BA02059C/07/EN/04.23-00
71626363
2023-08-18

Operating Instructions
Flowfit CYA27

Modular flow assembly for multiparameter measurements

Endress+Hauser
People for Process Automation

Table of contents

1 About this document

1.1 Warnings

Structure of information	Meaning
DANGER **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **will** result in a fatal or serious injury.
WARNING **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **can** result in a fatal or serious injury.
CAUTION **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.
NOTICE **Cause/situation** If necessary, Consequences of non-compliance (if applicable) ▶ Action/note	This symbol alerts you to situations which may result in damage to property.

1.2 Symbols

Symbol	Meaning
	Additional information, tips
	Permitted or recommended
	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

Reference to device documentation

Flow direction

2 Basic safety instructions

2.1 Requirements of the 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 Intended 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 (4.72 in) 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

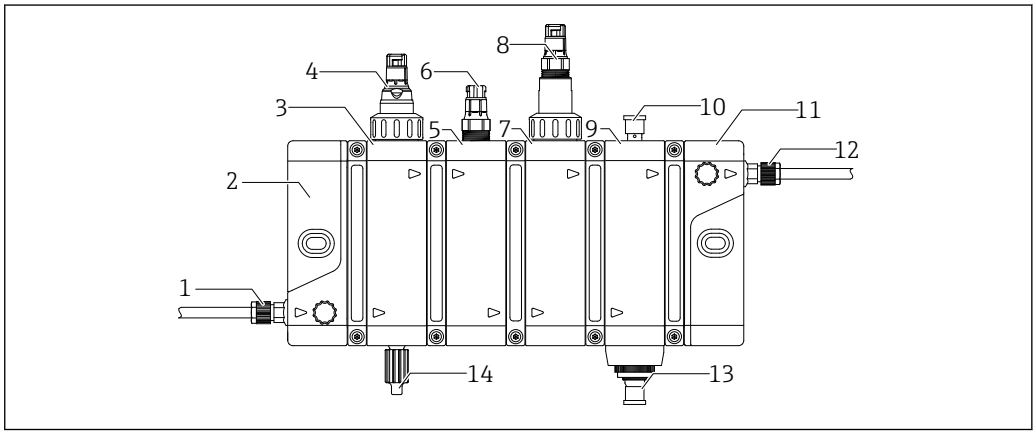
The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and international standards have been observed.

3 Product description

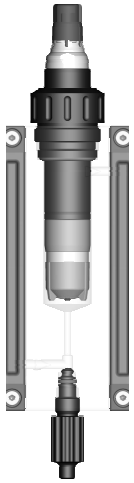
3.1 Product design

The Flowfit CYA27 is a modular assembly designed for operating sensors for liquid analysis with a 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, type and position of sensor slots.

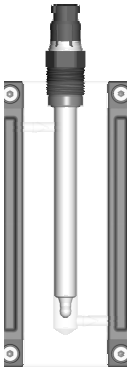
For additional functions, the assembly can be fitted with optional accessories, e.g.:
- Status lighting to indicate the operating status
- Flow switch for monitoring the flow
- Flowmeter for flow measurement
- Sampling valve for direct sampling at the assembly
- Particle filter for particle reduction



1 Process adapter inlet (female thread G 1/4") and hose connection (optional)
2 Inlet module
3 Module for holding a disinfection sensor with 25 mm (0.98 in) diameter
4 Disinfection sensor CCS5xD , e.g. CCS51D (not included in the scope of delivery)
5 Module for holding a sensor with Pg 13.5 connection, e.g. a pH sensor
6 pH sensor, e.g. CPS31E (not included in the scope of delivery)
7 Module for holding the conductivity sensor CLS82E with Pg 13.5 connection
8 Conductivity sensor CLS82E (not included in the scope of delivery)
9 Flow module
10 Flow switch or flowmeter (optional)
11 Outlet module
12 Process adapter outlet (female thread G 1/4") and hose connection (optional)
13 Status lighting (optional)
14 Sampling valve (optional)


A0043433

Module for disinfection sensors
- Medium flows to sensor from below
- Sensor slot for 25 mm (0.98 in) sensors
- Sensor secured via pressure screw M35x2
- Sensors: → 🖹 58
- Flow versions
  - 5 l/h (1.1 gal/h)
  - 30 l/h (6.6 gal/h)
- Flow-dependent module whose design varies depending on the selected flow version
- Optional function: sampling valve (see diagram)

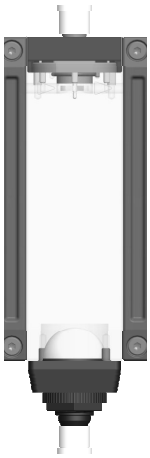

A0043434

Module for pH, ORP or oxygen sensors
- Medium flows to sensor from above
- Sensor slot for 12 mm (0.47 in) sensors in 120 mm (4.72 in) length
- Sensor installation via Pg 13.5 thread
- Sensors: → 🖹 58
- Flow-independent module that can be combined with both flow versions


A0043431

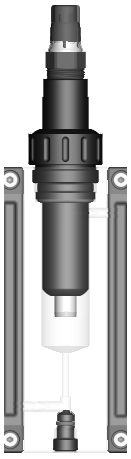
Flow module
- Qualitative display and control of the flow
- Flow must come from below
- Flow versions
  - 5 l/h (1.1 gal/h)
  - 30 l/h (6.6 gal/h)
- Flow-dependent module whose design varies depending on the selected flow version
- Optional function
  - Approved flow switch, see accompanying documentation
  - Status lighting

The flow module, if used, must be the last module upstream from the outlet module in order to guarantee flow through all modules.

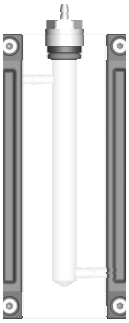

A0047941

Flow module for continuous flow measurement
- Qualitative control and quantitative measurement of the flow volume
- Medium flows crosswise from above
- Flow versions
  - 5 l/h (1.1 gal/h)
  - 30 l/h (6.6 gal/h)
- Flow-dependent module whose design varies depending on the selected flow version
- Optional function
  Status lighting

The flow module, if used, must be the last module upstream from the outlet module in order to guarantee flow through all modules.


A0043432

Module for the conductivity sensor CLS82E
- Medium flows to sensor from below
- Adapter for sensor CLS82E (12 mm (0.47 in) sensor with Pg 13.5 thread in 120 mm (4.72 in) length)
- Optional function: sampling valve (not shown here)
- Flow-dependent module whose design varies depending on the selected flow version


A0043430

Dosing module
- Connection for supplying a liquid for pH adjustment (acidification) or cleaning purposes
- 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 is not included in the scope of delivery)
- Medium flows through module from above
- Flow-independent module that can be combined with both flow versions

The dosing module, if used, should be the first module downstream from the inlet module. An exception to this is a measurement which could be falsified by the type of liquid added, e.g. a conductivity measurement. In this case, the dosing module should be installed as the second module → 🖹 22.


A0043894

Inlet module
- With needle valve (inlet valve)
- Connection G 1/4" (ISO 228-1)
- Medium flows crosswise from below
- Drill hole for mounting (→ 🖹 16)

 A0043895	**Outlet module** ▪ With needle valve (outlet valve) ▪ Connection G 1/4" (ISO 228-1) ▪ Medium flows crosswise from above ▪ Drill hole for mounting (→ 🖹 16)
 A0047942	**Module for particle removal** (only available through the replacement and retrofitting module structure XPC0014) ▪ Flow-independent module that can be combined with both flow versions ▪ With needle valve in the top section (clear water) ▪ With G 1/4" connection (ISO 228-1) in the bottom section (particle discharge) ▪ Central flow direction (channel seal) If used, the particle separator module should be the first module downstream from the inlet module → 🖹 23.

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 Identifying the product

Product page

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.
2. Page search (magnifying glass symbol): Enter valid serial number.
3. Search (magnifying glass).
   ↳ The product structure is displayed in a popup window.

4. Click the product overview.
   ↳ A new window opens. Here you fill information pertaining to your device, including the product documentation.

Manufacturer address

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

4.3 Scope of delivery

The scope of delivery comprises:
- Assembly including enclosed accessories in the version ordered
- Operating Instructions
- Manufacturer's Declaration

5 Mounting

5.1 Mounting requirements

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, → 16.

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

5.1.2 Installation instructions

NOTICE

Ambient conditions

- 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).

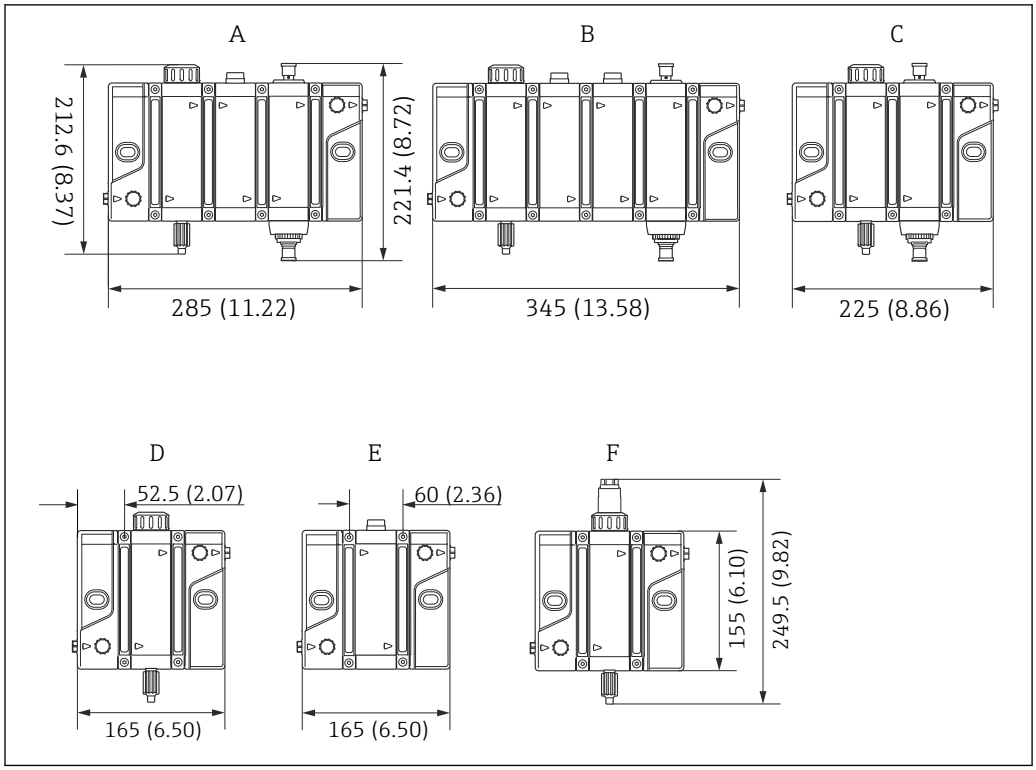
NOTICE

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 can freeze particularly with low flow conditions. The medium temperature and the flow volume must be adjusted accordingly. It may be necessary to insulate the supply and return lines and install the assembly in an additional enclosure. This must be fitted with a separate heating system if necessary.

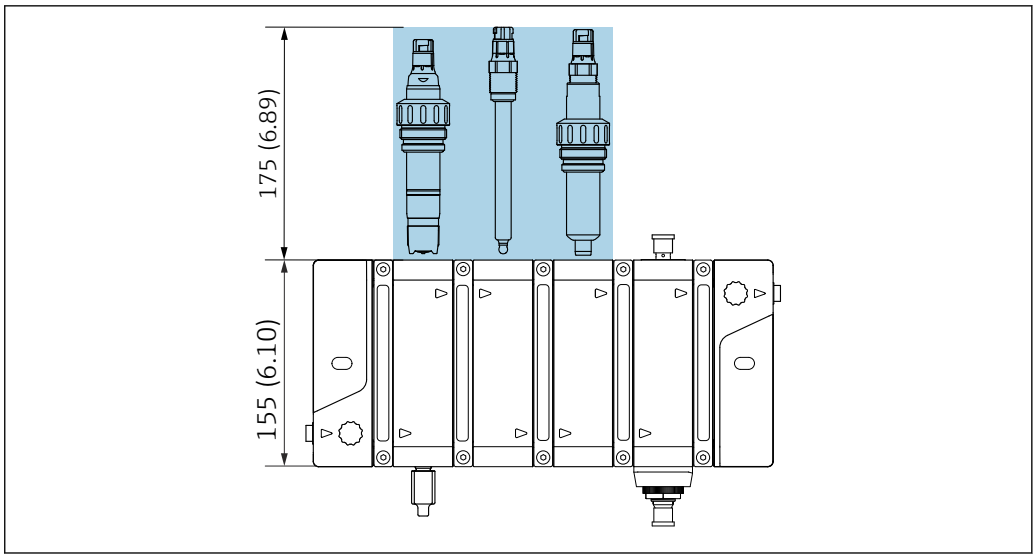
5.1.3 Dimensions



1 *Dimensions. Engineering unit: mm (in)*

A Disinfection, pH and flow display version with sampling valve, status lighting and flow switch or flow measurement
B Disinfection, pH, ORP and flow display version with sampling valve, status lighting and flow switch or flow measurement
C Disinfection and flow display version with sampling valve, status lighting and flow switch or flow measurement
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 kg (lb) max. weight depending on version without sensors	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)



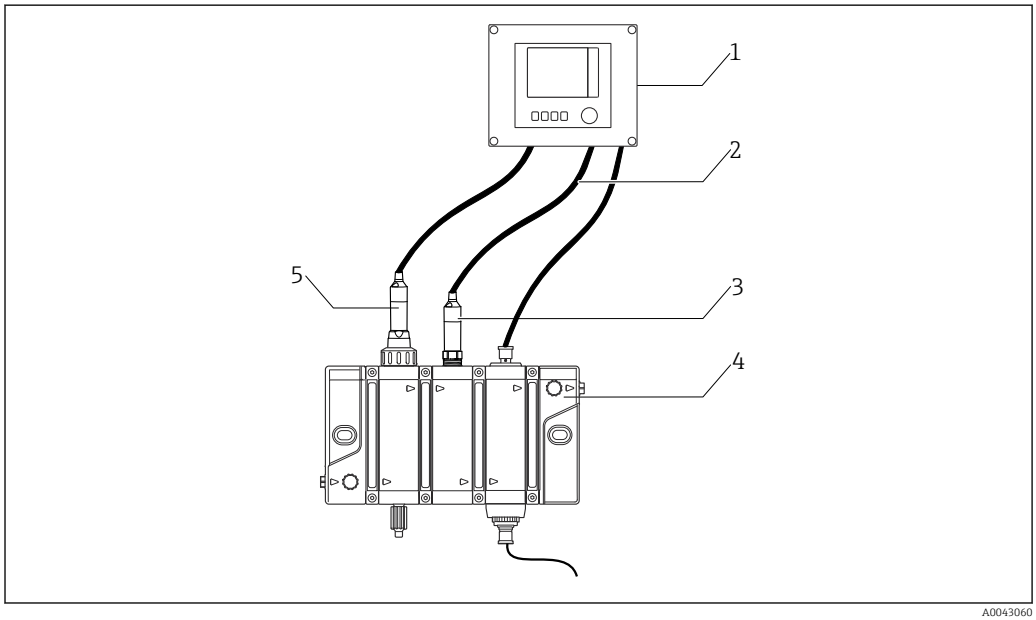
2 *Mounting distance. Engineering unit: mm (in)*

The minimum mounting distance required to remove the sensor(s) 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:
- Flow assembly Flowfit CYA27
- At least one sensor, e.g CCS51D for the measurement of 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 CPS31E
  - ORP sensors, e.g. Memosens CPS16E
  - Conductivity sensor CLS82E
  - Oxygen sensors, e.g. COS22E
  - Transmitter, e.g. Liquiline Compact CM82
  - Multiparameter handheld device Liquiline Mobile CML18
  - Extension cable CYK11
  - Sampling valve on assembly if using modules for disinfection and conductivity
  - Flow switch or flowmeter
  - Status lighting



3 Example of a measuring system

1 Transmitter Liquiline CM44x or CM44xR
2 Measuring cable CYK10
3 pH sensor, e.g. CPS31E
4 Flow assembly Flowfit CYA27
5 Disinfection sensor CCS5xD (membrane-covered, Ø25 mm (0.98 in)), e.g. CCS51D

5.2.2 Direct wall mounting

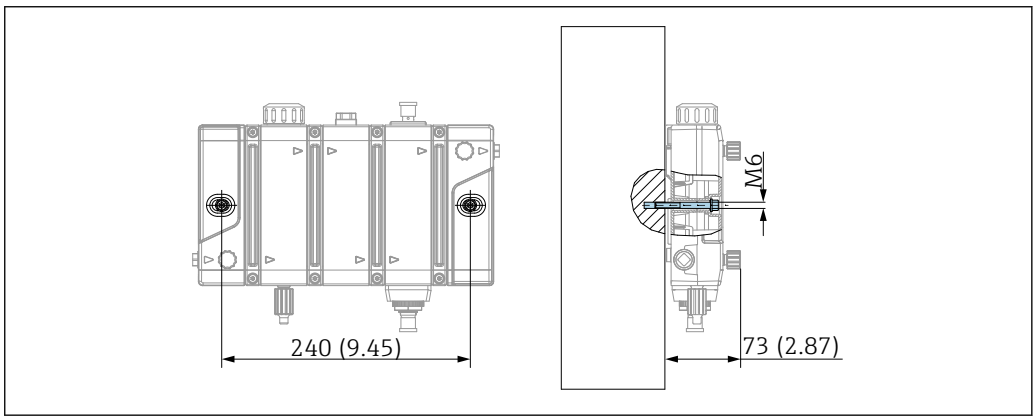
The assembly can be screwed directly onto the wall using two holes provided in the inlet and outlet module.

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 included in the scope of delivery.

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.



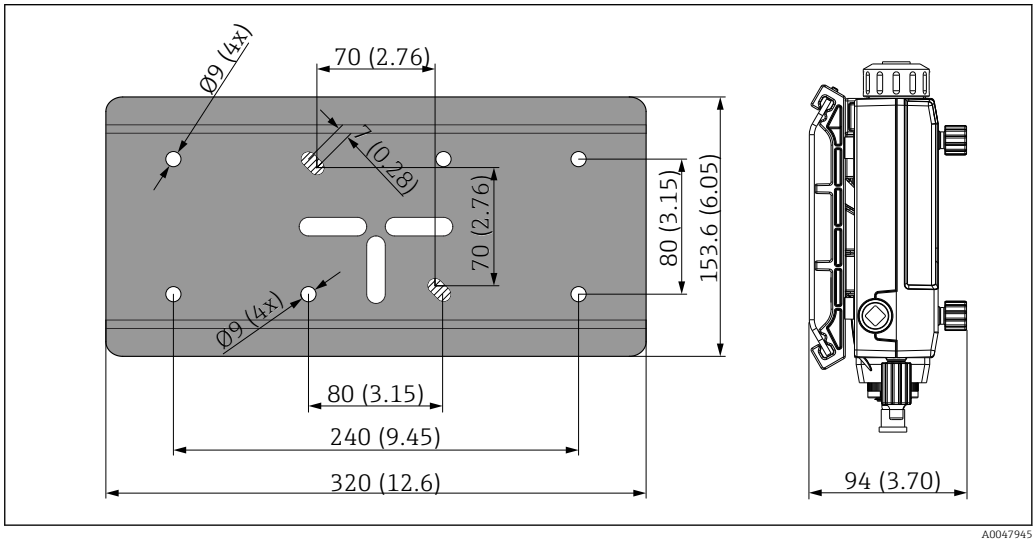
4 *Direct wall mounting. Engineering unit: mm (in)*

5.2.3 Mounting the assembly with wall holder

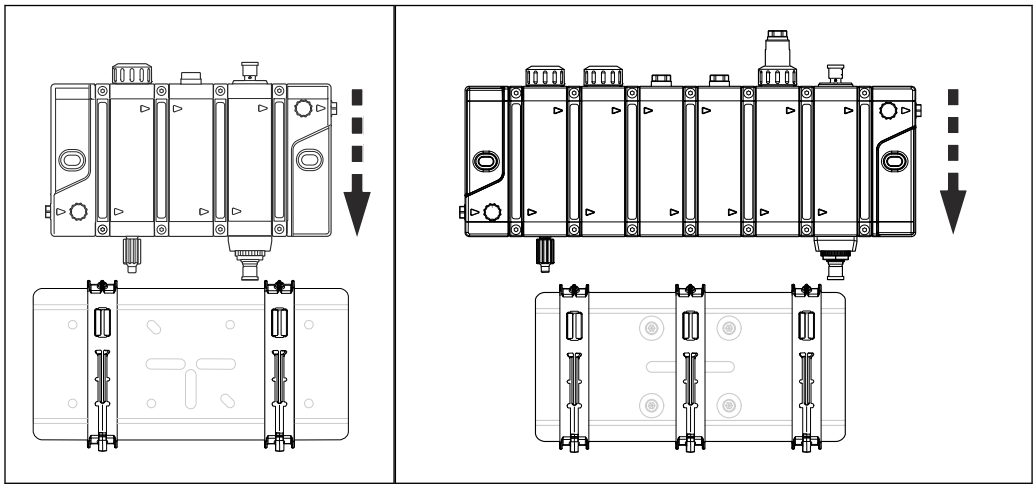
With the wall holder, it is possible to select up to six modules. It is then possible to remove individual modules while the rest of the assembly remains securely in the holder. Different drill holes allow, for example, the use of the Flowfit CCA250 hole pattern.

Optional accessories, consisting of a wall holder with securing clips for assemblies with 1 to 6 modules.

The drill holes (hatched in graphic) correspond to those of assembly CCA250, which can be reused.



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



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

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

1. Position the assembly in the center of the wall holder.
2. Slide the assembly downwards on the securing clips until it clicks into place.
3. Fix the securing clips on the wall holder by tightening the grub screw slightly.
   Tighten the grub screw so that it is as flush as possible against the securing clip.

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, 20. Ideally, the open outlet is unpressurized or without counterpressure.

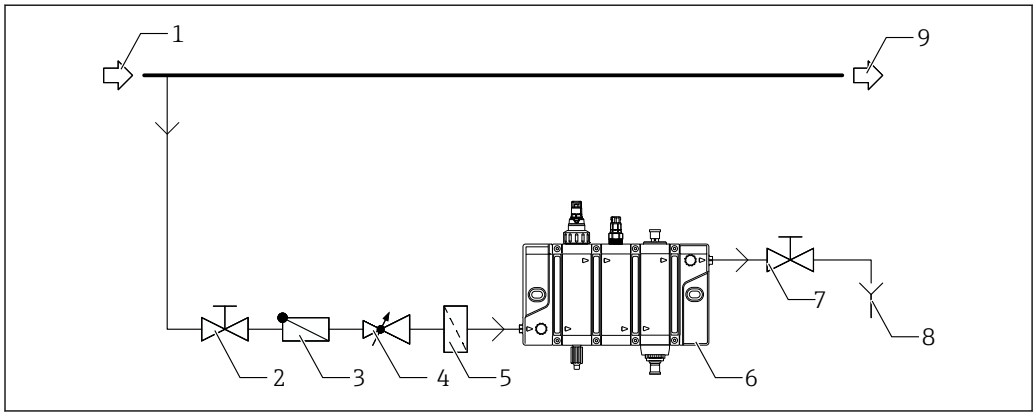
The pressure p must not exceed the permitted operating pressure of the assembly of 4 bar (58 psi) gauge pressure.

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

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

1. Mount the assembly horizontally → 13.
2. Installing in a branch pipe is preferable to installing directly in the process line. The branch pipe can be blocked off without interrupting the process (a shut-off valve is required upstream and downstream). This makes it possible to clean the sensor, for example, without affecting the process.
3. If necessary, install a dirt trap (screen) with a mesh size of 500 µm 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 the scope of delivery)*
3 *Check valve (optional, not included in the scope of delivery)*
4 *Pressure-reducing valve (optional, not included in the scope of delivery)*
5 *Filter trap (optional, not included in the scope of delivery)*
6 *Assembly Flowfit CYA27*
7 *Manual valve (optional in the case of an upward-sloping output line, not included in the 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

The counterpressure p2 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.

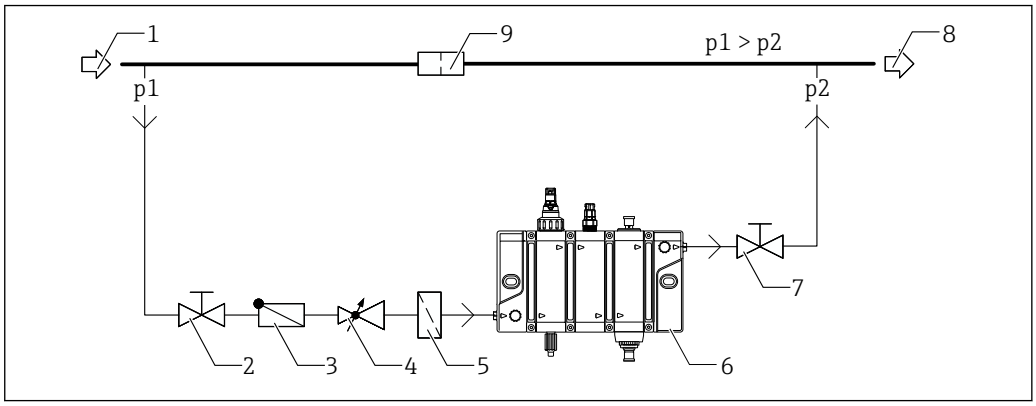
To achieve flow through the assembly with a bypass, pressure p1 must be higher than pressure p2.

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

p1 must not exceed the permitted operating pressure of the assembly of 4 bar (58 psi) gauge pressure.

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

1. Mount the assembly horizontally → 13.
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 makes it possible to clean the sensor, for example, without affecting the process.
4. If necessary, install a dirt trap (screen) with a mesh size of 500 µm 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 the scope of delivery)
3 Check valve (not included in the scope of delivery)
4 Pressure-reducing valve (optional, not included in the scope of delivery)
5 Filter trap (optional, not included in the scope of delivery)
6 Assembly Flowfit CYA27
7 Manual valve (not included in the scope of delivery)
8 Main output line
9 Orifice plate (not included in the scope of delivery)

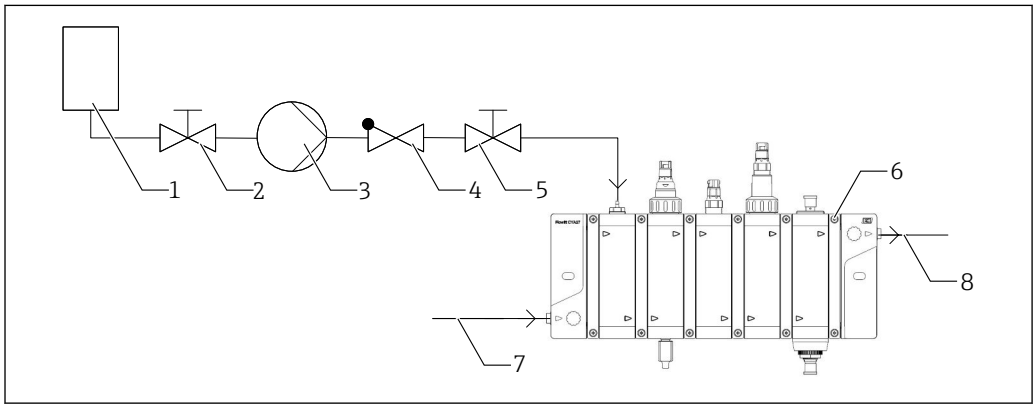
To take an assembly installed in this way out of operation, pressure relief should be provided so that the pressure in the assembly can be reduced safely after shutting off the supply and return lines. Suitable solutions include the optional sampling valve on the assembly or the provision of a sampling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

5.3.5 Dosing (optional)

For the metered addition of a cleaning agent or an acid (to acidify the medium), the following is required at a minimum:
- an assembly with dosing module,
- a feeder tank for the liquid to be dosed (must be provided by the customer) and
- a dosing pump (must be provided by the customer).

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

It is recommended to first put the assembly into operation without the dosing unit, and then to put the dosing unit into operation with a test run. When doing so, make sure that the liquid that is dosed drips into the assembly and does not leak at the dosing connection. Any leaks must be rectified immediately, either by changing the hose diameter (where necessary), additionally securing the hose, or by checking that the sealing of the dosing plug is tight (no leaks).



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

WARNING

Overdosing of cleaning or acid solution or backflow

Overdosing cleaning or acid solution into the assembly or reverse medium flow into the (feeder) vessel can cause injury or damage to property!

► If there is no flow through the assembly, the dosing pump must be switched off automatically. Relay control via the CM44x can be used for this purpose.

WARNING

Development of chlorine gas

Chlorine gas can develop with pH values below 4 and the simultaneous presence of free chlorine. This can cause injury and damage to property!

► In the case of media with free chlorine, the pH value must be measured after the dosing module. The control system must be set in such a way to ensure that the pH value does not drop below a critical value of 4.

⚠ WARNING

Escaping cleaning solution

If cleaning solution escapes, there is a risk of injury from high pressure, high temperature or chemical hazards!

- ▶ Adhere to the maintenance intervals for the components used, such as pipes or a dosing pump, and replace the component in the event of a defect.
- ▶ Shorten the maintenance intervals accordingly in the event of high operating temperatures.

⚠ CAUTION

Untested cleaning agent

Cleaning agents that have not been tested can damage the assembly and cause liquid to leak.

- ▶ Only the cleaning agents described in → 🖹 51 may be used.

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. The measured values may need to be set to HOLD during the dosing.

Time-dependent control of the dosing can be implemented by additionally connecting a dosing pump via a transmitter with a relay card. The cleaning function of the CM44x can be used for the automated dosing of cleaning agent.

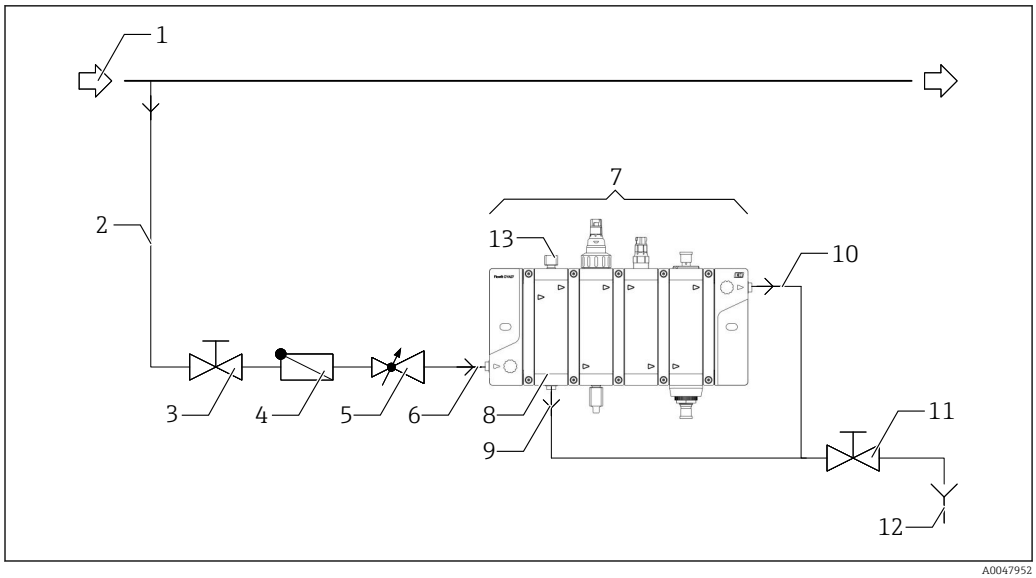
It is advisable to use a controllable dosing pump with which the added amount can be set or regulated.

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

5.3.6 Particle removal (optional)

The particle separator module can be used for impurities with a high density > 1.5 g/cm³ and particle sizes > 10 µm, such as soot, very fine sand or crystalline structures. The separator is not suitable for organic impurities such as algae, biofilms or suspended solids with a density similar to that of water (1 g/cm³).

This separator module is used instead of an upstream filter and has the advantage that it does not consume disinfectant, as could occur with biological deposits in the filter.



1 *Main pipe*
2 *Branch pipe*
3 *Valve (optional, not included in the scope of delivery)*
4 *Check valve (optional, not included in the scope of delivery)*
5 *Pressure-reducing valve (optional, not included in the scope of delivery)*
6 *Media inlet of the assembly*
7 *Assembly with particle separator module*
8 *Particle separator*
9 *Bottom section of particle separator for medium with separated particles*
10 *Outlet of assembly*
11 *Valve (optional, not included in the scope of delivery)*
12 *Outlet*
13 *Needle valve in the top section to set the flow volume*

When commissioning the assembly with a particle separator, please pay attention to the modified sequence for the opening of the valves → 43.

5.4 Connecting the flow switch, flow measurement or status lighting (optional)

⚠ WARNING

Device is live!

Incorrect connection may result in injury or death!

- ▶ The electrical connection may only be established by an electrical technician.
- ▶ The electrical technician must have read and understood the instructions in this manual and must adhere to them.
- ▶ Prior to commencing connection work, ensure that no voltage is present on any cable.

Use of flow measurement with status lighting is recommended (connection and configuration: version 6 → 🖹 36).

The flow switch is used to monitor a continuous, sufficient flow of medium through the assembly (connection and configuration of the flow switch only: version 1 → 🖹 26).

Flow measurement enables the continuous measurement of the flow volume (connection and configuration of the flowmeter only: version 2→ 🖹 28).

The status lighting enables the visualization of a malfunction detected by the transmitter, e.g. CM44x. The colors indicated by the status lighting correspond to NAMUR specifications (NE107):

- NAMUR category F (Failure) → steady red status lighting
- NAMUR category S (Out of specification) → flashing red status lighting
- NAMUR category C (Check function) → flashing red status lighting
- NAMUR category M (Maintenance required) → flashing green status lighting
- If no diagnostic message has occurred (OK) → steady green status lighting

The following status lighting connections are possible:

- Connection only (connection and configuration: version 3 → 🖹 29)
- Connection with flow switch (connection and configuration: version 5 → 🖹 33)
- Connection with flow measurement (recommended) (connection and configuration: version 6 → 🖹 36)

In addition, simplified status lighting can be set up (connection and configuration: version 4 → 🖹 31).

5.4.1 Connection to CM44x transmitter

The flow switch or flow measurement and the status lighting unit are connected to a CM44x transmitter via the power supply (24V) and the digital outputs and inputs (gray wire of the status lighting cable) of a DIO module, and with a relay, e.g. the alarm relay of the BASE-E or BASE2-E module or alternatively a 2R, 4R or AOR module.

The following components are also required for mounting (flow switch, flow measurement and status lighting) and are not included in the scope of delivery:

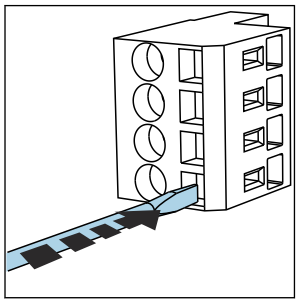
- Module DIO (Order No. 71135638)
- Module 2R (Order No. 71125375) or module 4R (Order No. 7112536) or module AOR (Order No. 71135632) (optional)
- Ferrules (optional)
- Small flat-blade screwdriver
- Cable stripper

1. Strip the cable of the flow switch and/or status lighting 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 transmitter.

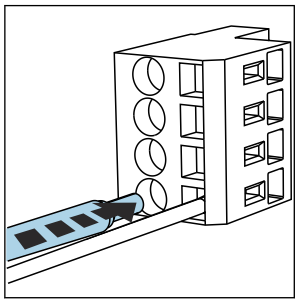
4. Wire the cables in accordance with the wiring diagram.

The cables for the flow switch and flowmeter and the status lighting cable are identical in design.

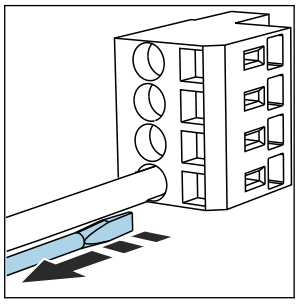
Plug-in terminals on the CM44x



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



▶ Insert the cable until the limit stop.

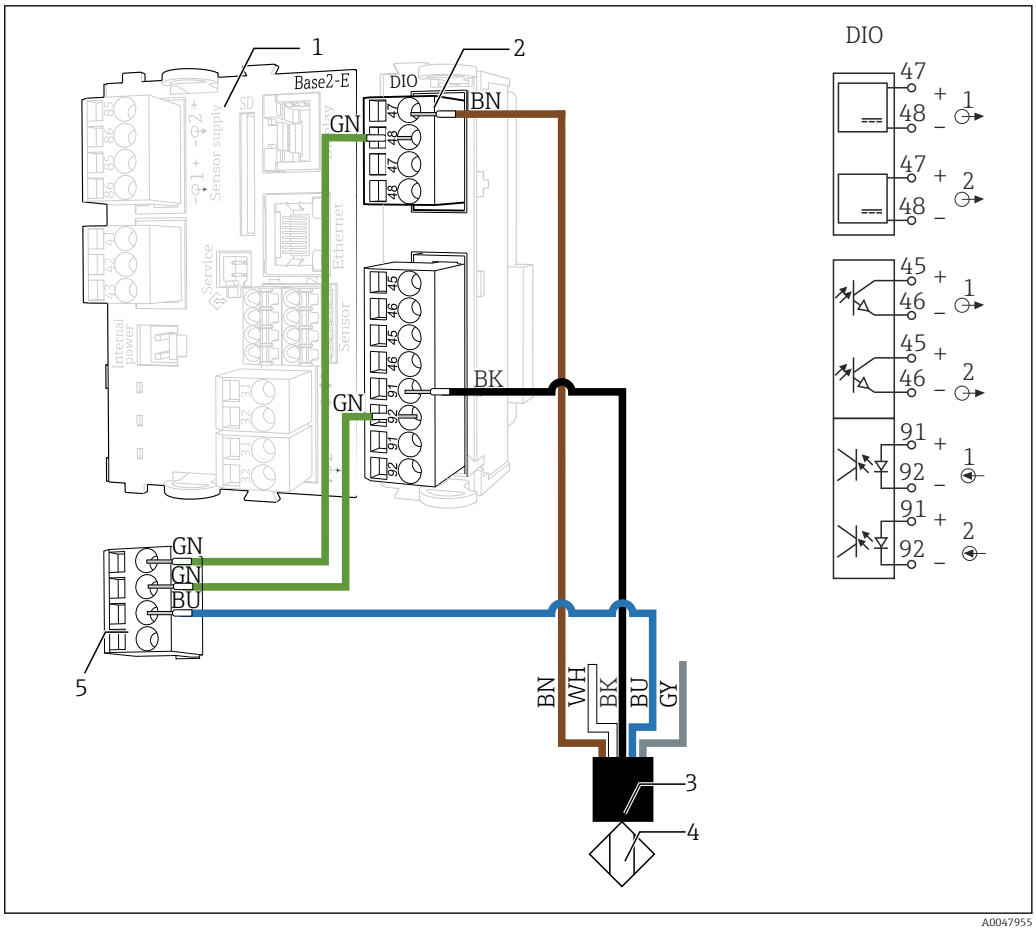


▶ Remove the screwdriver (closes the terminal).

5.4.2 Wiring diagram of version 1: connection of the flow switch (without status lighting)

With this type of connection

- a diagnostic message can be generated at the CM44x if the flow volume is too low
- an external device can be connected that is controlled depending on the flow



1 *BASE-E or BASE2-E module*
2 *DIO module (included in the scope of delivery for the CM44x transmitter or order separately)*
3 *Flow switch cable*
4 *Flow switch*
5 *Distributor terminal block (is located in the CM44x transmitter as standard)*

The digital inputs and outputs of the DIO module shown on the right are identical for all types of connection!

Flow switch cable	Connection
Brown (BN)	DIO module, power connection, port 1, terminal 47
White (WH)	Not connected
Black (BK)	DIO module, digital in, port 1, terminal 91
Blue (BU)	Distributor terminal block, terminal 3
Gray (GY)	Not connected

Distributor terminal block cable	Terminal	Connection
Connecting cable, green (GN)	1	DIO module, power connection, port 1, terminal 48
Connecting cable, green (GN)	2	DIO module, digital in, port 1, terminal 92

Settings on the CM44

Activating the binary input of the flow switch

1. Go to **Menu/Setup/Inputs/Binary input x:1** and enable **Binary input**.
2. Set **Binary input**: **On**, **Signal type**: **Static signal**, **Signal level**: **Low**.

3. Assign a limit switch to the binary switch in: **Menu/Setup/Basic setup/Limit switchesx** with the options: **Source of data**: **Binary input x:1**, **Input variable**: **Level**, **Cleaning program**: ---, **Operation mode**: **Above limit check**, **Function**: **On**, **Start delay0 s, Switch off delay: 0 s**

Assigning diagnostic message S910 of the limit switch as an error message F for insufficient flow

1. Reconfigure the diagnostic message for the **Limit switches** (S910) in **Menu/ Setup/ Basic setup/Diagnostics settings/ Diag. behavior/S910Limit switches**.
   ↳ The status of the limit switch and thus the flow rate in the assembly is available as a process value for all outputs of the transmitter. As soon as there is insufficient flow, **F910 Limit switches** is displayed on the device, along with a red screen.
2. Make the following settings:**Diag. code**: **F910Limit switches**, **Diagnostics**: **On**, **Failure current**: **Off**, **Status signal**: **Failure (F)**.

The diagnostic message can be changed if necessary.

3. Open **Menu/ Setup/Additional functions/Diagnostic modules/Diagnostic modulex**.
4. Make the following settings: **Source of data**: **Limit switchesx**, **Active low**: **On**, **Short text**: Enter the individual text here, e.g. Low flow.

5.4.3 Wiring diagram of version 2: connection of the flowmeter (without status lighting)

With this type of connection

- the flow volume can be determined
- a diagnostic message can be generated at the CM44x if the flow volume is too low or too high
- an external device can be connected that is controlled depending on the flow

The flowmeter is optimized for the recommended flow range (see Section 12 → 61).

NOTICE

Incorrect measurement results

Air bubbles in the medium can falsify the measured value.

► Only use the flowmeter in the recommended flow range.

The flowmeter is connected in the same way as the flow switch. See Figure in the wiring diagram for version 1.

Settings on the CM44x

Activating the binary input of the flowmeter

1. Go to **Menu/Setup/Inputs/Binary input x:1** and enable **Binary input**.
2. Set **Binary input**:**On**, **Signal type**:**PFMMax. frequency**:**100.00 Hz, Meas. value format: #.#, Input variable: Flow, Flow rate unit: l/h, Start of measuring range: 0.0 l/h, Upper range value: 320 l/h (for the 30 l/h CYA27 version) or 105 l/h (for the 5 l/h CYA27 version)**.
3. Assign a limit switch to the binary input if you are configuring the detection of a flow volume that is too low:
   Go to **Menu/ Setup/Limit switchesx** and configure the options **Source of data**: **Binary input x:1**, **Input variable**: **FlowCleaning program**: ---, **Operation mode**: **Above limit check**, **Function**: **On**, **Start delay0 s, Switch off delay: 0 s**.

4. Assign a limit switch to the binary input if you are configuring the detection of a flow volume that is outside the specified range:
   Go to **Menu/ Setup/Limit switchesx** and configure the options **Source of data**: **Binary input x:1**, **Input variable**: **FlowCleaning program**: ---, **Operation mode**:**Out of range check**, **Function**: **On**, **Range lower value**: **30 l/h(or 5 l/h for the 5 l/h CYA27 version), Range lower value: 80 l/h (or 30 l/h for the 5 l/h CYA27 version), hysteresis (+/-): 0.0 l/h, Start delay: 0 s, Switch off delay: 0 s**.

Assigning diagnostic message S910 of the limit switch as an error message F for insufficient flow

1. Reconfigure the diagnostic message for the limit switch (S910) in **Menu/ Setup/ Basic setup/Diagnostics settings/ Diag. behavior/S910Limit switches**.
   ↳ The status of the limit switch and thus the flow rate in the assembly is available as a process value for all outputs of the transmitter. As soon as there is insufficient flow, **F910Limit switches** is displayed on the device, along with a red screen.
2. Make the following settings:**Diag. code**: **F910Limit switches**, **Diagnostics**: **On**, **Failure current**: **Off**, **Status signal**: **Failure (F)**.

The diagnostic message can be changed if necessary.

3. Open **Menu/ Setup/Additional functions/Diagnostic modules/Diagnostic modulex**.
4. Make the following settings: **Source of data**: **Limit switchesx**, **Active low**: **On**, **Short text**: Enter the individual text here, e.g. Low flow.

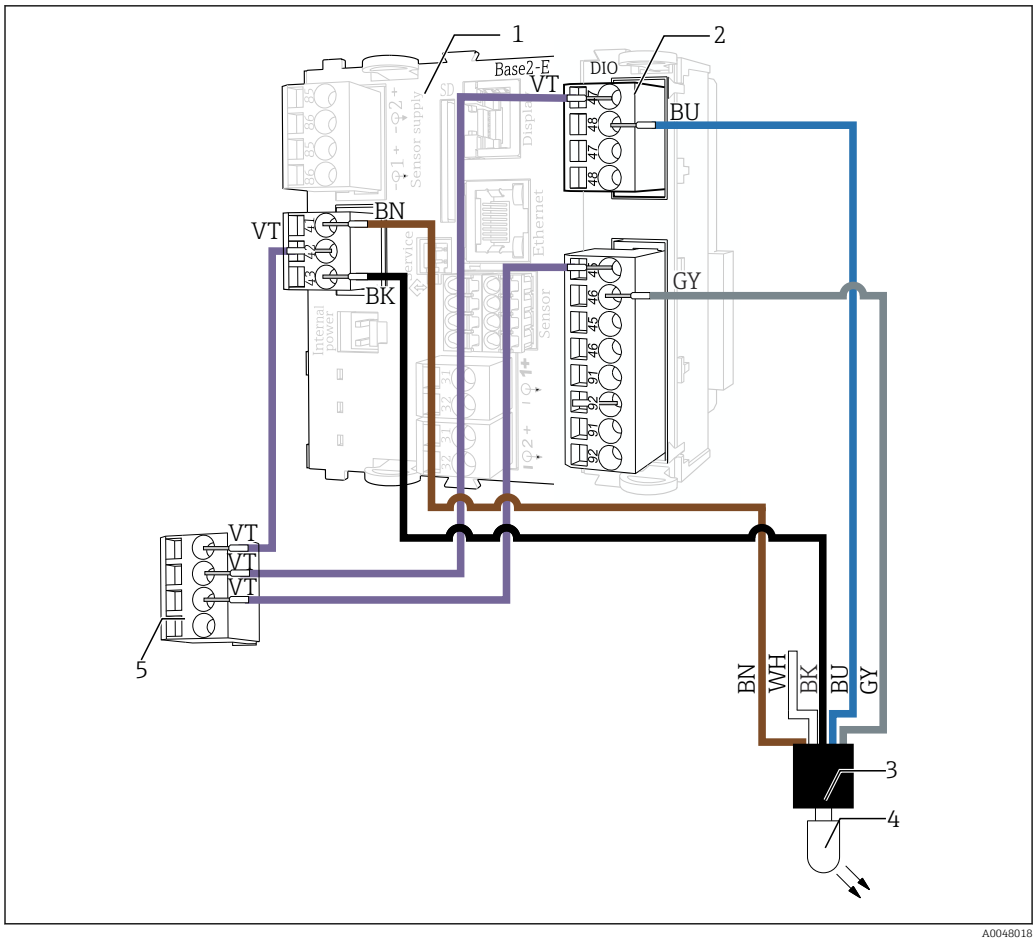
5.4.4 Wiring diagram of version 3: connection of status lighting (without flow monitoring)

Error messages can be indicated via the status lighting with this connection version. The colors indicated by the status lighting correspond to NAMUR specifications (NE107):

- NAMUR category F (Failure) → steady red status lighting
- NAMUR category S (Out of specification) → flashing red status lighting
- NAMUR category C (Check function) → flashing red status lighting
- NAMUR category M (Maintenance required) → flashing green status lighting
- If no diagnostic message has occurred (OK) → steady green status lighting

CM44 firmware 1.11.00 or higher must be used, as it contains an upgrade for diagnostic messages with a relay.

The status lighting alone can be used for the NAMUR status of the measuring system (transmitter and connected measuring devices). Flow control is then not covered.



1 *BASE-E or BASE2-E module*
2 *DIO module (included in the scope of delivery for the CM44x transmitter or order separately)*
3 *Status lighting cables*
4 *Status lighting*
5 *Distributor terminal block (is located in the CM44x transmitter as standard)*

Status lighting cables	Connection
Brown (BN)	BASE-2-E module, alarm, terminal 41
White (WH)	Not connected
Black (BK)	BASE-2-E module, alarm, terminal 43
Blue (BU)	DIO module, power connection, port 1, terminal 48
Gray (GY)	DIO module, digital out, port 1, terminal 46

Distributor terminal block cable	Terminal	Connection
Connecting cable, violet (VT)	1	BASE-2-E module, alarm, terminal 42
Connecting cable, violet (VT)	2	DIO module, power connection, port 1, terminal 47
Connecting cable, violet (VT)	3	DIO module, digital out, port 1, terminal 45

Settings on the CM44x

Activating a linked relay

1. Option A, alarm relay
   Open **Menu/Setup/Outputs/Alarm relay**.

2. Make the following settings: **Function**: **Device status signal**,**Operation mode**: **NAMUR S**+**NAMUR C**+**NAMUR F**

If the alarm relay is used, it is no longer available for other messages.

3. Option B, relay module (2R, 4R, AOR module)
   Open **Menu**/**Setup**/**Outputs**/**Relayy:x**.
4. Make the following settings: **Function**: **Device status signal**,**Operation mode**: **NAMUR S**+**NAMUR C**+**NAMUR F**

Activating the connected binary output

1. Go to **Menu**/**Setup**/**Outputs**/**OutputBinaryy:x** and enable **OutputBinary**.
2. Set **Signal type**: **Static signal**, **Function**: **Device status signal**, **Operation mode**: **OK**, **NAMUR F**.

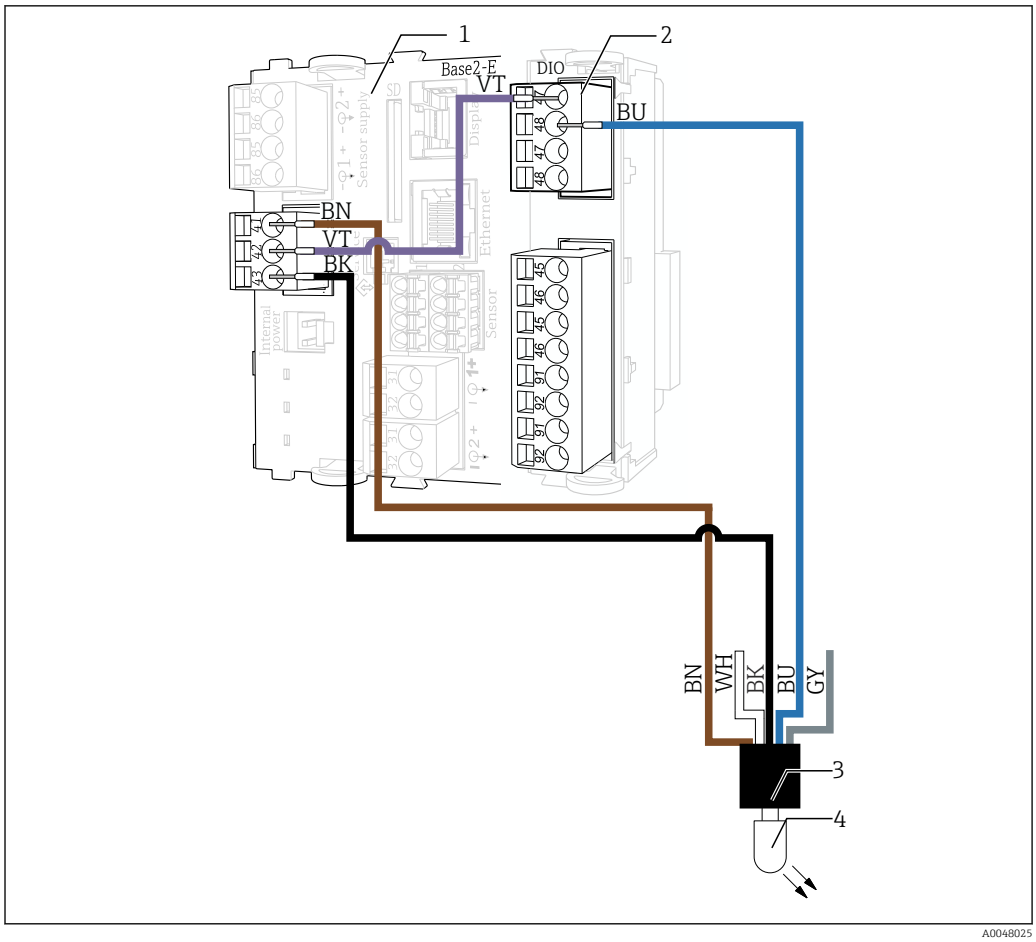
If a relay of a 2R, 4R or AOR module is used instead of the alarm relay, the wiring is the same apart from the location and name of the relay.

5.4.5 Wiring diagram of version 4: connection of simplified status lighting

This version is used exclusively to visualize the NAMUR status message F (steady red)!

With this type of connection

- The NAMUR message F (Failure) can be indicated in red via the status lighting
- The status lighting is green if no diagnostic message occurs
- The status lighting can be used before the CM44 software release version 01.11.00
- A flow switch or flowmeter can optionally be operated



1 *BASE-E or BASE2-E module*
2 *DIO module (included in the scope of delivery for the CM44x transmitter or order separately)*
3 *Status lighting cables*
4 *Status lighting*

Status lighting cables	Connection
Brown (BN)	BASE-2-E module, alarm, terminal 41
White (WH)	Not connected
Black (BK)	BASE-2-E module, alarm, terminal 43
Blue (BU)	DIO module, power connection, port 1, terminal 48
Gray (GY)	Not connected

Cable	Connection 1	Connection 2
Connecting cable, violet (VT)	BASE-2-E module, alarm, terminal 42	DIO module, power connection, port 1, terminal 47

Settings on the CM44x

Activating a linked relay

1. Option A, alarm relay
   Open **Menu/Setup/Outputs/Alarm relay**.

2. Make the following settings: **Function**: **Diagnostic message**, **Operation mode**: **NAMUR F**

If the alarm relay is used, it is no longer available for other messages.

3. Option B, relay module (2R, 4R, AOR module)
   Open **Menu/Setup/Outputs/Relayy:x**.
4. Make the following settings: **Function**: **Diagnostic message**,**Operation mode**: **NAMUR S**+**NAMUR C**+**NAMUR F**

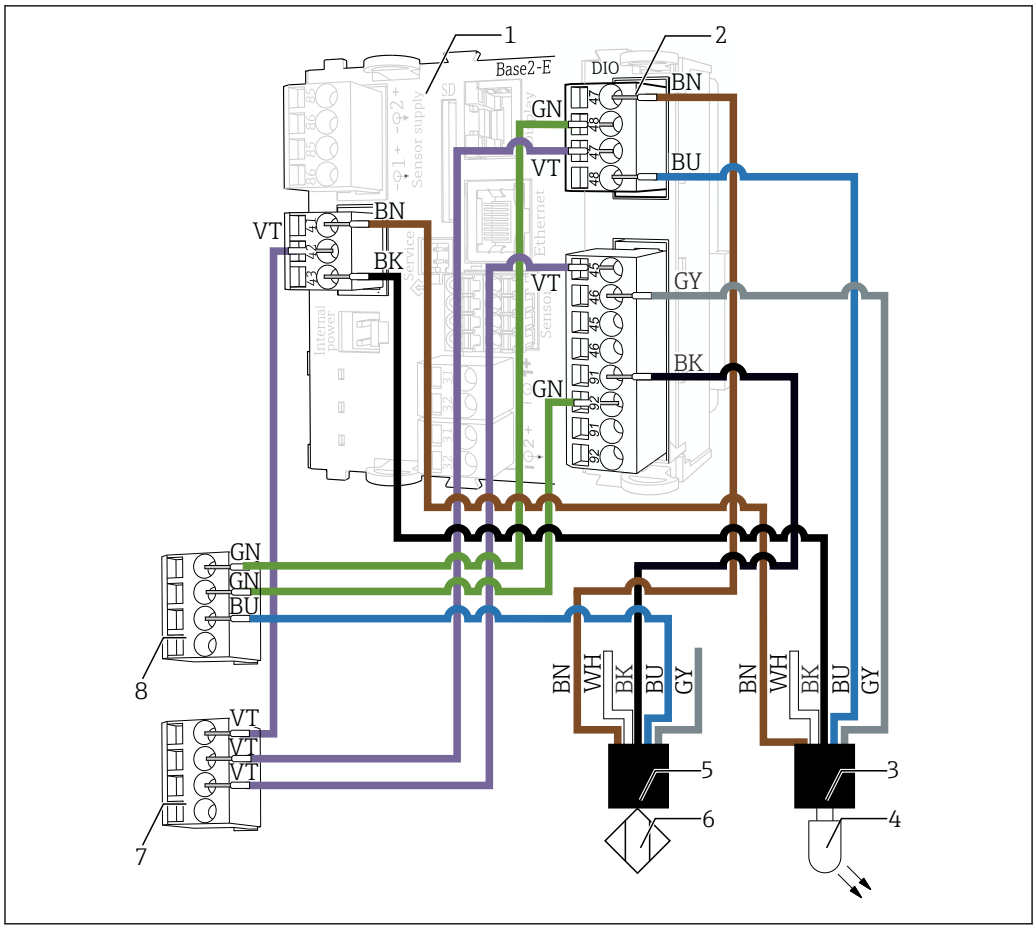
If a relay of a 2R, 4R or AOR module is used instead of the alarm relay, the wiring and the software configuration are the same apart from the location and name of the relay.

5.4.6 Wiring diagram of version 5: connection of the flow switch with status lighting

With this type of connection

- a diagnostic message can be generated at the CM44 if the flow volume is too low
- an external device can be connected that is controlled depending on the flow
- error messages can be indicated via the status lighting. The colors indicated by the status lighting correspond to NAMUR specifications (NE107)
  - NAMUR category F (Failure) → steady red status lighting
  - NAMUR category S (Out of specification) → flashing red status lighting
  - NAMUR category C (Check function) → flashing red status lighting
  - NAMUR category M (Maintenance required) → flashing green status lighting
  - If no diagnostic message has occurred (OK) → steady green status lighting

CM44 firmware 1.11.00 or higher must be used, as it contains an upgrade for diagnostic messages with a relay.



1 *BASE-E or BASE2-E module*
2 *DIO module (included in the scope of delivery for the CM44x transmitter or order separately)*
3 *Status lighting cables*
4 *Status lighting*
5 *Flow switch cable*
6 *Flow switch*
7 *Distributor terminal block 2 (is located in the CM44x transmitter as standard)*
8 *Distributor terminal block 1 (is located in the CM44x transmitter as standard)*

Flow switch cable	Connection
Brown (BN)	DIO module, power connection, port 1, terminal 47
White (WH)	Not connected
Black (BK)	DIO module, digital in, port 1, terminal 91
Blue (BU)	Distributor terminal block 1, terminal 3
Gray (GY)	Not connected

Status lighting cables	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, power connection, port 2, terminal 48
Gray (GY)	DIO module, digital out, port 1, terminal 46

Distributor terminal block cable 1	Terminal	Connection
Connecting cable, green (GN)	1	DIO module, power connection, port 1, terminal 48
Connecting cable, green (GN)	2	DIO module, digital in, port 1, terminal 92

Distributor terminal block cable 2	Terminal	Connection
Connecting cable, violet (VT)	1	BASE2-E module, alarm, terminal 42
Connecting cable, violet (VT)	2	DIO module, power connection, port 2, terminal 47
Connecting cable, violet (VT)	3	DIO module, digital out, port 1, terminal 45

Activating the binary input of the flow switch

1. Go to **Menu/Setup/Inputs/Binary input x:1** and enable **Binary input**.
2. Set **Binary input**: **On**, **Signal type**: **Static signal**, **Signal level**: **Low**.
3. Assign a limit switch to the binary switch in: **Menu/Setup/Basic setup/Limit switchesx** with the options: **Source of data**: **Binary input x:1**, **Input variable**: **Level**, **Cleaning program**: ---, **Operation mode**: **Above limit check**, **Function**: **On**, **Start delay0 s, Switch off delay: 0 s**

Assigning diagnostic message S910 of the limit switch as an error message F for insufficient flow

1. Reconfigure the diagnostic message for the **Limit switches** (S910) in **Menu/ Setup/ Basic setup/Diagnostics settings/ Diag. behavior/S910Limit switches**.
   ↳ The status of the limit switch and thus the flow rate in the assembly is available as a process value for all outputs of the transmitter. As soon as there is insufficient flow, **F910 Limit switches** is displayed on the device, along with a red screen.
2. Make the following settings: **Diag. code**: **F910Limit switches**, **Diagnostics**: **On**, **Failure current**: **Off**, **Status signal**: **Failure (F)**.

The diagnostic message can be changed if necessary.

3. Open **Menu/ Setup/Additional functions/Diagnostic modules/Diagnostic modulex**.
4. Make the following settings: **Source of data**: **Limit switchesx**, **Active low**: **On**, **Short text**: Enter the individual text here, e.g. Low flow.

Setting the status lighting

Activating a linked relay

1. Option A, alarm relay
   Open **Menu/Setup/Outputs/Alarm relay**.
2. Make the following settings: **Function**: **Device status signal**,**Operation mode**: **NAMUR S+NAMUR C+NAMUR F**

If the alarm relay is used, it is no longer available for other messages.

3. Option B, relay module (2R, 4R, AOR module)
   Open **Menu/Setup/Outputs/Relayy:x**.
4. Make the following settings: **Function**: **Device status signal**,**Operation mode**: **NAMUR S+NAMUR C+NAMUR F**

Activating the connected binary output

1. Go to **Menu/Setup/Outputs/OutputBinaryy:x** and enable **OutputBinary**.
2. Set **Signal type**: **Static signal**, **Function**: **Device status signal**, **Operation mode**: **OK**, **NAMUR F**.

If a relay of a 2R or 4R or AOR module is used instead of the alarm relay, the wiring and the software configuration are the same apart from the location and name of the relay.

5.4.7 Wiring diagram of version 6 (recommended): connection of the flowmeter with status lighting

With this type of connection

- the flow volume can be determined
- a diagnostic message can be generated at the CM44 if the flow volume is too low or too high
- an external device can be connected that is controlled depending on the flow
- the NAMUR-compliant status lighting can be displayed. The colors indicated by the status lighting correspond to the NAMUR recommendation (NE107)
  - Diagnostic messages with NAMUR category F (Failure) and insufficient flow cause a steady red light to be displayed
  - Diagnostic messages with NAMUR category S (Out of specification) or C (Check function) cause a flashing red light to be displayed
  - Diagnostic messages with NAMUR category M (Maintenance required) cause a green flashing light to be displayed
  - If no diagnostic message has occurred, the light is lit green continuously

CM44 firmware 1.11.00 or higher must be used, as it contains an upgrade for diagnostic messages with a relay.

The wiring diagram is identical to version 5 with a flow switch → 34.

Settings on the CM44x

Activating the binary input of the flowmeter

1. Go to **Menu/Setup/Inputs/Binary input x:1** and enable **Binary input**.
2. Set **Binary input**:**On**, **Signal type**:**PFMMax. frequency**:**100.00 Hz, Meas. value format: #.#, Input variable: Flow, Flow rate unit: l/h, Start of measuring range: 0.0 l/h, Upper range value: 320 l/h (for the 30 l/h CYA27 version) or 105 l/h (for the 5 l/h CYA27 version)**.
3. Assign a limit switch to the binary input if you are configuring the detection of a flow volume that is too low:
   Go to **Menu/ Setup/Limit switchesx** and configure the options **Source of data**: **Binary input x:1**, **Input variable**: **FlowCleaning program**: ---, **Operation mode**: **Above limit check**, **Function**: **On**, **Start delay0 s, Switch off delay: 0 s**.
4. Assign a limit switch to the binary input if you are configuring the detection of a flow volume that is outside the specified range:
   Go to **Menu/ Setup/Limit switchesx** and configure the options **Source of data**: **Binary input x:1**, **Input variable**: **FlowCleaning program**: ---, **Operation mode**:**Out of range check**, **Function**: **On**, **Range lower value**: **30 l/h (or 5 l/h for the 5 l/h CYA27 version), Range lower value: 80 l/h (or 30 l/h for the 5 l/h CYA27 version), hysteresis (+/-): 0.0 l/h, Start delay: 0 s, Switch off delay: 0 s**.

Assigning diagnostic message S910 of the limit switch as an error message F for insufficient flow

1. Reconfigure the diagnostic message for the **Limit switches** (S910) in **Menu/ Setup/ Basic setup/Diagnostics settings/ Diag. behavior/S910Limit switches**.
   ↳ The status of the limit switch and thus the flow rate in the assembly is available as a process value for all outputs of the transmitter. As soon as there is insufficient flow, **F910 Limit switches** is displayed on the device, along with a red screen.
2. Make the following settings:**Diag. code**: **F910Limit switches**, **Diagnostics**: **On**, **Failure current**: **Off**, **Status signal**: **Failure (F)**.

The diagnostic message can be changed if necessary.

3. Open **Menu/ Setup/Additional functions/Diagnostic modules/Diagnostic modulex**.
4. Make the following settings: **Source of data**: **Limit switchesx**, **Active low**: **On**, **Short text**: Enter the individual text here, e.g. Low flow.

Setting the status lighting

Activating a linked relay

1. Option A, alarm relay
   Open **Menu/Setup/Outputs/Alarm relay**.
2. Make the following settings: **Function**: **Device status signal**,**Operation mode**: **NAMUR S+NAMUR C+NAMUR F**.

If the alarm relay is used, it is no longer available for other messages.

3. Option B, relay module (2R, 4R, AOR module)
   Open **Menu/Setup/Outputs/Relayy:x**.
4. Make the following settings: **Function**: **Device status signal**,**Operation mode**: **NAMUR S+NAMUR C+NAMUR F**.

If a relay of a 2R, 4R or AOR module is used instead of the alarm relay, the wiring is the same apart from the location and name of the relay.

Activating the connected binary output

1. Go to **Menu/Setup/Outputs/OutputBinaryy:x** and enable **OutputBinary**.
2. Set **Signal type**: **Static signal**, **Function**: **Device status signal**, **Operation mode**: **OK**, **NAMUR F**.

If a relay of a 2R or 4R or AOR module is used instead of the alarm relay, the wiring and the software configuration are the same apart from the location and name of the relay.

5.5 Installing the sensor in the assembly

5.5.1 Disinfection sensor

If several modules are used, install the Memosens CCS58D sensor in the first module after the inlet module for the best possible flow conditions.

Please note the following during installation:

- Guarantee the minimum flow to the sensor and the minimum volume flow through the assembly (5 l/h or 30 l/h).
- If the medium is fed back into an overflow basin, piping or similar, the resulting counterpressure on the sensor must not exceed 1 bar relativ (14.5 psi relativ) (2 bar abs. (29 psi abs.)) and must remain constant.
- Avoid a vacuum 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.

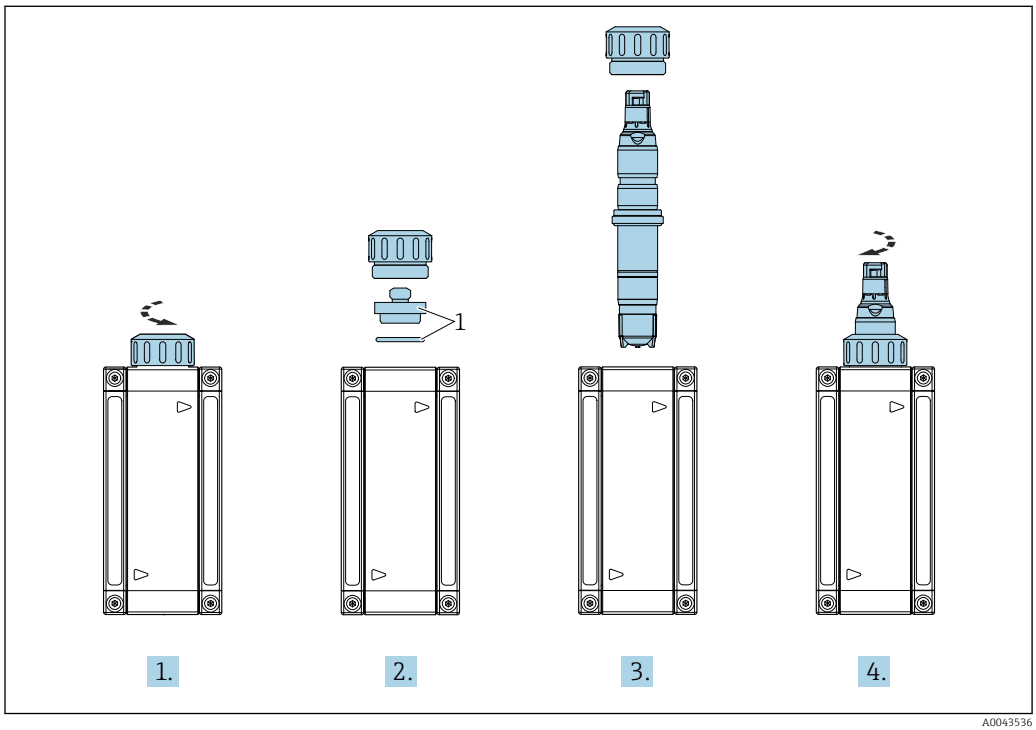
Equipping sensor with adapter

The necessary adapter (clamping ring, thrust collar and O-ring) can be ordered as a mounted accessory for the sensor or as a separate accessory.

- First slide the clamping ring (1), then the thrust collar (2), and then the O-ring (3) from the membrane cap towards the sensor head and into the lower groove.

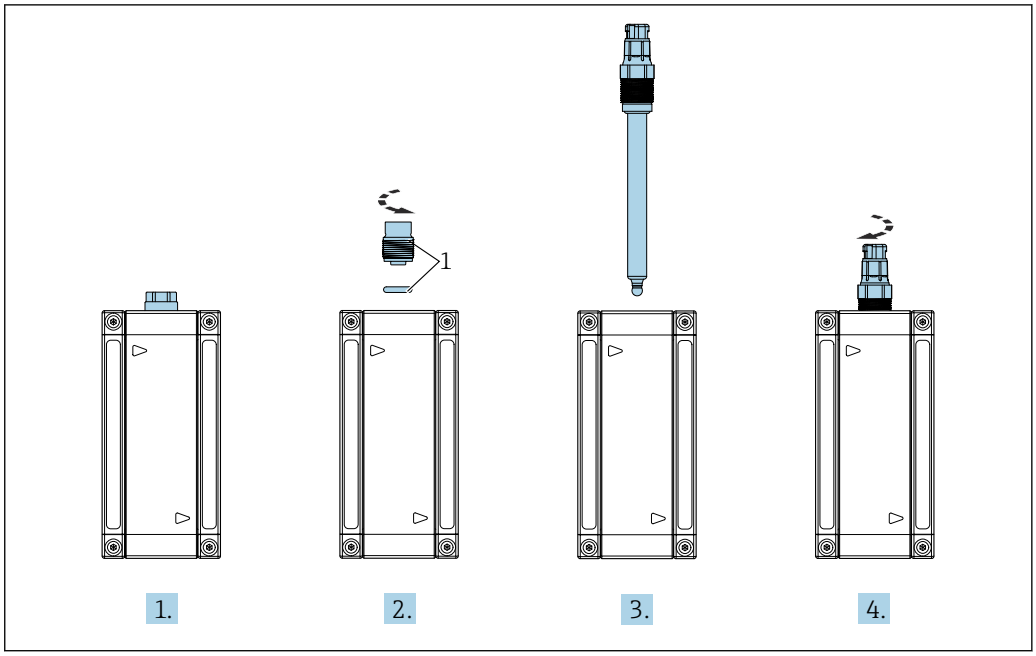
Installing the sensor in the assembly

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 adapter for Flowfit CYA27 into the opening of the assembly.
4. Screw the union nut onto the assembly.



1 Dummy plug and O-ring

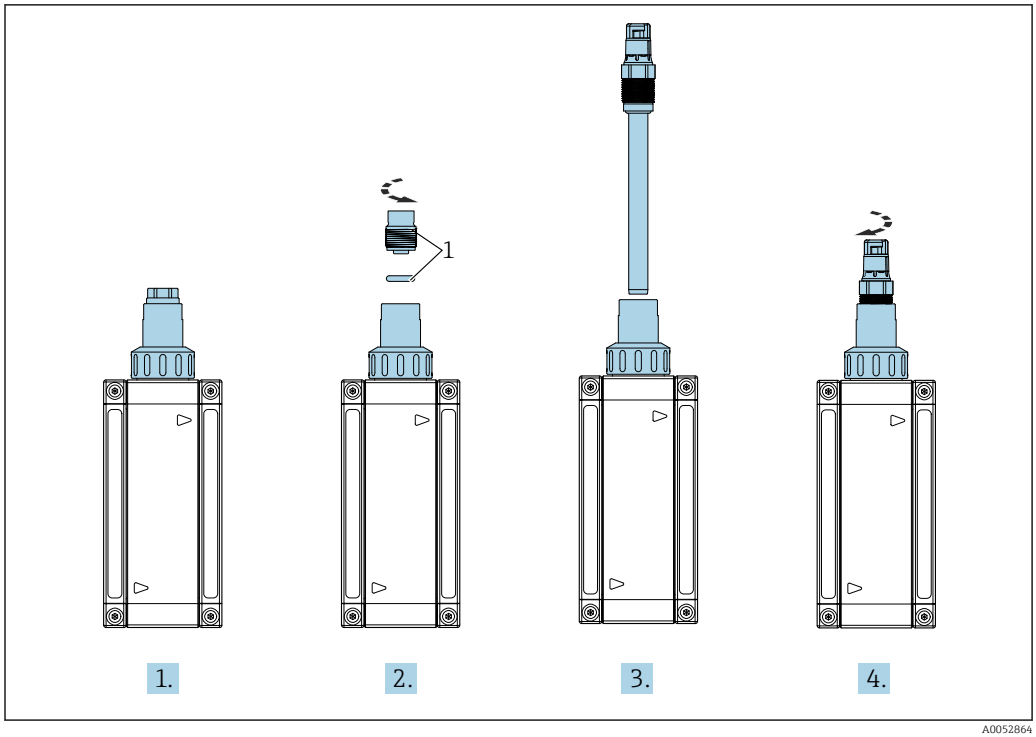
5.5.2 pH, ORP or oxygen sensor



1 Dummy screw with O-ring

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

5.5.3 Conductive sensor

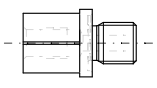
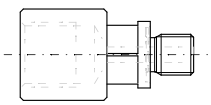
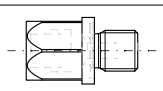
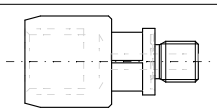


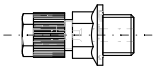
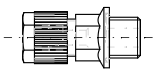
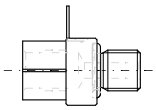
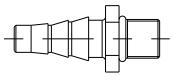
1 Dummy screw with O-ring

1. The assembly is supplied to the customer with a dummy screw mounted in the assembly.
2. Using a hexagon wrench AF17, remove the dummy screw and O-ring (1) from the assembly.
3. Slide the sensor into the adapter of the assembly.
4. Screw the sensor into the adapter of the assembly.

The CLS82E may not be installed in the pH or oxygen module, as the minimum distance to the wall causes measured errors.

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

Option	Process adapter	
QM	Hose fitting OD 6 mm (0.24 in), ID 4 mm (0.16 in)	 A0043720
QN	Hose fitting OD 8 mm (0.31 in), ID 6 mm (0.24 in)	 A0043719
PC	Adapter for potential equalization connection G 1/4	 A0043718
QS	Hose connector PVDF G1/4 8-12 mm + O-ring	 A0048033

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

5.7 Post-mounting checks

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 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.

When commissioning with a particle separator, pay attention to the modified opening of the valves → 📄 43.

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 piping and/or hoses are in perfect condition
- the removal prevention unit is installed on the Cl.I Div.2 cable, if used.

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.

6.2.1 Switch-on sequence (without particle separator)

1. Open the valve at the outlet. The valve should only be closed when removing sensors in order to prevent medium backflow.
2. Set the flow via the needle valve at the inlet.

6.2.2 Switch-on sequence (with particle separator)

1. Open the valve at the outlet. The valve should only be closed when removing sensors in order to prevent medium backflow.
2. Open the valve at the inlet slightly.
3. Set the flow via the valve at the top of the particle separator.

If there is air in the particle separator, the setting at the valve at the top of the separator should be changed until the air is discharged.

More medium is discharged through the bottom section of the particle separator than flows through the top section. The flow in the bottom section can be reduced with the inlet valve provided that sufficient flow through the top is still guaranteed.

7 Operation

⚠ CAUTION

Compressed media

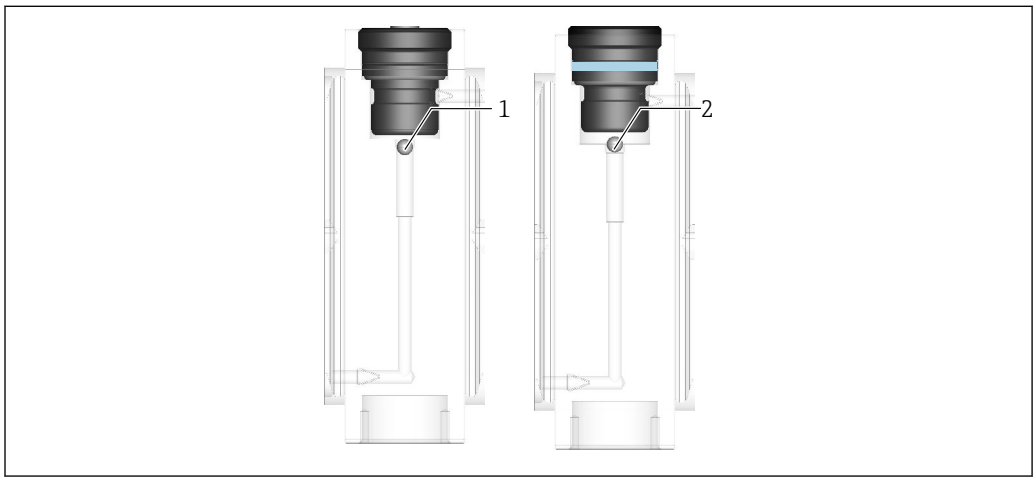
Risk of injury from high pressure, high temperature or chemical hazards if process medium escapes.

- ▶ 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

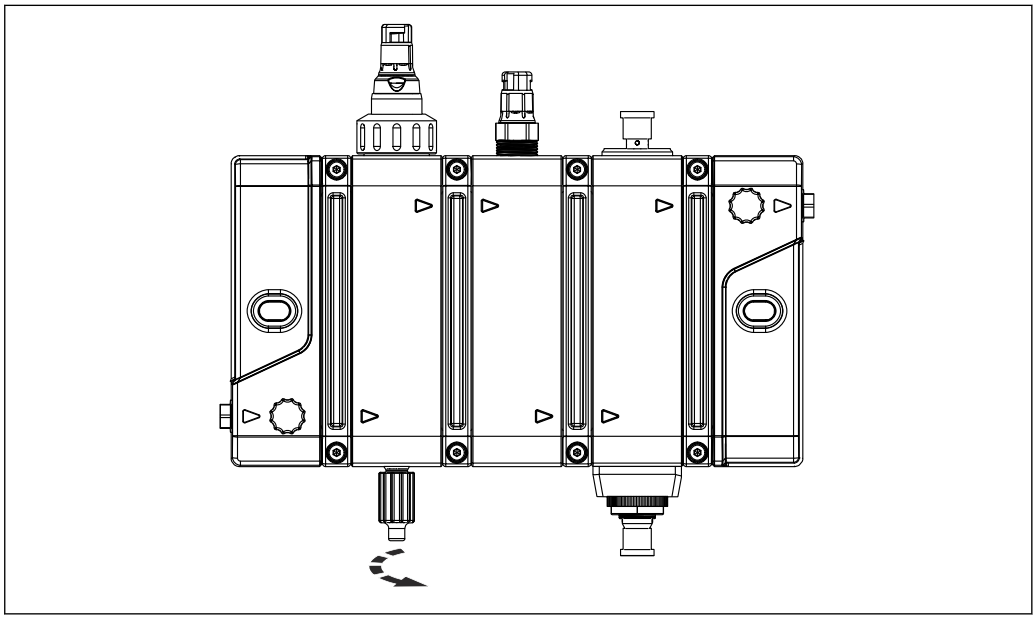
The assembly is designed in such a way that disruptive air bubbles cannot accumulate in the assembly under normal operating conditions. Any gas bubbles that form are usually discharged by the flow of liquid. If, however, manual venting is necessary, this can be done in two ways:

- 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.



10 *Close the sampling valve*

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 Diagnosis 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 (→ 🖹 13).

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	▶ Open valve at outlet module ▶ Open valve at inlet module ▶ Check existing valves in the process connection (supply and discharge line)
	Blocked filter in inlet line	▶ Check and, if necessary, clean or replace the filter medium
	Soiled assembly/pipes	▶ Clean the assembly and, if necessary, the supply and discharge lines
	Counterpressure through return line is too high	▶ Check return line, remove unnecessary flow resistance ▶ If necessary, shorten the length of the return line or route it a different way
	Incorrectly configured pressure-reducing valve in supply line	▶ Check and correct the pressure setting on the pressure-reducing valve
Highly fluctuating measured signal of membrane-covered sensors	Insufficient flow	▶ Check flow configuration ▶ Readjust flow at the valve of the inlet module
	Sampling is open or ongoing	▶ Close the sampling valve ▶ Set the sensor measured values on the transmitter to **HOLD** for the duration of sampling ▶ After sampling, cancel the **HOLD** on the sensor measured values on the transmitter.
Air is sucked into assembly when the sampling valve is open	Downward-sloping return line causes negative pressure	▶ Increase flow at the valve of the inlet module to a minimal degree ▶ Reduce flow at the valve of the outlet module ▶ After sampling, return the flow setting or the valve position of the assembly to the original setting
Electrolyte in membrane-covered sensors requires frequent replacement	Counterpressure in assembly is too high	▶ Check valve position at the outlet module and open if necessary ▶ Check return line, remove any unnecessary flow resistance ▶ If necessary, shorten the length of the return line or route it a different way

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

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
	1. Remove sensor and check for deposits. 2. If deposits are present, check cleaning cycle (cleaning agents, temperature, duration, flow volume).
As required, biannually or annually	▶ Replace seals in contact with the medium when using highly concentrated cleaning agents.

9.2 Maintenance work

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 (without particle separator)

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

1. Close the valve at the inlet.
2. Close the valve at the 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.

Switch-off sequence (with particle separator)

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

1. Close the valve at the top of the particle separator.
2. Close the valve at the inlet of the assembly.
3. Close the valve at the outlet.
4. 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 service before draining (→ 49).

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 holder.
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 Rinsing

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

Prior to rinsing, the assembly must be taken out of operation (→ 🖹 49) and drained (→ 🖹 49).

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 (→ 22).

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 (→ 49).
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 (→ 42), 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 (→ 49).
2. Rinse and drain the assembly as required (→ 49).
3. Remove the cable or connector from sensor.
4. Unscrew the coupling nut or unscrew the sensor directly.
5. Pull sensor out through opening in assembly.
6. Install calibrated or new sensors.
7. Connect the cable or connector.
8. Put the measuring point into operation (→ 42), 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 (→ 49).
2. Rinse and drain the assembly as required → 49.
3. Remove the relevant components.
4. Replace the seals.
5. Install the components.

6. Put the measuring point into operation (→ 42), 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.

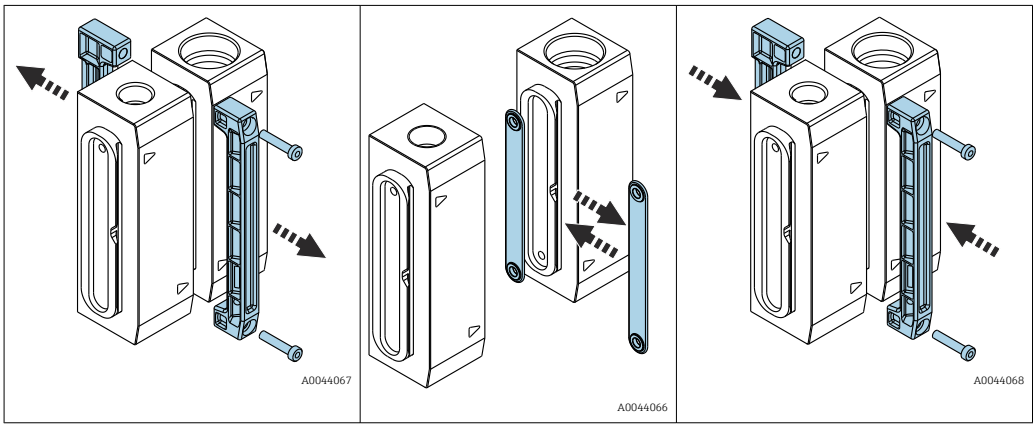
9.2.7 Replacing the seals and cleaning between the modules

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 (→ 49).
2. Rinse and drain the assembly as required (→ 49).
3. Disconnect the assembly from the process.
4. Remove the assembly from the wall installation (→ 54).
5. Using the clips, separate the assembly into the modules (→ 53).
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 ± 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 (→ 42), paying particular attention to leak-tightness.

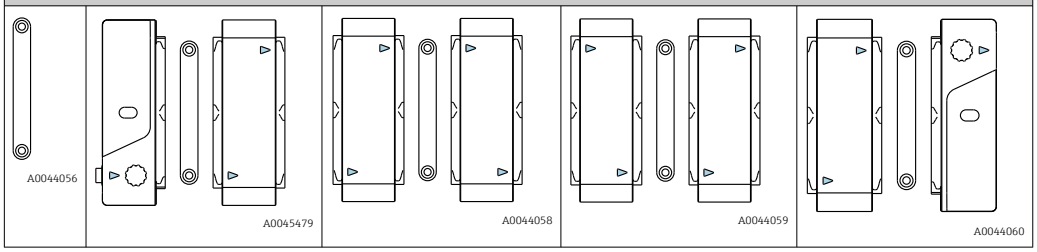


There are two different versions of the module seal:
- Gasket seals with bore hole
- Gasket seals with channel.

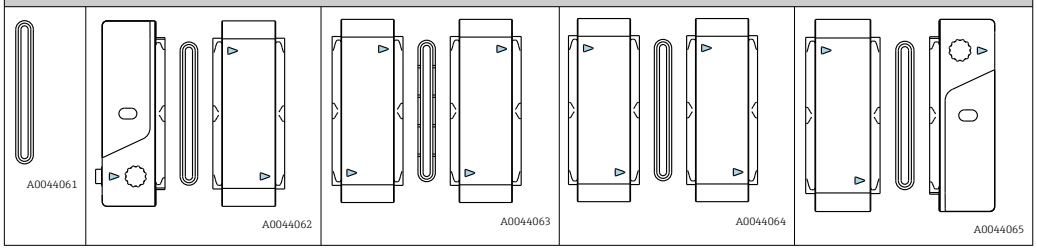
The correct selection of the seal depends on the flow direction of the adjacent modules in each case. The flow direction is indicated by an arrow.

- The gasket seal with bore hole should be used if the arrows of the adjacent module halves are at the same height in each case (→ 54)
- The gasket seal with channel should be used if the arrows of the adjacent module halves are offset to each other in each case → 54

Gasket seal with bore hole



Gasket seal with channel



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.

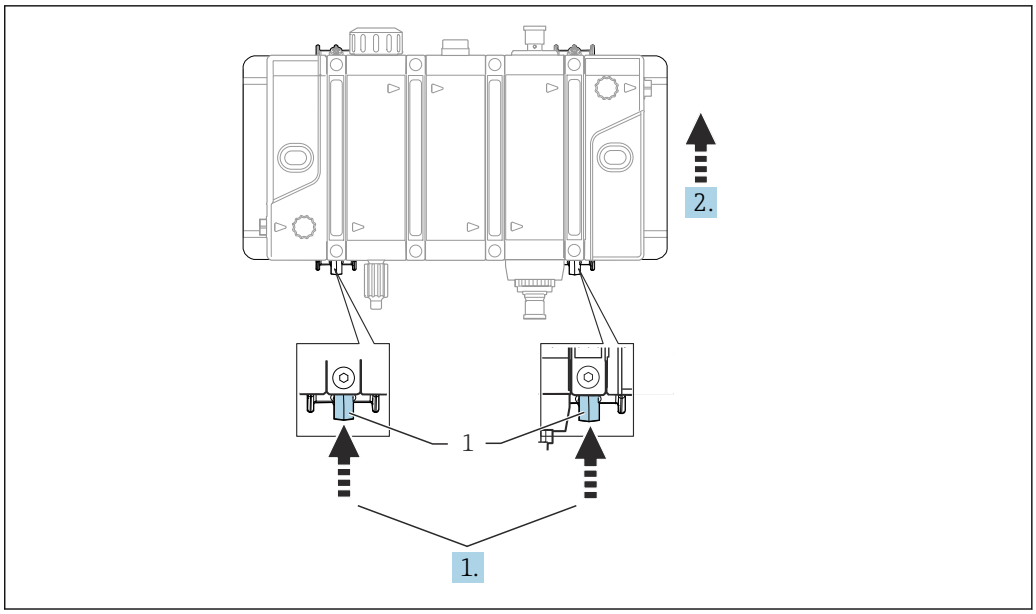
For detailed information on "Cleaning the sensor", see Operating Instructions for sensor.

9.3 Disassembly (e.g. for modification or cleaning)

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

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 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 the manufacturer for disposal under the applicable conditions.

11 Accessories

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

Listed accessories are technically compatible with the product in the instructions.

1. Application-specific restrictions of the product combination are possible.
   Ensure conformity of the measuring point to the application. This is the responsibility of the operator of the measuring point.
2. Pay attention to the information in the instructions for all products, particularly the technical data.
3. For accessories not listed here, please contact your Service or Sales Center.

11.1 Device-specific accessories

11.1.1 Peristaltic dosing pump

Kit CYA27 dosing pump 0.1-22 ml/min: order no. 71621627

Kit CYA27 pump maintenance 0.1-22 ml/min: order no. 71621629

Kit CYA27 dosing pump 1-200 ml/min: order no. 71610954

Kit CYA27 pump maintenance 1-200 ml/min: order no. 71610955

Kit CYA27 dosing pump suction lance: order no. 71610956

Installation Instructions EA01486C

11.1.2 Disinfection sensors

Memosens CCS50E
- Membrane-covered amperometric sensor for chlorine dioxide
- With Memosens technology
- Product Configurator on the product page: www.endress.com/ccs50e

Technical Information TI01353C

Memosens CCS51
- Sensor for measuring free available chlorine
- Product Configurator on the product page: www.endress.com/ccs51 or

Technical Information TI01424C (CCS51)

Memosens CCS51E
- Sensor for measuring free available chlorine
- Product Configurator on the product page: www.endress.com/ccs51e

Technical Information TI01423C

Memosens CCS55E
- Sensor for measuring free bromine
- With Memosens technology
- Product Configurator on the product page: www.endress.com/ccs55e

Technical Information TI01423C

Memosens CCS58E
- Sensor for determining ozone
- With Memosens technology
- Product Configurator on the product page: www.endress.com/ccs58e

Technical Information TI01583C

11.1.3 pH sensors

Memosens CPS31E
- pH sensor for standard applications in drinking water and swimming pool water
- Digital with Memosens 2.0 technology
- Product Configurator on the product page: www.endress.com/cps31e

Technical Information TI01574C

Memosens CPS11E
- pH sensor for standard applications in process and environmental engineering
- Digital with Memosens 2.0 technology
- Product Configurator on the product page: www.endress.com/cps11e

Technical Information TI01493C

Memosens CPS41E
- pH sensor for process technology
- With ceramic junction and KCl liquid electrolyte
- Digital with Memosens 2.0 technology
- Product Configurator on the product page: www.endress.com/cps41e

Technical Information TI01495C

11.1.4 ORP sensors

Memosens CPS12E
- ORP sensor for standard applications in process and environmental engineering
- Digital with Memosens 2.0 technology
- Product Configurator on the product page: www.endress.com/cps12e

Technical Information TI01494C

11.1.5 Combined pH/ORP sensors

Memosens CPS16E
- pH/ORP sensor for standard applications in process technology and environmental engineering
- Digital with Memosens 2.0 technology
- Product Configurator on the product page: www.endress.com/cps16e

Technical Information TI01600C

Memosens CPS76E
- pH/ORP sensor for process technology
- Digital with Memosens 2.0 technology
- Product Configurator on the product page: www.endress.com/cps76e

Technical Information TI01601C

11.1.6 Conductive sensor

Memosens CLS82E
- Four-electrode sensor
- With Memosens technology
- Product Configurator on the product page: www.endress.com/cls82e

Technical Information TI01529C

11.1.7 Oxygen sensors

Oxymax COS22E
- Sterilizable sensor for dissolved oxygen
- Digital with Memosens 2.0 technology
- Product Configurator on the product page: www.endress.com/cos22e

Technical Information TI00446C

Memosens COS81E
- Hygienic optical oxygen sensor with maximum measurement stability over multiple sterilization cycles
- Digital with Memosens 2.0 technology
- Product Configurator on the product page: www.endress.com/cos81e

Technical Information TI01558C

12 Technical data

12.1 Energy 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 conditions

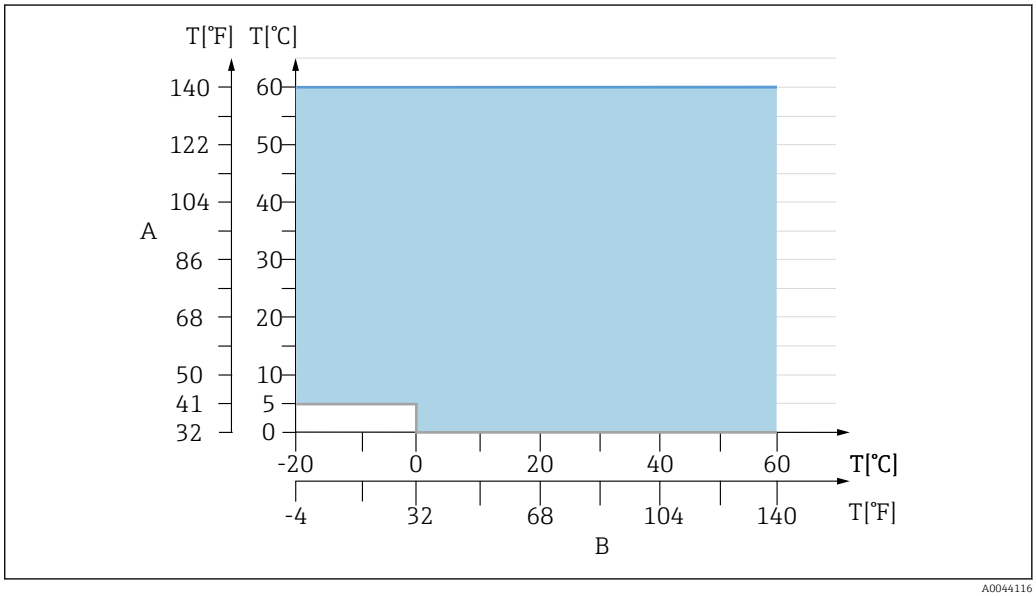
20 °C (68 °F)

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

- Flow switch: IP67
- Status indication light: IP66/67

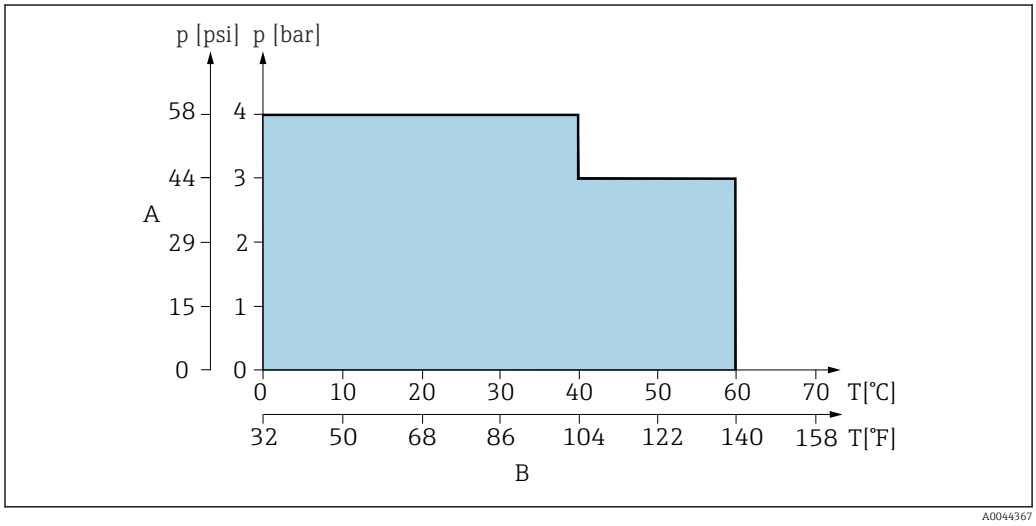
12.4 Process

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 rating



11 *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)

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

12.5 Mechanical construction

→ 14

Weight

Number of modules	1	2	3	4	5	6
Weight in kg (lb) max. weight depending on version without sensors	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)

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 in conjunction with PVDF Green compound in conjunction with PVC
Plugs, adapters, valves:	PVC/POM or PVDF
Floats:	Titanium
Flowmeter:	PVDF
Equipotential bonding connection:	1.4404/1.4571 (316L/316TI) (stainless Cr-Ni steel)

Not in contact with medium	
Clips, wall holder, inlet and outlet module	PBT-GF20/GF30

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.

Flow switch

Turck, BI8-M18-AP6X-H1141	
Area of application	Non-hazardous area
Switching element function	NAMUR NC contact
Switching element principle	Inductive
Enclosure material	Brass, chrome-plated

Turck, BI8-M18-AP6X-H1141/S1751	
Area of application	Hazardous area CSA Cl. I Div.2
Switching element function	NAMUR NC contact
Switching element principle	Inductive
Enclosure material	Brass, chrome-plated

Flow measurement

BIO-TECH, FCH-m--PVDF	
Area of application	Non-hazardous area
Measuring principle	Pulse measurement, Hall sensor
Pulse frequency	Inductive
Material	PVDF

Status lighting

Turck, K30L2RGB7Q	
Area of application	Non-hazardous area

Index

www.addresses.endress.com

Endress+Hauser

People for Process Automation