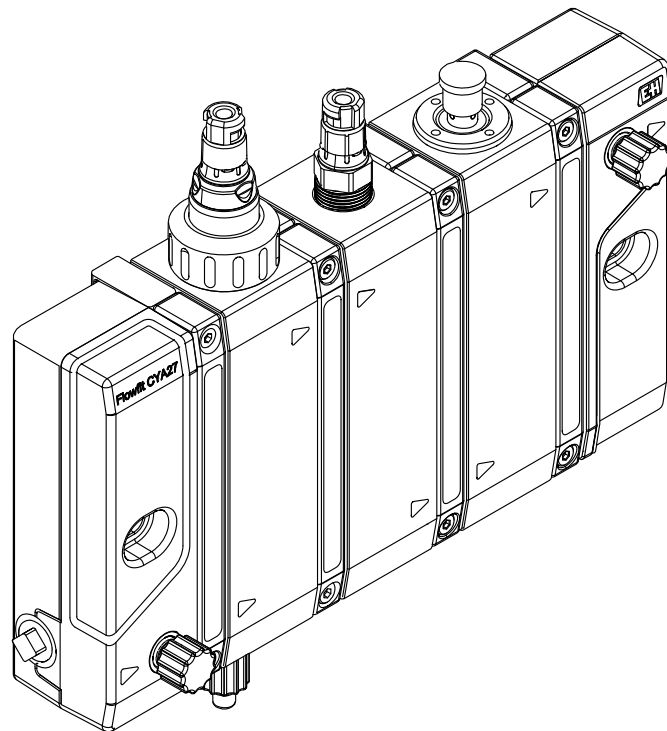


# Operating Instructions

## Flowfit CYA27

Modular flow assembly for multiparameter measurements








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# 1 About this document

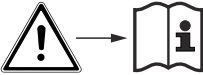

## 1.1 Warnings

Structure of information	Meaning
<p> <b>DANGER</b></p> <p><b>Causes (/consequences)</b> If necessary, Consequences of non-compliance (if applicable)</p> <ul style="list-style-type: none"> <li>▶ Corrective action</li> </ul>	<p>This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation <b>will</b> result in a fatal or serious injury.</p>
<p> <b>WARNING</b></p> <p><b>Causes (/consequences)</b> If necessary, Consequences of non-compliance (if applicable)</p> <ul style="list-style-type: none"> <li>▶ Corrective action</li> </ul>	<p>This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation <b>can</b> result in a fatal or serious injury.</p>
<p> <b>CAUTION</b></p> <p><b>Causes (/consequences)</b> If necessary, Consequences of non-compliance (if applicable)</p> <ul style="list-style-type: none"> <li>▶ Corrective action</li> </ul>	<p>This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.</p>
<p><b>NOTICE</b></p> <p><b>Cause/situation</b> If necessary, Consequences of non-compliance (if applicable)</p> <ul style="list-style-type: none"> <li>▶ Action/note</li> </ul>	<p>This symbol alerts you to situations which may result in damage to property.</p>

## 1.2 Symbols used

Symbol	Meaning
	Additional information, tips
	Permitted or recommended
	Not permitted or not recommended
	Reference to device documentation
	Reference to page
	Reference to graphic
	Result of a step


### 1.2.1 Symbols on the device

Symbol	Meaning
	Reference to device documentation
	Flow direction

## 2 Basic safety instructions

### 2.1 Requirements for personnel

- Installation, commissioning, operation and maintenance of the measuring system may be carried out only by specially trained technical personnel.
- The technical personnel must be authorized by the plant operator to carry out the specified activities.
- The electrical connection may be performed only by an electrical technician.
- The technical personnel must have read and understood these Operating Instructions and must follow the instructions contained therein.
- Faults at the measuring point may only be rectified by authorized and specially trained personnel.

 Repairs not described in the Operating Instructions provided must be carried out only directly at the manufacturer's site or by the service organization.

### 2.2 Designated use

The assembly is specially designed to hold sensors. This includes in particular membrane-covered disinfection sensors, e.g. Memosens CCS51D and 12 mm sensors with Pg 13.5 thread adapters and 120 mm installation length, such as pH or ORP sensors, oxygen sensors and conductivity sensors. Thanks to its design, it can be operated in pressurized systems.

Use of the device for any purpose other than that described, poses a threat to the safety of people and of the entire measuring system and is therefore not permitted.

The manufacturer is not liable for damage caused by improper or non-designated use.

### 2.3 Workplace safety

As the user, you are responsible for complying with the following safety conditions:

- Installation guidelines
- Local standards and regulations

## 2.4 Operational safety

### Before commissioning the entire measuring point:

1. Verify that all connections are correct.
2. Ensure that electrical cables and hose connections are undamaged.
3. Do not operate damaged products, and protect them against unintentional operation.
4. Label damaged products as defective.

### During operation:

- ▶ If faults cannot be rectified:  
products must be taken out of service and protected against unintentional operation.

## 2.5 Product safety

### 2.5.1 State-of-the-art technology

The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and international standards have been observed.

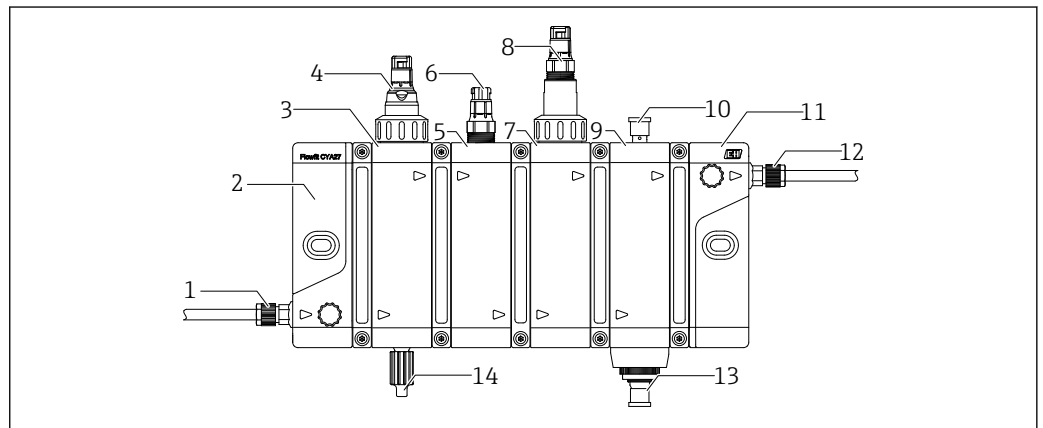
## 3 Product description

### 3.1 Product design

The Flowfit CYA27 is a modular assembly designed for operating sensors for liquid analysis with continuous flow of medium. The sensors are placed in specially adapted modules. Due to its modular design, the assembly is flexible in terms of the number and type of sensor slots.

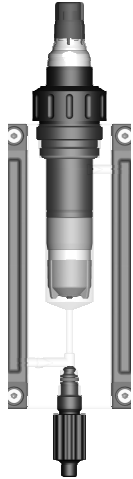
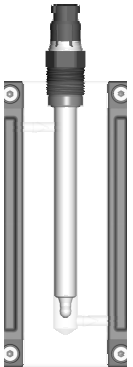

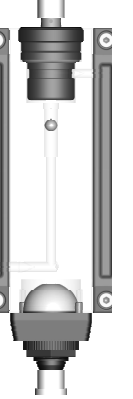

For additional functions, the assembly can be fitted with optional accessories, e.g.:

- Status indication light to indicate the operating status
- Flow switch for monitoring the flow
- Sampling valve for direct sampling at the assembly.

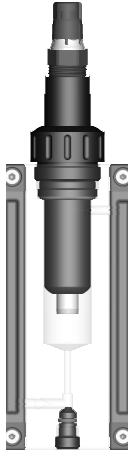
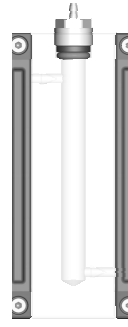




A0043472

- 1 Process adapter inlet (internal thread G 1/4") and hose connection (optional)
- 2 Inlet module
- 3 Module for holding a disinfection sensor with 25 mm diameter
- 4 Disinfection sensor CCS5xD, e.g. CCS51D (not included in scope of delivery)
- 5 Module for holding a sensor with Pg 13.5 connection, e.g. a pH sensor
- 6 pH sensor, e.g. CPS31D (not included in scope of delivery)
- 7 Module for holding the conductivity sensor CLS82D with Pg 13.5 connection
- 8 Conductivity sensor, e.g. CLS82D (not included in scope of delivery)
- 9 Flow module
- 10 Flow switch (optional)
- 11 Outlet module
- 12 Process adapter outlet (internal thread G 1/4") and hose connection (optional)
- 13 Status indication light (optional)
- 14 Sampling valve (optional)

 <p style="text-align: right; font-size: small;">A0043433</p>	<p><b>Module for disinfection sensors</b></p> <ul style="list-style-type: none"> <li>▪ Medium flows to sensor from below</li> <li>▪ Sensor slot for 25 mm sensors</li> <li>▪ Sensor secured via pressure screw M35x2</li> <li>▪ Sensors: CCS5x(D)</li> <li>▪ Flow options             <ul style="list-style-type: none"> <li>▪ 5 l/h (1.1 gal/h)</li> <li>▪ 30 l/h (6.6 gal/h)</li> </ul> </li> <li>▪ Optional function: sampling valve (see diagram)</li> </ul>
 <p style="text-align: right; font-size: small;">A0043434</p>	<p><b>Module for pH, ORP or oxygen sensors</b></p> <ul style="list-style-type: none"> <li>▪ Medium flows to sensor from above</li> <li>▪ Sensor slot for 12 mm sensors in 120 mm length</li> <li>▪ Sensor installation via Pg 13.5 thread</li> <li>▪ Sensors: →  43</li> </ul>
 <p style="text-align: right; font-size: small;">A0043431</p>	<p><b>Flow module</b></p> <ul style="list-style-type: none"> <li>▪ Flow display/monitoring</li> <li>▪ Flow must come from below</li> <li>▪ Flow options             <ul style="list-style-type: none"> <li>▪ 5 l/h (1.1 gal/h)</li> <li>▪ 30 l/h (6.6 gal/h) (identified by a blue distancing ring)</li> </ul> </li> <li>▪ Optional functions             <ul style="list-style-type: none"> <li>▪ Flow switch</li> <li>▪ Status indication light</li> </ul> </li> </ul> <p> The flow module, if used, must be the last module upstream from the outlet module in order to guarantee flow through all modules.</p>



 <p>A0043432</p>	<p><b>Module for conductivity sensor CLS82D</b></p> <ul style="list-style-type: none"> <li>Medium flows to sensor from below</li> <li>Adapter for sensor CLS82D (12 mm sensor with Pg 13.5 thread in 120 mm length)</li> <li>Optional function: sampling valve (not shown here)</li> </ul>
 <p>A0043430</p>	<p><b>Dosing module</b></p> <ul style="list-style-type: none"> <li>Connection for supplying a liquid for acidification (pH reduction) or cleaning purposes</li> <li>Connection: hose nipple 3 mm (0.12 in) on dosing plug Pg 13.5 suitable for hoses with internal diameter (ID) 1.6 mm (0.06 in), outer diameter (OD) 4.8 mm (0.19 in) (hose and hose clip not included in scope of delivery)</li> <li>Medium flows through module from above</li> </ul> <p><b>i</b> The dosing module, if used, should be the first module downstream from the inlet module. An exception to this is conductivity measurement, which could be falsified by the type of liquid added. In this case, the dosing module should be installed as the second module downstream from the conductivity measurement.</p>
 <p>A0043894</p>	<p><b>Inlet module</b></p> <ul style="list-style-type: none"> <li>with needle valve (inlet valve)</li> <li>Connection G 1/4" (ISO 228-1)</li> <li>Flow of medium from below</li> <li>Drill hole for mounting(→ 15)</li> </ul>
 <p>A0043895</p>	<p><b>Outlet module</b></p> <ul style="list-style-type: none"> <li>with needle valve (outlet valve)</li> <li>Connection G 1/4" (ISO 228-1)</li> <li>Flow of medium from above</li> <li>Drill hole for mounting(→ 15)</li> </ul>

## 4 Incoming acceptance and product identification

### 4.1 Incoming acceptance

1. Verify that the packaging is undamaged.
  - ↳ Notify the supplier of any damage to the packaging.  
Keep the damaged packaging until the issue has been resolved.
2. Verify that the contents are undamaged.
  - ↳ Notify the supplier of any damage to the delivery contents.  
Keep the damaged goods until the issue has been resolved.
3. Check that the delivery is complete and nothing is missing.
  - ↳ Compare the shipping documents with your order.
4. Pack the product for storage and transportation in such a way that it is protected against impact and moisture.
  - ↳ The original packaging offers the best protection.  
Make sure to comply with the permitted ambient conditions.

If you have any questions, please contact your supplier or your local Sales Center.

### 4.2 Product identification

#### 4.2.1 Nameplate

The nameplate provides you with the following information on your device:

- Manufacturer identification
  - Order code
  - Extended order code
  - Serial number
  - Ambient and process conditions
  - flow
  - Safety information and warnings
- ▶ Compare the information on the nameplate with the order.

#### 4.2.2 Product identification

##### Product page

[www.endress.com/cya27](http://www.endress.com/cya27)

##### Interpreting the order code

The order code and serial number of your product can be found in the following locations:

- On the nameplate
- In the delivery papers

##### Obtaining information on the product

1. Go to [www.endress.com](http://www.endress.com).
2. Call up the site search (magnifying glass).
3. Enter a valid serial number.
4. Search.
  - ↳ The product structure is displayed in a popup window.

5. Click on the product image in the popup window.
  - ↳ A new window (**Device Viewer**) opens. All of the information relating to your device is displayed in this window as well as the product documentation.

#### **Manufacturer's address**

Endress+Hauser Conducta GmbH+Co. KG  
Dieselstraße 24  
D-70839 Gerlingen

### **4.3 Scope of delivery**

The scope of delivery comprises:

- Assembly including enclosed accessories in the version ordered
- Operating Instructions
- Manufacturer's Declaration

### **4.4 Certificates and approvals**

#### **RL 2014/68/EU PED**

The assembly has been manufactured according to good engineering practice as per Article 4, Paragraph 3 of the Pressure Equipment Directive (PED) 2014/68/EU and is therefore not required to bear the CE label.

#### **ADI-free**


No materials or ingredients derived from animals are used during the entire production of all the parts in contact with the process.

## 5 Installation

### 5.1 Installation conditions

#### 5.1.1 Orientation

The assembly is designed for mounting on panels, walls, level surfaces, masts or railings. The only permitted orientation of the assembly is horizontal, →  15.

 The prescribed orientation of the assembly may limit the installation of certain sensors. e.g, upside-down installation.

#### 5.1.2 Installation instructions

##### NOTICE


##### Environment

- ▶ The ambient conditions of the technical specification of the assembly and sensors must be observed at the installation site.
- ▶ Take technical precautions, such as installing in an additional enclosure, to protect the measuring point from ambient or environmental influences (e.g. temperature, pollution).

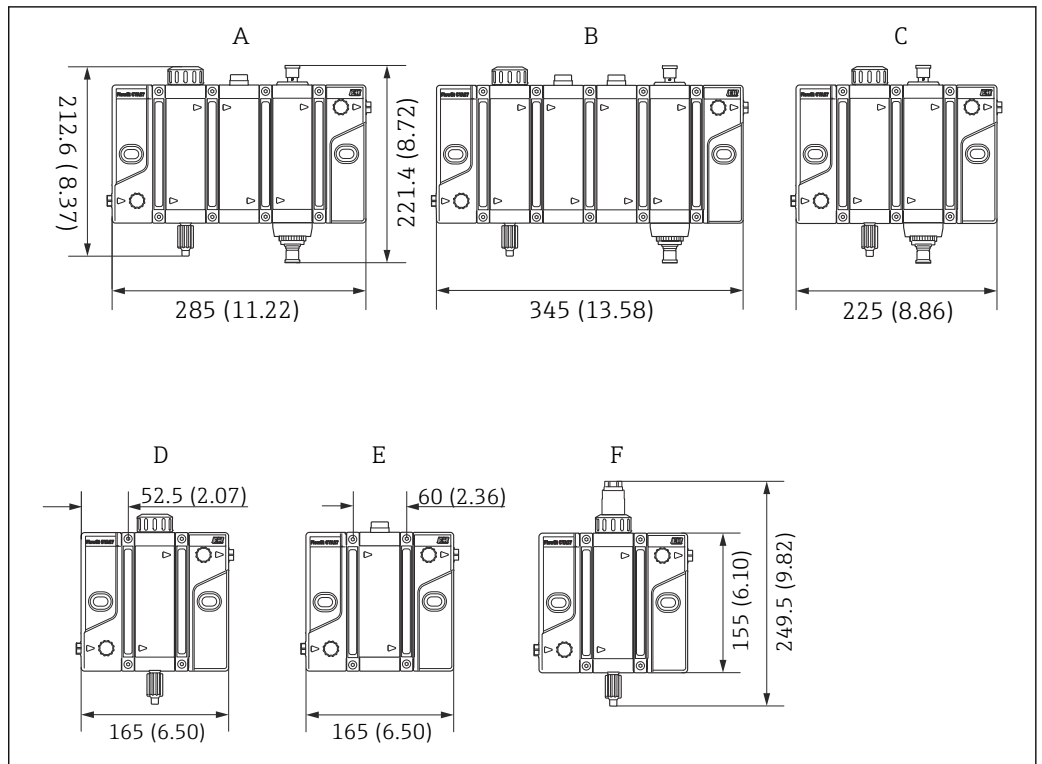
##### NOTICE

##### Direct sunlight or UV light

- ▶ Appropriate precautions should be taken at the installation site to protect the assembly from direct sunlight or other sources of UV radiation.

 At ambient temperatures below 0 °C (32 °F), the medium temperature must be at least 5 °C (41 °F) and the supply and return lines must be insulated.


### 5.1.3 Dimensions

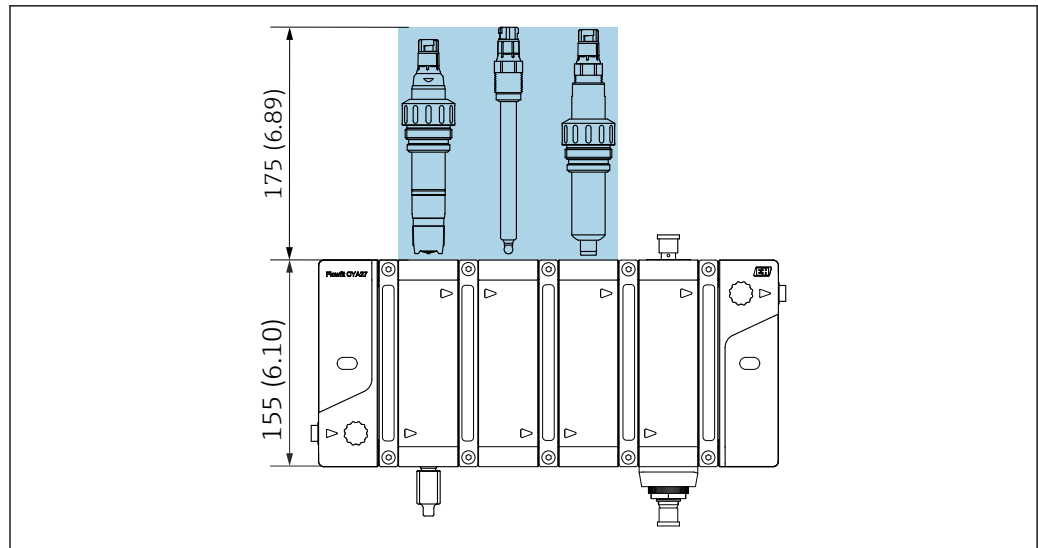


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1 Dimensions. Engineering unit: mm (in)

- A Disinfection, pH and flow rate indication version with sampling valve, status indication light and flow switch
- B Disinfection, pH, ORP and flow rate indication version with sampling valve, status indication light and flow switch
- C Disinfection and flow rate indication version with sampling valve, status indication light and flow switch
- D Disinfection version with sampling valve
- E pH, ORP or oxygen version
- F Conductivity version with sampling valve

Number of modules	1	2	3	4	5	6
Width mm (in)	165 (6.50)	225 (8.86)	285 (11.22)	345 (13.58)	405 (15.94)	465 (18.31)
Weight in kg (lb)	0.9 kg (1.98 lb)	1.5 kg (3.31 lb)	2.1 kg (4.63 lb)	2.7 kg (5.95 lb)	3.3 kg (7.28 lb)	3.8 kg (8.38 lb)
 max. weight depending on version without sensors						



2 Mounting distance. Engineering unit: mm (in)

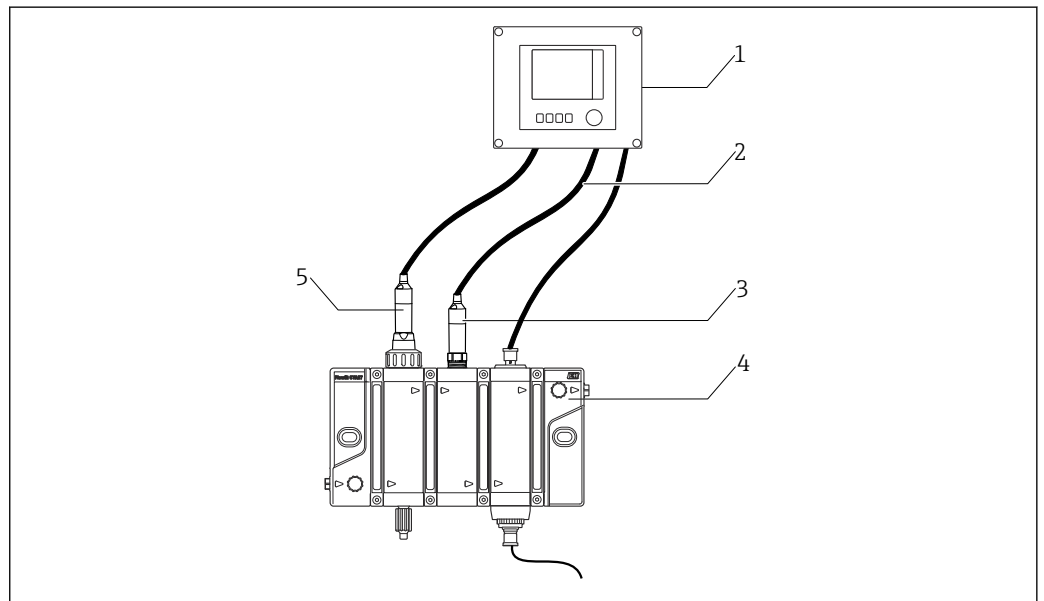
The mounting distance required to remove the sensor is 175 mm (6.9 in).

## 5.2 Mounting the assembly

### 5.2.1 Measuring system

A complete measuring system may contain up to six different sensors and consists, for example, of the following:

- Flowfit CYA27 flow assembly
- At least one sensor, e.g. CCS51D for measuring free chlorine
- At least one measuring cable, e.g. CYK10
- Transmitter, e.g. Liquiline CM44x or CM44xR with latest software
- Optional:
  - pH sensors, e.g. Memosens CPS31D
  - ORP sensors, e.g. Memosens CPS16D
  - Conductivity sensor CLS82D
  - Oxygen sensors, e.g. COS22D
  - Transmitter, e.g. Liquiline Compact CM82
  - Liquiline Mobile CML18 multi-parameter handheld instrument
  - Extension cable CYK11
  - Sampling valve on assembly if using modules for disinfection and conductivity
  - Flow switch
  - Status indication light



A0043060

3 Example of a measuring system

- 1 Transmitter Liquiline CM44x or CM44xR
- 2 Measuring cable CYK10
- 3 pH sensor, e.g. CPS31D
- 4 Flowfit CYA27 flow assembly
- 5 Disinfection sensor CCS5xD (membrane-covered,  $\varnothing 25$  mm), e.g. CCS51D

### 5.2.2 Direct wall mounting

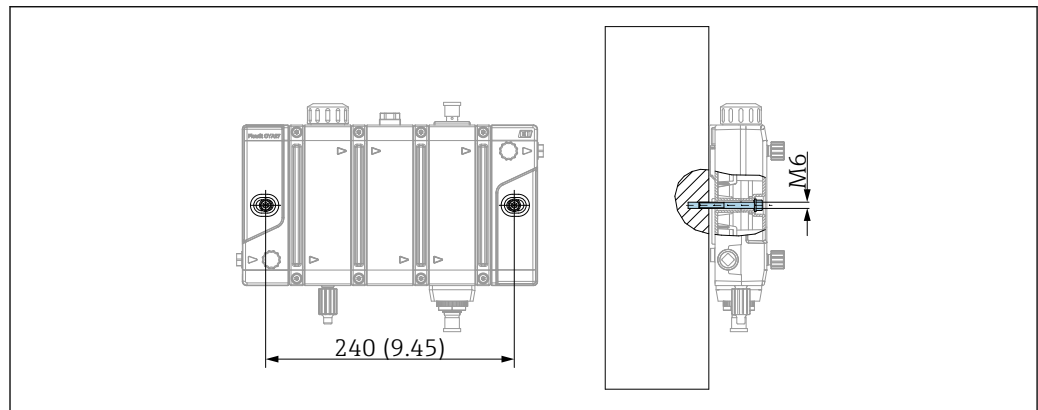
The assembly can be screwed directly onto the wall using two holes provided in the inlet and outlet module.

- i** Direct mounting on the wall is permitted for assemblies with one to a maximum of three modules.

Number of modules	1	2	3
Spacing between drill holes mm (in)	120 (4.73)	180 (7.09)	240 (9.45)

The mounting materials required to secure the device to the wall are not supplied.

1. Provide the mounting materials to secure the device to the wall (screws, wall plugs) onsite.
2. Use mounting material that is suited to the wall substrate.



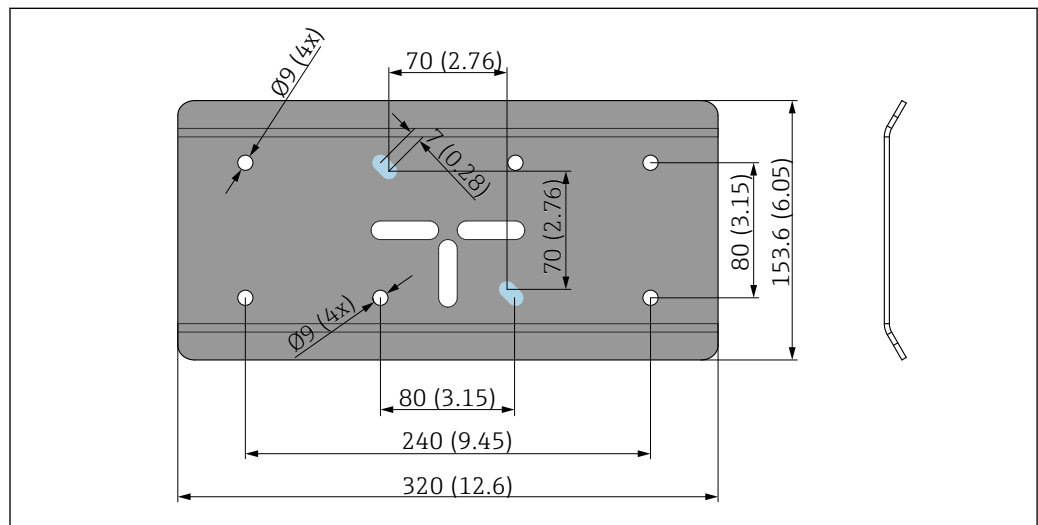
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4 Engineering unit: mm (in)

### 5.2.3 Mounting the assembly with wall holder unit

With the wall bracket, it is possible to select up to six modules. It is then possible to remove individual modules while the rest of the assembly remains securely in the bracket. Different drill holes allow, for example, the use of the Flowfit CCA250 hole pattern.

Optional accessories, comprising a wall bracket with securing clips for assemblies with 1 to 6 modules.

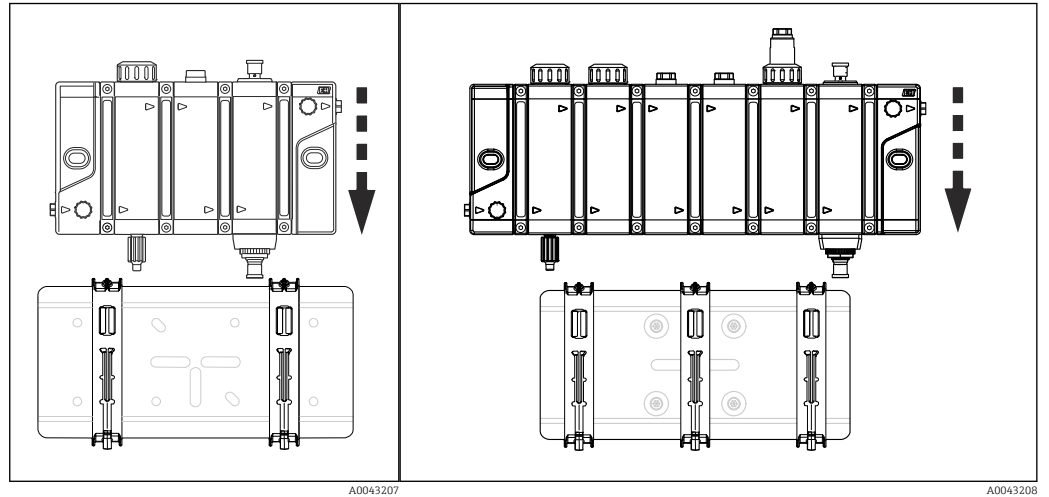


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5 Dimensions of wall bracket. Engineering unit: mm (in)

**i** The drill holes highlighted in color correspond to those of assembly CCA250, which can be reused.





▣ 6 2 securing clips for 1 to 5 modules ▣ 7 3 securing clips for 6 modules

**i** With six modules, three securing clips are required for increased stability.

1. Position the assembly in the center of the wall bracket.
2. Slide the assembly downwards on the securing clips until it clicks into place.

## 5.3 Mounting assembly in the process

### 5.3.1 General installation instructions

#### CAUTION

Risk of injury from high pressure, high temperature or chemical hazards if process medium escapes.

- ▶ Wear protective gloves, protective goggles and protective clothing.
- ▶ Install the assembly only in vessels or pipes that have cooled down, are empty and unpressurized and have been rinsed.

#### NOTICE

If the return lines are insufficiently sized, ascending, are too long or are incorrectly laid, there is a risk of excessive counterpressure in the assembly. This may impair or completely disrupt the functioning of the assembly and particularly the sensors, which may in turn cause further harm.

- ▶ Keep return lines as short as possible and avoid unnecessary flow resistance as well as rising pipes.
- ▶ Return lines should be designed, dimensioned and laid in compliance with the pressure specifications of the assembly and sensors.
- ▶ Short return lines with an open outlet are preferable, particularly for assemblies with a large number of modules.





- Due to its low **flow rates**, the assembly is not suitable for mounting directly in the process line. It must instead be installed in a **branch pipe** or a **bypass**. It is the responsibility of the user to select and test the appropriate type of process connection.
- If the **process pressure** is above 4 bar (58 psi) relative, the use of a **pressure-reducing valve** upstream from the assembly is required. The pressure-reducing valve should be configured in accordance with the pressure specifications of the sensors or assembly. The lower pressure here is the maximum permitted set pressure.
- If **solid particles** are present in the medium, this can affect the correct function of the assembly and sensors. It is recommended to install a particle filter/dirt trap with a mesh size of 500 µm upstream from the assembly. Please note here that the filter must also be maintained at regular intervals to ensure proper functioning.
- The **connecting lines** (pipe or hose lines) must be selected or dimensioned so that they can withstand the process medium, temperatures and pressures. Pay attention to the technical specification of the assembly and sensors.
- The **connecting lines** (pipe or hose lines) must be connected to the process connections of the assembly without force or tension. If necessary, provide appropriate strain relief devices.
- Prior to installation, check the **flange seal** between the flanges.

### 5.3.2 Process connection at the assembly

1. Mount the assembly on a vertical surface.
2. Connect the medium using the usual commercial connection fittings. Depending on requirements, use conventional sealing materials, e.g. thread sealing tape or O-ring (recommended) made of suitable material, e.g. FKM.


### 5.3.3 Open outlet


With this type of installation, the assembly is located in a branch pipe that branches off a main line and terminates in an open outlet →  8,  19. Ideally, the open outlet is unpressurized or without counterpressure.

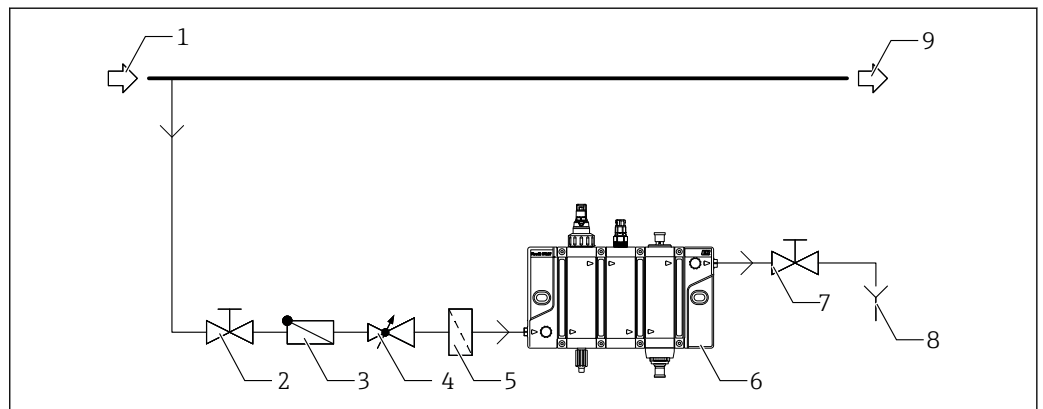
 The pressure  $p$  must not exceed the permitted operating pressure of the assembly of 4 bar (58 psi) relative.


If the sensor is installed, the sensor's pressure specifications must also be observed.

If the medium pressure is above 4 bar (58 psi) relative, a pressure-reducing valve is required.


1. Mount the assembly horizontally →  12.
2. Installing in the bypass is preferable to installing directly in the process line. The bypass line can be shut off without interrupting the process (one upstream and one downstream shut-off valve required). This enables sensor cleaning, for example, without affecting the process.
3. Install a dirt trap (screen) with a mesh size of 500  $\mu\text{m}$  upstream from the assembly. If a pressure-reducing valve is used, it usually includes a dirt trap.
4. Set the flow value upstream from the assembly, e.g. via an upstream flow regulator.

 The threaded adapters or hose adapters, which can be ordered, are sealed on the assembly with an FKM O-ring and do not require additional sealing between the assembly and adapter.



 8 Connection example with open outlet

- 1 Main inlet line
- 2 Manual valve (not included in scope of delivery)
- 3 Check valve (optional, not included in scope of delivery)
- 4 Pressure-reducing valve (optional, not included in scope of delivery)
- 5 Filter trap (optional, not included in scope of delivery)
- 6 CYA27 assembly
- 7 Manual valve (optional in the case of an upward-sloping output line, not included in scope of delivery)
- 8 Outlet
- 9 Main output line

 The use of a check valve in the supply line of the assembly prevents the unintentional backflow of media from the assembly into the process, e.g. during maintenance work.

### 5.3.4 Bypass with return

**i** The counterpressure  $p_2$  is the definitive counterpressure for the assembly or sensors and must not under any circumstances exceed the permitted pressure specification of the assembly or sensors.

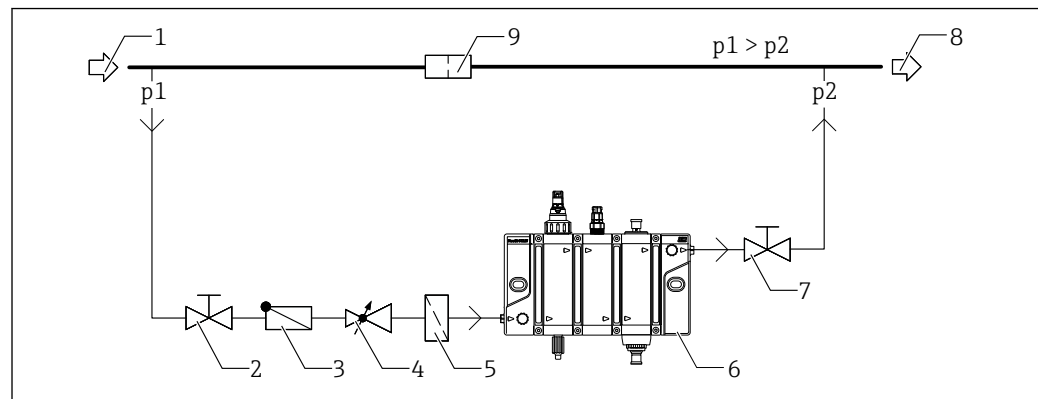
To achieve flow through the assembly with a bypass, pressure  $p_1$  must be higher than pressure  $p_2$ .

This requires the installation of an orifice plate or throttle valve in the main pipe.

**i**  $p_1$  must not exceed the permitted operating pressure of the assembly of 4 bar (58 psi) relative.

If the sensor is installed, the sensor's pressure specifications must also be observed.

1. Install the assembly horizontally → 12.
2. Connect the medium using the usual commercial connection fittings. Depending on requirements, use conventional sealing materials, e.g. thread sealing tape or O-ring made of FKM.
3. Installing the assembly in the bypass is preferable to installing it directly in the process line. The bypass line can be blocked off without interrupting the process (a shut-off valve is required upstream and downstream). This enables sensor cleaning, for example, without affecting the process.
4. Install a dirt trap (screen) with a mesh size of 500  $\mu\text{m}$  upstream from the assembly. If a pressure-reducing valve is used, it usually includes a dirt trap.
5. Set the flow value upstream from the assembly, e.g. via an upstream flow regulator.



**9** Connection example with bypass and orifice plate in the main pipe

- 1 Main inlet line
- 2 Manual valve (not included in scope of delivery)
- 3 Check valve (not included in scope of delivery)
- 4 Pressure-reducing valve (optional, not included in scope of delivery)
- 5 Filter trap (optional, not included in scope of delivery)
- 6 CYA27 assembly
- 7 Manual valve (not included in scope of delivery)
- 8 Main output line
- 9 Orifice plate (not included in scope of delivery)

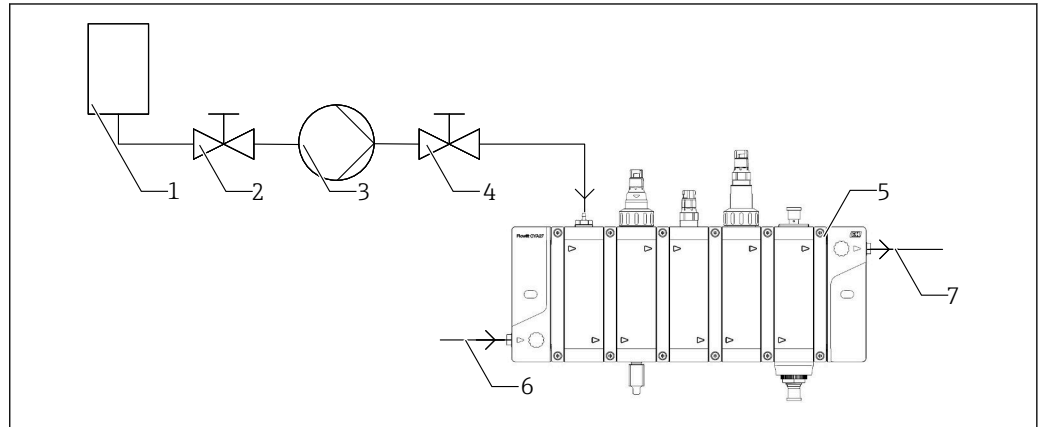
**i** To take an assembly installed in this way out of operation, pressure relief should be provided so that the pressure in the assembly can be reduced safely after shutting off the supply and return lines. Suitable solutions include the optional sampling valve on the assembly or the provision of a sampling point in the line.

### 5.3.5 Automatic cleaning of the assembly via the dosing module

For the metered addition of a cleaning agent or an acid (to acidify a medium), the following is required at a minimum:

- an assembly with dosing module,
- a feeder tank for the liquid to be dosed and
- a dosing pump.

Valves are optional and may be necessary depending on the type of pump and vessel.



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- 1 (Feeder) vessel for cleaning or acid solution (not included in scope of delivery)
- 2 Valve (optional, not included in scope of delivery)
- 3 Dosing pump (not included in scope of delivery)
- 4 Valve (optional, not included in scope of delivery)
- 5 Assembly with dosing module
- 6 Media inlet of the assembly
- 7 Media outlet of the assembly

Time-based control of dosing can be achieved by switching on the dosing pump via a transmitter, e.g. a CM44x with relay card.

For detailed information on connection and the electrical specifications, see the Operating Instructions of the transmitter.

- i** Measured values, e.g. pH value or conductivity, of installed sensors may change due to the type and composition of the added solutions, acids or cleaning agents. This may have undesired effects on processes that are controlled by these measured values. Changes in the measured values and their effects on a controller should be taken into account at all times. Alternatively, a test is recommended prior to implementation.

## 5.4 Flow switch and status indication light (optional)

### **⚠ WARNING**

#### Device is live!

Incorrect connection may result in injury or death!

- ▶ The electrical connection may be performed only by an electrical technician.
- ▶ The electrical technician must have read and understood these Operating Instructions and must follow the instructions contained therein.
- ▶ Prior to commencing connection work, ensure that no voltage is present on any cable.

Use of the flow switch and status indication light is recommended. The flow switch is used to monitor a continuous, adequate level of flow through the assembly. The status indication light enables easy identification of the operating status of the measuring point through the use of different colors to indicate malfunctions in the assembly that are detected by the transmitter.

Malfunctions generate error messages (also diagnostic messages) in transmitters, e.g. CM44x. If they belong to the diagnostic category NAMUR F, this will result in a red screen color on the display (CM44x).

### 5.4.1 Connecting to the CM44x

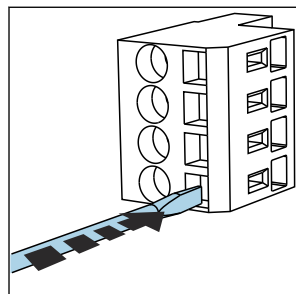
The flow switch and the status indication light are connected to a CM44x via the power supply (24 V) and the digital input of a DIO module, as well as a relay, e.g. the alarm relay of the BASE-E or BASE2-E module, or alternatively a 2R or 4R module.

The following components are also required for installation (flow switch and status indication light) and are not included in the scope of delivery of the assembly:

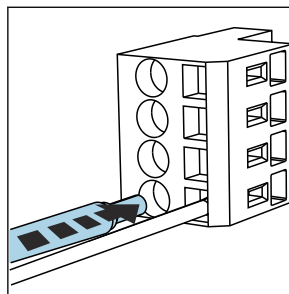
- DIO module (order no. 71135638)
- 3 connecting cables approx. 20 cm (7.87 in)
- Ferrules (optional)
- Small flat-blade screwdriver
- Cable stripper

1. Strip the cable of the flow switch and/or status indication light by at least 20 cm (7.87 in).
2. Install ferrules.
3. Guide the cable through the holes provided on the underside of the CM44x.
4. Wire the cables in accordance with the wiring diagram.

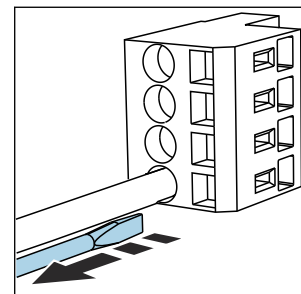
*Plug-in terminals on the CM44x*



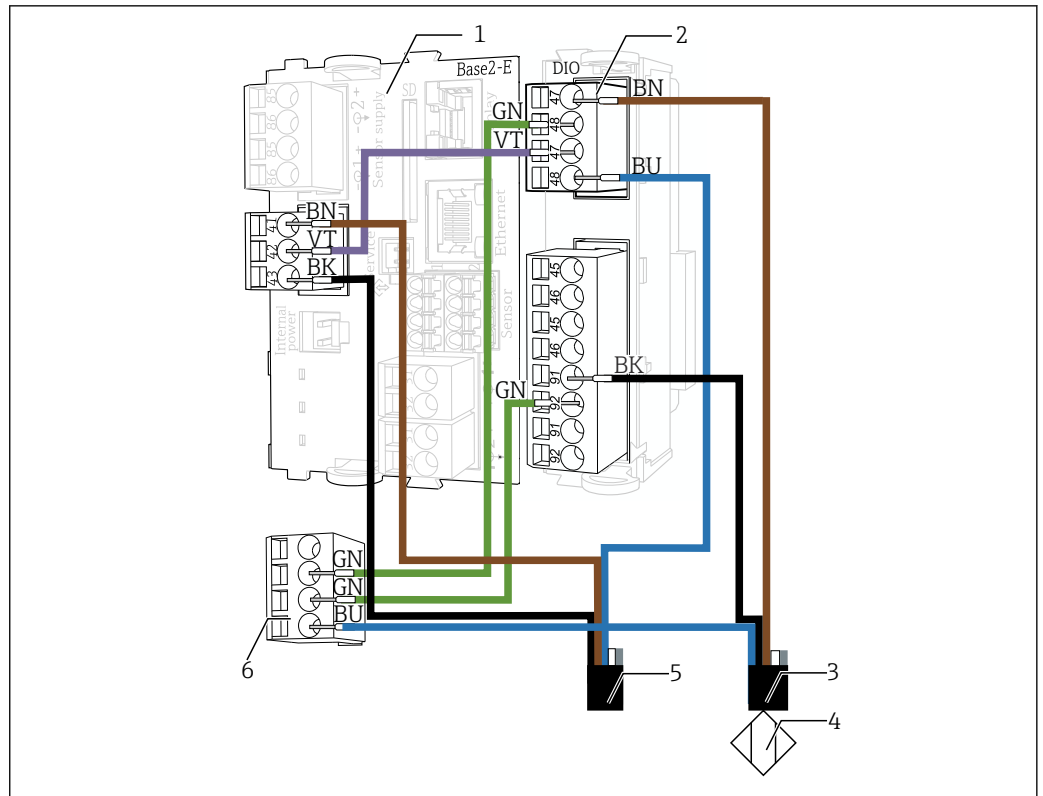
- ▶ Press the screwdriver against the clip (opens the terminal).



- ▶ Insert the cable until the limit stop.



- ▶ Remove the screwdriver (closes the terminal).



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- 1 BASE-E or BASE2-E module
- 2 DIO module (included in the scope of delivery of the CM44x or can be ordered separately)
- 3 Flow switch cable
- 4 Flow switch
- 5 Status indication light cable
- 6 Distributor terminal (included as standard in the CM44x)

**i** The flow switch cable and the status indication light cable are identical.

Flow switch cable	Connection
BN (brown)	DIO module, port 1, terminal 47
White (WH)	not connected
Black (BK)	DIO module, port 1, terminal 91
Blue (BU)	Distributor terminal (1)
Gray (GY)	not connected

Status indication light cable	Connection
Brown (BN)	BASE2-E module, alarm, terminal 41
White (WH)	not connected
Black (BK)	BASE2-E module, alarm, terminal 43
Blue (BU)	DIO module, port 2, terminal 48
Gray (GY)	not connected

Connecting cable		
Violet (VT)	BASE2-E module, alarm, terminal 42	DIO module, port 2, terminal 47
Green (GN)	DIO module, port 1, terminal 92	Distributor terminal (2)

Connecting cable		
Green (GN)	DIO module, port 1, terminal 48	Distributor terminal (3)
	Distributor terminal (4)	not connected

## 5.4.2 Settings on the CM44x


### Activating the binary input of the flow switch

1. Go to **Menu/Setup/Inputs/Binary input x:1** and enable **Binary input**.
2. Set **Signal type: Static signal, Signal level: Low**.
3. Assign a limit contactor to the binary input in: **Menu/Setup/Basic setup/Limit switches** with the options **Source of data: Binary input x:1, Operating mode: Above limit check, Function: On**

### Activating the relay for the status indication light


Depending on the relay used, the following options can be used to activate the connected relay:

- **Alarm relay:** No action necessary if the alarm relay has already been activated and the following has been configured: **Function: Diagnostics, Operating mode: Namur F**
- **2R/4R module:** **Menu/Setup/Basic setup/Relay x:1**, settings: **Function: Diagnostics, Operating mode: Namur F**

 When using the alarm relay, it is no longer available for other messages.

### Activation/assignment of flow switch for status indication light

- ▶ Reconfigure the diagnostic message for the limit contactor (S910) in **Menu/Setup/Basic setup/Diagnostics settings/Diag. behavior/S910 Limit switches/Status signal/Failure (F)**.
  - ↳ The status of the limit contactor and thus the flow rate in the assembly is available as a process value for all outputs of the transmitter. As soon as the flow rate is insufficient, **F910 Limit switches** is displayed on the device along with a red screen and a red status indication lamp on the assembly.

 Any other error on the transmitter that results in a red screen will also result in a red status display on the assembly.

The status indication light indicates the flow status only if the flow switch was also ordered. The status indication light on its own can also be used for the NAMUR status of the measuring system (transmitter and connected measuring devices/sensors).

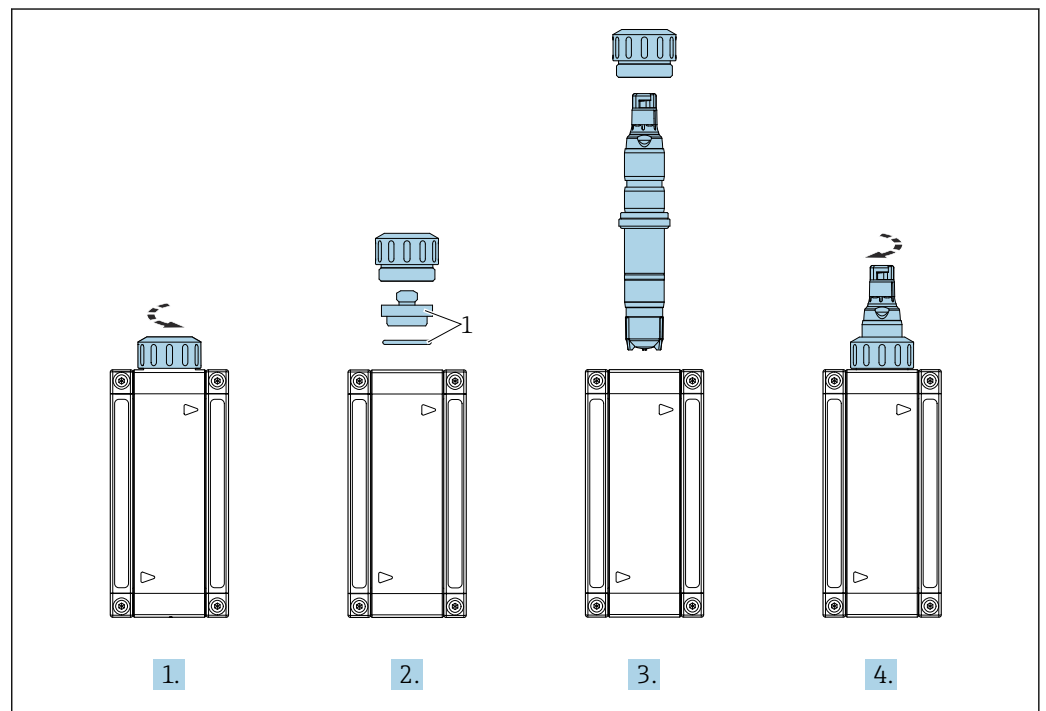


## 5.5 Installing sensor in assembly

### 5.5.1 Disinfection sensor

Please note the following during installation:

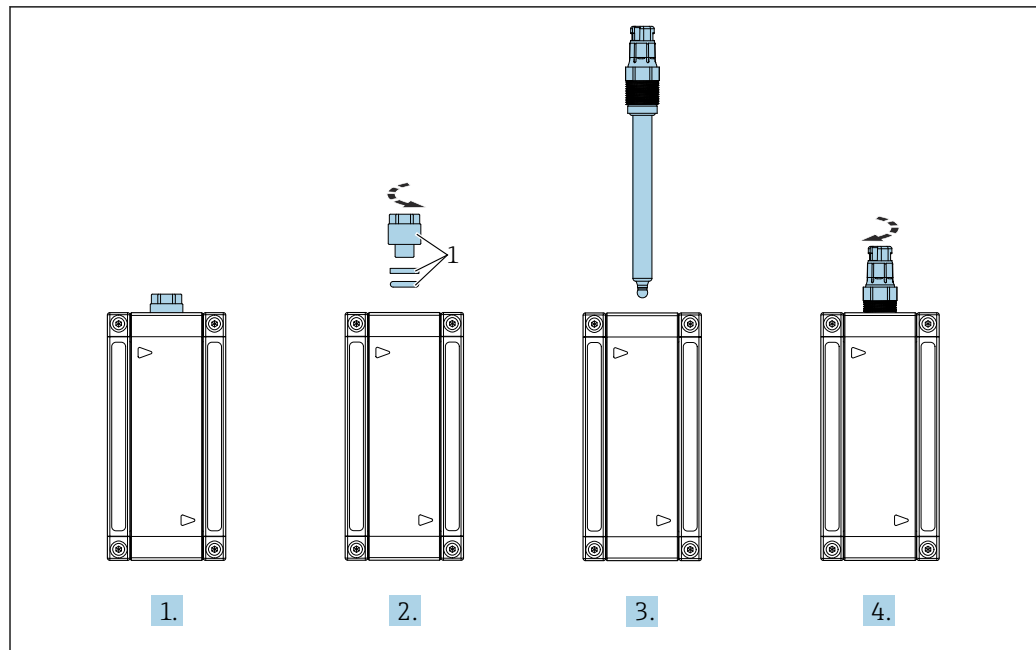
- ▶ Configure the minimum flow rate.
- ▶ If the medium is fed back into an overflow basin, pipe or similar, the resulting counterpressure on the sensor must not exceed 2 bar (29 psi) bar absolute and must remain constant.
- ▶ Avoid negative pressure at the sensor, e.g. due to medium being returned to the suction side of a pump.
- ▶ To avoid buildup, heavily contaminated water should also be filtered.



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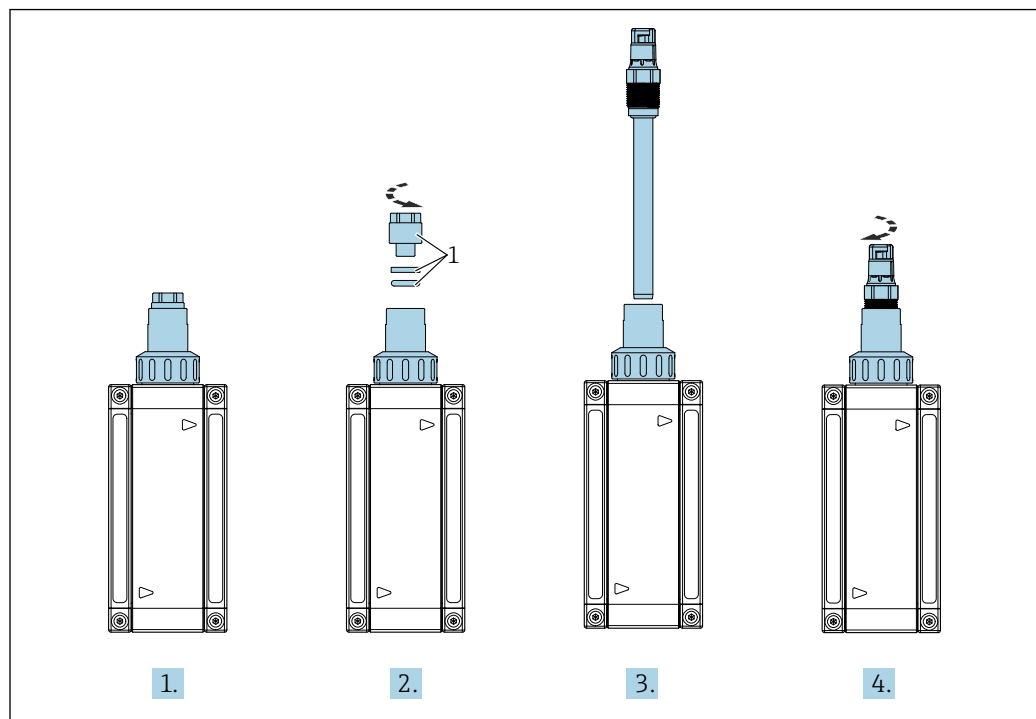
1. The assembly is supplied to the customer with a union nut screwed onto the assembly; unscrew union nut from assembly.
2. The assembly is supplied to the customer with a dummy plug inserted in the assembly; remove dummy plug and O-ring (1) from the assembly.
3. Slide the sensor with the adapter for Flowfit CYA27 into the opening in the assembly.
4. Screw union nut onto assembly on block.

### 5.5.2 pH, ORP or oxygen sensor



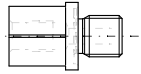
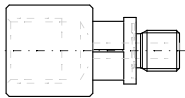

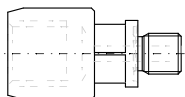
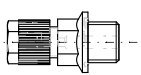
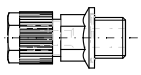
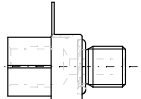
1. The assembly is supplied to the customer with a dummy screw mounted in the assembly.
2. Remove dummy screw, thrust collar and O-ring (1) from the assembly using a hexagon wrench AF17.
3. Slide the sensor into the opening in the assembly.
4. Screw the sensor into the assembly.

### 5.5.3 Conductivity sensor



1. The assembly is supplied to the customer with a dummy screw mounted in the assembly.
  2. Remove dummy screw, thrust collar and O-ring (1) from the assembly using a hexagon wrench AF17.
  3. Slide the sensor into the adapter of the assembly.
  4. Screw the sensor into the adapter of the assembly.
- i** The CLS82D must not be installed in the pH or oxygen module, as measured errors may occur due to the short distance to the wall.

## 5.6 Connecting optional accessories

Option	Process adapter	
QA	G 1/2 (ISO 228-1)	 A0043724
QB	G 1/8 (ISO 228-1)	 A0043723
QH	NPT 1/4"	 A0043722
QG	NPT 1/2"	 A0043721
QM	Hose connector OD 6 mm (0.24 in), ID 4 mm (0.16 in)	 A0043720
QN	Hose connector OD 8 mm (0.31 in), ID 6 mm (0.24 in)	 A0043719
PC	Adapter PAL G 1/4	 A0043718

- i** The process adapters are supplied with an O-ring seal on the assembly side.

## 5.7 Post-installation check

1. Close any sampling valves that may be installed.
2. Open needle valves to control flow at the assembly.
3. Close any pressure-reducing valves that may be installed upstream from the assembly.
4. After installation, check all connections to ensure they are correctly installed, secure and leak-tight.
5. Check all pipes and hoses for damage.

## 6 Commissioning

### CAUTION

**Risk of injury from high pressure, high temperature or chemical hazards if process medium escapes.**

- ▶ Before subjecting the assembly to the process pressure, verify that all connections are sealed.
- ▶ Wear personal protective equipment consisting of protective gloves, goggles and protective clothing.
- ▶ Increase the process pressure slowly.

### 6.1 Function check

Prior to commissioning, ensure that:

- all seals are correctly seated (on the assembly and on the process connection)
- the sensor is correctly installed and connected
- all other connection points of the assembly are correctly connected or appropriately sealed
- all pipes and/or hoses are in perfect condition.

### 6.2 Switching on the device

#### CAUTION

**Incorrect operating sequence of valves during commissioning**

This may lead to increased pressure in the assembly and may impair or completely disrupt the functioning of the sensors (loss of calibration). This may in turn cause further harm (to other plant components, dosing system personnel).

- ▶ Follow the operating sequence in accordance with the instructions below.
- ▶ Instruct operating personnel regularly and, if necessary, attach a notice to the measuring point.

#### CAUTION


**Medium may escape if the needle valves are unscrewed fully.**

- ▶ Open the needle valves by a maximum of three turns.

#### NOTICE

**Switch-on sequence of needle valves**

- ▶ First open the needle valve at the outlet and then open the needle valve at the inlet module.

 The needle valve at the outlet should always be open during operation and is not used to configure the flow.

The needle valve at the inlet is used to configure the flow.

## 7 Operation

### ⚠ CAUTION


#### Compressed media

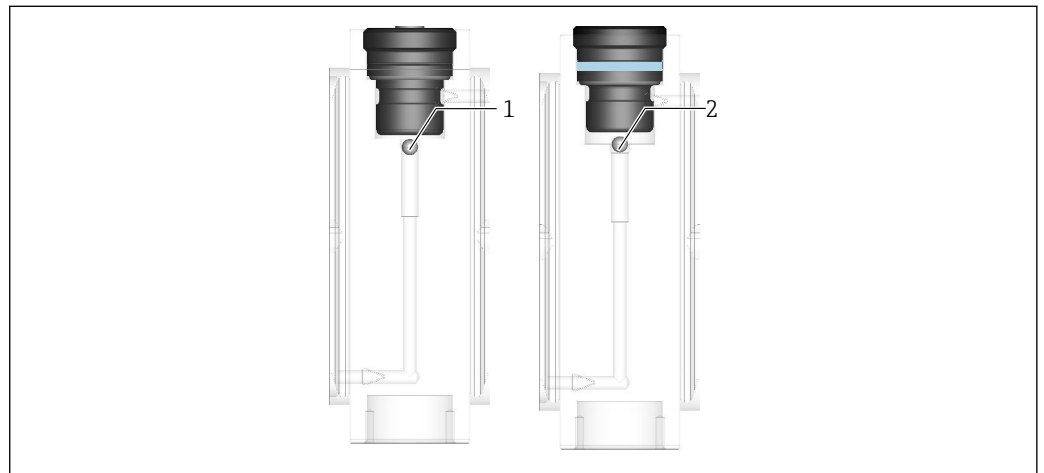
Risk of injury from high pressure, high temperature or chemical hazards if process medium escapes.

- ▶ Wear personal protective equipment consisting of protective gloves, goggles and protective clothing.

### 7.1 Adapting the measuring device to the process conditions

#### 7.1.1 Flow

 Use only the needle valve at the inlet to configure the flow.



- 1 Position of float for flow rate of 5 l/h (1.1 gal/h)  
 2 Position of float for flow rate of 30 l/h (6.6 gal/h)

#### 7.1.2 Venting during operation

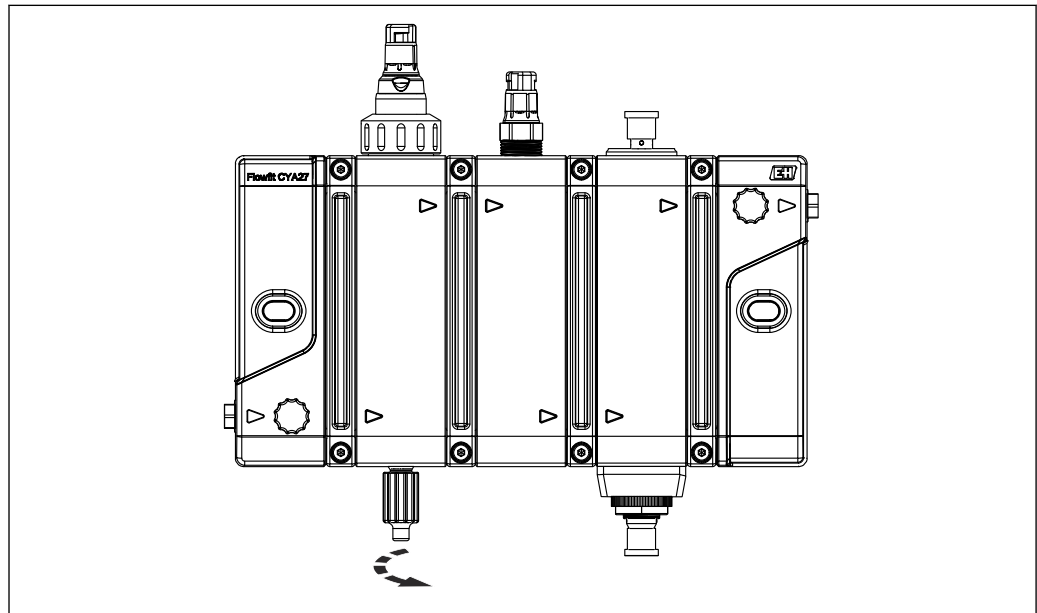
The assembly is designed in such a way that disruptive air bubbles cannot accumulate in the assembly under normal operating conditions. Any gas bubbles that form are usually discharged by the flow of liquid. If, however, manual venting is necessary, this can be done in two ways:

- Increase the liquid flow for a short time in order to discharge the gas bubbles (pay attention to the operation of the valves). Then reset to the original flow rate.
- Loosen the sensor carefully and to the smallest extent possible so that the air in the sensor module can be displaced by liquid. Then retighten the sensor.

## 7.2 Sampling

Depending on the module selected, the assembly can be optionally fitted with a valve for sampling. The sample, for example for a DPD test for sensor calibration, is taken as follows:

1. Carefully open the sampling valve and rinse for a few seconds.
  - ↳ Collect this quantity of liquid in a suitable vessel and discard.
2. Take a sample in a suitable vessel.
3. Close the sampling valve.
4. Check the flow setting/function of the assembly and readjust if necessary.



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Reduced flow may cause the sensor signals to fluctuate during sampling. This applies to the membrane-covered disinfection sensors and may occur in the following cases:

- in the case of assemblies with low flow rates of 5 l/h (1.1 gal/h) and/or
- in the case of large sample volumes or long rinsing intervals.

*Expected deviations in the sensor signal from membrane-covered disinfection sensors during sampling (determined under laboratory conditions)*

Flow variant Q	Sample volume	Sensor signal deviation
5 l/h (1.1 gal/h)	10 ml (0.34 fl oz)	Approx. 3 %
	50 ml (1.69 fl oz)	Approx. 20 %
	100 ml (3.38 fl oz)	Approx. 30 %
30 l/h (6.6 gal/h)	10 ml (0.34 fl oz)	None
	50 ml (1.69 fl oz)	None
	100 ml (3.38 fl oz)	Approx. 1 %

### Fluctuating sensor signal during sampling

Depending on the integration of the sensor measured values in a higher-level control system, the fluctuation of the sensor signal during sampling may have undesirable or inadmissible consequences, such as alarm signals or incorrect control processes and dosages.

To avoid this, the sensor values at the transmitter can be set to **HOLD** for the duration of sampling. In this case, sampling is performed as follows:


1. Set the sensor measured values on the transmitter to **HOLD**.
  - ↳ Follow the Operating Instructions for the transmitter.
2. Carefully open the sampling valve and rinse for a few seconds.
  - ↳ Collect this quantity of liquid in a suitable vessel and discard.
3. Take a sample in a suitable vessel.
4. Close the sampling valve securely.
5. Cancel the **HOLD** status of the sensor measured values on the transmitter.
6. Check the flow setting/function of the assembly and readjust if necessary.

## 8 Diagnostics and troubleshooting

### 8.1 General troubleshooting

Faults at the measuring point can affect not only the assembly but also the sensors and transmitters used. For this reason, the respective Operating Instructions of the sensors and transmitters must also be observed for diagnostics and troubleshooting.

Diagnostics/troubleshooting can be performed directly on the assembly or its process integration as well as using the sensor measured values and the information displayed on the transmitter at the measuring point.

If a status indication light is used on the assembly, possible errors such as absent flow or Namur F can also be detected more easily (→  12).

Contact the Service Department if you cannot rectify the error yourself.

### 8.2 Faults in the assembly and process integration

Problem	Possible cause	Tests and/or remedial measures
No flow	Closed valves	<ul style="list-style-type: none"> <li>▶ Open valve at outlet module</li> <li>▶ Open valve at inlet module</li> <li>▶ Check existing valves in the process connection (supply and discharge line)</li> </ul>
	Blocked filter in inlet line	<ul style="list-style-type: none"> <li>▶ Check and, if necessary, clean or replace the filter medium</li> </ul>
	Soiled assembly/pipes	<ul style="list-style-type: none"> <li>▶ Clean the assembly and, if necessary, the supply and discharge lines</li> </ul>
	Counterpressure through return line is too high	<ul style="list-style-type: none"> <li>▶ Check return line, remove unnecessary flow resistance</li> <li>▶ If necessary, shorten the length of the return line or route it a different way</li> </ul>
	Incorrectly configured pressure-reducing valve in supply line	<ul style="list-style-type: none"> <li>▶ Check and correct the pressure setting on the pressure-reducing valve</li> </ul>
Highly fluctuating measured signal of membrane-covered sensors	Insufficient flow	<ul style="list-style-type: none"> <li>▶ Check flow configuration</li> <li>▶ Readjust flow at the valve of the inlet module</li> </ul>
	Sampling is open or ongoing	<ul style="list-style-type: none"> <li>▶ Close the sampling valve</li> <li>▶ Set the sensor measured values on the transmitter to <b>HOLD</b> for the duration of sampling</li> <li>▶ After sampling, cancel the <b>HOLD</b> on the sensor measured values on the transmitter.</li> </ul>
Air is sucked into assembly when the sampling valve is open	Downward-sloping return line causes negative pressure	<ul style="list-style-type: none"> <li>▶ Increase flow at the valve of the inlet module to a minimal degree</li> <li>▶ Reduce flow at the valve of the outlet module</li> <li>▶ After sampling, return the flow setting or the valve position of the assembly to the original setting</li> </ul>
Electrolyte in membrane-covered sensors requires frequent replacement	Counterpressure in assembly is too high	<ul style="list-style-type: none"> <li>▶ Check valve position at the outlet module and open if necessary</li> <li>▶ Check return line, remove any unnecessary flow resistance</li> <li>▶ If necessary, shorten the length of the return line or route it a different way</li> </ul>



## 9 Maintenance

### ⚠ CAUTION

#### Danger resulting from improper maintenance

- ▶ Maintenance work on the assembly that compromises pressure safety must be performed only by authorized specialist staff.
- ▶ The valve must comply with the original technical specifications following each maintenance activity. Appropriate measures must be taken to check and ensure leak-tightness.

### ⚠ CAUTION

#### Risk of injury if medium escapes

- ▶ Before each maintenance task, ensure that the process pipe is unpressurized, empty and rinsed.
- ▶ The assembly may contain medium residue. Rinse sufficiently before starting work.

The following regular maintenance activities may be necessary on the assembly or measuring point, depending on the application and the process conditions:

- Function check (leak-tightness and flow)
- Cleaning of assembly
- Cleaning, replacement or calibration of sensors
- Replacement of seals

### 9.1 Maintenance schedule

**i** The specified intervals serve as a guide. For harsh process or ambient conditions, it is recommended that the interval be shortened accordingly. Cleaning intervals for the sensor and assembly are dependent on the medium.

Window	Maintenance work
Monthly	▶ Verify that process connections are leak-tight
	<ol style="list-style-type: none"> <li>1. Remove sensor and check for deposits.</li> <li>2. If deposits are present, check cleaning cycle (cleaning agents, temperature, duration, flow volume).</li> </ol>
As required, biannually or annually	▶ Replace seals in contact with the medium when using highly concentrated cleaning agents.

## 9.2 Maintenance tasks

### 9.2.1 Decommissioning

#### CAUTION

##### Compressed media

Risk of injury from high pressure, high temperature or chemical hazards if process medium escapes.

- ▶ Wear personal protective equipment consisting of protective gloves, goggles and protective clothing.
- ▶ Perform maintenance or repair work on the assembly only when it is depressurized, has cooled down and has been rinsed.

#### CAUTION

##### Incorrect operating sequence of valves during decommissioning


This may lead to increased pressure in the assembly and may impair or completely disrupt the functioning of the sensors (loss of calibration). This may in turn cause further harm (to other plant components, dosing system personnel).

- ▶ Follow the operating sequence in accordance with the switch-off sequence.
- ▶ Instruct operating personnel regularly and, if necessary, attach a notice to the measuring point.

##### Switch-off sequence

To switch off or stop the flow at the measuring point, proceed as follows:

1. Close valve at inlet.
2. Close valve at outlet.
3. Carefully open the sampling valve or loosen a sensor to relieve pressure in the assembly.

 If the measuring point is temporarily shut down and the sensors are to remain in the assembly, ensure that sufficient medium (water) is present in the assembly and the sensors do not dry out. Keep the valves at the inlet and outlet of the assembly closed for this purpose.

### 9.2.2 Draining

Take the assembly out of operation prior to draining (→  34).

Draining can be performed safely at different locations or in different ways:

#### At the installation site:

1. Open the sampling valve.
2. Open the sensor slot or the outlet connection, whichever is positioned further away from the valve.
  - ↳ The process medium drains off through the sampling valve.
3. Collect process medium at the sampling valve.

Or:

The negative pressure effect can be used for outlet lines that have an open end and a downward slope.

1. Open the outlet valve.

2. Open the sampling valve.
  - ↳ The medium is discharged via the outlet line.

**At a prepared workstation (e.g. with collection basin or drain):**

1. Disconnect the assembly from the process connection.
2. Remove the assembly from the wall bracket.
3. Open the inlet and outlet valves, sensor slots and sampling valve at the prepared workstation.
  - ↳ Collect the escaping liquid in an appropriate manner.

The amount of liquid remaining in the assembly depends on the module version.

Depending on the module version, draining allows the liquid content in the assembly to be reduced to the following experimentally determined values:

Module version	Disinfection + pH + flow rate indication	Disinfection + pH + ORP + flow rate indication	2x disinfection + 2x pH + conductivity + flow rate indication
Media volume with sensors	25 ml (0.85 fl oz)	30 ml (1.01 fl oz)	60 ml (2.03 fl oz)
Volume of medium remaining after draining with sensors	9 ml (0.3 fl oz)	13 ml (0.44 fl oz)	19 ml (0.64 fl oz)

### 9.2.3 Flush


Depending on the process medium, flushing is necessary to minimize or eliminate possible chemical hazards.

Prior to rinsing, the assembly must be taken out of operation (→  34) and drained (→  34).

Rinsing can be performed safely at different locations or in different ways:

**At the installation site:**


1. Connect line for rinsing medium to the inlet module of the assembly.
2. Open the inlet and outlet valves.
3. Carry out rinsing.
4. Channel the rinsing medium into the usual outlet.

 The flow rate of the rinsing medium must not exceed the assembly specifications.

**At a prepared workstation (e.g. with collection basin or drain):**

1. Connect a rinsing line to the inlet module of the drained assembly.
2. Open the inlet and outlet valves.
3. Rinse the assembly.
4. Collect the escaping liquid.

### 9.2.4 Cleaning the assembly and sensors

Clean the assembly and sensor regularly as required. The frequency and intensity of cleaning depend on the medium. Cleaning of the surfaces of the assembly and sensors in contact with the medium can be performed manually or automatically (→  21).

The following methods and cleaning agents are recommended:

1. Remove light dirt and fouling using a cloth moistened with suitable cleaning solutions.
2. Remove heavy soiling using a soft brush and a suitable cleaning agent.
3. For very persistent dirt, soak the parts in a cleaning solution. Then clean the parts with a brush.

### Cleaning agent

The choice of cleaning agent depends on the degree and type of contamination. The most common types of contamination and the appropriate cleaning agents are listed in the following table.

Type of soiling	Cleaning agent
Greases and oils	Hot water or water-soluble organic solvents (e.g. ethanol)
Limescale deposits, metal hydroxide buildup, lyophobic biological buildup	Approx. 3% hydrochloric acid
Sulfide deposits	Mixture of 3% hydrochloric acid and thiocarbamide (commercially available)
Protein buildup	Mixture of 3% hydrochloric acid and pepsin (commercially available)
Fibers, suspended substances	Pressurized water, possibly surface-active agents
Light biological buildup	Pressurized water

### **CAUTION**

#### Solvents

Solvents are harmful to health, may destroy plastic components of the sensor and are also suspected carcinogens (e.g. chloroform)!

- ▶ Do not use any halogen-containing organic solvents or acetone.

### **NOTICE**

#### Media containing surfactants

Damage to the sensor membrane!

- ▶ The sensor membrane must not come into contact with agents containing surfactants.

### **NOTICE**


#### Isopropanol


Attacks PMMA!

- ▶ Do not use isopropanol.

### Manual cleaning

For manual cleaning of the assembly, proceed as follows:

1. Take the measuring point out of operation (→  34).
2. Rinse and drain the assembly as required.
3. Remove the sensors.
4. Clean the assembly.
5. Install the sensors.

6. Put the measuring point into operation (→  28), paying particular attention to leak-tightness.



For detailed information on "Cleaning the sensor", see Operating Instructions for sensor.

### 9.2.5 Calibrating or replacing the sensors



For detailed information on "Calibrating the sensor", see Operating Instructions for sensor.




#### **CAUTION**

#### **When removing a sensor with a glass shaft, the glass may shatter.**

Risk of injury from glass splinters!




- ▶ When handling these sensors, always wear protective goggles and appropriate protective gloves.

To replace or remove the sensors, e.g. for external calibration or maintenance, proceed as follows:

1. Take the measuring point out of operation (→  34).
2. Rinse and drain the assembly as required (→  34).
3. Remove the relevant sensors.
  - Remove the cable or connector.
  - Unscrew the coupling nut or unscrew the sensor directly.
  - Pull sensor out through opening in assembly.
4. Install calibrated or new sensors.
5. Connect the cable or connector.
6. Put the measuring point into operation (→  28), paying particular attention to leak-tightness.

### 9.2.6 Replacing seals in valves, process adapters, plugs and sensors

Seals in valves, process adapters, plugs and sensors can be replaced easily by dismantling the relevant components. The seals can also be replaced while the assembly remains at the mounting location. To do so, proceed as follows:

1. Take the measuring point out of operation (→  34).
2. Rinse and drain the assembly as required →  34.
3. Remove the relevant components.
4. Replace the seals.
5. Install the components.
6. Put the measuring point into operation (→  28), paying particular attention to leak-tightness.






The needle valves at the inlet and outlet can only be dismantled if the assembly with additional valves is integrated into the process.


### 9.2.7 Replacing the seals and cleaning between the modules

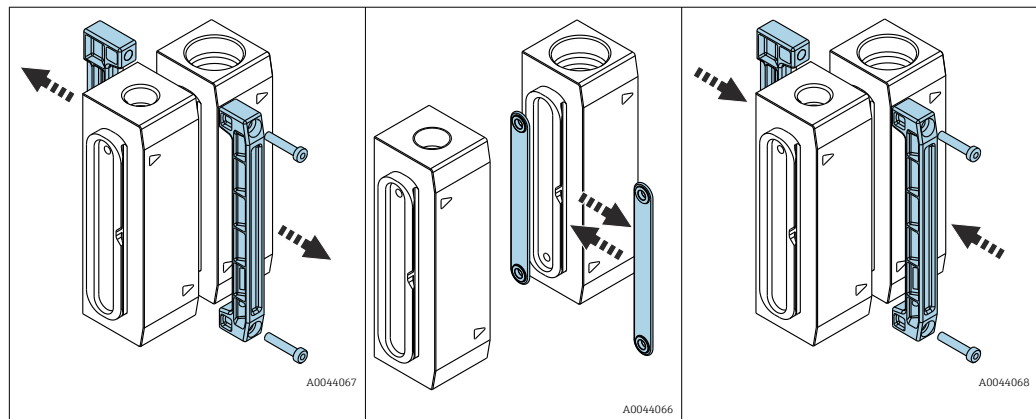
The module seals are located in the channel between the modules. To replace them, the assembly must be disassembled at the clips and then reassembled correctly. To do so, proceed as follows:

1. Take the measuring point out of operation (→  34).

2. Rinse and drain the assembly as required (→  34).
3. Disconnect the assembly from the process.
4. Remove the assembly from the wall installation (→  39).
5. Using the clips, separate the assembly into the modules(→  37).
6. Replace or clean the seals.
7. Clean sealing surfaces of the modules before inserting new seals.
8. Use the clips to reassemble the modules back into the assembly.

Please note the following:



- Pay attention to the correct position of the modules (orientation, position, sequence).
  - Ideally, mount the assembly lying on its side so that the seal can be inserted flat into the mounting groove.
  - Ensure that the seal is not displaced when attaching the next module.
  - Tighten the screws evenly using a torque of  $2.5 \pm 0.5$  Nm.
  - Visually inspect the clips. When installed correctly, there should be no gaps between them.
9. Carry out a leak test in advance at low water pressure, with the dummy plugs or plugs installed and without the sensors.
  10. Mount the assembly on the wall again.
  11. Connect the assembly to the process.
  12. Put the measuring point into operation (→  28), paying particular attention to leak-tightness.

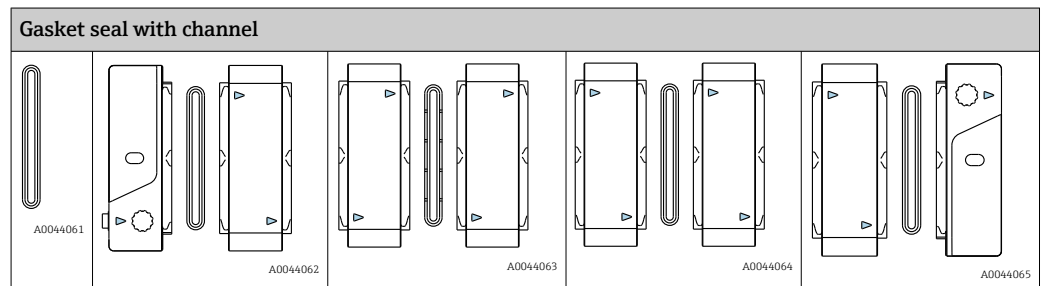
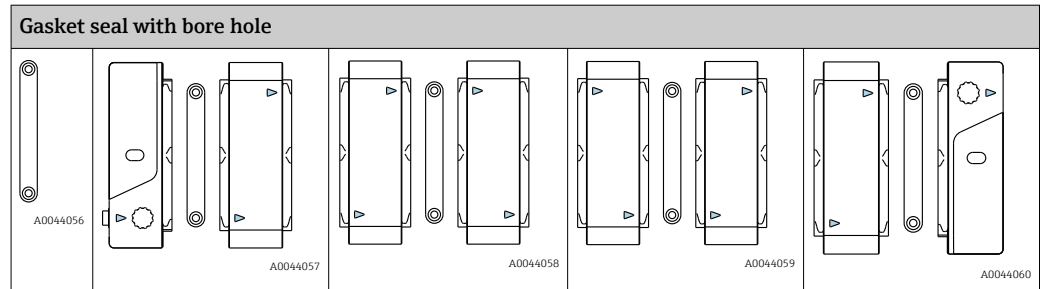


There are two different versions of the module seal:

- Gasket seals with bore hole
- Gasket seals with channel.

The correct selection of the seal depends on the flow direction of the adjacent modules in each case. The flow direction is indicated by an arrow.

- The gasket seal with bore hole should be used if the arrows of the adjacent module halves in question are at the same height (→  39).
- The gasket seal with channel should be used if the arrows of the adjacent module halves in question are offset to each other →  39.



**i** The flow function of the assembly is dependent on the correct use of seals that are suitable for the adjacent modules in question. An incorrectly inserted seal may lead to a flow blockage. This can be detected during a flow test or during commissioning.

### 9.2.8 Cleaning the sensor

1. Prior to calibration, if dirt is visible on the surface.
2. Regularly during operation.
3. Before returning for repair.

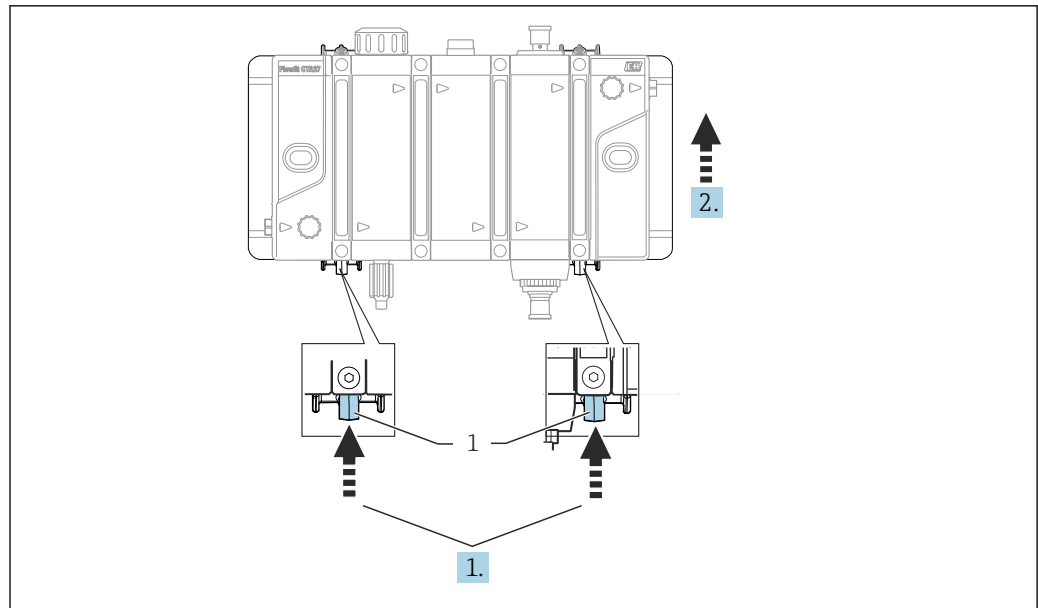
**i** For detailed information on "Cleaning the sensor", see Operating Instructions for sensor.

## 9.3 Disassembly (for conversion, cleaning etc.)

### NOTICE

**The device can be damaged if dropped**

- ▶ When sliding the assembly up and out of the holder, secure the assembly to prevent it from falling down.



A0043717

1 Detents

1. Keep detents pressed down.
2. Slide the assembly upwards and out of the holder.



## 10 Repair

### CAUTION

#### Incorrect repair


Danger due to damage to the device!

- ▶ Any damage to the assembly that compromises pressure safety must be repaired only by authorized and qualified personnel.
- ▶ The assembly must comply with the original technical specifications following repair work. Appropriate measures must be taken to check and ensure leak-tightness.
- ▶ Replace all other damaged components immediately.

### 10.1 Spare parts

For more detailed information on spare parts kits, please refer to the "Spare Part Finding Tool" on the Internet:

[www.endress.com/spareparts\\_consumables](http://www.endress.com/spareparts_consumables)

 The product-specific spare parts can be ordered via the "XPC0014" spare parts ordering structure.

Description and contents	Order No.
Kit CYA27 flow switch non-Ex	71486835
Kit CYA27 flow switch Ex Cl. I Div. 2	71486836
Kit CYA27 sampling valve PVC	71486839
Kit CYA27 sampling valve PVDF	71486841
Kit CYA27 status indication light	71486843
Kit CYA27 potential matching connection	71486844
Kit CYA27 wall-mounting kit	71486845
Kit CYA27 pipe- + rail-mounting kit	71472188
Kit CYA27 2x adapter G1/4-G1/8 PVC G1/8 internal thread with O-ring FKM	71486849
Kit CYA27 2x adapter G1/4-G1/2 PVC G1/2 internal thread with O-ring FKM	71486850
Kit CYA27 2x adapter G1/4-NPT1/4 PVC NPT1/4 internal thread with O-ring FKM	71486852
Kit CYA27 2x adapter G1/4-NPT1/2 PVC NPT1/2 internal thread with O-ring FKM	71486855
Kit CYA27 2x adapter G1/4-G1/8 PVDF G1/8 internal thread with O-ring FKM	71486857
Kit CYA27 2x adapter G1/4-G1/2 PVDF G1/2 internal thread with O-ring FKM	71486858
Kit CYA27 2x adapter G1/4-NPT1/4 PVDF NPT1/4 internal thread with O-ring FKM	71486860
Kit CYA27 2x adapter G1/4-NPT1/2 PVDF NPT1/2 internal thread with O-ring FKM	71486863
Kit CYA27 2x adapter G1/4-6mm OD PVDF Hose connection 6 mm OD/ 4 mm ID with O-ring FKM	71486865
Kit CYA27 2x adapter G1/4-8mm OD PVDF Hose connection 8 mm OD/ 6 mm ID with O-ring FKM	71486867
Kit CYA27 2x adapter G1/4-12 mm PVC Hose nozzle 12 mm OD with O-ring FKM	71486871

Description and contents	Order No.
Kit CYA27 cable 10 m non-Ex for flow switch or status indication light	71486872
Kit CYA27 cable 10 m Ex for flow switch Cl. I Div.2	71486877
Kit CYA27 tool set	71486881
Kit CYA27 cleaning brush set	71486882
Kit CYA27 sealing set complete	71486884
Kit CYA27 2x manual valve inlet/outlet PVC	71486885
Kit CYA27 2x manual valve inlet/outlet PVDF	71488273
Kit CYA27 module clamp with screws with counterpart for wall-mounting	71486888
Kit CYA27 set of blind plugs	71486889
Kit CYA27 2x spare flow body	71486892

## 10.2 Return

The product must be returned if repairs or a factory calibration are required, or if the wrong product was ordered or delivered. As an ISO-certified company and also due to legal regulations, Endress+Hauser is obliged to follow certain procedures when handling any returned products that have been in contact with medium.

To ensure the swift, safe and professional return of the device:

- ▶ Refer to the website [www.endress.com/support/return-material](http://www.endress.com/support/return-material) for information on the procedure and conditions for returning devices.

## 10.3 Disposal

Electronic components may be used in the product. The product must be disposed of as electronic waste.

- ▶ Observe the local regulations.



If required by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), the product is marked with the depicted symbol in order to minimize the disposal of WEEE as unsorted municipal waste. Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to Endress+Hauser for disposal under the applicable conditions.

# 11 Accessories

The following are the most important accessories available at the time this documentation was issued.

- ▶ For accessories not listed here, please contact your Service or Sales Center.

## 11.1 Device-specific accessories

### 11.1.1 Disinfection sensors

#### CCS51D

- Sensor for measuring free chlorine
- With Memosens technology
- Product Configurator on the product page: [www.endress.com/ccs51d](http://www.endress.com/ccs51d)



Technical Information TI01423C

#### CCS50D

- Membrane-covered amperometric sensor for chlorine dioxide
- With Memosens technology
- Product Configurator on the product page: [www.endress.com/ccs50d](http://www.endress.com/ccs50d)



Technical Information TI01353C

#### CCS55D

- Sensor for measuring free bromine
- With Memosens technology
- Product Configurator on the product page: [www.endress.com/ccs55d](http://www.endress.com/ccs55d)



Technical Information TI01423C

### 11.1.2 pH sensors

#### Memosens CPS31D

- pH electrode with gel-filled reference system with ceramic diaphragm
- Product Configurator on the product page: [www.endress.com/cps31d](http://www.endress.com/cps31d)



Technical Information TI00030C

#### Orbisint CPS11D / CPS11

- pH sensor for process technology
- With dirt-repellent PTFE diaphragm
- Product Configurator on the product page: [www.endress.com/cps11d](http://www.endress.com/cps11d) or [www.endress.com/cps11](http://www.endress.com/cps11)



Technical Information TI00028C

#### Ceraliquid CPS41D / CPS41

- pH electrode with ceramic junction and KCl liquid electrolyte
- Product Configurator on the product page: [www.endress.com/cps41d](http://www.endress.com/cps41d) or [www.endress.com/cps41](http://www.endress.com/cps41)



Technical Information TI00079C

### 11.1.3 ORP sensors

#### Orbisint CPS12D / CPS12

- ORP sensor for process technology
- Product Configurator on the product page: [www.endress.com/cps12d](http://www.endress.com/cps12d) or [www.endress.com/cps12](http://www.endress.com/cps12)



Technical Information TI00367C

### 11.1.4 pH and ORP combined sensors

#### Memosens CPS16D

- Combined pH/ORP sensor for process technology
- With dirt-repellent PTFE diaphragm
- With Memosens technology
- Product Configurator on the product page: [www.endress.com/cps16D](http://www.endress.com/cps16D)



Technical Information TI00503C

#### Memosens CPS76D

- Combined pH/ORP sensor for process technology
- Hygienic and sterile applications
- With Memosens technology
- Product Configurator on the product page: [www.endress.com/cps76d](http://www.endress.com/cps76d)



Technical Information TI00506C

### 11.1.5 Conductivity sensor

#### Memosens CLS82D

- Four-electrode sensor
- With Memosens technology
- Product Configurator on the product page: [www.endress.com/cls82d](http://www.endress.com/cls82d)



Technical Information TI01188C

### 11.1.6 Oxygen sensors

#### Oxymax COS22D

- Sterilizable sensor for dissolved oxygen
- With Memosens technology
- Product Configurator on the product page: [www.endress.com/cos22d](http://www.endress.com/cos22d)



Technical Information TI00446C

#### Memosens COS81D

- Sterilizable, optical sensor for dissolved oxygen
- With Memosens technology
- Product Configurator on the product page: [www.endress.com/cos81d](http://www.endress.com/cos81d)



Technical Information TI01201C

## 12 Technical data

### 12.1 Power supply

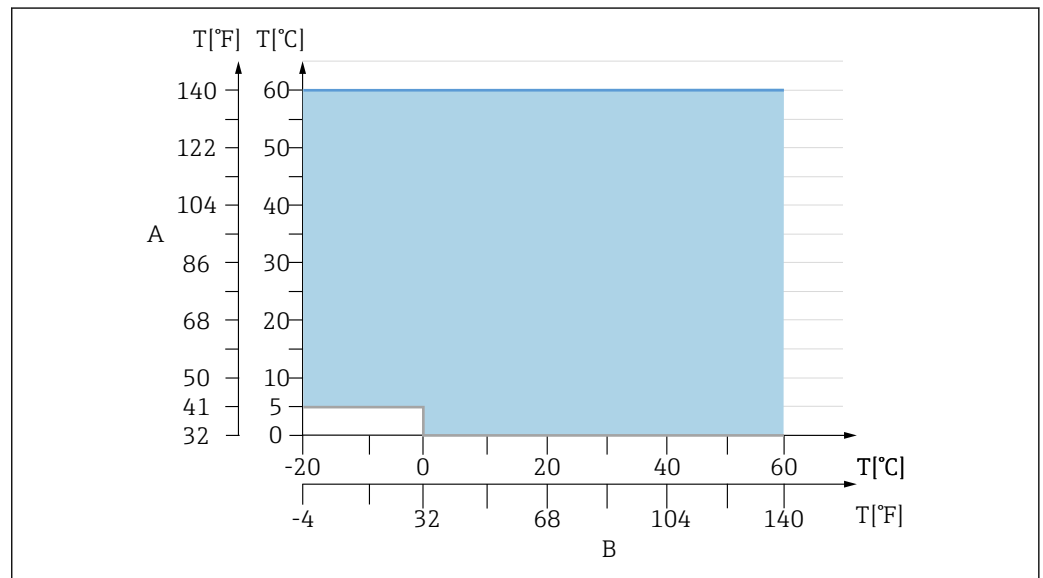
Cable specification	Cable accessories 10 m (32.8 ft), M12 socket straight, 5-pin version Cable accessories Ex (US) Cl.1 Div.2 cable, 10 m (32.8 ft), M12 socket straight, 4-pin version
---------------------	--

### 12.2 Performance characteristics

Reference operating conditions	20 °C (68 °F)
--------------------------------	---------------

### 12.3 Environment

Ambient temperature	-20 to 60 °C (-4 to 140 °F) At ambient temperatures below 0 °C (32 °F), the medium temperature must be at least 5 °C (41 °F) and the supply and return lines must be insulated.
---------------------	--



A Medium temperature  
B Ambient temperature

Storage temperature	-20 to +60 °C (-4 to 140 °F)
---------------------	------------------------------

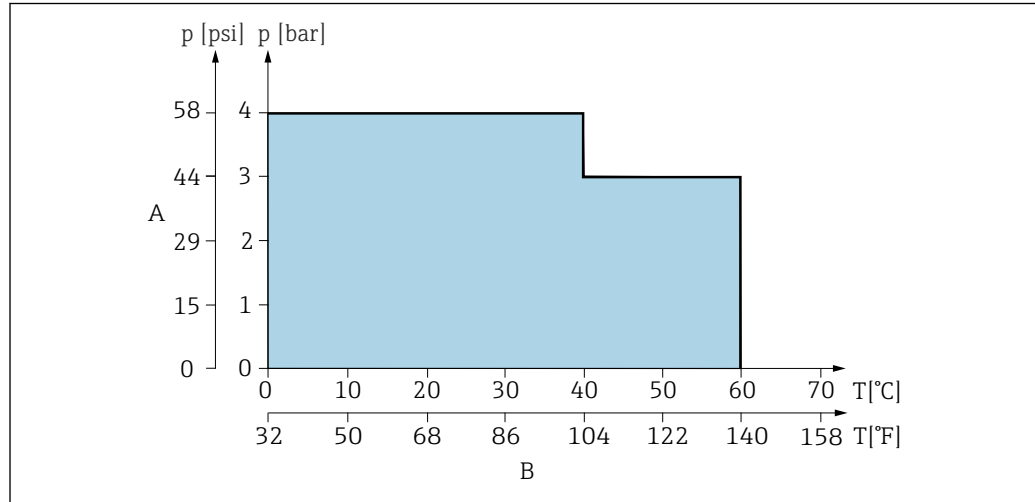
Degree of protection	<ul style="list-style-type: none"> <li>■ Flow switch: IP67</li> <li>■ Status indication light: IP66/67</li> </ul>
----------------------	---

## 12.4 Process

Process temperature range 0 to 60 °C (32 to 140 °F), non-freezing

Process pressure range 0 to 4 bar (0 to 58 psi) relative

Pressure/temperature ratings



10 Pressure/temperature ratings

A Process pressure

B Medium temperature

pH range pH1 to 12

Process connections G 1/4" (ISO 228)

Flow

*Recommended flow range*

5 l version	5 to 8 l/h (1.32 to 2.11 gal/h)
30 l version	30 to 40 l/h (7.92 to 10.46 gal/h)

*Critical upper limits*

5 l version	40 l/h (10.56 gal/h)
30 l version	80 l/h (21.13 gal/h)

**i** Above the specified flow rate, the pressure in the assembly may exceed the specification limits of the sensors.

## 12.5 Mechanical construction

→  13

### Weight

Depends on the configuration:

- 1 module: 0.9 kg (1.98 lb)
- 2 modules: 1.5 kg (3.31 lb)
- 3 modules: 2.1 kg (4.63 lb)
- 4 modules: 2.7 kg (5.95 lb)
- 5 modules: 3.3 kg (7.28 lb)
- 6 modules: 3.8 kg (8.38 lb)

Wall mounting accessories: 1.3 kg (2.87 lb)

Pipe mounting accessories (incl. wall bracket): 2.2 kg (4.85 lb)

### Materials

In contact with medium	
Assembly:	PMMA (modules) PVDF for inlet and outlet module
Seals:	FPM (FKM) black compound with hygiene certificates in conjunction with PVDF green compound without hygiene certificates in conjunction with PVC
Plugs, adapters, valves:	PVC, PVDF
Floats:	Titanium
Potential equalization connection (PAL):	1.4404/1.4571 (316L/316TI) (stainless Cr-Ni steel)

#### Materials not in contact with the medium

#### Obligation to provide information in accordance with Art. 33 REACH regulation (EU no. 1907/2006):

The PVC used (hard) contains more than 0.1% of the following substance: dioctyltin compounds (DOTE) CAS number: 15571-58-1. No special precautions are required when handling the item, since the substance is firmly embedded in the plastic and is not released if used as intended.

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