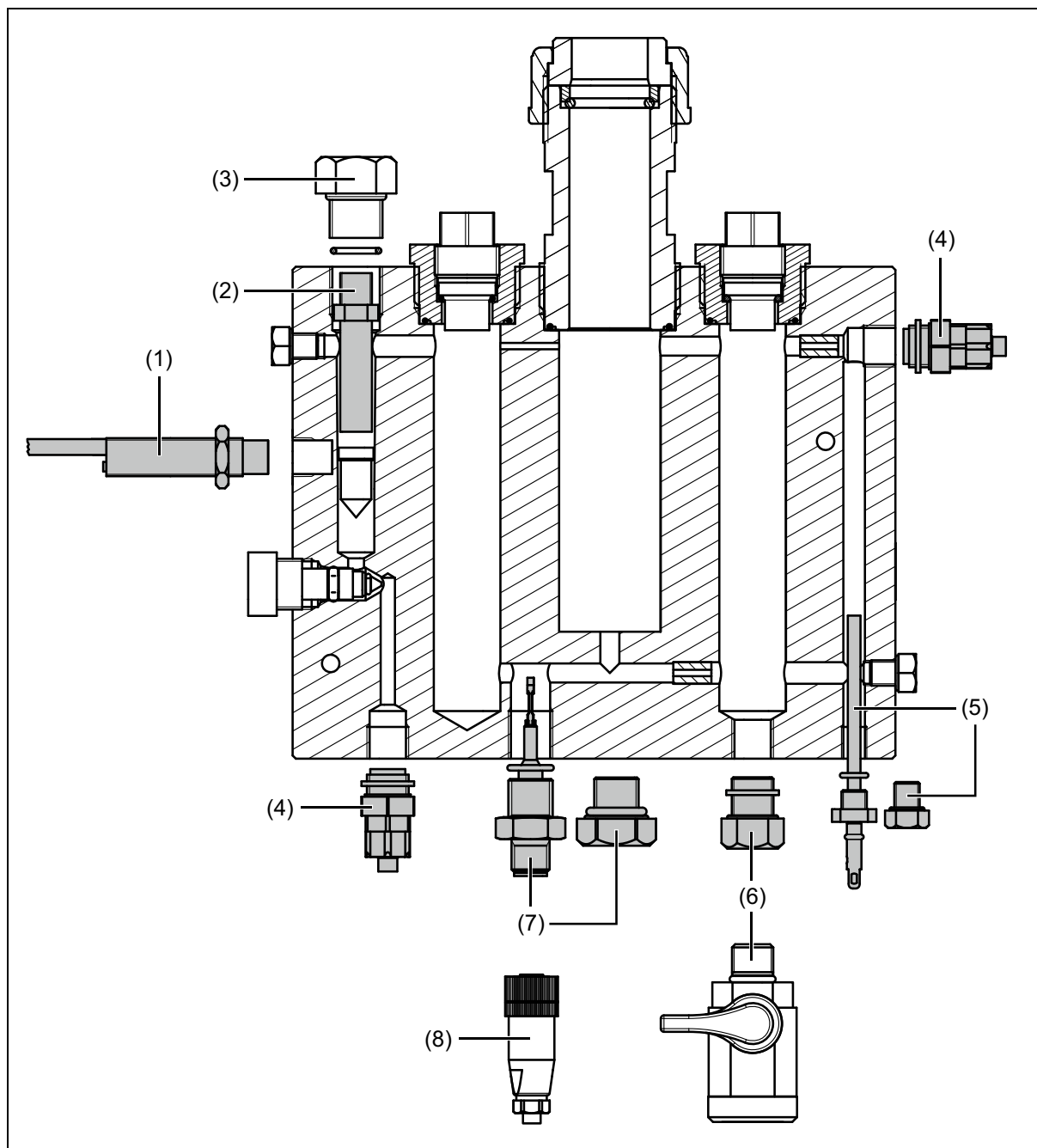
4.3 Mounting the enclosed components

Depending on the ordered version of the combination fitting, the user must install the components highlighted in gray in the graphic below.



NOTE!

Maximum tightening torque for all components to be mounted: **3 Nm!**



Inductive proximity sensor (1)

1. Screw the inductive proximity sensor into the combination fitting up to the limit stop. (Electrical connection of the inductive proximity sensor ⇒ chapter 5 "Electrical connection", Page 20).

4 Mounting

Extension (2) for the sealing screw (3)

1. Unscrew the sealing screw (3) from the combination fitting.
2. Screw the extension (2) into the internal thread of the sealing screw up to the limit stop.
3. Screw the sealing screw into the fitting with the extension installed; tighten the screw with a tightening torque of 3 Nm.



NOTE!

If the flow is greater than the nominal flow (typically 30 l/h), the extension for the sealing screw prevents the floating body from moving upward and out of the detection range of the inductive proximity sensor and from incorrectly signaling to the connector controller that the flow is too low.

Hose connections (4) for measurement water inflow and outflow

1. Screw the two hose connections into the fitting at the positions shown in the graphic and tighten with a tightening torque of 3 Nm.

Ground rod or M8 sealing screw (5)

1. Depending on the ordered version, either screw the ground rod or the M8 sealing screw into the fitting at the position shown in the graphic; tighten the screw with a tightening torque of 3 Nm.

G 1/4 sealing screw or optional ball valve (6)

1. Screw the G 1/4 sealing screw or the ball valve ordered as an accessory into the fitting at the position shown in the graphic and tighten with a tightening torque of 3 Nm.

Temperature probe or M14 × 1.5 sealing screw (7)

1. Depending on the ordered version, either screw the temperature probe or the M14 x 1.5 sealing screw into the fitting at the position shown in the graphic and tighten with a tightening torque of 3 Nm.

PVC connecting cable with 4-pole M12 cable socket (8)

1. Connect the M12 cable socket of the PVC connecting cable to the connector of the installed temperature probe. (Electrical connection of the temperature probe ⇒ chapter 5 "Electrical connection", Page 20).

4.4 Mounting the combination fitting

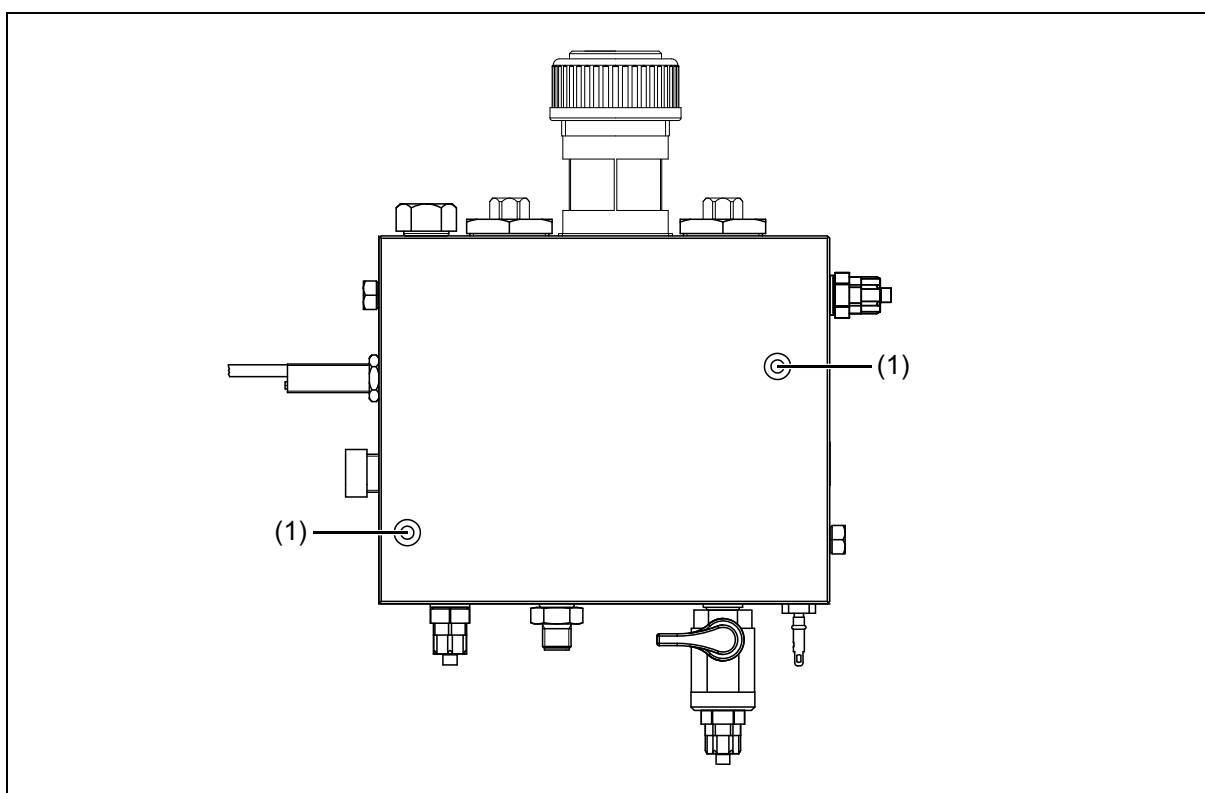
The combination fitting can be mounted on a wall or an installation panel with the mounting holes (1) using two commercially available M5 cylinder head screws (dia. 5.5 mm, countersink according to DIN 974-1: dia. 11 mm, depth 5 mm, not included in the scope of delivery).

NOTICE!

Damage to the fitting due to incorrect installation

Incorrect installation can cause cracks in the acrylic glass block and therefore result in leaks.

- ▶ Always install the fitting on a level surface.
- ▶ Do not overtighten the fastening screws (maximum tightening torque of 3 Nm).



(1) Mounting holes for M5 cylinder head screws (dia. 5.5 mm; countersink: dia. 11 mm, 5 mm deep)



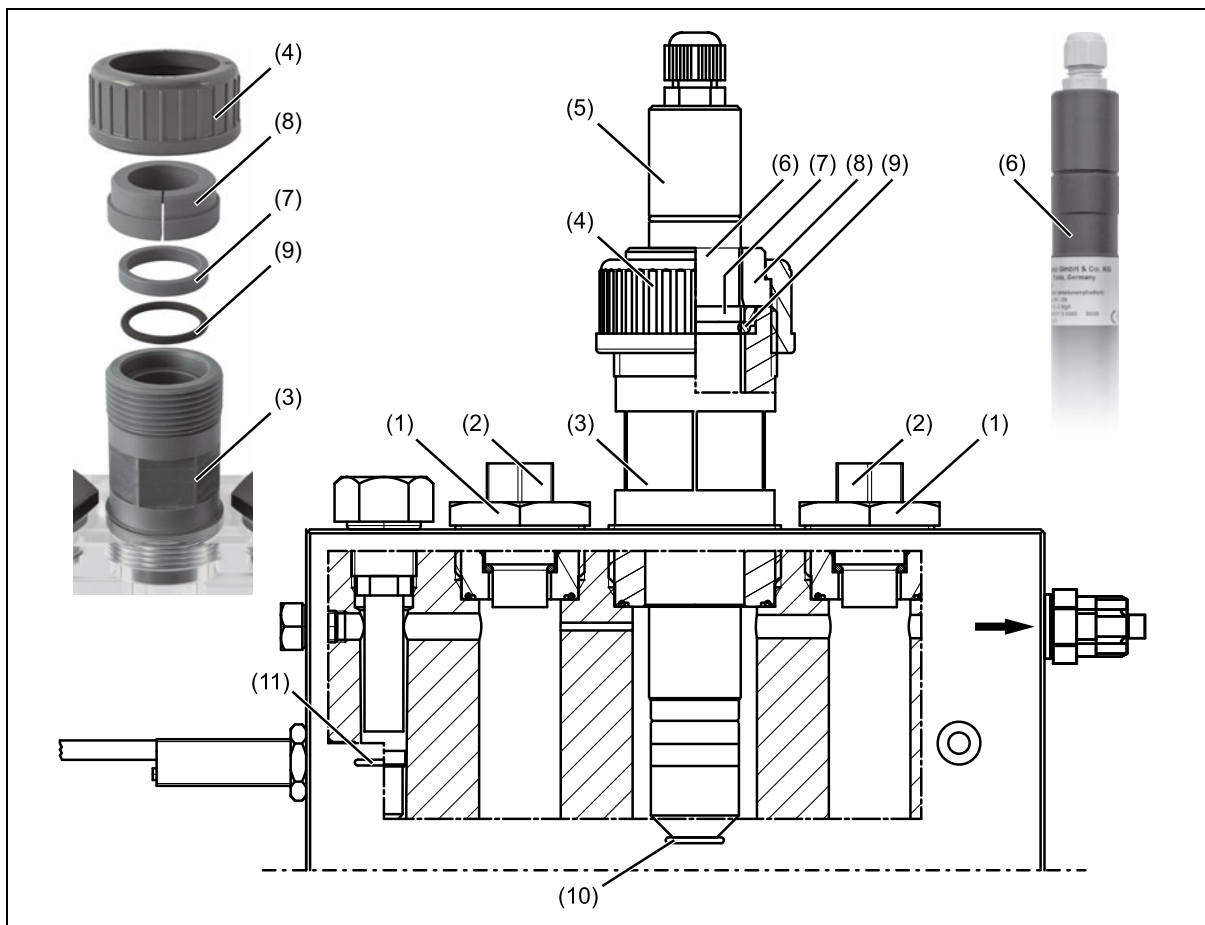
NOTE!

When selecting the installation location, make sure that there is sufficient space to install and remove the sensors, e.g. for maintenance work.

4 Mounting

4.5 Installing the sensors

Overview



- | | |
|------------------------------------------|--------------------------------------|
| (1) Mounting for pH/Redox sensors | (7) Pressure ring |
| (2) Pg 13.5 pressure screw | (8) Stepped collar |
| (3) Mounting for membrane-covered sensor | (9) O-Ring |
| (4) Union nut | (10) Mark for sensor immersion depth |
| (5) Membrane-covered sensor | (11) Mark for floating body height |
| (6) Sensor slot | |

Installing the membrane-covered sensor

NOTICE!

Leaks due to incorrect installation

Pollutants on the thread of the union nut (4), the pressure ring (7), the stepped collar (8), the O-ring (9), or a hardened O-ring can cause the fitting to leak when the sensor (5) is installed.

- ▶ When assembling or installing the sensor, make sure that the O-rings and threads are clean and in good working order.

1. Before installing the sensors, make sure that the system is depressurized.
2. Close the shut-off valves in the inflow and outflow of the fitting.
3. Unscrew the union nut (4).

4. Remove the stepped collar (8). The pressure ring (7) and the O-ring (9) remain in the sensor mounting (3).
5. Slide the stepped collar from above onto the sensor (5) until it engages in the sensor slot (6). The step collar should now rotate easily on the sensor housing.
6. Insert the sensor with the mounted stepped collar into the sensor mounting (3) as far as it will go.
7. Screw the union nut (4) back onto the sensor mounting and tighten it hand-tight.

Installing a pH sensor or a Redox sensor with Pg 13.5 thread

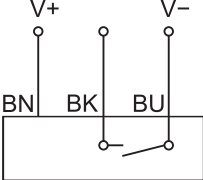
1. Before installing the sensors, make sure that the system is depressurized.
2. Close the shut-off valves in the inflow and outflow of the fitting.
3. Remove the pressure screw (2) by unscrewing it out of the sensor mounting (1).
4. Remove the pressure screw (2) by unscrewing it from the sensor mounting (1) and the pressure disc below it.
5. Screw the sensor (not shown in figure) into the sensor mounting (1) and tighten it with a tightening torque of 3 Nm.

5 Electrical connection

5.1 Flow monitoring

5.1.1 Terminal assignment

Switching contact = NPN N/O contact (illustration = minimum inflow not reached)



Function	Wire color
+12 V voltage supply from transmitter/controller (V+)	brown (bn)
Contact (NPN N/O contact)	black (bk)
GND (V-)	blue (bu)

5.2 Temperature probe

5.2.1 Terminal assignment

Connection for M12 machine connector



6.1 General information

Before startup, make sure that the following requirements are met:

- The enclosed components, the sensors, and the fitting are correctly installed (⇒chapter 4 "Mounting", Page 12)
- The electrical connection of the sensors and the ground rod has been performed correctly (⇒chapter 5 "Electrical connection", Page 20)
- All components for operation in the bypass or in the tap line with open outflow are installed (⇒chapter 4.2 "Installation types", Page 13)
- Measurement water inflow and outflow are complete

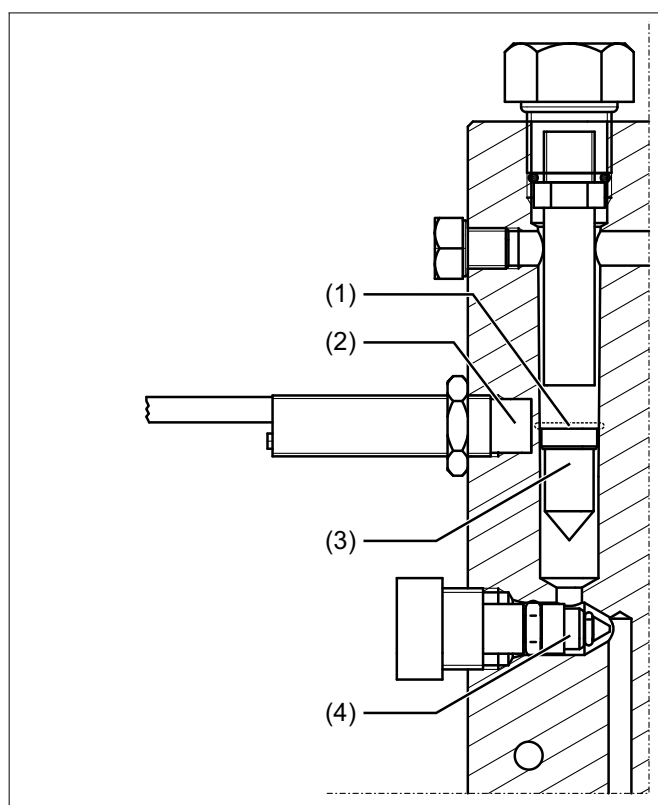
6.2 Adjusting the minimum inflow



NOTE!

The flow rate from the measurement medium must be at least **15 cm/s** in order for a membrane-covered sensor to work correctly for disinfection control. The minimum flow rate in the combination fitting is **30 l/h**. Values measured by the sensors below the minimum inflow speed are too low. This can cause dangerous overdosing in a connected regulating system. At speeds above the minimum inflow speed, the measurement signal is only marginally influenced by the inflow speed.

- The flow in the fitting is regulated by turning the valve insert (4).
- The minimum inflow is reached when the flow of the measurement medium lifts the floating body (3) sufficiently for the top edge to reach the mark on the fitting body (1).
- If the combination fitting is equipped with a flow monitor, the contact on the inductive proximity sensor (2) closes and sends a signal to the connected evaluation unit/controller indicating that the minimum inflow has been reached.



7 Maintenance

7.1 Removing the sensors

Removing the membrane-covered sensor

NOTICE!

Uncontrolled dosing possible

Removing the sensor can result in an incorrect measured value on the transmitter/controller that leads to underdosing or overdosing in the system.

- ▶ Turn off the transmitter/controller or switch to manual mode.
-

1. Close the shut-off valve in the inflow.
2. Close the shut-off valve in the outflow.
The system is now depressurized.
3. Loosen the threaded nipple ((3), ⇒ "Overview", Page 18) by turning it counter-clockwise (do not unscrew and remove!).
4. Pull the sensor upward out of the fitting.

Removing a pH sensor or a Redox sensor with Pg 13.5 thread

1. Close the shut-off valve in the inflow.
2. Close the shut-off valve in the outflow.
The system is now depressurized.
3. Unscrew the sensor out of the sensor mounting.

7.2 Cleaning

Regularly check the fitting and clean it if you can see pollutants or deposits.

1. Remove the sensors (⇒chapter 7.1 "Removing the sensors", Page 22)
2. Remove light pollutants using the cleaning agents listed below
3. Remove heavy pollutants using a soft brush and a cleaning agent listed below.
4. In case of persistent pollutants, soak the parts in a cleaning solution.
Then clean the parts using a brush.

Depending on the type of pollutants, use the following agent to clean the fitting:

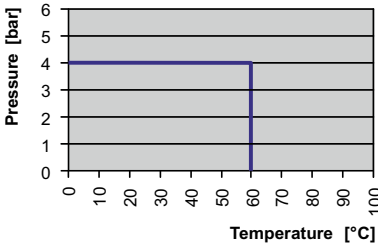
Type of pollutant	Cleaning agent
Calcifications, metal hydroxide coatings, stubborn biological coatings	Hydrochloric acid (approx. 3%)
Greases and oils	(Alkaline) Media containing surfactants or water-soluble, organic solvents (halogen-free, e.g. ethanol)
Sulfide deposits	Thiourea solution, part no.: 00307586
Protein coatings	Pepsin hydrochloric acid solution, part no.: 00307114
Light biological coatings	Pressurized water
Fibers, suspended substances	Pressurized water, possibly wetting agent

7.3 Storage

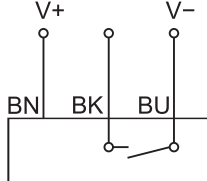
Proceed as follows to remove the combination fitting and to prepare for storage:

1. Close the shut-off valve in the inflow.
2. Close the shut-off valve in the outflow.
The system is now depressurized.
3. Remove the inflow and outflow hose connections.
4. Remove the sensors (⇒chapter 7.1 "Removing the sensors", Page 22).
5. Thoroughly rinse the fitting using tap water. Remove pollutants, if necessary (⇒chapter 7.2 "Cleaning", Page 22).
6. Dry the fitting.
7. Store the fitting in a dust-free location.

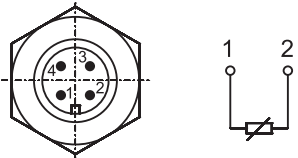
8 Technical data

Materials	Mounting block: PMMA GS Screw connections: POM, PP, PPO, PVC Temperature probe: Stainless steel 1.4571 Floating body: Stainless steel 1.4571 Ground pin: Stainless steel 1.4571
Admissible medium temperature	0 to +60 °C Deviating temperature ranges must be taken into account for the sensors utilized
Admissible process pressure at +60 °C	4 bar  Deviating pressure ranges must be taken into account for the sensors utilized
Sensor mountings	Two mountings for sensors with a Pg 13.5 thread, insertion length of 120 mm One mounting for membrane-covered sensors with a dia. of 25 mm One mounting for temperature probes with a M14 x 1.5 thread, max. insertion length of 30 mm One mounting for inductive proximity sensor with a M12 x 1 thread
Process connection	G1/4 screw connections for 6 × 8 hose (inner dia. 6 mm, outer dia. 8 mm)
Weight	Approx. 1820 g (with series accessory, without sensors)

Inductive proximity sensor

Circuit diagram	Switching contact = NPN N/O contact (illustration = minimum inflow velocity not reached) 
Operating voltage	DC 5 to 36 V
Current consumption without load	< 10 mA
Ampacity	200 mA
Voltage drop	< 1.5 V
Protection type	IP67

Temperature probe

Connection for M12 machine connector	
Protection type	IP 67 when plugged in

	 More than  automation					
产品组别 Product group: 202811	产品中有害物质的名称及含量 China EEP Hazardous Substances Information					
部件名称 Component Name						
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
外壳 Housing (Gehäuse)	○	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	○	○	○	○	○	○
本表格依据SJ/T 11364的规定编制。 This table is prepared in accordance with the provisions SJ/T 11364. ○ : 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。 Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572. × : 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。 Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.						



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