Brief Operating Instructions
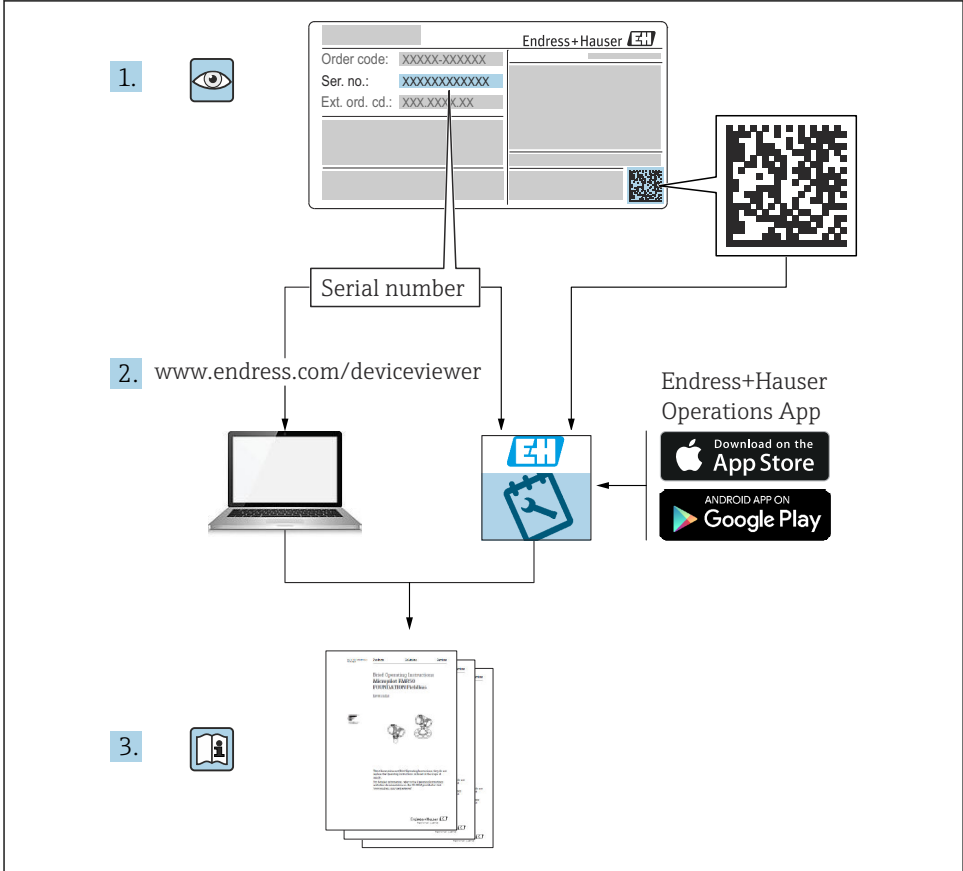# **Liquiline Control CDC90**

Automated cleaning and calibration of Memosens sensors

These instructions are Brief Operating Instructions; they are not a substitute for the Operating Instructions pertaining to the device.

Detailed information on the device can be found in the Operating Instructions and in the other documentation available at:
- www.endress.com/device-viewer
- Smart phone/tablet: Endress+Hauser Operations App

Endress+Hauser [EH]

People for Process Automation

1.

Order code: XXXXX-XXXXXX
Ser. no.: XXXXXXXXXXXX
Ext. ord. cd.: XXX.XXXX.XX

Endress+Hauser

Serial number

2. www.endress.com/deviceviewer

Endress+Hauser
Operations App

Download on the
App Store

ANDROID APP ON
Google Play

3.

A0023555

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1   About this document

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.

1.1   Symbols

🛈	Additional information, tips
☑	Permitted
☑☑	Recommended
☒	Not permitted or not recommended
📖	Reference to device documentation
📄	Reference to page
🖼	Reference to graphic
↳	Result of an individual step

1.1.1   Symbols on the device

⚠–📖	Reference to device documentation
⊠	Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

1.2   Documentation

The following manuals complement these Brief Operating Instructions and are available on the product pages on the Internet:

- Operating Instructions for Liquiline Control CDC90
  - Device description
  - Commissioning
  - Operation
  - Software description (excluding sensor menus; these are described in a separate manual - see below)
  - Device-specific diagnostics and troubleshooting
  - Maintenance
  - Repair and spare parts
  - Accessories
  - Technical data
- Operating Instructions for Memosens, BA01245C
  - Software description for Memosens inputs
  - Calibration of Memosens sensors
  - Sensor-specific diagnostics and troubleshooting
- For more detailed information on fieldbus communication:
  - Ethernet/IP (adapter) via Modbus TCP - Ethernet/IP gateway: BA02241C
  - Modbus TCP (server): BA02238C
  - PROFIBUS DP (slave) via Modbus TCP - PROFIBUS DP gateway. BA02239C
  - PROFINET (device) via Modbus TCP - PROFINET gateway: BA02240C

2   Basic safety instructions

2.1   Requirements for 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

Liquiline Control CDC90 is a fully automatic measuring, cleaning and calibration system for Memosens sensors.

2.2.1   Non-designated use

Any use other than that intended puts the safety of people and the measuring system at risk. Therefore, any other use is not permitted.

The manufacturer is not liable for harm caused by improper or unintended use.

2.3   Workplace safety

As the user, you are responsible for complying with the following safety conditions:
- Installation guidelines
- Local standards and regulations
- Regulations for explosion protection

Electromagnetic compatibility
- The product has been tested for electromagnetic compatibility in accordance with the applicable international standards for industrial applications.
- The electromagnetic compatibility indicated applies only to a product that has been connected in accordance with these Operating Instructions.

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,
  take products out of service and protect them against unintentional operation.

2.5   Product security

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.

2.6   IT security

We only provide a warranty if the device is installed and used as described in the Operating Instructions. The device is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves.

3   Product description

3.1   Product design

The complete Liquiline Control CDC90 consists of the following components:
• CDC90 control unit
• Ethernet switch
• Pneumatic control unit
• Pumps
• Canisters for buffer solutions and cleaner
• Multihoses for medium control
• Rinsing block
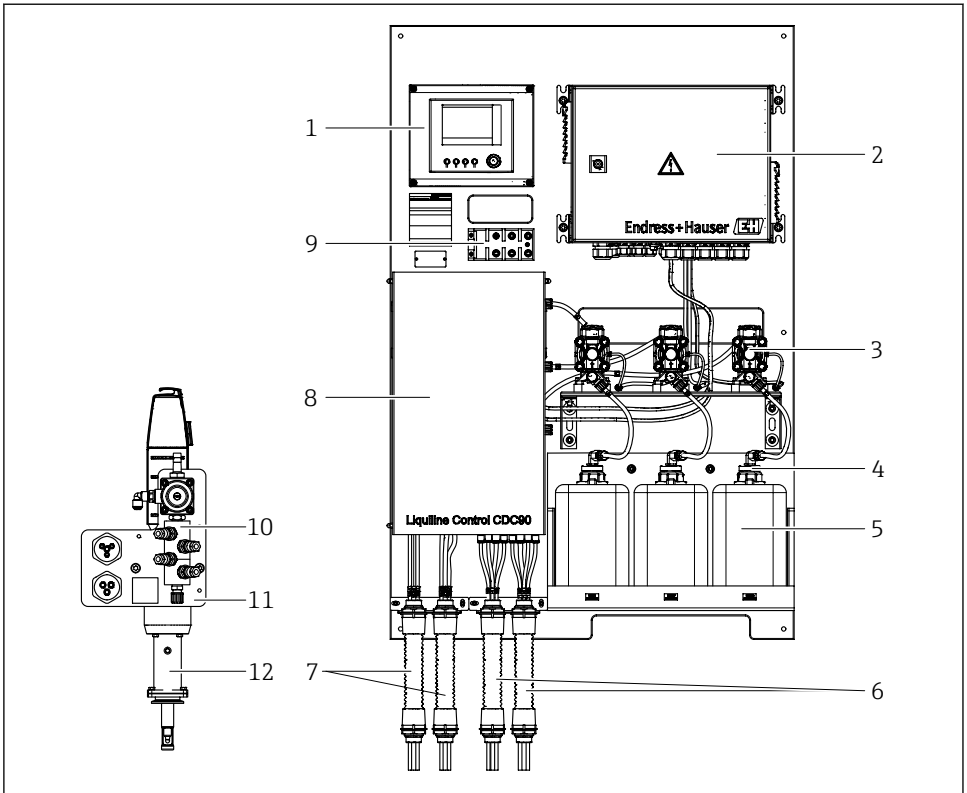
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⊞ *1   Overview of CDC90*

1	*CDC90 control unit*	*7*	M1/M3 multihoses
2	*Pneumatic control unit*	*8*	Cover
3	*Pumps*	*9*	*Ethernet switch*
4	*Float switch*	*10*	Rinsing block
5	*Canister for buffer solutions and cleaner*	*11*	Rinsing block bracket
6	M2/M4 multihoses	*12*	Assembly (not included in delivery)

3.1.1 Overview of rinsing block
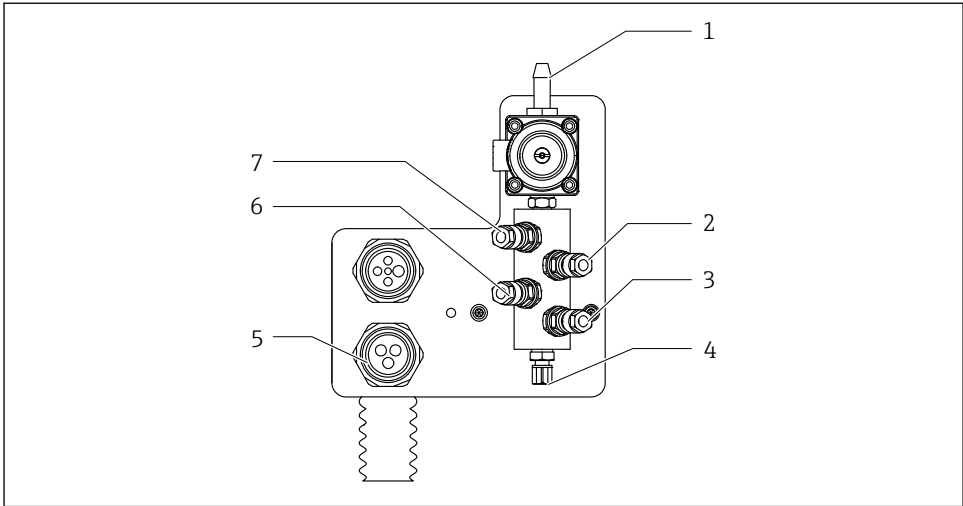
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⊡ *2*   *Rinsing block*

1	*Water connection (hose connector D12 PP)*	*5*	*Multihose connection*
2	*Liquid, pump A*	*6*	*Liquid, pump B*
3	*Liquid, pump C*	*7*	*Air rinsing block (pilot valve 4)*
4	*Outlet rinse connection to assembly*		

3.1.2   Overview of CDC90 control unit
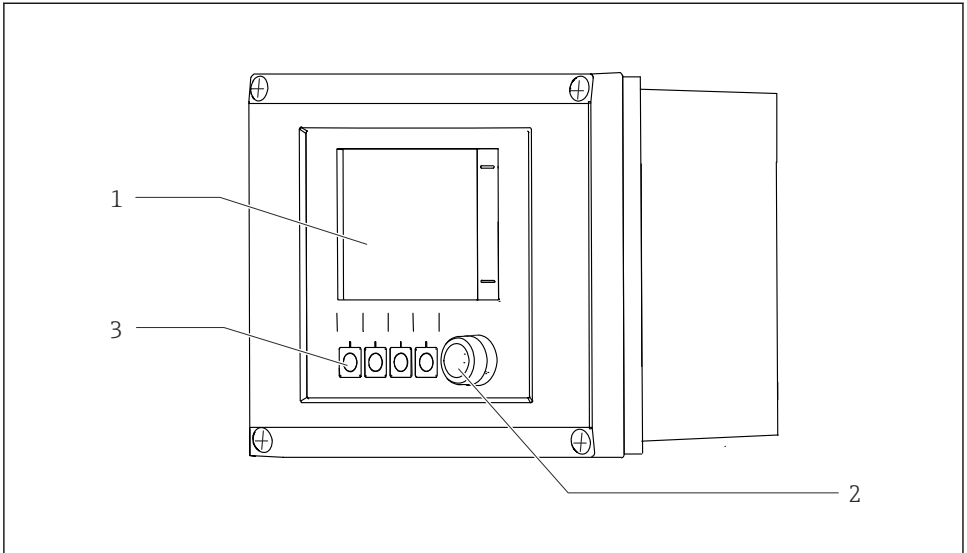
⊡ 3   *CDC90 control unit, outside*

1   Touchscreen display
2   Status LED
3   Soft keys 1-4 (4 functions can be configured)
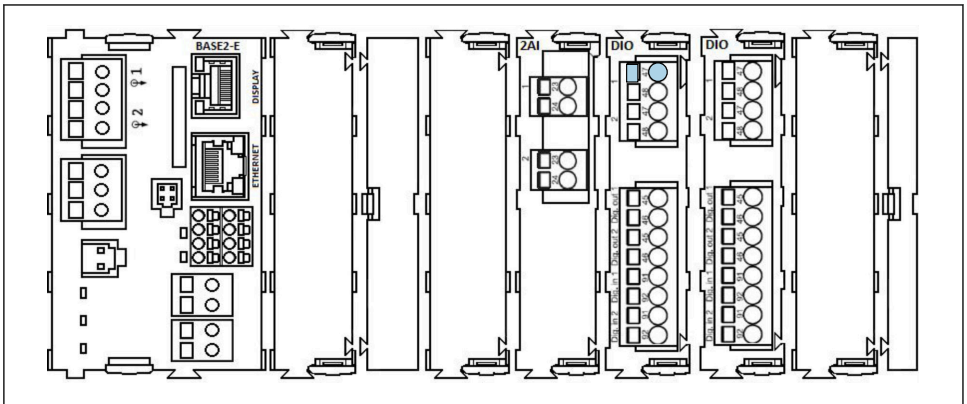
⊡ 4   *CDC90 control unit, inside depending on order version*

Modules from left to right depending on order version:
- Base module BASE2-E
- Empty
- 2AI module
- 2x DIO module
- 4AO module (optional, not shown)
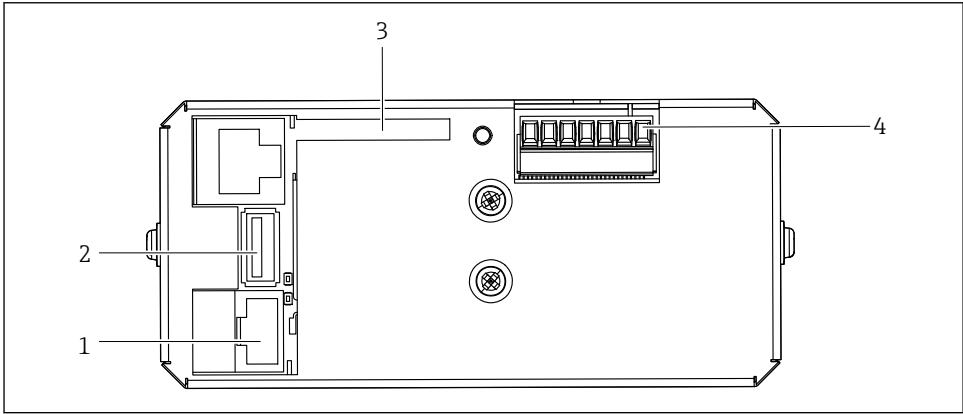
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⊞ 5   *CDC90 control unit, IPC*

1   Connection to Ethernet switch
2   USB port
3   SD card
4   Supply voltage

3.1.3   Overview of pneumatic control unit

1-channel

The pneumatic control unit controls air, liquids and electricity. The supply voltage is applied here, for example.
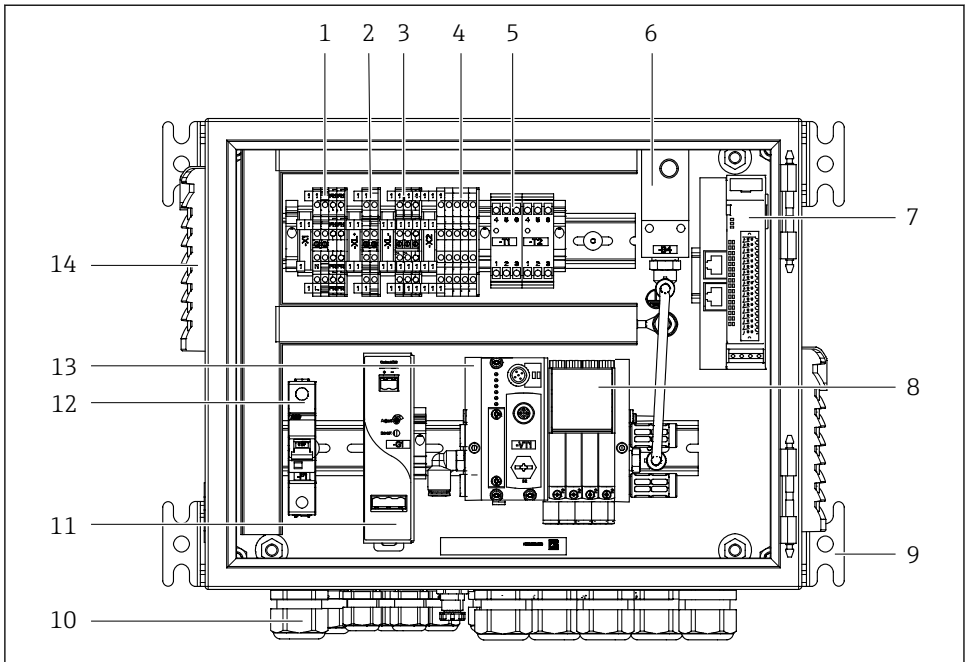
⊞ 6   Pneumatic control unit for a single channel

1	*100 / 230 VAC terminal*	*8*	*Pilot valves*
2	*+24 V terminal*	*9*	*Mounting*
3	*0 V terminal*	*10*	*Cable gland*
4	*Terminals for float switches and pressure switches*	*11*	*24 VDC power unit*
5	*Output interface terminal for assemblies, limit position switch*	*12*	*F1 system fuse*
6	*Pressure switch*	*13*	*Pilot valve manifold, bus node*
7	*External remote IO, DIO*	*14*	*Ventilation slot*

2-channel
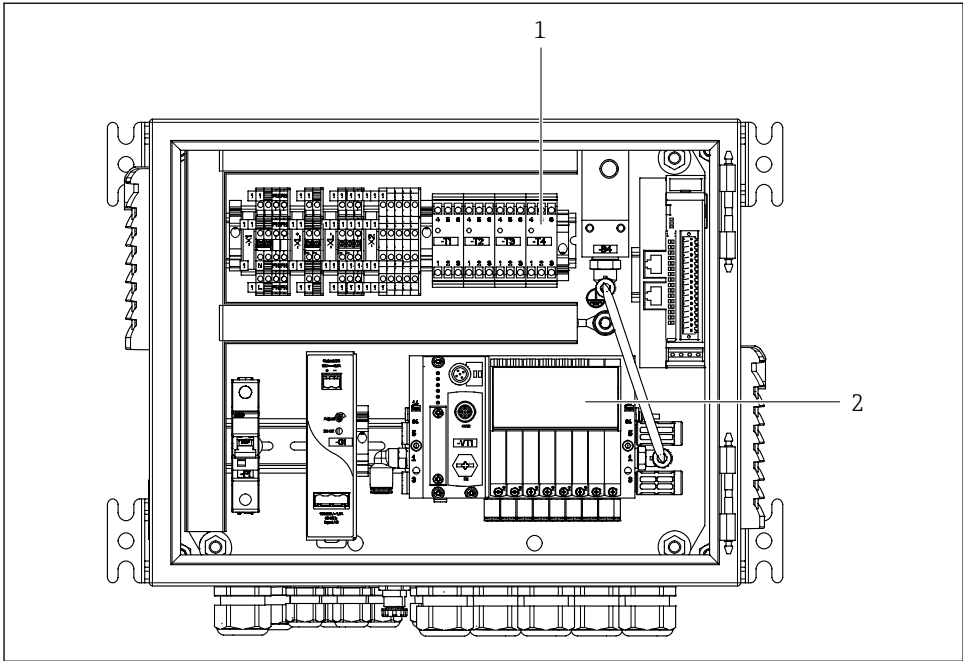
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⊞ 7   *Pneumatic control unit for 2 channels*

1   Extension of the output interface terminals for a 2nd measuring point
2   Extension of the pilot valves for a 2nd channel

4   Incoming acceptance and product identification

4.1   Incoming acceptance

On receipt of the delivery:

1. Check the packaging for damage.
    ↳ Report all damage immediately to the manufacturer.
      Do not install damaged components.

2. Check the scope of delivery using the delivery note.

3. Compare the data on the nameplate with the order specifications on the delivery note.

4. Check the technical documentation and all other necessary documents, e.g. certificates, to ensure they are complete.

If one of the conditions is not satisfied, contact the manufacturer.

4.2   Product identification

4.2.1   Nameplate

The nameplate provides you with the following information on your device:
• Manufacturer identification
• Order code
• Serial number
• Ambient and process conditions
• Input and output values
• Safety information and warnings

▶ Compare the information on the nameplate with the order.

4.2.2   Identifying the product

Product page

www.endress.com/cdc90

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.

4.2.3   Manufacturer address

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

4.3   Scope of delivery

The scope of delivery comprises:

Basic version
- 1 Liquiline Control CDC90 unit in the version ordered
- 1 x Brief Operating Instructions (hard copy)
- USB stick for data transmission and backup, software update
- Gateway (optional, only for Ethernet/IP, PROFIBUS DP, Profinet version)
- Control cabinet key for pneumatic control unit
- Ethernet cable
- Spacer sleeves for wall mounting

Version with single channel
- 2 hose packs for compressed air and liquid
- 1 rinsing block with bracket for mounting
- 2x hose connectors G 1/4" to 6/8 mm hose (ID/OD) for rinse connectors of assembly

Version with 2 channels
- 4 hose packs for compressed air and liquid
- 2 rinsing blocks with bracket for mounting
- 4x hose connectors G 1/4" to 6/8 mm hose (ID/OD) for rinse connectors of assembly

▶ If you have any queries:

   Please contact your supplier or local sales center.

5   Mounting

5.1   Mounting requirements

The device is designed for wall mounting or for mounting on a suitable structure, e.g. steel beam.

5.1.1   Installation site

Note the following when erecting the device:

1. Make sure that the wall or steel beam has sufficient load-bearing capacity and is fully perpendicular.
2. Protect the device against additional heating (e.g. from heaters).
3. Protect the device against mechanical vibrations.

5.1.2   Dimensions

CDC90 panel
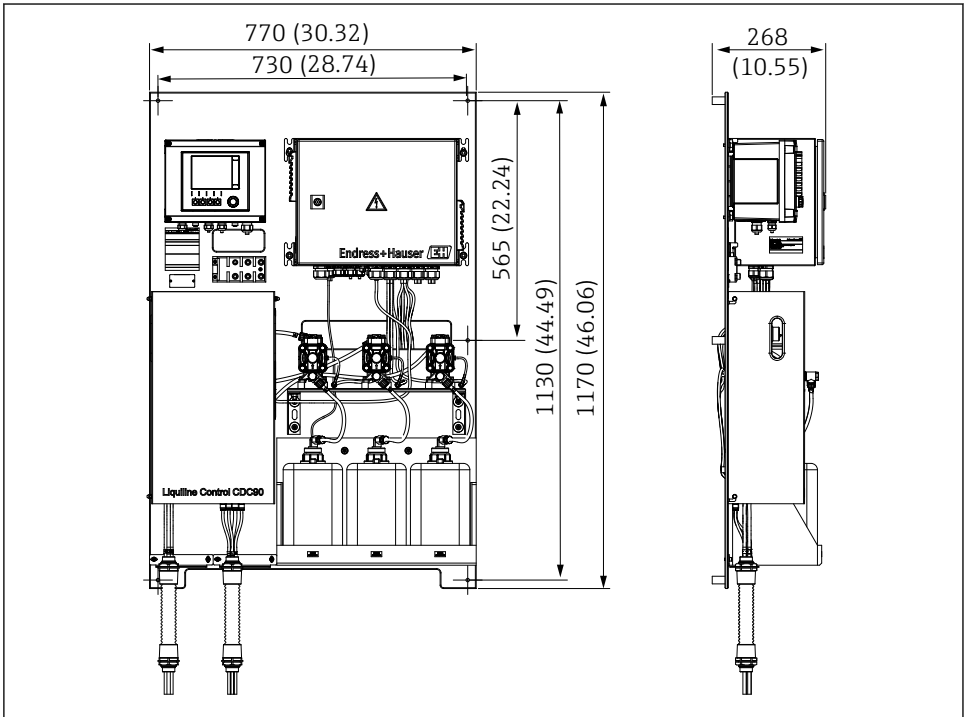
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🔲 *8   Panel dimensions. Unit of measurement mm (in)*
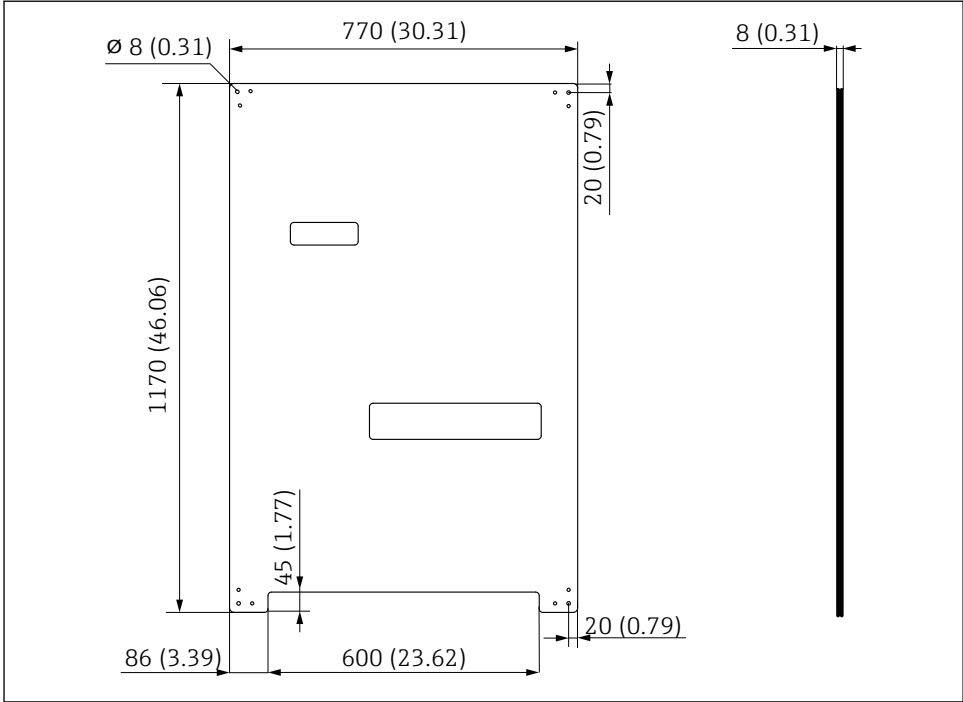
⊞ 9   Dimensions of mounting plate. Unit of measurement mm (in)

Rinsing block
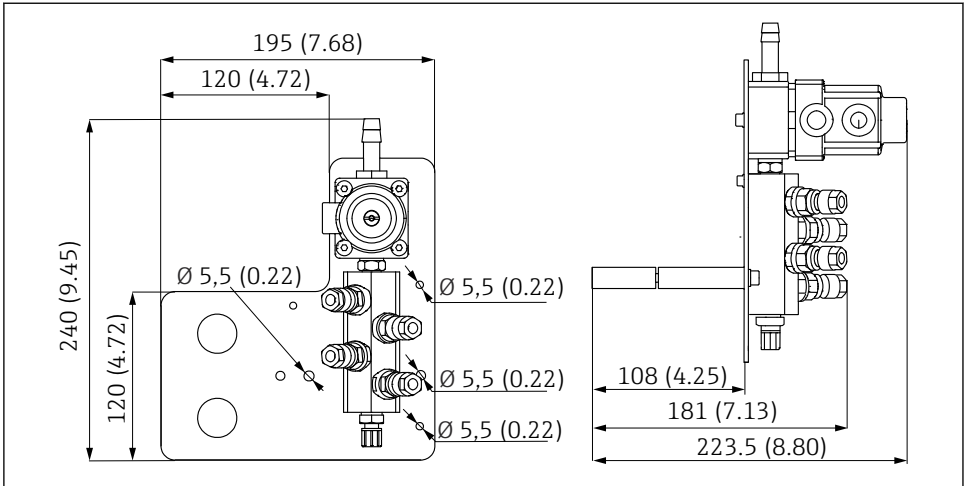
⊡ *10   Dimensions of PVDF rinsing block. Unit of measurement mm (in)*

Gateway (optional)

43.4 (1.71)

113.7 (4.47)

124.5 (4.90)

129.7 (5.11)
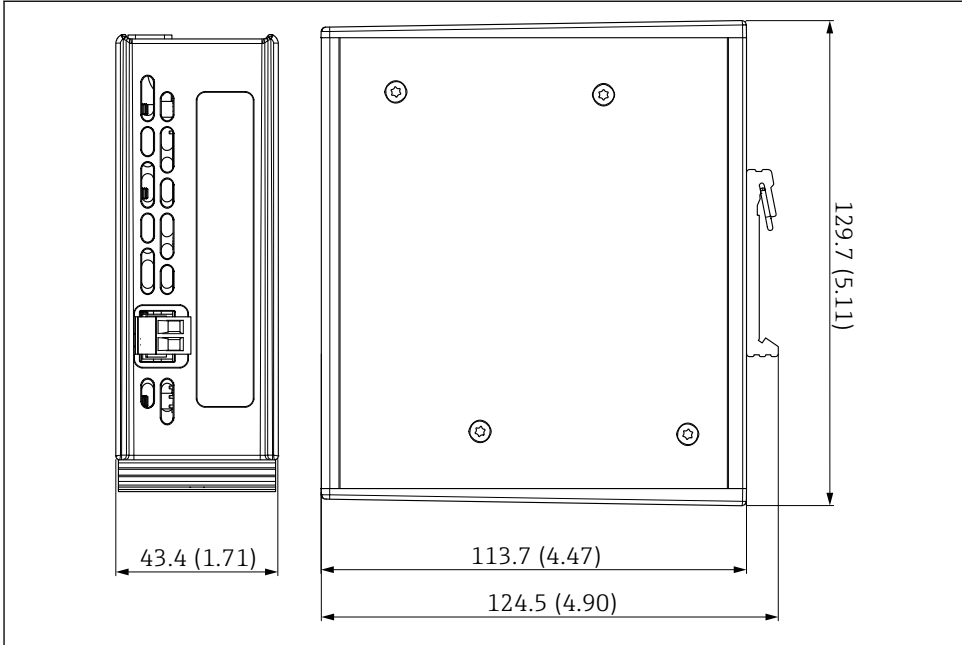
A0056038

⊠ *11   Gateway dimensions. Unit of measurement mm (in)*

5.2   Mounting the system

5.2.1   Mounting the panel on the wall or steel beam

⚠ CAUTION

Risk of injury

The weight of the unit may result in crush injuries or other injuries.

▸ Mount the device in pairs.

▸ Use a suitable mounting tool.

ℹ️ The assemblies are pre-assembled on a mounting plate and pre-wired.

Distance sleeves (30 mm (1.2 in) distance) are included in the scope of delivery to secure the mounting plate on the wall.
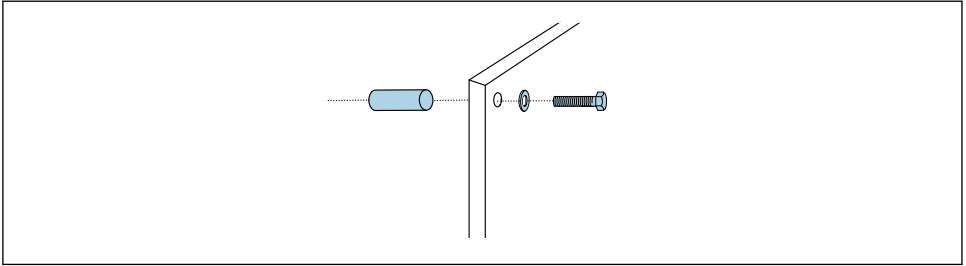
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🖾 *12   Wall mounting*

The mounting plate features drill holes for the bracket on the wall. The wall plugs and screws must be provided by the customer.

▶ Mount the mounting plate at the securing holes provided for this purpose and using the enclosed distance sleeves.

5.2.2   Connection of multihoses to the panel

Depending on the order code, the multihoses are pre-mounted on the bracket on delivery. The bracket with multihoses still need to be screwed onto the mounting plate.

1. Using the screws provided, secure the bracket of the multihoses to the mounting plate to a torque of 3 Nm. Threaded holes are provided on the mounting plate.

2. Mount the bracket with multihoses M3 and M4 first for better positioning.
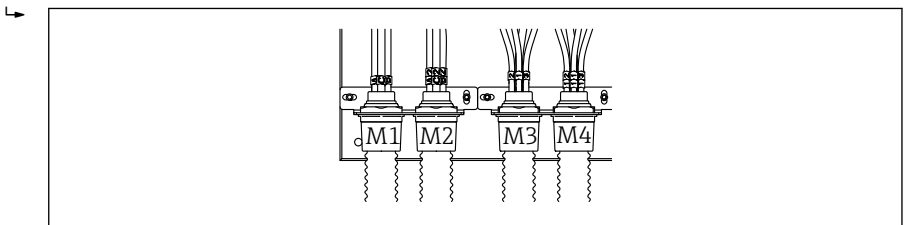
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Depending on the configuration (single-channel/two-channel), the individual hoses on the system are connected at the factory:

Multihose	Function	Hose name Single-channel/two-channel	Panel terminal name Single-channel/two-channel
M1/M3 (compressed air hose)	Compressed air control for assembly, measure position	1/11	1/11
	Compressed air control for assembly, service position	2/12	2/12

Multihose	Function	Hose name Single-channel/two-channel	Panel terminal name Single-channel/two-channel
	Compressed air control for water valve on rinsing block	3/13	3/13
	Compressed air control for purge air on rinsing block (check valve)	4/14	4/14
M2/M4 (liquid hose)	Pump A/canister A (left)	A/A2	A/A2
	Pump B/canister B (middle)	B/B2	B/B2
	Pump C/canister C (right)	C/C2	C/C2

Maximum multihose length

ℹ️ The maximum length of the multihose is 10 m (32.8 ft).

Shortening the multihoses

The hoses in the multihose must be altered depending on the distance.

> **NOTICE**

The individual hoses cannot be assigned.

▶ Do not remove the hose markings.

1. Unscrew the coupling from the corrugated hose and pull the corrugated hose to the back.
   ↳ The plug releases itself from the coupling of the corrugated hose when the coupling is pulled back.
2. Shorten the corrugated hose to the desired length using a hose cutter.
3. Guide the coupling of the corrugated hose over the corrugated hose and screw into place.
4. Then push the plug back into the coupling of the corrugated hose and press it firmly into the coupling.
5. If the individual media/air hoses are to be adapted, they can now be shortened and connected.

5.2.3   Securing the rinsing block to the assembly or pipe

> ⚠️ **CAUTION**

Risk of injury
Crush injuries or other injuries may occur.
▶ Use a suitable mounting tool, e.g. an Allen key.

> **NOTICE**

The rinsing block runs dry.
If the rinsing block is mounted below the canisters, the valves of the rinsing block open due to the pressure of the liquid and the canisters drain uncontrolled.
▸ Always mount the rinsing block and the assembly above the canisters.
▸ Keep the distance between the rinsing block and retractable assembly and the length of the connecting hose from the rinsing block to the assembly as short as possible to minimize media consumption.

Rinsing block bracket on assembly
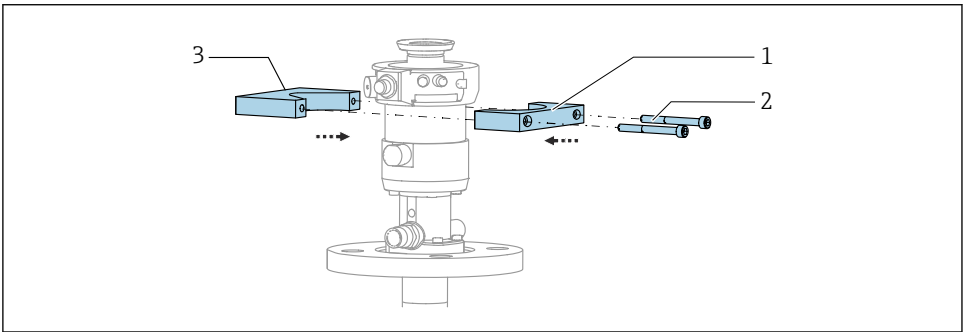
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⊞ *13   Mounting the rinsing block bracket*

1. Fit one half of the rinsing block bracket (1) on the assembly cylinder.
2. Fit the counterpart (3) on the assembly cylinder from the other side.
3. Connect the rinsing block bracket using the screws (2) provided.
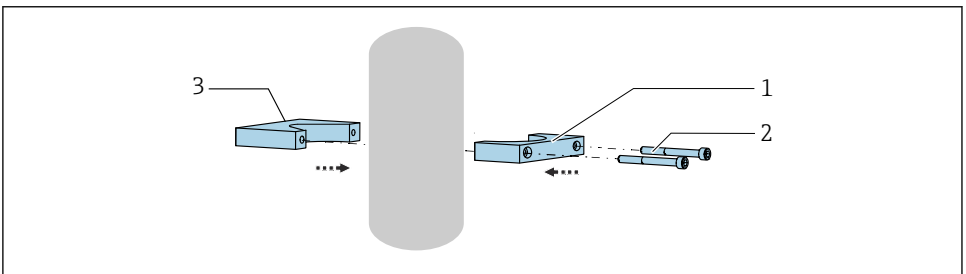
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Alternatively, the rinsing block can also be mounted on a pipe. The outer diameter of the pipe must be at least 60.3 mm (2.38 in) and max. 80 mm (3.15 in).

1. Fit one half of the rinsing block bracket (1) on the pipe.
2. Fit the counterpart (3) on the pipe from the other side.
3. Connect the rinsing block bracket using the screws (2) provided.

Rinsing block on rinsing block bracket
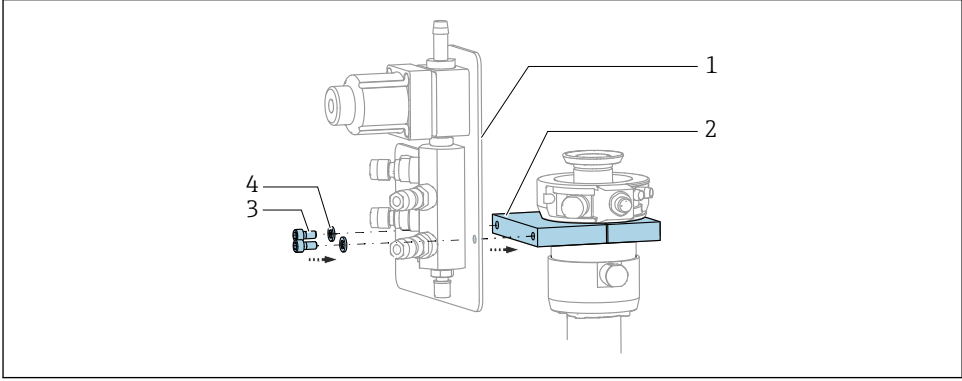
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▶ Secure the rinsing block panel (1) to the rinsing block bracket (2) using the screws (3) and washers (4) provided.

5.2.4 Connect compressed air and media to the rinsing block

Depending on the configuration, a distinction is made between one and two-channel devices and is indicated with a "/ ".

Securing the M1/M3 multihose to the rinsing block bracket
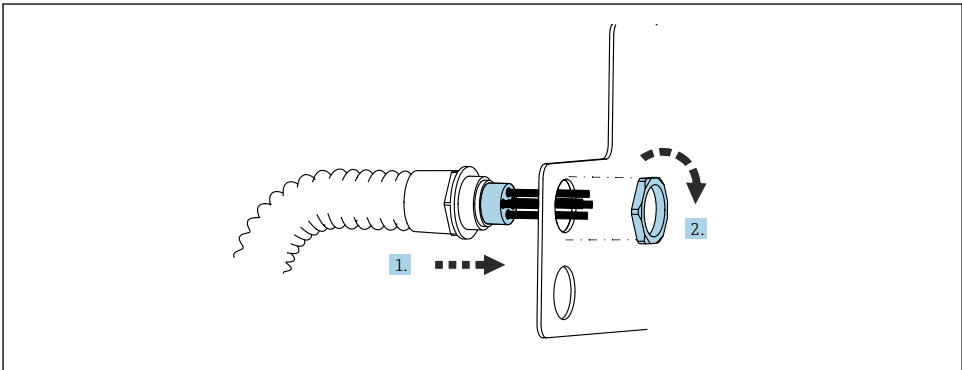
A0032731

1. Guide the hoses through the opening on the rinsing block plate.
2. Use the counterpart to secure the cable gland.

Assigning individual hoses from the M1/M3 multihose to the rinsing block
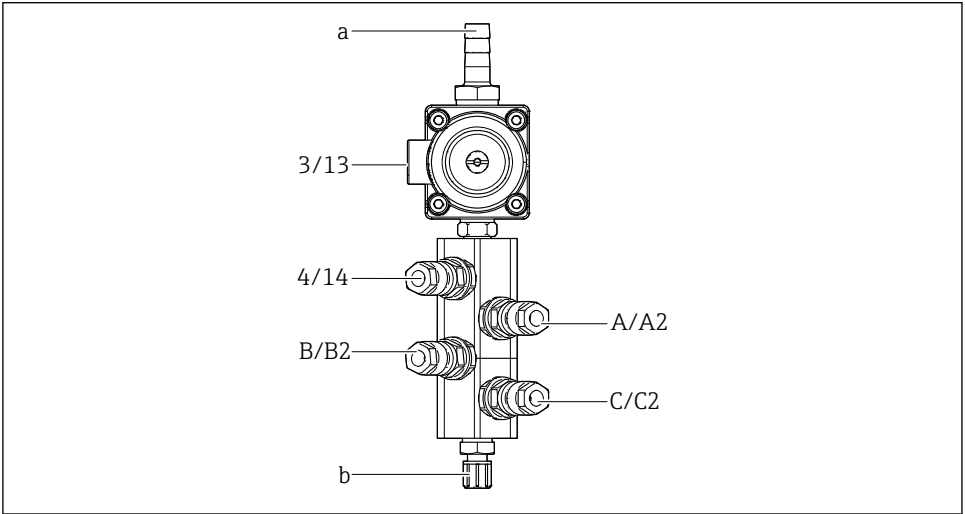
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⊠ *14   Rinsing block, labeling depending on system configuration*

a   Water connection
b   Rinse connection outlet to assembly

▶ Connect the individual hoses on the system as follows:

Multihose	Function	Hose name Single-channel/two-channel	Rinsing block position Single-channel/two-channel
M1/M3 (compressed air hose)	Compressed air control for water valve on rinsing block	3/13	3/13
	Purge air on rinsing block	4/14	4/14
M2/M4 (liquid hose)	Pump A/canister A (left)	A/A2	A/A2
	Pump B/canister B (middle)	B/B2	B/B2
	Pump C/canister C (right)	C/C2	C/C2

Connecting the individual hoses
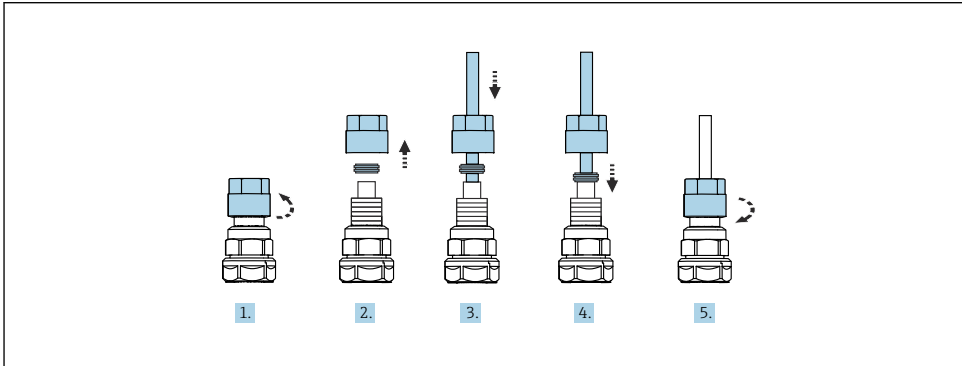
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1. Unscrew the union nut of the valve.

2. Remove the union nut and the clamping ring located underneath it.

3. Guide the hose through the union nut and the clamping ring into the valve.

4. Using the clamping ring, secure the hose to the valve by pressing lightly on it.

5. Screw the union nut back onto the valve.
   ↳ The hose is now firmly positioned in the valve.

5.2.5 Connecting the rinse water to the rinsing block

⚠ CAUTION

Excessive water temperatures will damage the rinsing hoses.
Risk of injury due to water vapor discharge.
▶ Ensure that the water temperature does not exceed 60 ℃ (140 ℉).

When connecting the water, pay attention to the following:
- The rinse water pipe is to be provided by the customer.
- The water pressure must be 3 to 6 bar (44 to 87 psi).
- The internal diameter of the rinse water hose must be 12 mm (0.47 in); interface to rinsing block: hose connector = d12 mm (0.47 in).
- If using an assembly with sealing water function, the sealing water pressure must be greater than the process pressure. The sealing water function is described in the Operating Instructions of the relevant assembly.

ℹ Pay attention to the quality of the rinse water. Particles larger than 100 μm must be filtered using a water filter.

Two G1/4" adapters to a 6/8 mm hose are enclosed to adapt the rinse connections of the assembly. The assembly must have G 1/4" rinse connections.
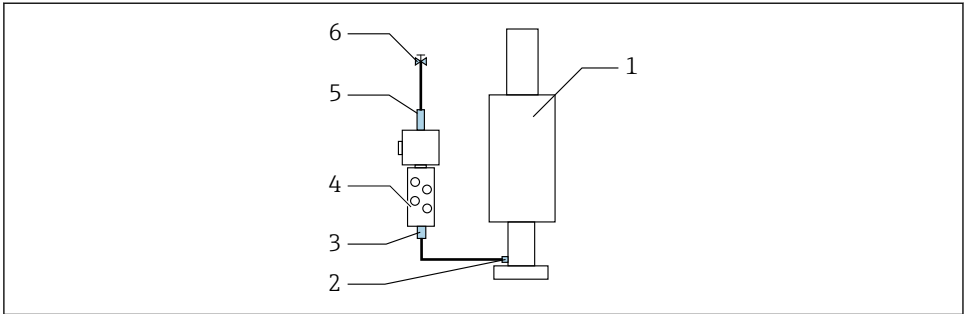
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⊡ *15   Rinsing block with one assembly*

1. Rinse the pipe thoroughly.

2. Connect the rinse water (6) to the water connection (5) of the rinsing block (4). The hose must be secured on site using state-of-the-art methods, e.g. by using a hose clamp.

3. Connect the rinse chamber connection (3) on the rinsing block to the rinse connection (2) of the assembly (1).

5.2.6   Connecting the compressed air to the assembly

Depending on the configuration, a distinction is made between a single-channel and two-channel device and is indicated with a "/ ".

Connecting the individual hoses from the M2/M4 multihose to the assembly
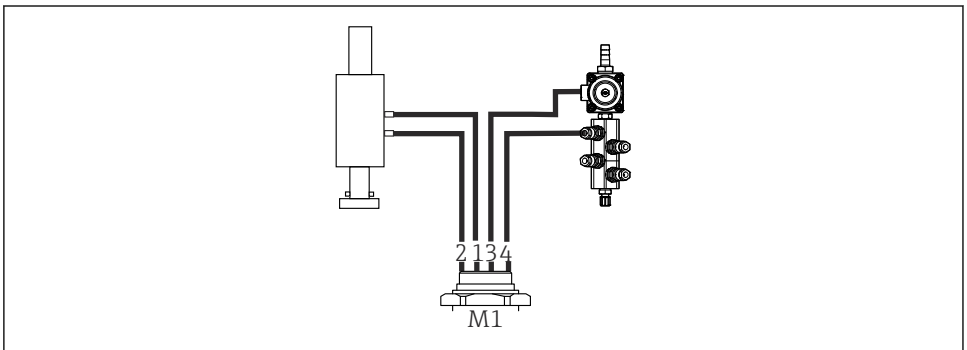
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⊡ *16   M1 connections on assembly and rinsing block, example with single-channel device*

1. Connect hose 1/11 to the connection for moving the assembly in the measure position.

2. Connect hose 2/12 to the connection for moving the assembly in the service position.

3. Connect hose 3/13 to the compressed air control unit for the water valve of the rinsing block.

4. Connect the hose 4/14 to the connection for the purge air on the rinsing block.

Connecting the assembly for CPA87x and CPA472D assemblies

▶ Connect the hoses as follows:

Hose number:	Connection on assembly:
CPA87x	
Hose 1/11	I, measure position
Hose 2/12	O, service position
CPA472D	
Hose 1/11	Upper connection
Hose 2/12	Lower connection

Connecting assembly CPA473/474
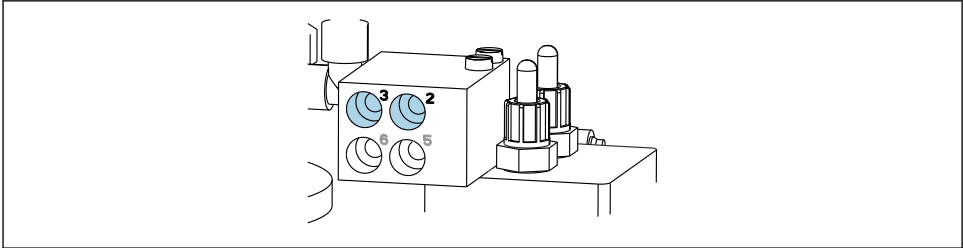
A0033220

▶ Connect the hoses as follows:

Hose number:	Connection on assembly:
Hose 1/11	2 on block, measuring
Hose 2/12	3 on block, service

5.2.7   Connecting compressed air supply

Compressed air supply

When connecting, pay attention to the following:
- Hose specifications according to the technical data
- The compressed air line is to be provided by the customer.
- The compressed air is 4 to 6 bar (58 to 87 psi).
- The optimum operating air pressure is 6 bar (87 psi).
- The air must be filtered (maximum pore size 50 μm) and free from oil and condensate.
- The internal diameter must not exceed 6 mm (0.24 in).
- The outer diameter must not exceed 8 mm (0.31 in).

Connection in the pneumatic control unit

ℹ️ The hose system for the internal compressed air supply in the pneumatic control unit is already connected at the factory.

1.
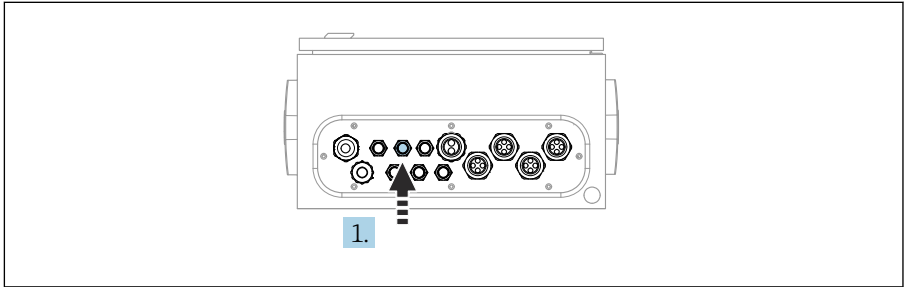
A0033429

Guide the hose for the external compressed air supply into the cable gland provided on the pneumatic control unit.

2.
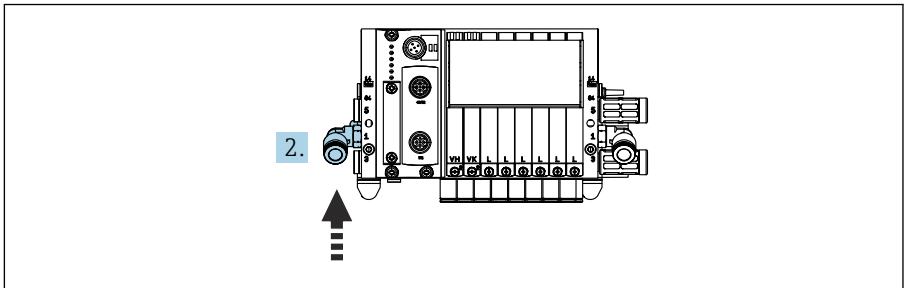
A0033430

Connect the hose for the compressed air supply to the supply for the pilot valve manifold.

5.3 Mounting the gateway (optional)

The optional gateway is supplied when the following digital communication types are ordered:
- Ethernet/IP
- PROFIBUS DP
- Profinet

The gateway has to be installed on site by customer.

▶ Mount the gateway on a TS 35/7.5 mounting rail. See the manufacturer's documentation.

5.4 Post-mounting check

1. Following the installation, check all devices for damage.

2. Verify that the specified installation clearances have been observed.

3. Ensure that the temperature limits are observed at the mounting location.

4. Verify that all hoses are securely mounted and leak-tight.

5. Verify that all multihoses are positioned in such a way that they are protected.

6   Electrical connection

6.1   Connecting requirements

⚠ WARNING

Device is live!

Incorrect connection may result in injury or death!

▶ The electrical connection may be performed only by an electrical technician.

▶ The electrical technician must have read and understood these Operating Instructions and must follow the instructions contained therein.

▶ **Prior** to commencing connection work, ensure that no voltage is present on any cable.

NOTICE

The device does not have a power switch

▶ A fuse with a maximum rating of 16 A must be provided by the customer. Observe the local regulations for installation.

▶ The circuit breaker must be a switch or power switch, and must be labeled as the circuit breaker for the device.

▶ The protective ground connection must be established before all other connections. Danger may arise if the protective ground is disconnected.

▶ The circuit breaker must be located near the device.

1. Ensure a sufficient connection to the building's protective conductor system of at least 0.75 mm² (0.029 in²).

2. Ensure the mechanical loading capacity of the feed cables complies with the conditions at the place of installation.

Only the mechanical and electrical connections which are described in these instructions, and which are necessary for the required intended use, may be established on the device delivered.

▶ Exercise care when carrying out the work.

Supply voltage:
100 to 230 V AC
Fluctuations in the line voltage may not exceed ± 10 %.

6.2   Setting up the CDC90 control unit

6.2.1   Overview of CDC90 control unit

Modules:
- Slot 1: base module BASE2-E (contains 2 sensor inputs, 2 current outputs)
- Slot 2 and 3: empty
- Slot 4: 2AI module (2 current inputs)
- Slot 5 and 6: 2x DIO module
- Slot 7: optional: module 4AO (4 current outputs)

6.2.2   Opening the CDC90 control unit

NOTICE

Pointed or sharp tools
The use of unsuitable tools can cause scratches on the housing or damage to the seal, and therefore negatively affect the leak-tightness of the housing!
▶ Do not use any sharp or pointed objects, e.g. a knife, to open the housing.
▶ Only use a PH2 Phillips screwdriver.

1.
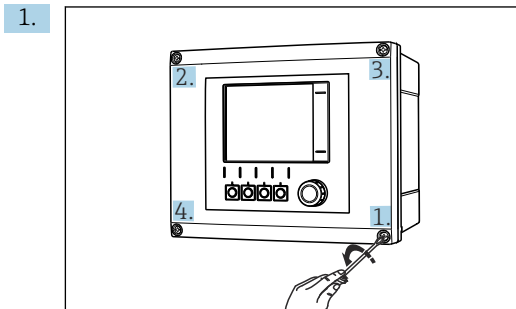
Loosen the housing screws crosswise with a PH2 Phillips head screwdriver.

2.
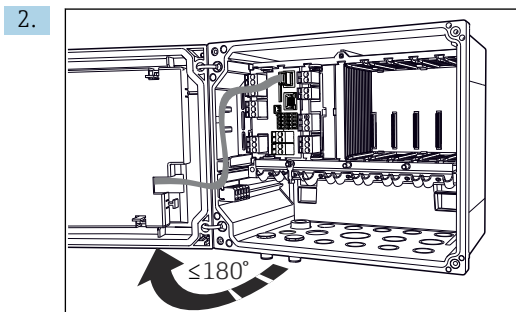
Open the display cover, max. opening angle 180˚ (depends on installation position).

3. To close the housing: tighten the screws in a similar step-by-step, crosswise sequence.

6.2.3   Connecting the cable shield

The device cables must be shielded cables.

Only use terminated original cables where possible.

Clamping range of cable clamps: 4 to 11 mm (0.16 to 0.43 in)

Sample cable (does not necessarily correspond to the original cable supplied)
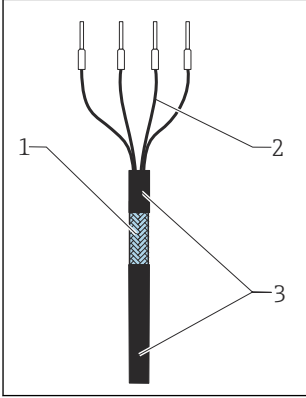
🔲 *17   Terminated cable*

1   Outer shield (exposed)
2   Cable cores with ferrules
3   Cable sheath (insulation)
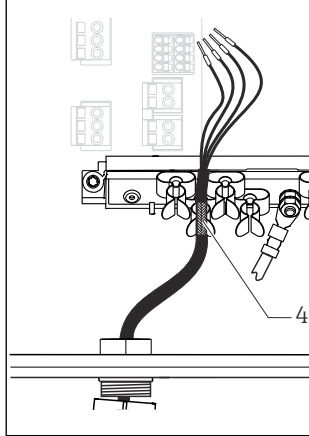
🔲 *18   Connect the cable to the grounding clamp*

4   Grounding clamp
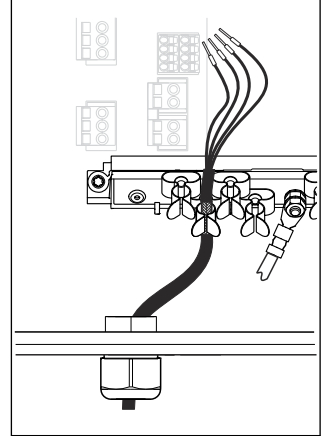
🔲 *19   Press the cable into the grounding clamp*

The cable shield is grounded by the grounding clip

1. Loosen a suitable cable gland at the bottom of the housing.
2. Remove the dummy plug.
3. Attach the gland to the cable end, making sure the gland is facing the right direction.
4. Pull the cable through the gland and into the housing.
5. Route the cable in the housing in such a way that the **exposed** cable shield fits into one of the cable clamps and the cable cores can be easily routed as far as the connection plug on the electronics module.
6. Connect the cable to the cable clamp.
7. Clamp the cable.
8. Connect cable cores as per the wiring diagram.
9. Tighten the cable gland from outside.

6.2.4   Cable terminals

Plug-in terminals for Memosens connections
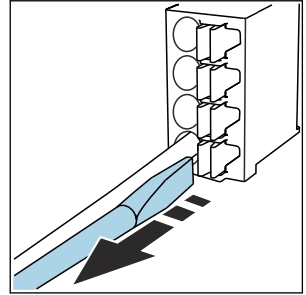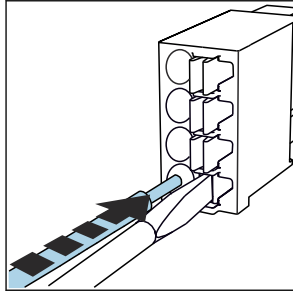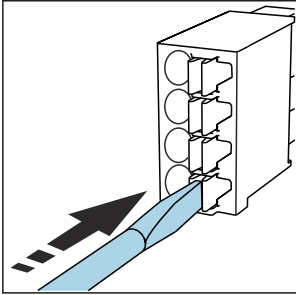
▸ Press the screwdriver against the clip (opens the terminal).

▸ Insert the cable until the limit stop.

▸ Remove the screwdriver (closes the terminal).

▸ After connection, make sure that every cable end is securely in place. Terminated cable ends, in particular, tend to come loose easily if they have not been correctly inserted as far as the limit stop.

All other plug-in terminals
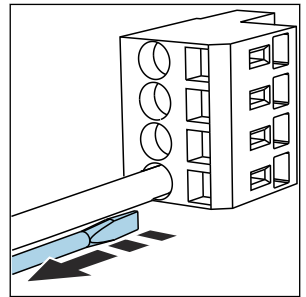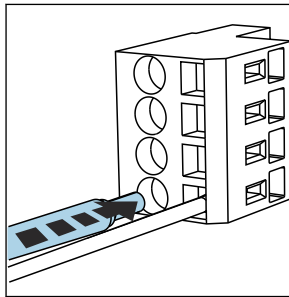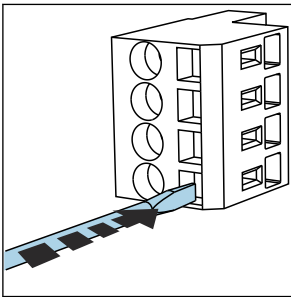
▸ Press the screwdriver against the clip (opens the terminal).

▸ Insert the cable until the limit stop.

▸ Remove the screwdriver (closes the terminal).

6.3 Connecting the sensors

6.3.1 Sensor types

Sensors with Memosens protocol

Sensor types	Sensor cable	Sensors
Digital sensors **without** additional internal power supply	With plug-in connection and inductive signal transmission	• pH sensors • ORP sensors • Combined pH/ORP sensors
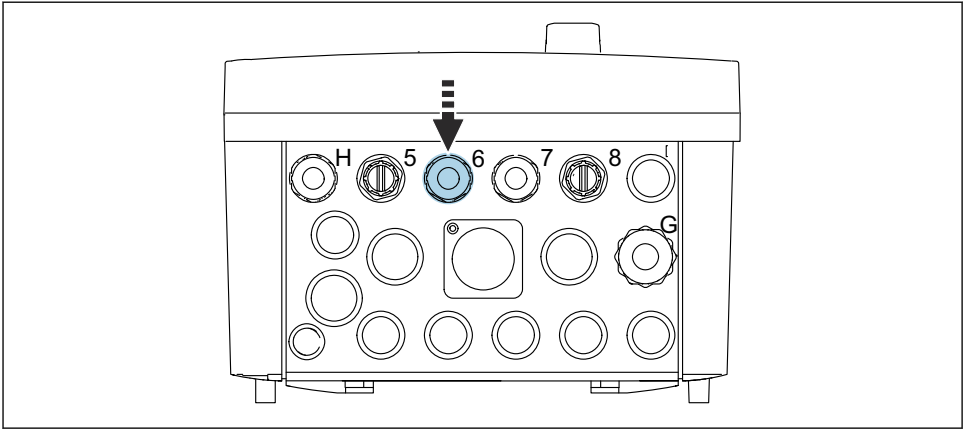
A0033455

▶ Guide the sensor cable of the 1st measuring point through cable gland "6" provided.

ℹ️ Cable gland "7" is provided for the sensor of the 2nd measuring point.

Connecting the sensor cable

▶ Sensor cable connected directly
Connect the sensor cable to the terminal connector of the BASE2-E module.
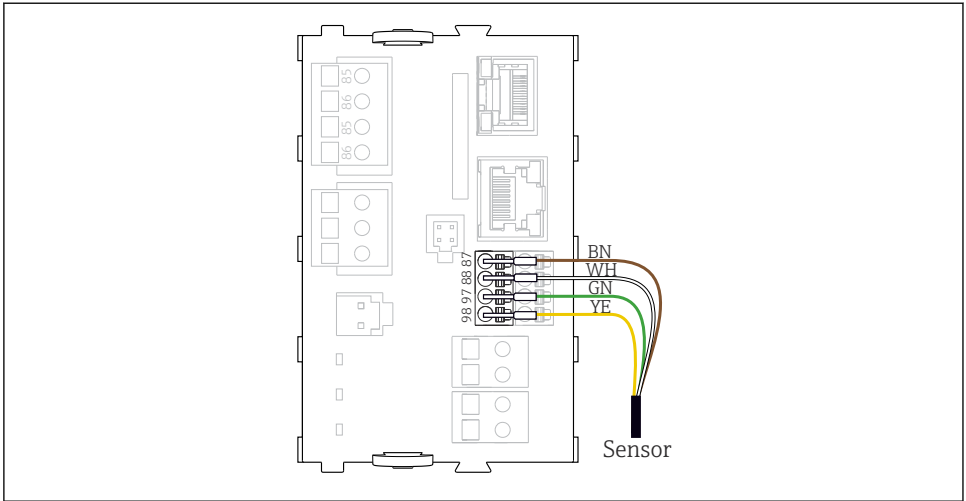
A0039629

⊞ *20   Direct connection of sensors without additional supply voltage*

6.4   Connecting the communication

The following communication options are available in the CDC90 control unit:
- Analog current inputs and outputs
  - Activation is via the analog current input (AI).
  - Signal feedback is via the analog current output (AO).
  - The settings can be made via the web server of the transmitter (default IP address 192.168.0.4) or local display.
- Modbus TCP (server). For the connection between Modbus TCP and the device. The following protocols from the process control system are enabled with a preconfigured gateway.
  - PROFIBUS DP (slave)
  - Ethernet/IP
  - PROFINET (device)
- Digital communication

6.5   Connecting analog communication

⚠ WARNING

Module not covered

No shock protection. Danger of electric shock!

▶ Only the 4AO module can be retrofitted at slot 7. Other hardware must not be modified.

1. If additional shields are required, connect them with PE centrally in the control cabinet via terminal blocks supplied by the customer.

2. Follow the connection of the terminals here:

Connection of analog communication

For analog communication, attach the signal line to the following connections:
- The analog output 1:2 on the BASE2-E module is used for communication with the CDC90.
- The analog input 4:2 (2AI module) is used for communication with the CDC90.

A0044848
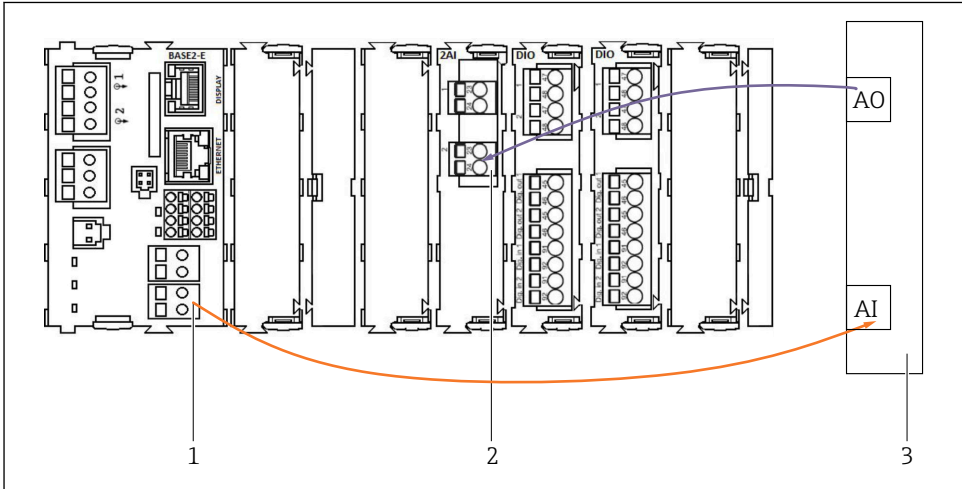
1   Analog output in BASE2-E
2   Analog input 2AI
3   Process control system, PCS

Status signals

Transmission of the status signals from the measuring point to the control system:
- 2. Output to transmit the status signals from the measuring point to the control system
- Optional: additional 4AO module for measured values.

Module BASE2-E, 2AO
A0045051
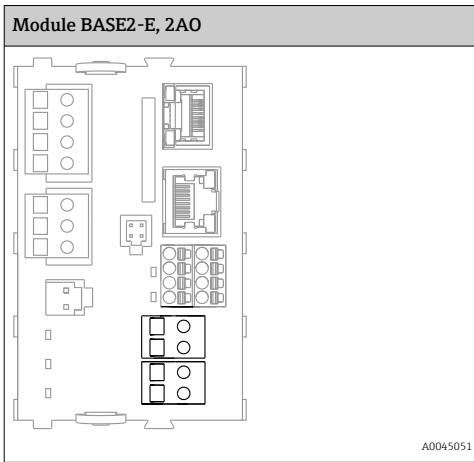
Measured value transmission

Measured values are transmitted from the measuring point to the control system via the optional analog current output module. The analog outputs are configured via the CDC90 control unit. To do this, either access the internal control module via the web server (BA01225C) or using an optionally available external display.

4AO (optional)	
⊡ 21 *Module*	⊡ 22 *Wiring diagram*
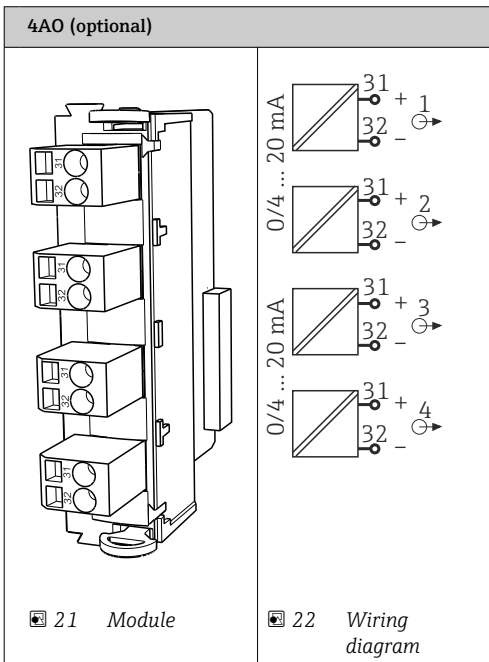
6.6 Connecting fieldbus communication

Modbus TCP connection to Ethernet switch

A gateway is not required for Modbus communication.

1. To connect to the CDC90, connect the Ethernet cable to the Ethernet switch at port 5.
2. Connect the end piece to the process control system.

Assignment of Ethernet cable

RJ45	Stand. cable		Ind. cable	M12
1	Orange	TxD-	Orange	3
2	Amber/White	TxD+	Yellow	1
3	Green	RxD-	Blue	4
4	Green/White	RxD+	White	2

Assignment of M12 connection

M12		M12
1	Yellow	1
2	White	2
3	Orange	3
4	Blue	4

RJ45 assignment to M12 connection

RJ45		M12
1	Yellow	1
3	White	2
2	Orange	3
6	Blue	4

Connection of PROFINET and PROFIBUS DP via gateway

The gateway must be installed externally. A 3 m (3.28 ft) Ethernet cable is provided. The cable to the process control system must be provided by the customer.
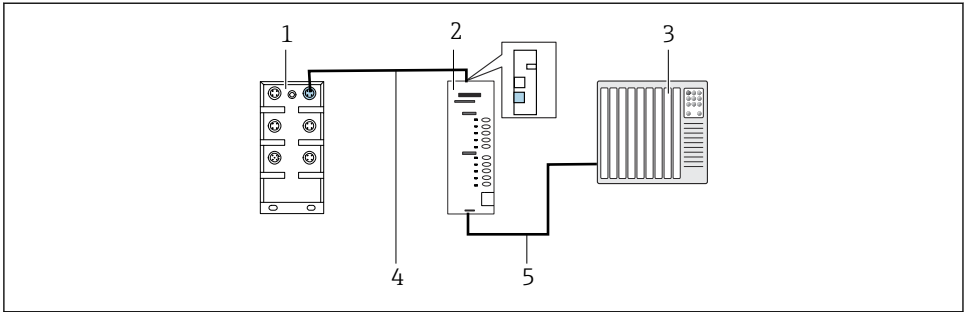
A0044818

⊡ 23   PROFINET and PROFIBUS DP communication connection

1   Ethernet switch on the CDC90
2   Gateway
3   Process control system (PCS)
4   Ethernet cable, CDC90/gateway communication
5   Communication connection, gateway/process control system (PCS)

1. For connection to the CDC90, connect the Ethernet cable (4) at the top of the gateway.

2. Connect the end piece to the Ethernet switch (1) at port 5.

3. To connect to the process control system, connect the communication cable (5) to the bottom of the gateway.

4. Connect the end piece to the process control system (3).

Connection of Ethernet/IP via gateway

The gateway must be installed externally. A 3 m (3.28 ft) Ethernet cable is provided. The cable to the process control system must be provided by the customer.
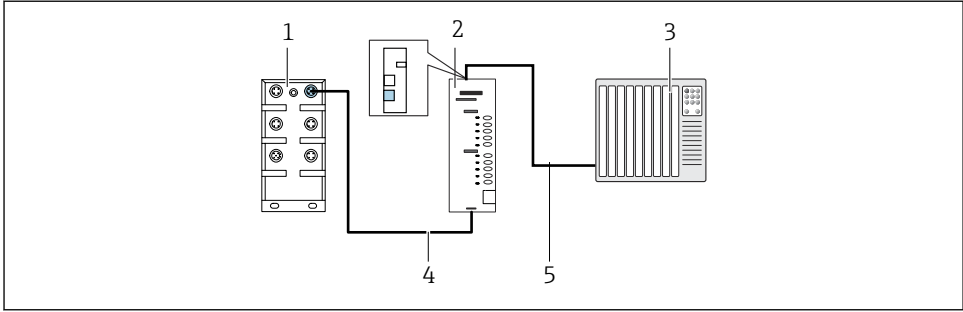
A0044819

⊠ *24   Ethernet/IP communication connection*

1   Ethernet switch on the CDC90
2   Gateway
3   Process control system (PCS)
4   Ethernet cable, CDC90/gateway communication
5   Communication connection, gateway/process control system (PCS)

1. For connection to the CDC90, connect the Ethernet cable (4) at the bottom of the gateway.
2. Connect the end piece to the Ethernet switch (1) at port 5.
3. For connection to the process control system, connect the cable for communication (5) at the top of the gateway.
4. Connect the end piece to the process control system (3).

More detailed information on fieldbus communication is provided on the product pages on the Internet:

- Ethernet/IP (adapter) via Modbus TCP - Ethernet/IP gateway: BA02241C
- Modbus TCP (server): BA02238C
- PROFIBUS DP (slave) via Modbus TCP - PROFIBUS DP gateway. BA02239C
- PROFINET (device) via Modbus TCP - PROFINET gateway: BA02240C

6.7   Connecting digital communication

6.7.1   Connecting additional inputs and outputs

The wiring of external inputs and outputs, such as a flowmeter for example, is carried out on the remote IO/DIO (1) in the pneumatic control unit.

These external inputs and outputs can be evaluated during program configuration and activated or deactivated.

The configuration must be carried out by Endress+Hauser specialist staff.
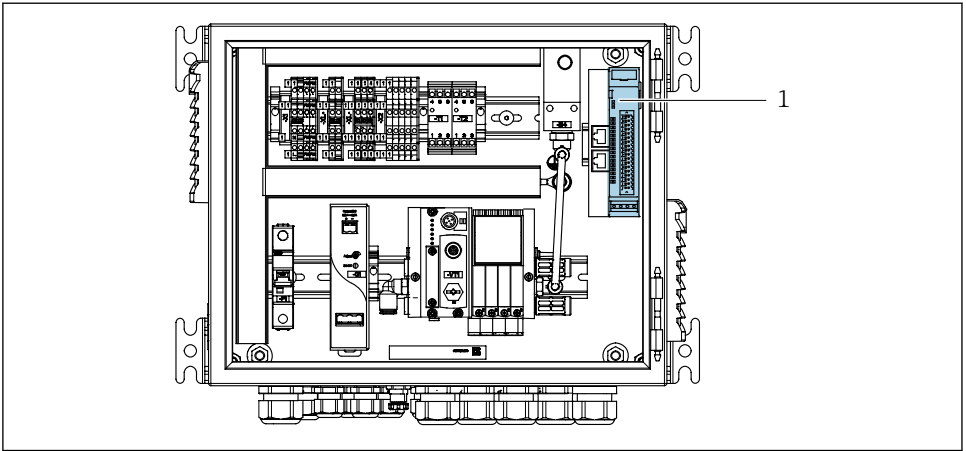
A0055123

⊠ 25   *Remote IO/DIO in the pneumatic control unit*

1   Remote IO/DIO

1. Guide the cables through the cable gland at the bottom of the pneumatic control unit.

2. Wire the cables to the desired terminal on the remote IO/DIO (1). The terminals on the remote IO/DIO are preconfigured as follows:
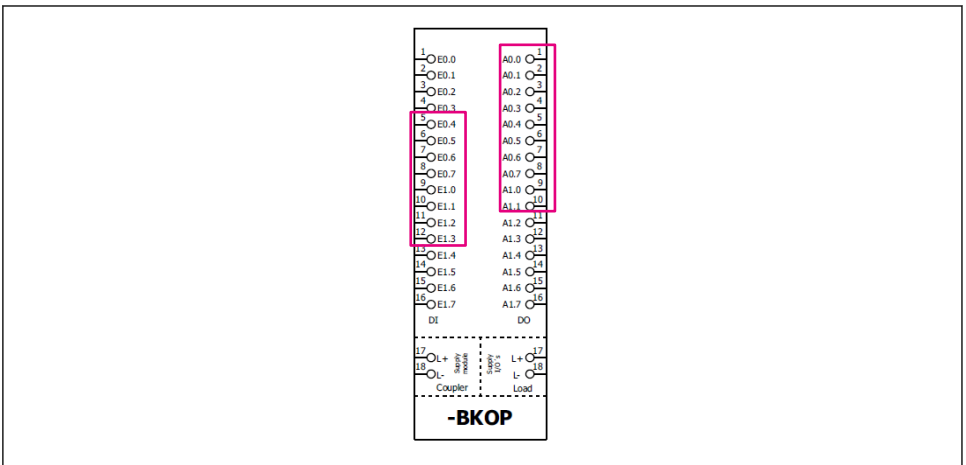
A0055909

⊠ 26   *Free terminals of the remote IO/DIO*

Terminal assignment:

DI	Function	Program
5-12	Can be used freely	
13	Soft key 1	801
14	Soft key 2	802
15	Soft key 3	803
16	Soft key 4	804

DO	Function	Assignment
1-10	Can be used freely	
11	Operating mode	Setting, if DO11 = 0 and DO12 = 0
12		Manual, if DO11= 0 and DO12 = 1 Automatic, if DO11 = 1 and DO12 = 0 Remote access, if DO11 = 1 and DO12 = 1
13	Assembly 1	Service = 0 Measure = 1
14	Assembly 2	Service = 0 Measure = 1
15	Program status	No program = 1 Program running = 0
16	Error status	Alarm = 0 No alarm = 1

6.8 Connecting the position indicators of the assembly

CDC90 is designed for the following assemblies:
• Cleanfit CPA4xx
• Cleanfit CPA871/CPA875

Monitoring of assembly position

The wiring for confirmation of assembly position is carried out in the pneumatic control unit at the output interface terminal (1).
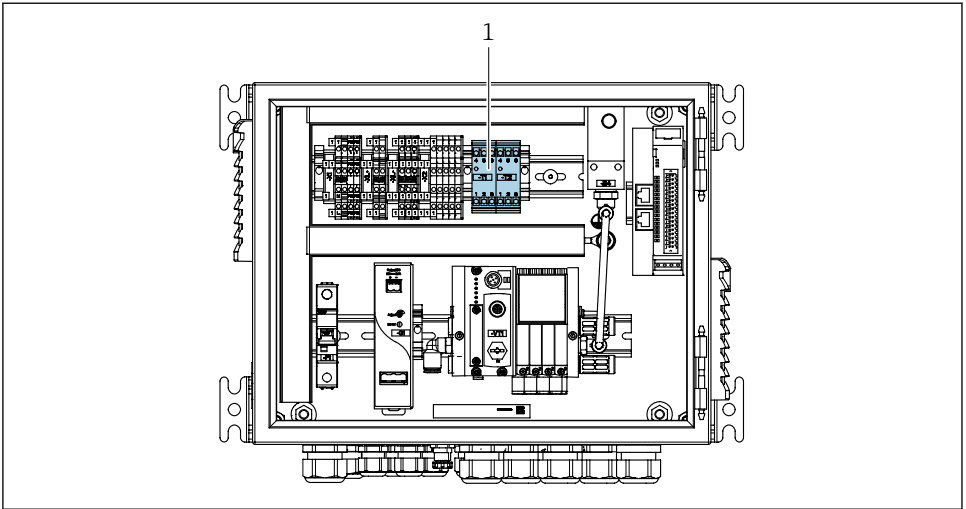
A0055126

⊡ *27   Output interface terminal in the pneumatic control unit*

1   Output interface terminal

6.8.1   Cleanfit CPA472D

Assemblies with pneumatic limit position switches must be converted to electrical limit position switches.

Monitoring of assembly position
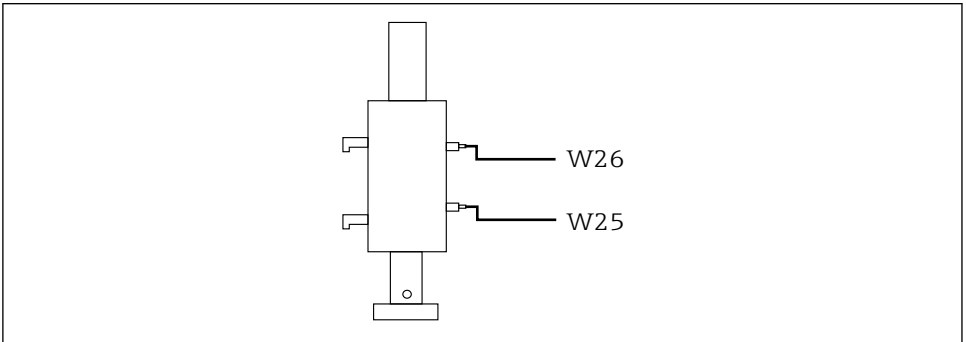
A0032747

⊡ *28   Assembly postion feedback CPA472D*

1.   Guide the cables for confirmation of position through the cable gland at the bottom of the pneumatic control unit.

2.   Wire the cables to the output interface terminal. The terminals at the output interface terminal are preassigned as follows:

The connections on the output interface terminal in the pneumatic control unit for single-channel device

Output interface terminal T1, bottom	Cable wire	Function
Pin 1	W26, BN	Upper limit position switch
Pin 2	W26, BU	Upper limit position switch

Output interface terminal T2, bottom	Cable wire	Function
Pin 1	W25, BN	Lower limit position switch
Pin 2	W25, BU	Lower limit position switch

The connections on the output interface terminal in the pneumatic control unit for 2-channel device

Output interface terminal T3, bottom	Cable wire	Function
Pin 1	W27, BN	Upper limit position switch
Pin 2	W27, BU	Upper limit position switch

Output interface terminal T4, bottom	Cable wire	Function
Pin 1	W28, BN	Lower limit position switch
Pin 2	W28, BU	Lower limit position switch

6.8.2   Cleanfit CPA473/474

Assemblies with pneumatic limit position switches must be converted to electrical limit position switches.

Monitoring of assembly position

A0033325

🖾 *29   Compressed air control CPA473/474*

▶ Attach the connections for confirmation of position in the pneumatic control unit as
  follows:

Connections on the output interface terminal in the pneumatic control unit

Output interface terminal T1, bottom	Limit position switches	Function
Pin 1	Pos 2, BN limit position switch on ball valve	Limit position switch, service feedback signal
Pin 2	Pos 2, BU limit position switch on ball valve	Limit position switch, service feedback signal

Output interface terminal T2, bottom	Cable wire	Function
Pin 1	Pos 1, BN limit position switch on assembly	Limit position switch, measuring feedback signal
Pin 2	Pos 1, BU limit position switch on assembly	Limit position switch, measuring feedback signal

6.8.3   Cleanfit CPA87x

Assembly monitoring
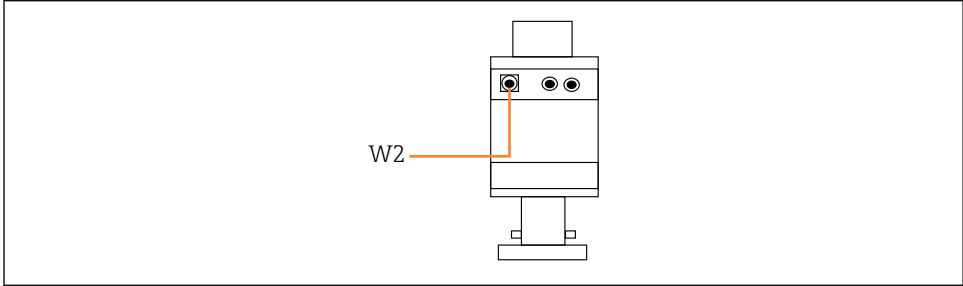
A0032753

⊠ *30   Position feedback signal, CPA87x*

W2   Feedback cable

1.
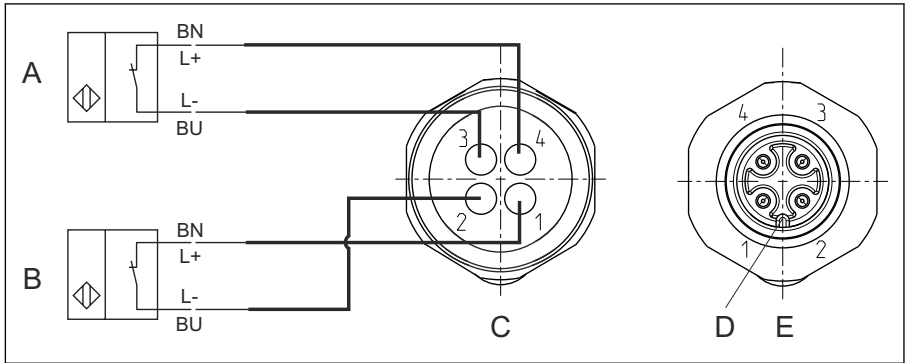
A0017831

A   Limit position switch, service position
B   Limit position switch, measure position
C   Connector, M12, solder side (inside of assembly)
D   Coding
E   Connector, pin side (outside of assembly)
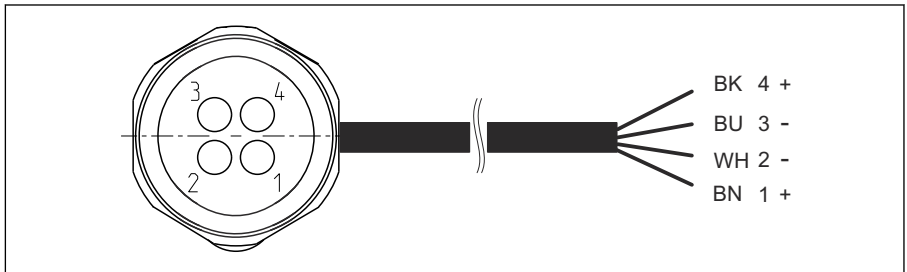
A0022163

⊠ *31   Connecting cable for limit position switch on transmitter, switching amplifier, output*
       interface terminal etc.

1   "Measuring" position
2   "Measuring" position
3   "Service" position
4   "Service" position

Attach the cables to the pins provided, as described in the graphic.

2. Attach the connections for confirmation of position as follows:

The connections on the output interface terminal in the pneumatic control unit for single-channel device

Output interface terminal T1, bottom	Cable wire	Function
Pin 1	W2, BK	Limit position switch, confirmation of position
Pin 2	W2, BU	Limit position switch, confirmation of position

Output interface terminal T2, bottom	Cable wire	Function
Pin 1	W2, BN	Limit position switch, confirmation of position
Pin 2	W2, WH	Limit position switch, confirmation of position

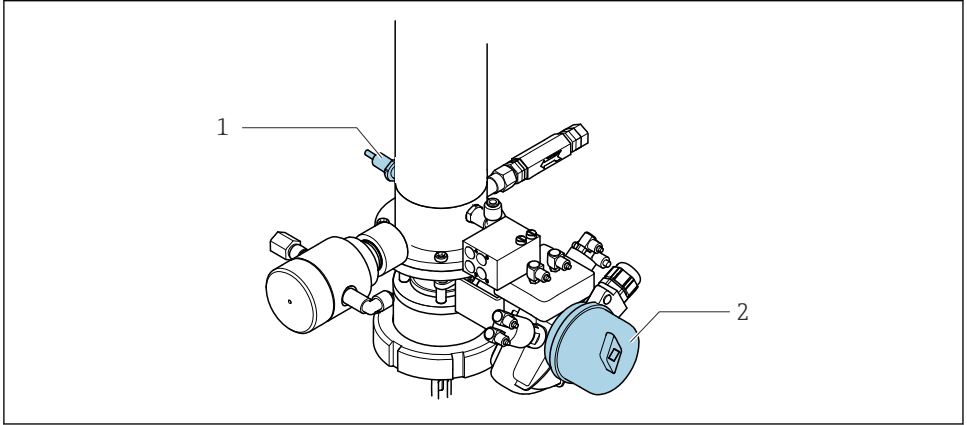*The connections on the output interface terminal in the pneumatic control unit for 2-channel device*

Output interface terminal T3, bottom	Cable wire	Function
Pin 1	W3, BN	Upper limit position switch
Pin 2	W3, BU	Upper limit position switch

Output interface terminal T4, bottom	Cable wire	Function
Pin 1	W28, BN	Lower limit position switch
Pin 2	W28, BU	Lower limit position switch

6.9   Connecting the main supply voltage

The cable for the supply voltage must be provided by the customer on site and is not included in the scope of delivery.

NOTICE

The device does not have a power switch

▸ A fuse with a maximum rating of 16 A must be provided by the customer. Observe the local regulations for installation.

▸ The circuit breaker must be a switch or power switch, and must be labeled as the circuit breaker for the device.

▸ The protective ground connection must be established before all other connections. Danger may arise if the protective ground is disconnected.

▸ The circuit breaker must be located near the device.

Preparing the main supply voltage

1. Ensure an adequate connection to the protective grounding system of the building.

2. Use a ground cable with min. 0.75 mm^2 (corresponding to 18 AWG), not included in the scope of delivery.

Connecting the main supply voltage

1.
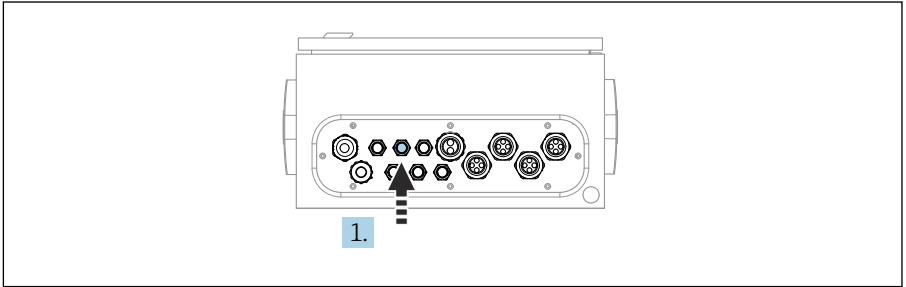
Guide the cable of the main supply voltage through cable gland "3" of the pneumatic control unit.

2.
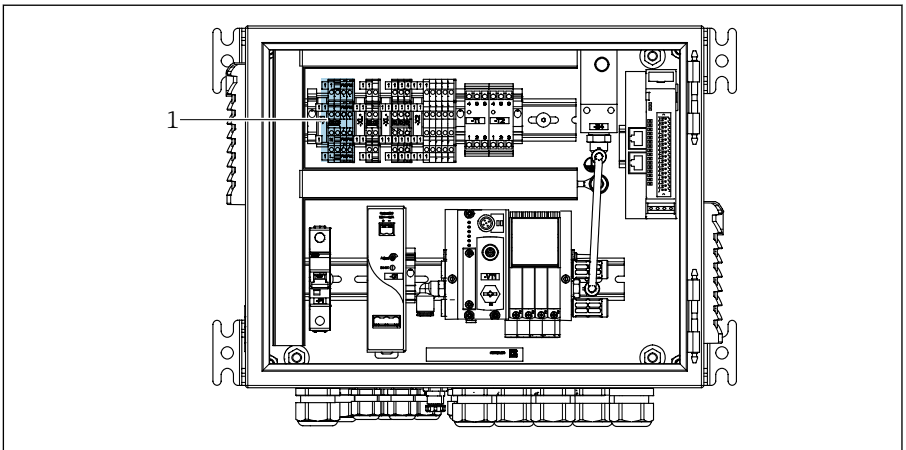
Connect the wires to the actuator terminal (1) as follows:
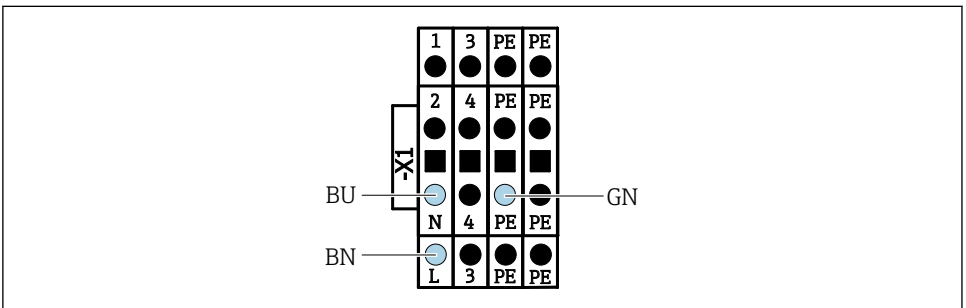
🔲 *32   Terminal diagram of main supply voltage of actuator terminal X1 in the pneumatic control unit*

Terminal X1, bottom	Cable wire
L	L1, BN
PE	PE, GN-YE
N	N, BU

6.10   Connecting the gateway (optional)

Connecting the power supply to the gateway

The power supply to the gateway is provided on site by the customer. See the manufacturer's documentation.

▶ Assign the 2.5mm² 2-pin terminal block for the power supply at the top of the gateway:

Pin	Signal
1	+ 24 VDC
2	Grounding

More detailed information on fieldbus communication is provided on the product pages on the Internet:

- Ethernet/IP (adapter) via Modbus TCP - Ethernet/IP gateway: BA02241C
- Modbus TCP (server): BA02238C
- PROFIBUS DP (slave) via Modbus TCP - PROFIBUS DP gateway. BA02239C
- PROFINET (device) via Modbus TCP - PROFINET gateway: BA02240C

6.11   Ensuring the degree of protection

Only the mechanical and electrical connections which are described in these instructions, and which are necessary for the required intended use, may be established on the device delivered.

▶ Exercise care when carrying out the work.

Individual types of protection permitted for this product (impermeability (IP), electrical safety, EMC interference immunity) can no longer be guaranteed if, for example:
- Covers are left off
- Different power units to the ones supplied are used
- Cable glands are not sufficiently tightened (must be tightened with 2 Nm (1.5 lbf ft) for the permitted level of IP protection)
- Unsuitable cable diameters are used for the cable glands
- Modules are not fully secured
- The display is not fully secured (risk of moisture entering due to inadequate sealing)
- Cables/cable ends are loose or insufficiently tightened
- Conductive cable strands are left in the device

6.12   Post-connection check

⚠ **WARNING**

Connection errors

The safety of people and of the measuring point is at risk! The manufacturer does not accept any responsibility for errors that result from failure to comply with the instructions in this manual.

▶ Put the device into operation only if you can answer **yes** to **all** the following questions.

Device condition and specifications
▶ Are the device and all the cables free from damage on the outside?

Electrical connection
▶ Are the mounted cables strain relieved?
▶ Are the cables routed without loops and cross-overs?
▶ Are the signal cables correctly connected as per the wiring diagram?
▶ Have all the other connections been established correctly?
▶ Are unused connection wires connected to the protective ground connection?
▶ Are all plug-in terminals securely engaged?
▶ Are all the connection wires securely positioned in the cable terminals?
▶ Are all cable entries mounted, tightened and leak-tight?
▶ Does the supply voltage match the voltage indicated on the nameplate?

7   Operation options

7.1   Overview of operation options

7.1.1   Display and operating elements
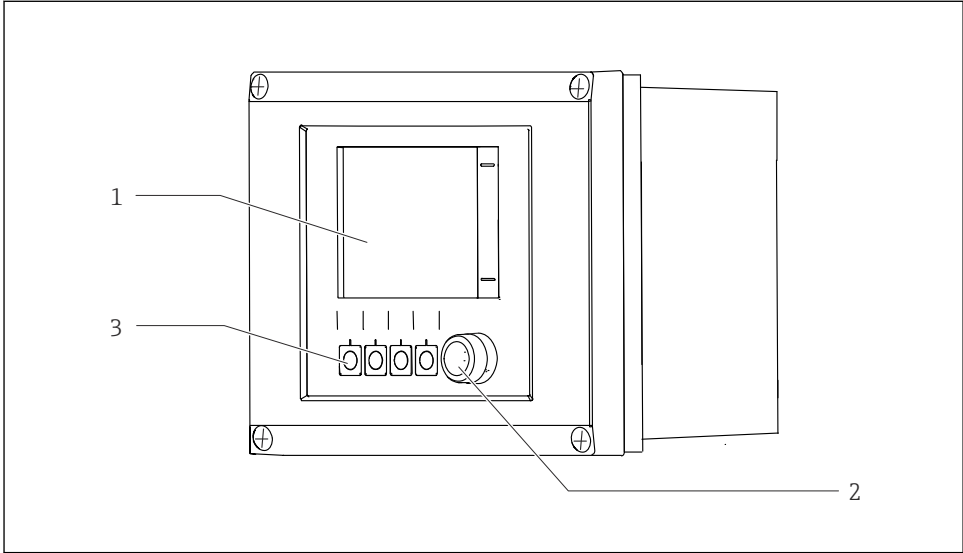
A0031833

⊠ *33   Overview of operation*

1   Touchscreen display
2   Status LED
3   Soft keys (function selectable)

Status according to NAMUR

Category	Description	LED status
NAMUR category F (Failure)	F (Failure): No programs are started until it is fixed. The cause of the malfunction is to be found in the measuring point or in the system.	Status LED continuously red
NAMUR category S (Out of specification)	Outside the specification: The measuring point is operated outside its specification. It is still possible to start programs. However, you run the risk of increased wear, a shorter operating life or lower accuracy levels. The cause of the problem is to be found outside the measuring point.	Red flashing status LED
NAMUR category C (check function)	Function check: Hold function, calibration active	Red flashing status LED

Category	Description	LED status
NAMUR category M (Maintenance required)	Maintenance request: The device still measures correctly. Immediate measures are not necessary. However, proper maintenance efforts would prevent a possible malfunction in the future, e.g. pump service life. The message should be acknowledged so that other programs can be started. After a restart, the M message returns until the counters are set to ZERO.	Green flashing status LED
If there is no diagnostic message (OK)		Continuously green status LED

See the diagnostic list for information on remedial measures for individual categories: .

7.2   Access to operating menu via local display

7.2.1   Operation concept
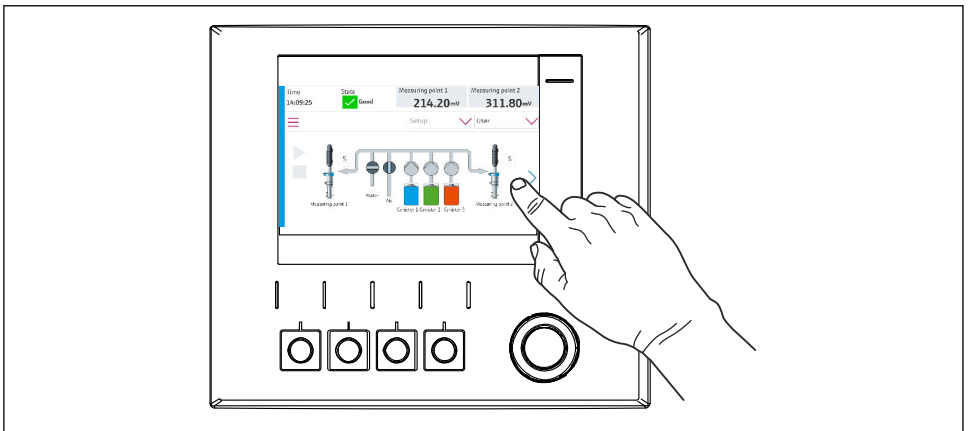
A0033711

⊠ *34   Touchscreen display*

The CDC90 can be operated via a touchscreen display. Soft keys are also available for program operation.

7.2.2   Soft keys

You can start programs with the soft keys. The keys are preset and can be configured. Soft keys only work in the "Manual" operating mode.

7.2.3 Menu overview

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Item	Function
1	Time
2	Display and fast access to the most important error message
3	Navigation to measuring point 1 and display of: • pH sensor: pH value • ORP sensor: ORP value in mV • Combined pH/ORP sensor: pH value
4	For one measuring point: • pH sensor: Temperature in ℃ • ORP sensor: Or ORP value in mV • Combined pH/ORP sensor: Temperature in ℃ For two measuring points: Navigation to measuring point 2 and display of: • pH sensor: pH value • ORP sensor: ORP value in mV • Combined pH/ORP sensor: pH value
5	User profile display and log-in
6	Operating mode
7	Overview of main menu
8	Navigation

Operation is via four main menus:

Menu	Function
Guidance	• Guided operation to schedule and execute programs. • Import and export files and settings.
Diagnostics	Contains information about device operation, diagnostics, troubleshooting and simulation.
Application	Device data for detailed measuring point adjustment. Setting for communication with the distributed control system.
System	These menus contain parameters for configuring and managing the overall system.

7.3   Access to the operating menu via the web server

Web server via control system is only available with the Modbus TCP communication type.

The web server enables full access to the visualization of the CDC90. When the web server is active, on-site visualization at the CDC90 is disabled.

The menu structure of the web server corresponds to on site operation.

8 System integration

8.1 Integrating the measuring instrument in the system

8.1.1 Web server

The web server enables full access to the visualization of the CDC90. When the web server is active, on-site visualization at the CDC90 is disabled.

NOTICE

Data are lost.

▶ Cancel the connection to the web server before restarting the IPC.

Establishing a connection to the web server
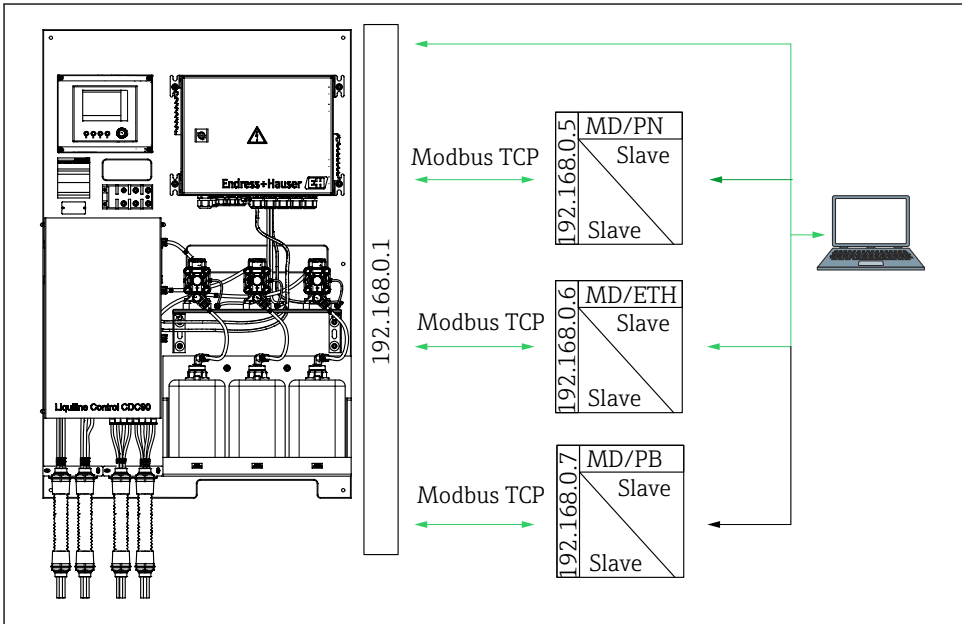
A0055930

MD   Modbus TCP
ETH Ethernet/IP
PN   Profinet
PB   Profibus DP

The web server is only available with the Modbus TCP protocol. If the PROFINET, Ethernet/IP and Profibus DP protocols are used, operation of the web server is not possible.

The IP address of the transmitter's web server must be in the same subnet as the IP address of the CDC90 <IP address +3 >.

Example:

IP address for PC (set as default):	192.168.0.1
IP address, Liquiline:	IP address for the PC + 3 = 192.168.0.**4**

1. Connect the computer's communication cable to the Ethernet interface of the Ethernet switch.
2. Start the PC.
3. Start the Internet browser.
4. If you use a proxy server to connect to the Internet:
   Disable the proxy (browser settings under "Connections/LAN settings").
5. Enter the IP address of your device in the address line. Pay attention to the ending of the address (in the example: 192.168.0.**4**).
   ↳ The system takes a few moments to establish the connection and then the web server starts. You might be asked for a password. The factory setting is "admin" for the user name and "admin" for the password.

Example: Microsoft Windows 10

1. Open Network and Sharing Center.
   ↳ Apart from your standard network, it should also be possible to see an additional Ethernet connection (e.g. as "Unidentified network").
2. Select the link to this Ethernet connection.
3. In the pop-up window select the "Properties" button.
4. Double-click "Internet Protocol Version 4 (TCP/IPv4)".
5. Select "Use the following IP Address".
6. Enter the desired IP address. This address must be in the same subnetwork as the IP address of the device. Example:
   ↳ IP address: 192.168.0.11
   Subnet mask: 255.255.255.0

> If the IP address of the IPC has changed, enter the default IP address:
> *http://:<IP-Adress>8080/cdc90.htm*

8.1.2 Fieldbus systems

NOTICE

The device uses an EtherCat connection for internal communication. Depending on the network load, EtherCAT may cause failures in the CDC90 IPCs if multiple CDC90 devices are integrated in the same network.

▶ To reduce the network load in the case of a Modbus TCP connection, the networks must be separated. Physical separation with a VLAN-enabled switch, e.g. Layer 2 managed switch, or software-based separation is possible.

More detailed information on fieldbus communication is provided on the product pages on the Internet:

- Ethernet/IP (adapter) via Modbus TCP - Ethernet/IP gateway: BA02241C
- Modbus TCP (server): BA02238C
- PROFIBUS DP (slave) via Modbus TCP - PROFIBUS DP gateway. BA02239C
- PROFINET (device) via Modbus TCP - PROFINET gateway: BA02240C

9 Commissioning

9.1 Preliminaries

⚠ WARNING

Incorrect connection, incorrect supply voltage
Safety risks for staff and device malfunctions!

▶ Check that all connections have been established correctly in accordance with the wiring diagram.
▶ Ensure that the supply voltage matches the voltage indicated on the nameplate.

NOTICE

Uncontrolled activation of pumps, valves or similar.
Damage to devices.

▶ Perform the post-installation and function check.
▶ Ensure that all moving parts are correctly mounted.

9.1.1 Filling the canisters

⚠ CAUTION

Moving assembly
Risk of injury

▶ Set the operating mode to configuration before commencing the maintenance work.

⚠ CAUTION

Automatic operation during calibration.
Risk of injury from the movement of the assembly, chemicals or contaminated media.

▸ Before hoses are removed, make sure that no operation is currently running or about to start.
▸ Set the device to the configuration mode.
▸ Wear protective clothing, goggles and gloves or take other suitable measures to protect yourself.
▸ In the case of remote control, set the device to the configuration mode and make sure that no other actions are running.

▸ Fill the canisters as follows from left to right:

Canister (left to right)	Contents
A	Liquid 1 (e.g. cleaner, for version "Cleaning and calibration of pH sensors")
B	Liquid 2 (e.g. buffer 1, for version "Cleaning and calibration of pH sensors")
C	Liquid 3 (e.g. buffer 2, for version "Cleaning and calibration of pH sensors")

> ℹ️ We recommend you replace the buffers every 6 months at the latest. Ensure compliance with the expiration date on the canisters which can be configured in the **System/Operating counter/Canisters and pumps**
> menu. See:

1. Unscrew the float switch.
2. Remove the float switch.
3. Fill the empty canister or replace it with a full one. Use a funnel when filling the canister.
4. Screw the float switch into the canister.

9.2   Post-installation and function check

Put the device into operation only if you can answer **yes** to **all** the following questions:

1. Is the device securely mounted and installed?
2. Have all the hose systems been correctly implemented according to the plans?
3. Has all wiring been carried out correctly according to the wiring diagram?
4. Is the assembly mounted and connected to the rinsing block?
5. Is the sensor that has been precalibrated in the factory with Memosens technology connected in the assembly?
6. Does the supply voltage match the voltage indicated on the nameplate?

9.3 Switching on the measuring instrument

Energizing the device

1. Energizing the device.
   - ↳ After power-up, the device performs a self-test and then goes to the **Setup** operating mode.
2. Watch out for possible effects on any actuators which may be connected.

Filling the rinse chamber of the assembly

During the device startup phase, the current outputs have an undefined status for a few seconds prior to initialization.

1. Watch out for possible effects on any actuators which may be connected.
2. Fill the rinse chamber of the assembly with water following the steps below:
   Operating mode: Select **Setup**.
3. Go to **Diagnosis/Simulation** in the menu.
4. For valve 3: Set **Water channel 1** to **On** or for valve 13: **Water channel 2**
   - ↳ The saved sensor-specific calibration data are automatically transmitted to the CDC90 control unit as soon as the control unit is switched on.
     The measured value is displayed.
5. After filling the rinse chamber of the assembly, end the function with **Off**.
6. Carry out initial calibration of the sensor. An initial calibration is necessary to transfer the sensor data to the system.

9.3.1 Start screen

🖾 *35   Start screen*
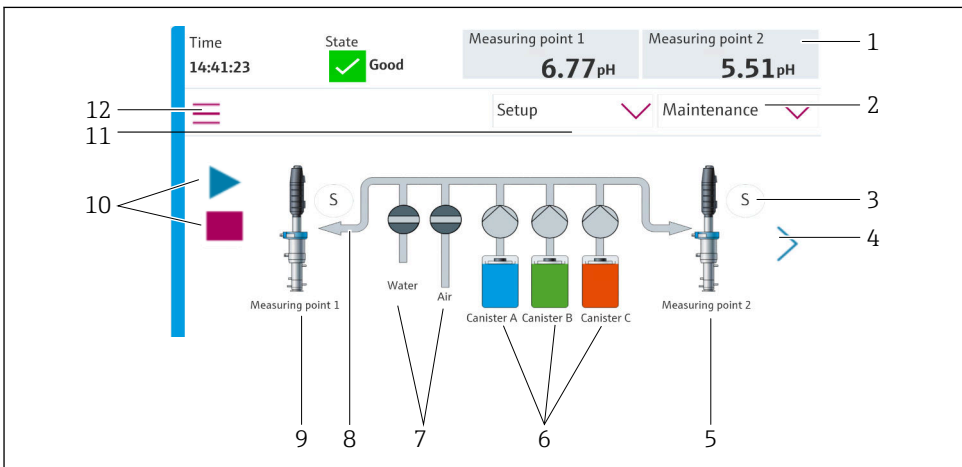
Item	Function
1	Header with time, status and measured value display
2	User guidance
3	Measure or service position of assembly
4	Next page
5	Visualization of measuring point 2
6	Display of pumps for canisters 1-3
7	Valve (water or air) closed or open.
8	Visualization of the active medium, depending on the program.
9	Visualization of measuring point 1
10	Play symbol visible when program is running. Stop button active and can be operated when program is running. Control only possible when program is running.
11	Operating mode
12	Main menu

To return to the home screen, go to the home icon in the menu path.

9.4 Configuring the measuring instrument

9.4.1 Configuring the language

The language can be configured and changed at all times on the local display, also during live operation.

▸ Select the desired language in the **System**/**Setup**/**Language** menu.
  ↳ The user interface immediately appears in the selected language.

9.4.2 Setting the date and time

User role: **Maintenance**

Operating mode: **Setup**

▸ Change the **Date and Time** under: **System**/**Setup**/**Date and Time**

or

▸ Click directly on the time.
  ↳ It can take a few seconds for the setting to be accepted.

ℹ The device does not support automatic summer/wintertime changeover. These settings can be made manually in the software, e.g. in the event of time-dependent program versions.

9.4.3   Configuring system settings of the measuring points

User role: **Maintenance**

Operating mode: **Setup**

Path: System/Information/Measuring point		
Function	Options	Info
Measuring point	• Serial number: • Firmware • Original extended order code • Current extended order code	**General information**: Apart from the tag name of the order number, all the settings are preconfigured and cannot be modified.

9.4.4   Configuring the system communication

External communication is always disabled at the factory even if fieldbus communication has been ordered. This communication must be enabled if the connection to the gateway or process control system has been established. As soon as the fieldbus is enabled, the communication is checked. If the communication is not working, the message S1003 is displayed.

Types of communication
- Analog
- Ethernet/IP
- Modbus TCP
- PROFIBUS DP
- PROFINET

User role: **Maintenance**

Operating mode: **Setup**

1. Go to **Application**/**Communication** in the menu.
   ↳ The configured communication protocol is visible under **Selected communication**.
2. Select the desired communication protocol under **Communication selection**.
3. Click Apply.

Connectivity can be viewed here for Modbus TCP and Ethernet/IP:

Path: System/Connectivity		
Function	Options	Info
Modbus	**Communication to DCS** Byte order	Modbus information transmission to the control station when Modbus is used as a fieldbus protocol. For detailed information on "Modbus communication", see the product pages on the Internet.
Ethernet	**InformationEthernet** • IP address • Used address area • Subnetmask • Gateway address	Ethernet adapter settings The device occupies 7 consecutive IP addresses. These addresses must be free in the network. Example: configured IP address: 192.168.0.1 IP addresses 192.168.0.2 - 192.168.0.7 are also occupied.

9.4.5   Configuring the current outputs

The current outputs for transmitting measured values on an additional analog card can only be configured with an external display or via the web server of an external transmitter.

The current outputs are configured during initial commissioning by Endress+Hauser specialist staff.

9.4.6   Configuration of the sensor type

The device is preconfigured for the use of pH glass sensors.

If another sensor type is used (pH ISFET, ORP), another configuration file must be uploaded to the transmitter using an external display. This is performed by Endress+Hauser specialists during initial commissioning.

User role: **Maintenance**

Operating mode: **Setup**

Path: System/Information/Sensor		
Function	Options	Info
Channel 1 or **Channel 2**	**Sensor 1 or Sensor 2** • Sensor type • Serial number: • Measuring point • Hardwareversion • Software version • Date of commissioning **Operating time** • Total • Over max. operating temperature • Below min. operating temperature **Measured value:** • Number of sterilizations • Number of calibrations • Last calibration • Last zero point calibration method **Sensor specifications:** Max. temperature:	List of sensor-specific information

9.4.7   Monitoring the pilot valves

User role: **Maintenance**

Operating mode: **Setup**

Path: System/Operating counter/Valves		
Function	Options	Info
Valves	Number of switching operations and warning limits for channel 1 and/or channel for: • Water • Air	Warning limit settings for the switching operations of the pilot valves: • V 3: Water for channel 1 • V 4: Air for channel 1 • V 8: Valves for channel 1 • V 9: Valves for channel 2 • V 10: User-configurable valve • V 13: Water for channel 2 • V 14: Air for channel 2 • V 15 to 16: User-configurable valves

9.4.8   Assembly

User role: **Maintenance**

Operating mode: **Setup**

Path: System/Operating counter/Assemblies		
Function	**Options**	**Info**
Assembly 1 or **Assembly 2**	**Assembly 1 or Assembly 2** • Number of strokes • Warning limit	Settings of the warning limit for the number of assembly strokes.

9.4.9 Pumps and canisters

User role: **Maintenance**

Operating mode: **Setup**

Path: System/Operating counter/Canisters and pumps		
Function	**Options**	**Info**
Canister and Pump A to C	**Canister A to C** • Expiry date • Filling level • Max. filling level • Warning limit **Pump 1 to C** • Flow rate • Pumped volume • Warning limit • Operating time	Settings for the expiry date, the maximum level, the flow and the warning limits for the canisters and pumps. ℹ If level monitoring is used, the flow must be calculated after the installation of the system. Fill the canister to full capacity for this purpose, start the pump by simulation and stop the time when the canister is completely empty. Flow = volume of canister/time in l/min

9.4.10 Calibrating the sensor

• Sensors with the Memosens protocol are calibrated at the factory.
• A calibration is necessary during initial commissioning of the sensor to load the calibration data into the CDC90 logbook.
• An additional calibration is not required in many standard applications.

▶ Calibrate sensors at sensible intervals depending on the process.

📖 Operating Instructions "Memosens", BA01245C

9.4.11 Starting commissioning

Initial commissioning is performed by Endress+Hauser specialists.

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