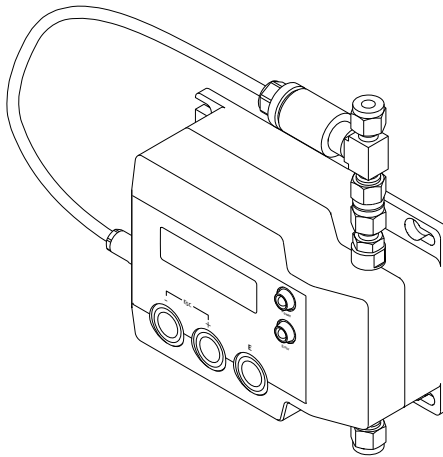


Brief Operating Instructions

Nanomass Gas Density

MEMS Coriolis density meter



These Instructions are Brief Operating Instructions; they do not replace the Operating Instructions included in the scope of supply.

Refer to the Operating Instructions and other documentation for detailed information:

- On the CD-ROM supplied
- On the Internet: www.endress.com/deviceviewer
- By smartphone/tablet: *Endress+Hauser Operations App*





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1 Document information

1.1 Symbols used


1.1.1 Safety symbols








Symbol	Meaning
 A0011189-EN	DANGER This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
 A0011190-EN	WARNING This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
 A0011191-EN	CAUTION This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium personal injury.
 A0011192-EN	NOTE This symbol contains information on procedures and other facts which do not result in personal injury.

1.1.2 Electrical symbols




Symbol	Meaning
 A0011197	Direct current A terminal to which DC voltage is applied or through which direct current flows.
 A0011198	Alternating current A terminal to which alternating voltage is applied or through which alternating current flows.
 A0017381	Direct current and alternating current <ul style="list-style-type: none"> ▪ A terminal to which alternating voltage or DC voltage is applied. ▪ A terminal through which alternating current or direct current flows.
 A0011200	Ground connection A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.

1.1.3 Symbols for certain types of information

Symbol	Meaning
 A0011182	Permitted Indicates procedures, processes or actions that are permitted.

Symbol	Meaning
 A0011183	Preferred Indicates procedures, processes or actions that are preferred.
 A0011184	Forbidden Indicates procedures, processes or actions that are forbidden.
 A0011193	Tip Indicates additional information.
 A0011194	Reference to documentation Refers to the corresponding measuring device documentation.
 A0011195	Reference to page Refers to the corresponding page number.
1., 2., 3.,...	Series of steps
↳	Result of a sequence of actions
 A0013562	Help in the event of a problem
 A0015502	Visual inspection

1.1.4 Symbols in graphics

Symbol	Meaning
1, 2, 3,...	Item numbers
A, B, C, ...	Views
A-A, B-B, C-C,..	Sections
 A0013441	Flow direction
 A0011187	Hazardous area Indicates the hazardous area.
 A0011188	Safe area (non-hazardous area) Indicates the non-hazardous area.

1.1.5 Abbreviations

Abbreviation	Meaning
MEMS	Micro-electro mechanical system (MEMS)

2 Basic safety instructions

2.1 Requirements for personnel

Personnel involved in installation, commissioning, diagnostics and maintenance must meet the following requirements:

- Are trained specialists with relevant qualifications for the specific functions and tasks.
- Are authorized by the plant owner/operator.
- Are familiar with federal/national regulations.
- Before starting work, personnel must read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
- Follow instructions and comply with basic conditions.

Operating personnel must meet the following requirements:

- Are instructed and authorized according to the requirements of the task by the facility's owner-operator.
- Follow the instructions in the manual.

2.2 Designated use

Application and media

The measuring device described in this manual is intended for the density and concentration measurement of non-corrosive gases only. Only permitted media can be used.

Permitted media are the gases listed below with the following features:

- Noncorrosive
- Absolute humidity < 10 g/m³ (dew point < 11 °C)
- Relative humidity (non-condensing) < 80%
- Concentration of helium < 50 ppm (pure helium is not permitted)

Permitted gases or mixtures of such gases:

- Nitrogen (N₂)
- Oxygen (O₂)
- Air
- Carbon dioxide (CO₂)
- Neon (Ne)
- Argon (Ar)
- Krypton (Kr)
- Xenon (Xe)
- Hydrogen (H₂)
- Methane (CH₄)
- Natural gas (maximum permitted helium concentration: 50 ppm)
- Ethyne (acetylene) (C₂H₂)
- Ethylene (C₂H₄)
- Ethane (C₂H₆)
- Propene (C₃H₆)

- Propane (C₃H₈)
- Butane (C₄H₁₀)
- LPG (supplied as gas)

Depending on the version ordered, the measuring device can also measure explosive and flammable media.

Measuring devices designed for use in hazardous areas are specially labeled as such on the nameplate.

To ensure that the measuring device remains in perfect condition during the operating time, compliance with the following conditions is mandatory:

- ▶ Only use the measuring device in full compliance with the data on the nameplate and the general conditions in the Operating Instructions and supplementary documentation.
- ▶ Based on the nameplate, check whether the ordered measuring device is permitted for the intended use in the hazardous area (e.g. explosion protection, pressure vessel safety).
- ▶ Use the measuring device only for media against which the process-wetted materials are adequately resistant.
- ▶ If the measuring device is not operated at atmospheric temperature, compliance with relevant basic conditions specified in the device documentation provided is absolutely essential.

Incorrect use

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

Clarification of borderline cases:

- ▶ For special fluids and fluids for cleaning, Endress+Hauser is glad to provide assistance in verifying the corrosion resistance of fluid-wetted materials, but does not accept any warranty or liability as even minute changes in the temperature, concentration or level of contamination in the process can alter the corrosion resistance properties.

Residual risks

Possible burn hazard due to fluid temperatures!

- ▶ If fluid temperatures are high, ensure protection against contact to prevent burns.

2.3 Workplace safety

If working on and with the measuring device:

- ▶ Wear the required personal protective equipment according to federal/national regulations.

2.4 Operational safety

Risk of injury.

- ▶ Only operate the measuring device in proper technical condition, free from errors and faults.
- ▶ The operator is responsible for the interference-free operation of the device.

Modifications to the measuring device

Unauthorized modifications to the measuring device are not permitted and can lead to unforeseeable dangers.

- ▶ If, despite this, modifications are required, consult with Endress+Hauser.

Repairs

To ensure continued operational safety and reliability:

- ▶ Carry out repairs on the measuring device only if they are expressly permitted.
- ▶ Observe federal/national regulations pertaining to repair of an electrical device.
- ▶ Use original spare parts and accessories from Endress+Hauser only.

2.5 Product safety

This measuring device is designed in accordance with good engineering practice 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. It meets general safety standards and legal requirements. It also complies with the EC directives listed in the device-specific EC Declaration of Conformity. Endress+Hauser confirms this by affixing the CE mark to the device.

2.6 IT security

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

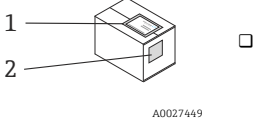
IT security measures in line with operators' security standards and designed to provide additional protection for the measuring device and device data transfer must be implemented by the operators themselves.


3 Product description

☞ For detailed information on the product description, see the Operating Instructions for the device.

4 Incoming acceptance and product identification

4.1 Incoming acceptance


<p>Is the order code on the delivery note (1) identical to the order code on the product sticker (2)?</p>	 <input type="checkbox"/>
<p>Is the measuring device undamaged?</p>	<input type="checkbox"/>
<p>Do the nameplate data match the ordering information on the delivery note?</p>	<input type="checkbox"/>

 If one of the conditions is not satisfied, contact your Endress+Hauser Sales Center.

4.2 Product identification

The following options are available for identification of the measuring device:

- Nameplate specifications
- Order code with breakdown of the device features on the delivery note.
- Enter the serial number indicated on the nameplate in *W@M Device Viewer* (www.endress.com/deviceviewer): All the information about the measuring device is displayed.
- Enter the serial number indicated on the nameplate into the *Endress+Hauser Operations App* or scan the 2-D matrix code (QR code) on the nameplate with the *Endress+Hauser Operations App*: All the information about the measuring device is displayed.

 For detailed information on the product description, see the Operating Instructions for the device.

5 Storage and transport

5.1 Storage conditions

Observe the following notes for storage:

- Store in the original packaging to ensure protection from shock.
- Do not remove protection caps mounted on connections.
They prevent contaminations of the micro-electro mechanical system (MEMS).
- Protect from direct sunlight to avoid unacceptably high surface temperatures.
- Select a storage location where moisture cannot collect in the measuring device as fungus and bacteria infestation can damage the MEMS.
- Store in a dry and dust-free place.
- Do not store outdoors.
- Storage temperature: -20 to +60 °C (-40 to +140 °F)

5.2 Transporting the product

Observe the following notes during transport:

- Transport the measuring device to the measuring point in the original packaging.
- Do not remove protection caps mounted on connections. They prevent contaminations of the MEMS.
- Observe the transport instructions on the adhesive label on the packaging.

6 Installation

6.1 Installation conditions

No special measures such as supports are necessary. External forces are absorbed by the construction of the device.

6.1.1 Mounting position

Mounting location

The measuring device is usually installed in a bypass pipe. If flow rates are low, the device can also be installed in the main pipe.

Installation in a bypass pipe is recommended in the following cases:

- Flow rate >1 l/min (0.26 gal/min.)
- Pipeline diameter >6 mm (0.24 in)

Orientation

The orientation of the device does not affect the measuring accuracy.

Flow direction

The flow direction does not affect the measuring accuracy.

Inlet and outlet runs

Inlet and outlet runs do not affect the measuring accuracy.

6.1.2 Requirements from environment and process

Ambient temperature range

Non-Ex version	-20 to +60 °C (-4 to +140 °F)
Ex ia IIC T4 version	-20 to +60 °C (-4 to +140 °F)

- If operating via USB port: Operating temperature is limited to 0 to 60 °C (32 to 140 °F).
- If operating outdoors: Avoid direct sunlight, particularly in warm climatic regions.

System pressure

Permitted absolute system pressure	Max. 20 bar (290 psi)
---	-----------------------

The relative accuracy of the density measurement increases with increasing system pressure.

Filter

To prevent the micro-channel from clogging, it is advisable to install a filter upstream from the measuring device. The filter is included in the delivery.

- Recommended filter pore size: $\leq 15 \mu\text{m}$

Thermal insulation

Due to a low thermal capacity of the medium, the medium temperature can be greatly affected by the ambient temperature through the supply line and the measuring device. The influence of the ambient temperature on the medium temperature can be reduced by insulating the supply line.

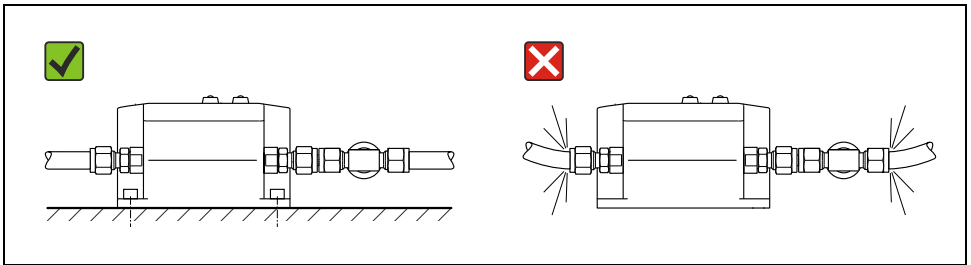
Vibrations

Due to the high operating frequency of the micro-channel, vibrations ($< 20 \text{ kHz}$) do not affect measuring accuracy.

6.1.3 Special mounting instructions

Wall mounting

- ▶ Use drill holes and M6 screws to secure the filter to a wall or a secure base.



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Pipe mounting

- ▶ Use the "pipe mounting kit" accessory to secure to a pipe or post.

Installation in a bypass pipe

Note the following when installing in a bypass pipe:

- A pressure drop must be created for the medium to flow through the measuring device.
- The maximum permissible pressure drop of 0.1 bar (1.45 psi) across the measuring device may not be exceeded.
- The bypass pipe can be routed to the atmosphere or back to the process pipe.

Examples:

- Create necessary pressure drop with throttle (or flow monitor) downstream from the measuring device.

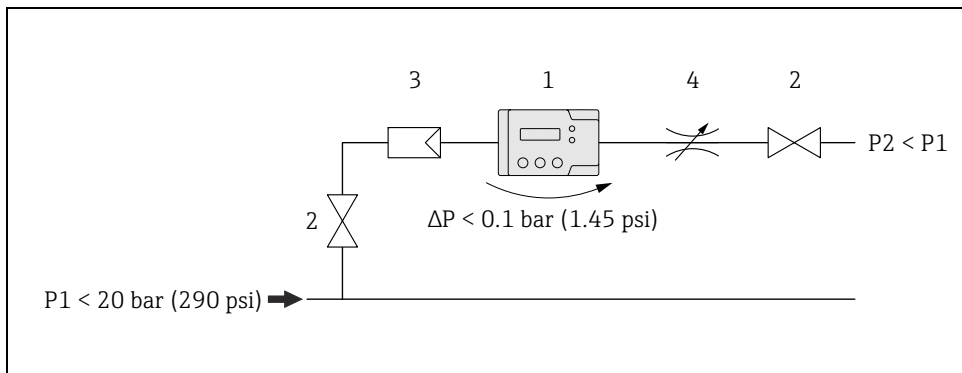


Fig. 1: 1 = Nanomass; 2 = Valve; 3 = Filter; 4 = Throttle

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- Create necessary pressure drop with orifice plate in process pipe and with throttle (or flow monitor) downstream from the measuring device.

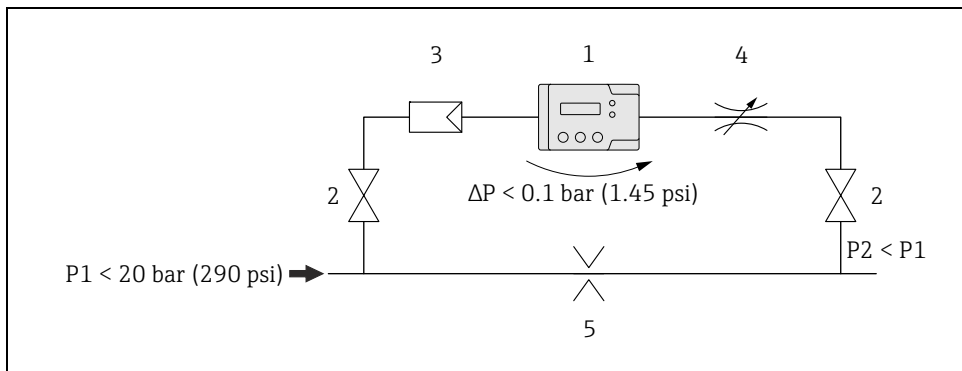


Fig. 2: 1 = Nanomass; 2 = Valve; 3 = Filter; 4 = Throttle; 5 = Orifice plate

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- Create necessary pressure drop with compressor upstream and throttle (or flow monitor) downstream from the measuring device.

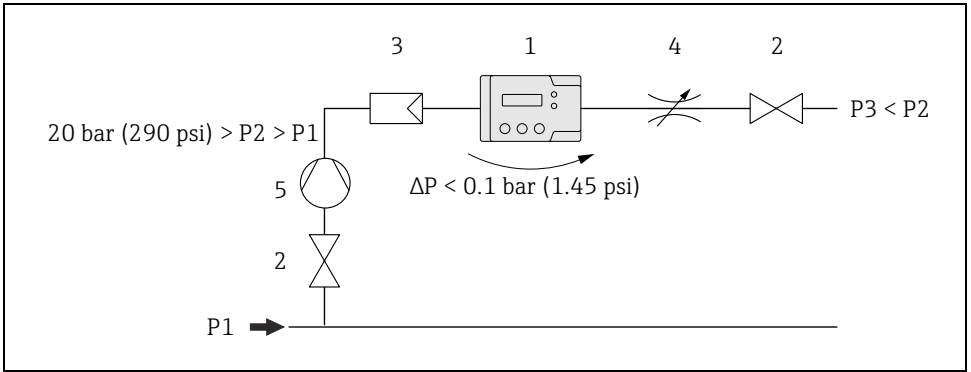


Fig. 3: 1 = Nanomass; 2 = Valve; 3 = Filter; 4 = Throttle; 5 = Compressor

A0026154

- If process pressure > 20 bar: Create necessary pressure drop with pressure reduction valve upstream and throttle (or flow monitor) downstream from the measuring device.

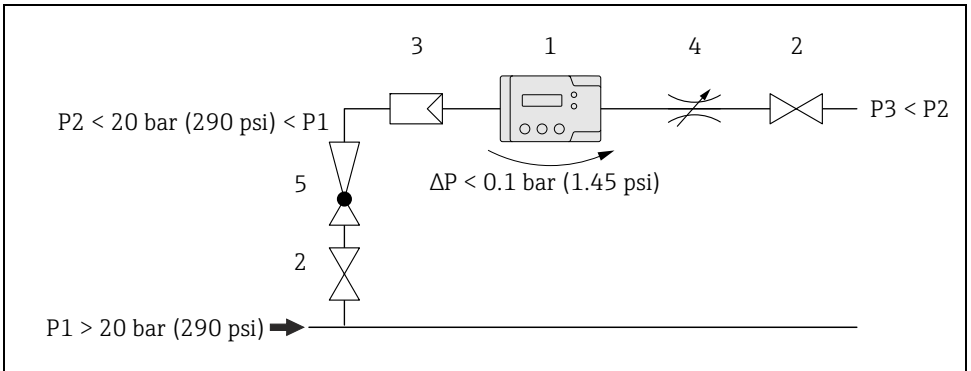


Fig. 4: 1 = Nanomass; 2 = Valve; 3 = Filter; 4 = Throttle; 5 = Pressure reduction valve

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Swagelok pipe union

The measuring device and the filter supplied are mounted in the pipe using a $\frac{1}{4}$ " Swagelok pipe union.

1. Cut the pipe at a right-angle and deburr it.
2. Push the pipe into the fitting as far as it will go.
3. Tighten the nut finger-tight.
4. Mark the nut at the 6-o'clock position.
5. Tighten the nut. In doing so, observe the following options:
 - When mounting for the first time, tighten with $1\frac{1}{4}$ rotations.
 - When mounting a second time, tighten with a $\frac{1}{4}$ rotation.

For more information, see the installation instructions for pipe unions provided by Swagelok.

Pressure sensor

The measuring device only provides correct measured values when the pressure sensor is connected. The pressure sensor is already connected when the device is delivered.

- ▶ Make sure that the pressure sensor is connected correctly.

6.2 Mounting the measuring device

6.2.1 Required tools

For process connections: Use an appropriate tool for mounting with Swagelok pipe unions.

6.2.2 Preparing the measuring device

1. Remove all remaining transport packaging.
2. Remove the protection caps on the inlet and outlet.

6.2.3 Mounting the measuring device

WARNING

Incorrect device mounting

Burst pipes can cause injury.

- ▶ Never install the device in the pipe in such a way that it is suspended freely without additional support.

NOTICE

Mechanical load on the process connections

Pipe forces can affect the vibrations of the micro-channel and thereby impact the accuracy of measurement.

- ▶ Avoid high mechanical load on the pipes at process connections.
- ▶ If mounting on the process pipe, use a wrench to cushion the torque. Do not allow torques to act on the measuring device.

NOTICE**Blockage of the micro-channel**

- Install a filter upstream from the measuring device (→ [13](#)).
1. To ensure compliance with the maximum flow specifications in the measuring device and the recommended pressure drop across the measuring device, use a bypass pipe with appropriate assemblies where necessary (→ [13](#)).
 2. Connect the filter to the pipe (→ [13](#)) and secure with a Swagelok pipe union (→ [16](#)).
 3. Mount the measuring device on a wall or ceiling using drill holes (→ [13](#)).
 4. Connect the measuring device to the pipe and secure with a Swagelok pipe union (→ [16](#)).

6.3 Post-installation check

Is the device undamaged (visual inspection)?	<input type="checkbox"/>
If assemblies are installed, are they undamaged (visual inspection)?	<input type="checkbox"/>
Does the measuring device conform to the measuring point specifications? For example: <ul style="list-style-type: none"> ■ Medium ■ Medium temperature range ■ Process pressure (refer to the section on "Pressure-temperature ratings" in the "Technical Information" document) ■ Ambient temperature range → 12 ■ Measuring range 	<input type="checkbox"/>
Are the measuring point identification and labeling correct (visual inspection)?	<input type="checkbox"/>
Is the measuring device adequately protected from precipitation and direct sunlight?	<input type="checkbox"/>
Are the securing screws tightened securely?	<input type="checkbox"/>
Is the pressure sensor connected?	<input type="checkbox"/>

7 Electrical connection



The measuring device does not have an internal circuit breaker. For this reason, assign the measuring device a switch or power-circuit breaker so that the power supply line can be easily disconnected from the mains.

7.1 Connection conditions

7.1.1 Required tools

- For cable entries: Use an appropriate tool.
- When using stranded cables: Use a crimper for wire end ferrule.

7.1.2 Connecting cable requirements

The connecting cables provided by the customer must fulfill the following requirements:

Electrical safety

In accordance with applicable national regulations.

Permitted temperature range

- -40 to 80 °C (-40 to 176 °F)
- Minimum requirement: Cable temperature range \geq ambient temperature + 20 K

Power supply cable

Outer diameter	3.5 to 5 mm
Number of cores	Min. 2
Cable resistance	77.8 Ω /km at 20 °C
Shielding	Single shielding

Signal cable

Shielding	A shielded cable is recommended. Observe grounding concept of the plant.
-----------	--

USB cable

Cable type	Mini USB, type B, Buccaneer; standard USB, type A
Cable length	Max. 5 m

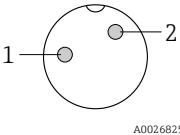
RS232 cable

Cable type	M12, 4-pin; D-Sub, 9-pin
------------	--------------------------

Cable length	Max. 5 m
Transmission rate	57600 Bd

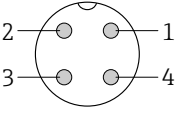
7.1.3 Pin assignment of connector

Connector for supply voltage

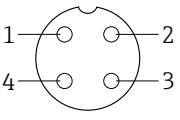
	Pin	Assignment		Coding, connector face	Connector/socket
	1	L-	DC 8 to 30 V	A	Connector
	2	L+			

Connector for signal transmission

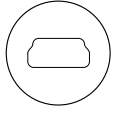
4-20 mA connector

	Pin	Assignment		Coding, connector face	Connector/socket
	1	+/-	Current output 1, 4-20 mA (passive)	A	Connector
	2	-/+	Current output 1, 4-20 mA (passive)		
	3	+/-	Current output 2, 4-20 mA (passive)		
4	-/+	Current output 2, 4-20 mA (passive)			

RS232 device socket

	Pin	Assignment	Coding, connector face	Connector/socket
	1	Shield (shield ground)	A	Socket
	2	Txout (transmitted data)		
	3	Rxin (received data)		
4	Common ground (signal ground)			

USB device socket

	Assignment	Connector/socket
	Mini USB, type B, Buccaneer	Socket

7.1.4 Preparing the measuring device

- ▶ Remove the protection caps from the connections.

NOTICE

Measuring device not leak tight

If the measuring device is not leak tight, this can impair the operational reliability of the measuring device.

- ▶ Only remove the protection caps if connections are used.

7.2 Connecting the measuring device

⚠ WARNING

Improper connection can cause serious injury or death

- ▶ Have electrical connection work carried out by correspondingly trained specialists only.
- ▶ Observe applicable federal/national installation codes and regulations.
- ▶ Comply with local workplace safety regulations.
- ▶ If using in hazardous areas, observe the explosion protection documentation.

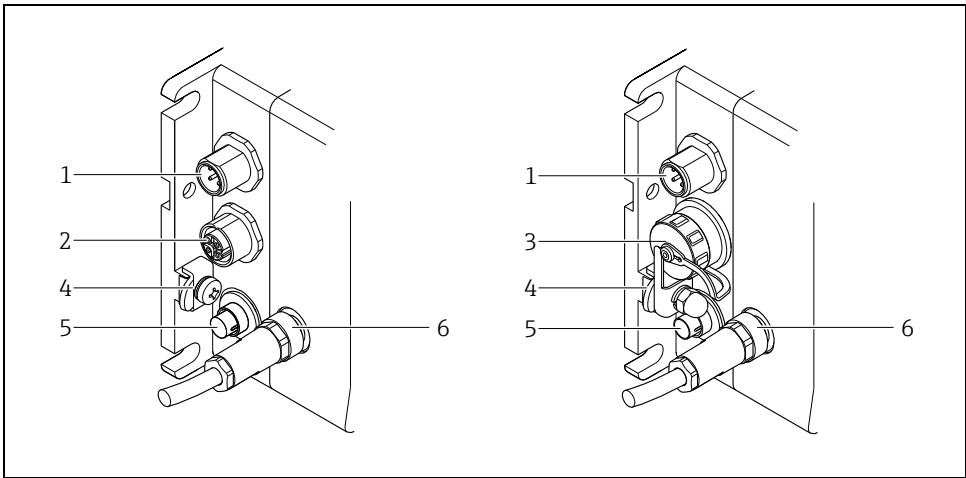



Fig. 5: Measuring device versions and connection versions

A0026017

- 1 Connector for 4-20 mA
- 2 RS232 interface (optional)
- 3 USB port (optional)
- 4 Ground terminal
- 5 Connector for supply voltage
- 6 Connector for pressure sensor (connected on delivery)

7.2.1 Connecting the supply voltage cable



The supply voltage can be connected via the supply voltage connection and optionally via the USB port in a non-hazardous area. If the supply voltage connection is to be used for the supply voltage, perform the following steps:

1. Measuring device with USB port: Make sure that the measuring device is disconnected from the USB port.
2. If necessary, strip 10 mm (0.4 in) of the supply voltage cable and cable ends. In the case of stranded cables, also fit ferrules.
3. Where applicable, connect the cable to the connector for supply voltage in accordance with the pin assignment →  19.
4. Insert the connector into the supply voltage connection of the measuring device and screw tight.
5. If using in hazardous areas: Fit the USB protection cap and tighten securely.


7.2.2 Connecting the signal cables

Signals can be transmitted digitally via a USB port or RS232 interface or by analog communication via the passive 4-20 mA connection.

Connect the 4-20 mA cable

1. Strip 10 mm (0.4 in) of the cable and cable ends. In the case of stranded cables, also fit ferrules.
2. Connect the cable to the 4-20 mA connector in accordance with the pin assignment →  19.
3. Insert the connector into the 4-20 mA connection of the measuring device and screw tight.
4. Connect the signal cable to the 12-24 V power supply →  22.

Connect the RS232 cable (optional)

1. If necessary, strip 10 mm (0.4 in) of the cable and cable ends. In the case of stranded cables, also fit ferrules.
2. Where applicable, connect the cable to the RS232 connector in accordance with the pin assignment →  19.
3. Connect the RS232 cable to the RS232 socket of the measuring device and the COM port (RS232) of the PC and screw tight.

Connect the USB cable (optional)

1. Make sure that the measuring device is disconnected from the supply voltage.
2. Connect the USB cable to the USB port of the measuring device and the USB port of the PC.
3. Secure the cable to the device with a protection cap and cable clamp.

7.3 Special connection instructions

7.3.1 Connection examples

Current output 4-20 mA

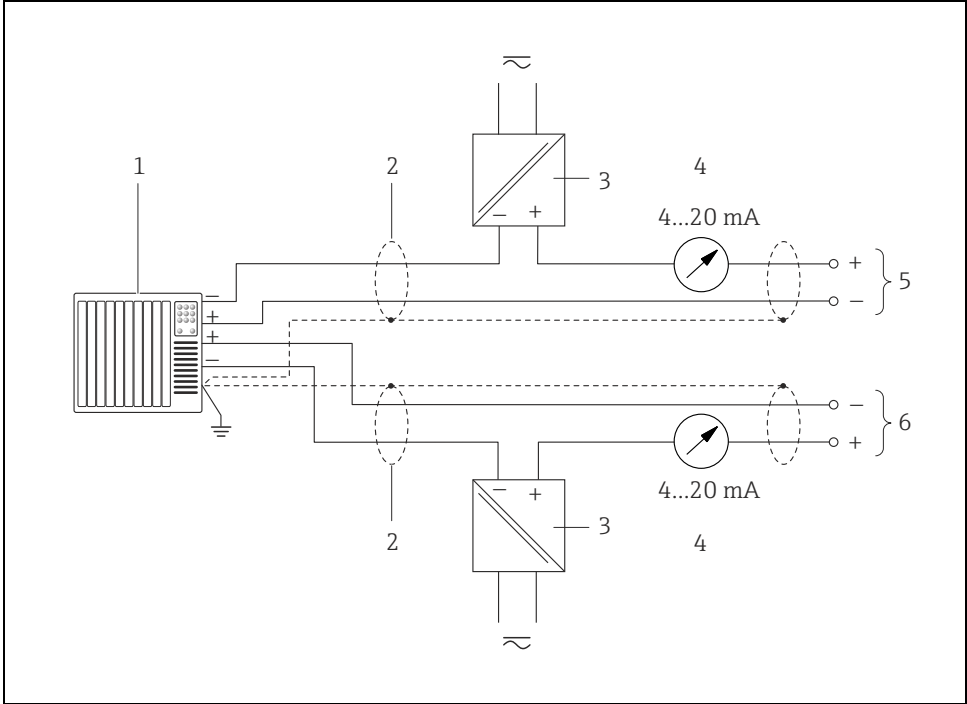


Fig. 6: Connection example for 4-20 mA current output

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- 1 Automation system with current input (e.g. PLC)
- 2 Cable shield, comply with connecting cable requirements (→ 18)
- 3 Power supply 12-24 V
- 4 Analog display unit: Observe maximum load
- 5 Measuring device, current output 1 (pin 1 and 2, protected against reverse polarity)
- 6 Measuring device, current output 2 (pin 3 and 4, protected against reverse polarity)

7.4 Ensuring the degree of protection


The measuring device meets all the requirements of IP65/67 protection.

To guarantee IP65/67 protection, carry out the following steps after electrical connection:

For USB port:

1. Check whether the seals of protection caps are clean and inserted correctly.
2. Fit the protection caps and tighten securely.

7.5 Post-connection check

Are cables and the device undamaged (visual inspection)?	<input type="checkbox"/>
Do the cables comply with the requirements (→  18)?	<input type="checkbox"/>
Do the cables have adequate strain relief?	<input type="checkbox"/>
Does the supply voltage match the specifications on the nameplate?	<input type="checkbox"/>
Are all connectors installed and protection caps securely tightened?	<input type="checkbox"/>
Is the pin assignment of the connectors correct?	<input type="checkbox"/>
Depending on the device option and the use of the device: Is the USB connector secure?	<input type="checkbox"/>
If supply voltage is provided, is the power LED on the measuring device lit?	<input type="checkbox"/>

8 Operating options

8.1 Overview of operating options

The measuring device offers users the following operating options:

- Local operation
- "Nanomass Communication" operating tool (via USB port or RS232 interface)



The operating language of the measuring device is English. Other language options are not supported.

NOTICE

Errors during measured value transmission

Errors may occur at the current outputs when the measured values are being transmitted during local operation or operation using the "Nanomass Communication" operating tool.

- ▶ Complete operation for correct measured value.

8.2 Access to the measuring device via the local display

8.2.1 Operational display

The operational display is used to display measured variables, parameters, dialog texts and error messages.

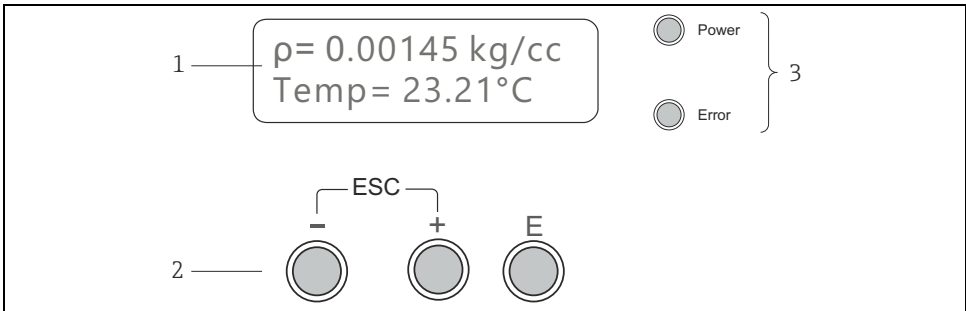


Fig. 7: Operational display

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- 1 Measured value display and parameter configuration view (2-lines)
- 2 Operating elements
- 3 LED status indicator

Measured value display

A measured variable is displayed on every line. A maximum of four measured variables in total can be displayed in multiplex mode. In multiplex mode, the measured variables alternate on the screen every 5 seconds.

Measured variables

Abbreviation	Description
ρ	Density
ρ_r	Reference density
Temp	Temperature
Conc	Concentration
Press	Pressure



The number and display format of the measured values can be configured in the "User interface" → "Assign" menu.

Parameter configuration views


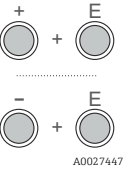
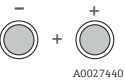


The user is in the operational display mode: Press Enter to open parameter configuration mode.

Menu	Submenu	Parameter
<p>1 Selected menu item</p> <p>2 Next menu item</p>	<p>1 Selected submenu item</p> <p>2 Next submenu item</p>	<p>1 Parameter name</p> <p>2 Parameter value</p>

Operating elements

Key	Description
	<p>Minus key</p> <p><i>In a menu or submenu</i> Navigate between the menus or submenus</p> <p><i>In a parameter</i> Change a parameter value</p>
	<p>Plus key</p> <p><i>In a menu or submenu</i> Navigate between the menus or submenus</p> <p><i>In a parameter</i> Change the parameter value</p>

Key	Description
 <small>A0027445</small>	<p>Enter key</p> <p><i>In a menu or submenu</i> Call a submenu or parameter</p> <p><i>In a parameter</i> Confirm an entry or navigate to the next parameter</p>
 <small>A0027447</small>	<p>Back/Forwards key combination (press keys simultaneously)</p> <p><i>In a parameter</i> Navigate within a parameter value to the next or previous number or digit.</p>
 <small>A0027440</small>	<p>Escape key combination (press keys simultaneously)</p> <p><i>In a menu</i> Exit parameter configuration view and go to the measured value display</p> <p><i>In a submenu</i> Exit the submenu and go to the menu</p> <p><i>In a parameter</i> Exit the parameter and go to the submenu</p>

LED status indicators


For a description, see "Diagnostic information via light emitting diodes" → 30.

8.2.2 Functions

Function	Operation
Display measured values	Once the measuring device has been connected to the supply voltage and the measuring device is ready for operation, the measured values appear on the operational display.
Enter parameter configuration	The user is in the operational display. ▶ Press Enter.
Disabling write protection via access code	Parameter configuration is protected by an access code. This code cannot be configured. ▶ Enter the access code 0074 using the plus and minus keys. Press Enter to confirm each digit.
Navigate between the menus or submenus	The user is in the parameter configuration view in a menu or submenu. ▶ Press the Plus or Minus key.
Call submenus or parameters	The user is in the parameter configuration view in a menu or submenu. ▶ Press Enter.

Function	Operation
Change parameter values	The user has called up a parameter. ▶ Press the Plus or Minus key.
Navigate within the parameter value to the next number or digit	The user has called up a parameter and makes changes to a parameter value. ▶ Press the Plus and Enter key or the Minus and Enter key simultaneously.
Confirm entries	The user has called up a parameter and makes changes to a parameter value. ▶ Press Enter.
Navigate to the next parameter	The user has called up a parameter. ▶ Press Enter.
Return to the previous menu or submenu	▶ Press the Plus and Minus key simultaneously. The user has reached the end of a parameter list. ▶ System returns to the previous menu automatically after one second.



8.3 Access to the measuring device via the "Nanomass Communication" operating tool

 For detailed information on accessing the measuring device, see the Operating Instructions for the device.

9 Commissioning

9.1 Function check


Before commissioning the device, make sure that the post-installation and post-connection checks are performed.

- "Post-installation check" checklist →  17.
- "Post-connection check" checklist →  23.

9.2 Switching on the measuring device

After a successful function check, switch on the measuring device. If power is supplied via the USB port, the measuring device starts automatically as soon as the USB cable is connected.


After a successful startup, the local display switches automatically from the startup display to the operational display.

 For detailed information on error messages or what action to take if nothing appears on the local display, see the Operating Instructions for the device.

9.3 Setting the operating language

The operating language of the measuring device is English. Other language options are not supported.

9.4 Configuring the measuring device

 If an application package is used, additional settings must be made: Please refer to the Operating Instructions for the device.

9.4.1 Defining the tag name

Navigation

Function area "Device settings" (access code 0074) → "Device information" → "Tag name"

9.4.2 Setting the serial port delay time

The delay time for sending and receiving data via the serial port must be defined via the "Nanomass Communication" operating tool.

Navigation

Function area "Device settings" (access code **0074**) → "COM-Port" → "Data retrieval delay"

9.4.3 Setting the date and time

The date and time should be checked when the measuring device is commissioned so that the measured data can be saved with the correct time.

☞ If the "Datalog Function" application package is used, the internal data memory may need to be formatted once the date and time have been configured: Please refer to the Operating Instructions for the device.

Navigation "Nanomass Communication" operating tool

1. Function area "Device settings" (access code **0074**) → "Device settings" → "Set clock hh:mm:ss"
2. Function area "Device settings" (access code **0074**) → "Device settings" → "date format DD.MM.YYYY"

☞ For detailed information on configuring the date and time, see the Operating Instructions for the device.

Navigation local display

Function area "Device settings" → "Device settings" → "Act time hhhmmss"

☞ For detailed information on configuring the date and time, see the Operating Instructions for the device.

9.4.4 Configuring the current output

Navigation

1. Menu "Measuring variables" → "System units"
2. Menu "Output 4-20 mA" → "Output channel 1" and "Output channel 2"
3. Menu "Supervision" → "Error prompt channel 1/2"

☞ For detailed information on the parameters, see the Operating Instructions for the device.

9.4.5 Configuring the local display

Navigation

1. Menu "User interface" → "Assign display" → "Top line"
2. Menu "User interface" → "Assign display" → "Top line multiplex"
3. Menu "User interface" → "Assign display" → "Bottom line"
4. Menu "User interface" → "Assign display" → "Bottom line multiplex"

☞ For detailed information on the parameters, see the Operating Instructions for the device.

9.4.6 Configuring the output behavior

Navigation

1. Menu "Output 4-20 mA" → "Output characteristics" → "Time constant output"
2. Menu "Basic function" → "System parameter" → "Measurement value damping"

☞ For detailed information on the parameters, see the Operating Instructions for the device.

10 Diagnostic information

10.1 Diagnostic information via light emitting diodes

Two light emitting diodes (LED) on the measuring device provide information on the device status.

LED	Signal	Meaning
Power	Lit green	Power is supplied to the device.
Error	Lit red	An error has occurred.

10.2 Diagnostic information

Any faults detected by the measuring device are shown on the local display and indicated in the "Nanomass Communication" operating tool by red LEDs under "Device state" in the "Device settings" function area.

Diagnostics message	Description	Measures
Temperature range	Temperature value is outside the permitted range.	<ol style="list-style-type: none"> 1. Check the configuration and correct it if necessary. 2. Observe the limit values specified in the "Technical Data".
Pressure range	Pressure value is outside the permitted range.	<ol style="list-style-type: none"> 1. Check the configuration and correct it if necessary. 2. Observe the limit values specified in the "Technical Data".
Density range	Density value is outside the permitted range.	<ol style="list-style-type: none"> 1. Observe the limit values specified in the "Technical Data". 2. Perform internal cleaning (see the Operating Instructions for the device)
Tube not oscillating	Measuring channel not oscillating or oscillating in the wrong frequency range.	Perform internal cleaning (see the Operating Instructions for the device)

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