bürkert
FLUID CONTROL SYSTEMS

Type 8098
FLOWave L

SAW Flowmeter

QUICKSTART - English

Software version A.05.00.00 and higher

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

QUICKSTART 2303/10_EU-EN 00567159 / Original EN

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

1 THE QUICKSTART

The Quickstart includes main information and instructions for using the device.

The complete description of the device is in the Operating Instructions of the device.

Please keep this Quickstart in a safe place, accessible to all users and any new owners.

Important safety information.

Fully read the Quickstart. In particular, observe the safety recommendations and intended use.

▸ The Quickstart must be read and understood.

The full Operating Instructions are available on the internet at country.burkert.com.

1.1 Symbols used

DANGER

Warns against an imminent danger.

▸ Failure to observe this warning results in death or in serious injury.

WARNING

Warns against a potentially dangerous situation.

▸ Failure to observe this warning can result in serious injury or even death.

CAUTION

Warns against a possible risk.

▸ Failure to observe this warning can result in substantial or minor injuries.

NOTICE

Warns against material damage.

Indicates additional information, advice or important recommendations.

Refers to information contained in the Quickstart or in other documents.

▸ Indicates an instruction to be carried out to avoid a danger, a warning or a possible risk.

→ Indicates a work step which you must carry out.

A highlighted term is related to a menu or a menu item.

Indicates the result of a specific instruction.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

1.2 Definition of the term device

The term "device" used in the Quickstart always refers to the Type 8098 FLOWave L flowmeter.

1.3 Definition of the term büS

The term "büS" used in the Quickstart refers to the industrial communication, developed by Bürkert, based on the CANopen protocol. The term "büS" refers to the Bürkert system bus.

→ For more information on büS, read the cabling guide available in English and in Japanese (Cabling_guide_for_büS/EDIP.pdf) at country.burkert.com.

→ For more information on CANopen which is related to the device, refer to the Operating Instructions "CANopen Network configuration" at country.burkert.com.

1.4 Validity of the Quickstart

The Quickstart is valid for the devices from software version A.04.00.00.

To read out the version number of the device software, do the following:

→ Go to the CONFIGURATION view.

→ General settings

→ Confirm to access the Parameter view.

→ Go to the MAINTENANCE view.

→ Device information ----►

→ Software version ----►

→ Go back to the parent menu.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

2 INTENDED USE

Use of the device that does not comply with the instructions could present risks to people, nearby installations and the environment.

The Type 8098 FLOWave L flowmeter uses the Surface Acoustic Wave (SAW) measurement principle and is intended to measure the flow rate of liquids that have all of the following characteristics:

- clean liquids
- non emulsified liquids (homogeneous liquids)
- liquids that are free of air bubbles
- liquids that are free of gas bubbles
- liquids that are free of solids.

▸ The device is not intended to measure the flow rate of liquids if gas bubbles are present, whatever the origin of the bubbles (air intake, cavitation, degassing…).

▸ Use the device in compliance with the characteristics and the conditions of commissioning and use specified in the contractual documents and in the Operating Instructions.

▸ Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions.

▸ Only operate a device in perfect working order.

▸ Properly transport, store, install and operate the device.

▸ Only use the device as intended.

2.1 Device with ATEX / IECEx certification

DANGER

Risk of explosion in the event of improper use of the device in potentially explosive areas.

▸ Observe the specifications of the ATEX / IECEx-conformity certificate.

▸ Observe the specifications in the ATEX / IECEx supplement for Type 8098 FLOWave L. The supplement is available at country.burkert.com.

The ATEX / IECEx certification is only valid if the device is used as described in the ATEX / IECEx supplement.

If unauthorized changes are made to the device, then the ATEX / IECEx certification becomes invalid.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

3 BASIC SAFETY INFORMATION

This safety information does not take into account any contingencies or occurrences that may arise during installation, use and maintenance of the device. The operating company is responsible for the respect of the local safety regulations, including staff safety.

Risk of injury due to electrical voltage.

- Before carrying out work on the system, disconnect the electrical power for all the conductors and isolate it.
- In accordance with standard UL/EN 61010-1, all equipment connected to the Type 8098 FLOWave L flowmeter shall be double insulated with respect to the mains and all circuits connected to the Type 8098 FLOWave L flowmeter must be limited energy circuits.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury due to pressure in the installation.

- Before any intervention in the installation, stop the circulation of liquid, cut off the pressure and drain the pipe.
- Before any intervention in the installation, make sure there is no pressure in the pipe.
- Observe the dependency between the liquid temperature and the liquid pressure for the fitting used.

If switched on for a prolonged time, risk of burns or fire due to hot device surfaces

- Do not touch with bare hands.
- Keep the device away from highly flammable substances and liquids.

Risk of burns due to high liquid temperatures.

- Do not touch with bare hands the parts of the device that are in contact with the liquid.
- Use safety gloves to handle the device.
- Before opening the pipe, stop the circulation of liquid and drain the pipe.
- Before opening the pipe, make sure the pipe is completely empty.

Risk of injury due to the nature of the liquid.

- Respect the prevailing regulations on accident prevention and safety relating to the use of dangerous liquids.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

General dangerous situations

To avoid injury, obey the following instructions:

- Do not use the device in explosive atmospheres [1].
- Do not use the device in an environment incompatible with the device materials.
- Do not use liquid that is incompatible with the device materials. Find the compatibility chart on our homepage: country.burkert.com.
- Do not subject the device to mechanical loads.
- Do not make any modifications to the device.
- Prevent any unintentional power supply switch-on.
- Only qualified and skilled staff may carry out installation and maintenance work.
- Ensure a defined or controlled restarting of the process after a power supply interruption.
- Observe the general technical rules.

[1] *only applicable for devices without ATEX / IECEx certification*

CAUTION

Risk of injury due to a heavy device.

A heavy device can fall down during transport or during installation and cause injuries.

- Transport, install and dismantle a heavy device with the help of another person.
- Use appropriate tools.

NOTICE

Elements and components sensitive to electrostatic discharges

- This device contains electronic components that are sensitive to electrostatic discharges. They may be damaged if they are touched by an electrostatically charged person or object. In the worst case scenario, these components are instantly destroyed or disabled as soon as they are activated.
- To minimise or even avoid any damage caused by an electrostatic discharge, take all the precautions described in standard EN 61340-5-1.
- Also make sure that you do not touch any of the live electrical components.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

4 GENERAL INFORMATION

4.1 Manufacturer's address and international contacts

To contact the manufacturer of the device, use the following address:

Bürkert SAS

Rue du Giessen

BP 21

F-67220 TRIEMBACH-AU-VAL

You may also contact your local Bürkert sales office.

The addresses of our international sales offices are available on the internet at: country.burkert.com.

4.2 Warranty conditions

The condition governing the legal warranty is the conforming use of the device in observance of the operating conditions specified in the Operating Instructions.

4.3 Information on the Internet

You can find the operating instructions and the technical data sheets for Type 8098 FLOWave L at: country.burkert.com.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

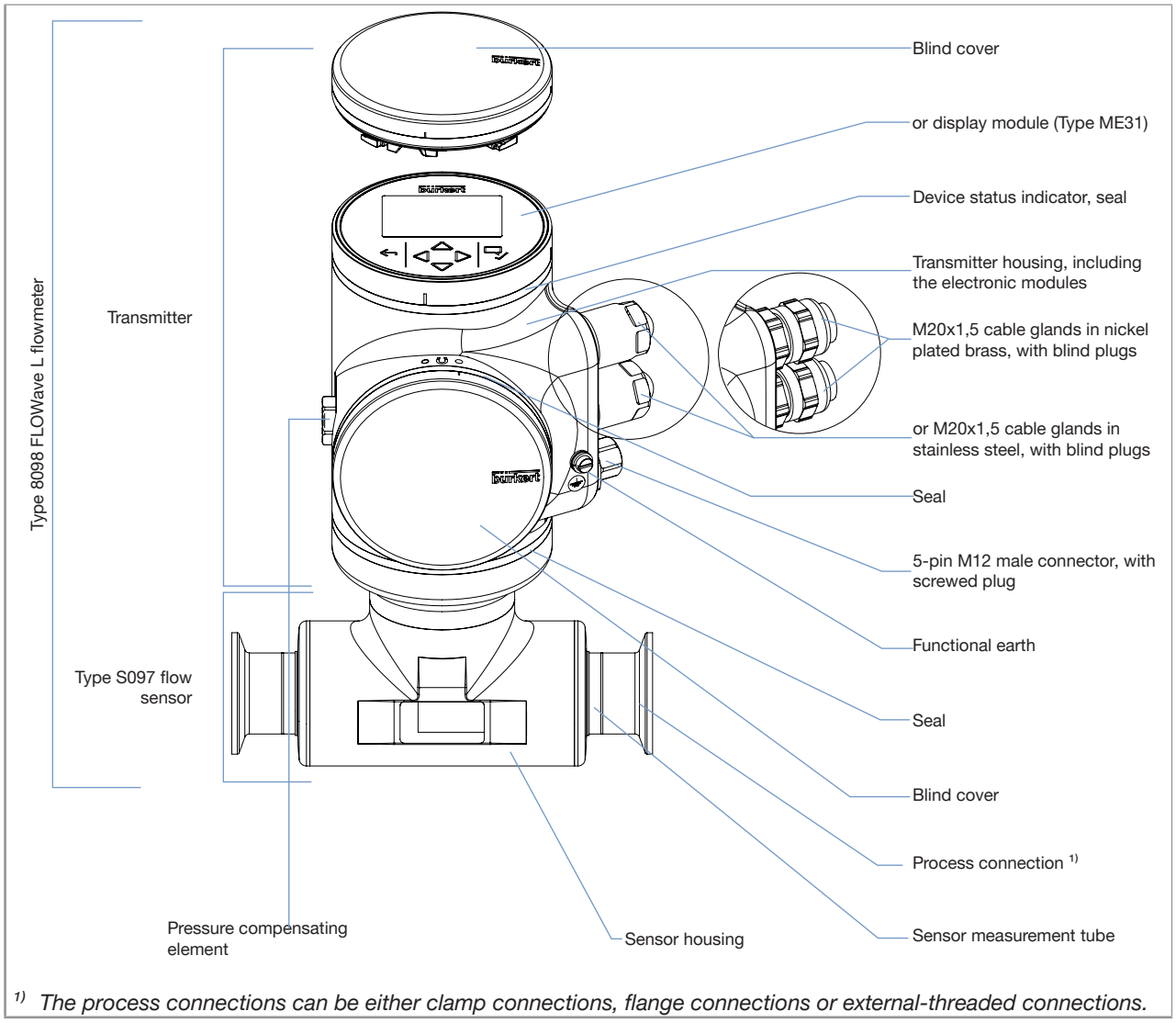
5 DESCRIPTION

5.1 Device variants

The Type 8098 FLOWave L flowmeter is made up of a transmitter and a Type S097 flow sensor.

The following pictures describe the main device variants of the Type 8098 FLOWave L flowmeter:

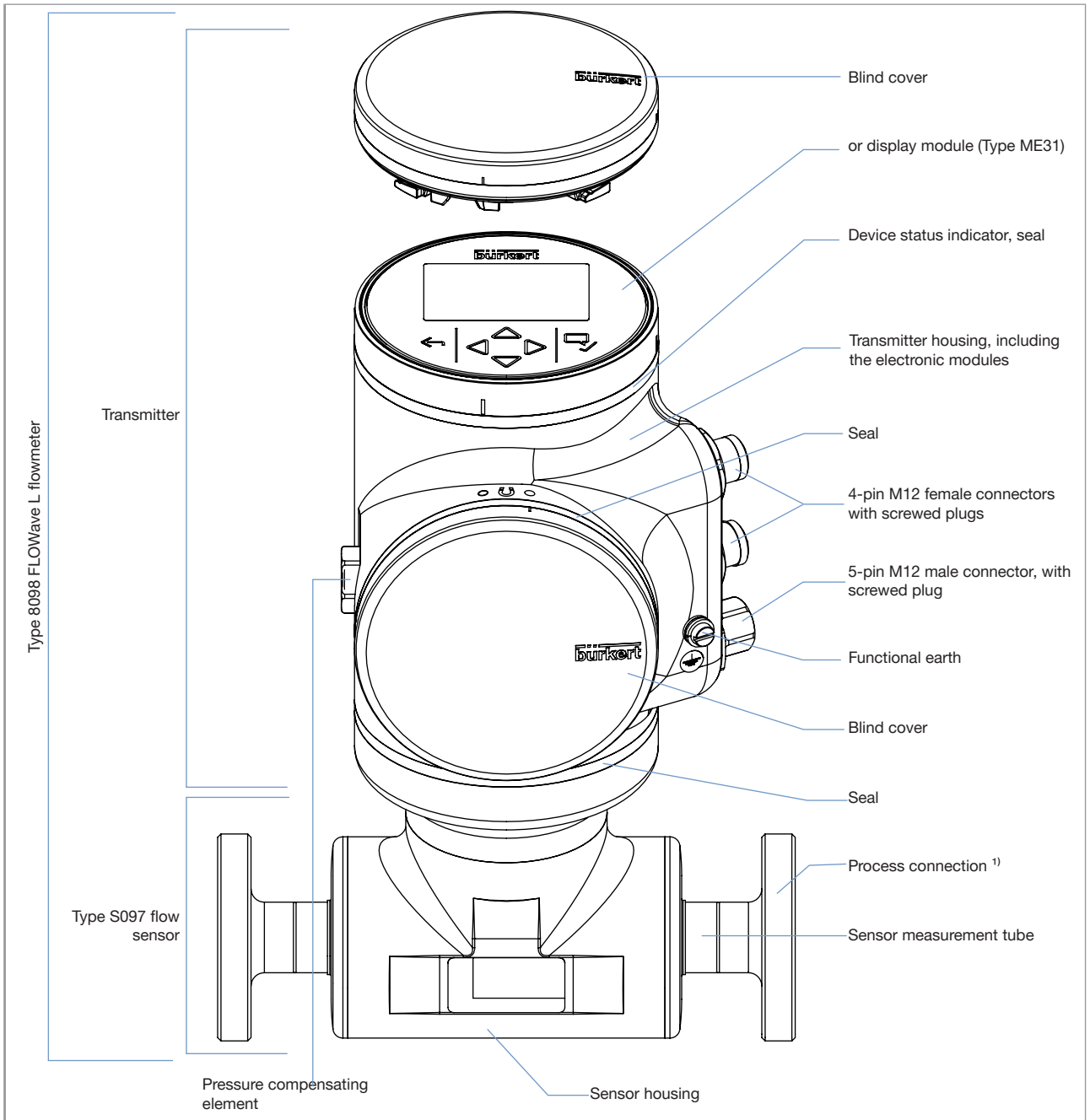
- Fig. 1 describes a device with two M20x1.5 cable glands in stainless steel (or in nickel plated brass) and one 5-pin M12 male connector.
- Fig. 2 describes the Ethernet device variant, i.e. a device with two 4-pin M12 female connectors and one 5-pin M12 male connector.



1) *The process connections can be either clamp connections, flange connections or external-threaded connections.*

Fig. 1: Description of the device variants with two M20x1.5 cable glands and one 5-pin M12 male connector

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023



1) *The process connections can be either clamp connections, flange connections or external-threaded connections.*

Fig. 2: Description of an Ethernet device variant, with two 4-pin M12 female connectors and one 5-pin M12 male connector

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

5.2 Wi-Fi module

The device can be equipped with a Wi-Fi module in place of or in addition to the display module. The Wi-Fi module has the Type number ME31. The Wi-Fi module has the same functional scope as the display module.

The Wi-Fi module is intended for use in Europe, the USA, and Canada.

The module can be integrated into an existing WLAN infrastructure. The wireless range is approximately 10 m.

The module provides a web server which can be accessed if the following requirements are met:

- Windows 7/8.1/10: IE11, Edge, Google Chrome, from version 53.
- Android with Google: Chrome, from version 53.
- Apple: Safari, from iOS 9.3.5.

→ For more informations about the Wi-Fi module, refer to the Software manual ME31 | WLAN module, available at country.burkert.com.

5.3 Unlocking magnetic key

The device is delivered with a magnetic key to unlock the display module, the Wi-Fi module or the blind cover. See Fig. 3.

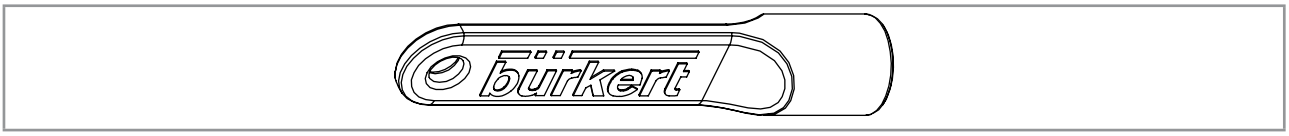


Fig. 3: Unlocking magnetic key

The device operates on a 4-wire system and needs a 12...35 V DC power supply.

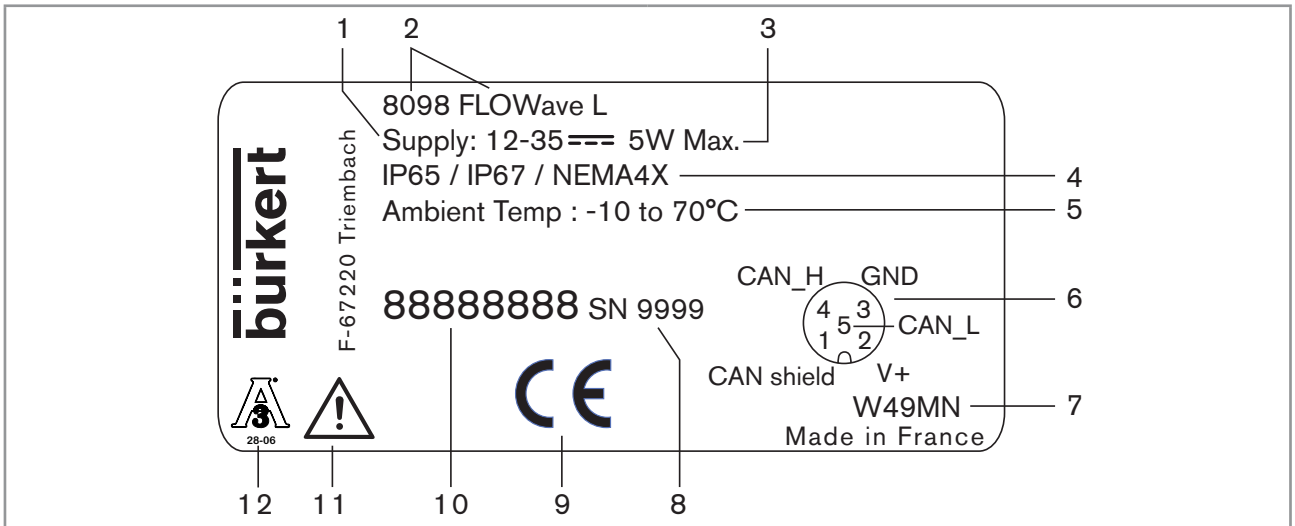
The device has three outputs:

- 1 analogue output,
- 1 digital output,
- 1 output, which can be configured as an analogue output or as a digital output.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

5.4 Type labels

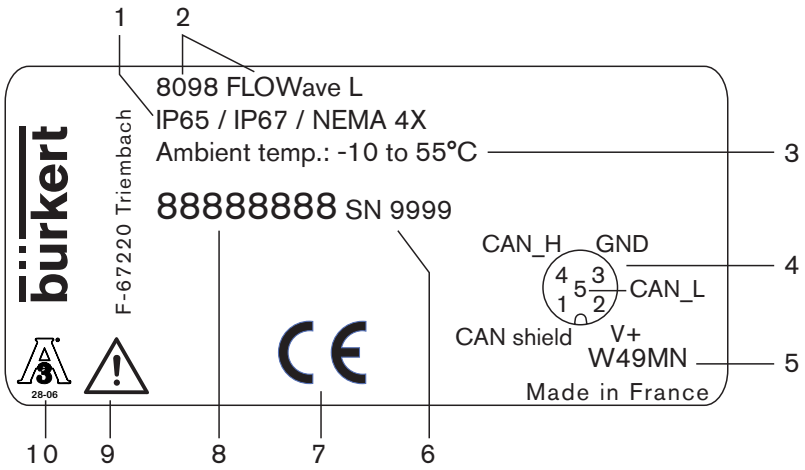
5.4.1 Adhesive labels



1. Supply voltage	8. Serial number
2. Type of the device	9. Conformity marking
3. Power consumption	10. Article number
4. IP-Code, NEMA protection type	11. Warning: Before using the device, take into account the technical specifications given in the Operating Instructions.
5. Ambient temperature range	
6. Pin assignment of the 5-pin M12 male connector	12. Certification
7. Manufacturing code	

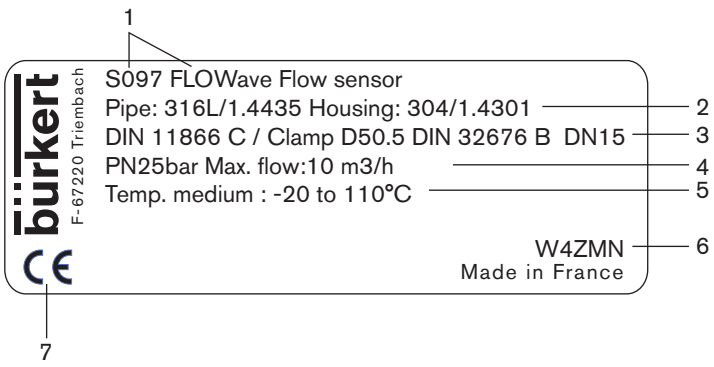
Fig. 4: Type label of the Type 8098 FLOWave L flowmeter (example of a UL device)

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023



1. IP-Code, NEMA protection type
2. Type of the device
3. Ambient temperature range
4. Pin assignment of the 5-pin M12 male connector
5. Manufacturing code
6. Serial number
7. Conformity marking
8. Article number
9. Warning: Before using the device, take into account the technical specifications given in the Operating Instructions.
10. Certification

Fig. 5: Type label of the Type 8098 FLOWave L flowmeter (example of a non-UL Ethernet device)

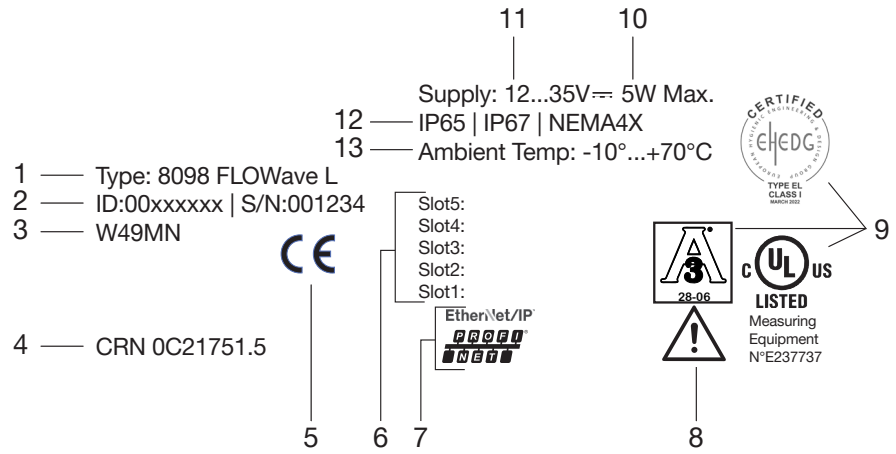


1. Type of the flow sensor
2. Material of the pipe, material of the housing
3. Standard the pipe conforms to; type of process connection, external diameter of the clamp and standard the process connection conforms to; DN of the measurement tube
4. Pressure class of the device and maximum flow rate
5. Liquid temperature range
6. Manufacturing code
7. Conformity marking

Fig. 6: Type label of the Type S097 flow sensor (example)

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

5.4.2 Laser marking



1. Type of the device	8. Warning: Before using the device, take into account the technical specifications given in the Operating Instructions.
2. Article number | Serial number	9. Certifications
3. Manufacturing code	10. Power consumption
4. Canadian Registration Number (CRN)	11. Operating voltage
5. Conformity marking	12. IP-Codes, NEMA protection type
6. Electronic modules	13. Ambient temperature range
7. Supported protocols, Ethernet device variant	

Fig. 7: Laser marking, Type 8098 FLOWave L flowmeter (example of a UL Ethernet device)

5.5 Marking with the MAC address

The marking with the MAC address can be seen by opening the front of the transmitter.

→ To open the front of the transmitter, see chapter 8.9.

Fig. 8: Marking with the MAC address of the device (example)

5.6 Certification markings

Certification markings are either located on the Type label of the measuring device or on separate labels.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

5.7 Marking of the Unique Serial Number (USN)

The USN is marked on the side of the sensor. The USN is built with the device article number and the device serial number.

5.8 Device status indicator

The device status indicator changes its colour based on the NAMUR NE 107 recommendation.

The colour of the device status indicator gives the following pieces of information:

- Whether device diagnostics are active on not.
- If device diagnostics are active, then the device status indicator shows whether diagnostics events have been generated or not. If several diagnostics events have been generated, then the device status indicator shows the diagnostics event with the highest priority. Refer to Table 1.

If the device status indicator flashes, then the device is selected in a man-machine interface such as the Bürkert Communicator software.

Table 1: Device status indicator in accordance with NAMUR NE 107, edition 2006-06-12

Colour according to NE 107	Colour code (for a PLC)	Diagnostics event according to NE 107	Meaning
Red	5	Failure, error or fault	Due to a malfunction of the device or its periphery, the measured values can be incorrect.
Orange	4	Check function	Ongoing work on the device (for example, checking the correct behaviour of the outputs by simulating measurement values); the output signal is temporarily invalid (e.g. frozen).
Yellow	3	Out of specification	The ambient conditions or process conditions for the device are outside the permitted ranges. Device-internal diagnostics point to problems in the device or with the process properties.
Blue	2	Maintenance required	The device continues to measure but a function is temporarily restricted. → Do the required maintenance operation.
Green	1	-	Diagnostics are active and no diagnostics event has been generated.
White	0	-	Diagnostics are inactive.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

6 TECHNICAL DATA

6.1 Operating conditions

Ambient temperature	Depends on the liquid temperature (see Fig. 9 or Fig. 10)
• Device variant with two M20x1.5 cable glands and one 5-pin M12 connector	• –10 °C...+70 °C, if the liquid temperature is –10 °C...+80 °C (see Fig. 9) • See Fig. 9, if the liquid temperature is higher than +80 °C
• Device variant with two 4-pin M12 female connectors and one 5-pin M12 connector (Ethernet device variant)	• –10 °C...+55 °C (see Fig. 10)
Air humidity	< 85 %, non condensing
Height above see level	≤ 2000 m
Operating conditions	Continuous operation
Equipment mobility	Fixed device
Use	Indoor and outdoor ▸ Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions.
Installation category	Category I according to UL/EN 61010-1
Degree of pollution	Degree 2 according to UL/EN 61010-1
IP-Code according to IEC/ EN 60529	IP65[1)], IP67[1)] if the following conditions are observed: • The device must be wired. • The cable glands must be tightened. • The covers must be screwed tight. • Unused cable glands must be sealed with the blind plugs provided. The blind plugs are mounted upon delivery of the device. • Unused M12 connectors must be protected by a screwed plug.
Protection type according to NEMA250[1)]	4X if the following conditions are observed: • The device must be wired. • The cable glands must be tightened. • The covers must be screwed tight. • Unused cable glands must be sealed with the blind plugs provided. The blind plugs are mounted upon delivery of the device. • Unused M12 connectors must be protected by a screwed plug.

[1)] not evaluated by UL; only IP64 is evaluated by the ATEX / IECEx notified body.

→ For the special operating conditions of devices with ATEX / IECEx certification, refer to the ATEX / IECEx supplement for the device. The supplement is available at country.burkert.com.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

6.2 Standards and directives

The device complies with the relevant EU harmonisation legislation. In addition, the device also complies with the requirements of the laws of the United Kingdom.

The harmonised standards that have been applied for the conformity assessment procedure are listed in the current version of the EU Declaration of Conformity/UK Declaration of Conformity.

6.2.1 Conformity to the Pressure Equipment Directive

- ▸ Make sure that the device materials are compatible with the liquid.
- ▸ Make sure that the pipe DN is adapted for the device.
- ▸ Observe the liquid nominal pressure (PN) for the device. The nominal pressure (PN) is given by the device manufacturer.

The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

- Device used on a pipe (PS = maximum admissible pressure, in bar; DN = nominal dimension of the pipe)

Type of liquid	Conditions
Fluid group 1, Article 4, Paragraph 1.c.i	DN ≤ 25
Fluid group 2, Article 4, Paragraph 1.c.i	DN ≤ 32 or PSxDN ≤ 1000
Fluid group 1, Article 4, Paragraph 1.c.ii	DN ≤ 25 or PSxDN ≤ 2000
Fluid group 2, Article 4, Paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PSxDN ≤ 5000

6.2.2 UL certification

The devices with variable key PU01 or PU02 are UL-certified devices and comply also with the following standards:

- UL 61010-1
- CAN/CSA-C22.2 n°61010-1

Identification on the device	Certification	Variable key
c US	UL recognized	PU01
c UL US LISTED Measuring Equipment E237737	UL listed	PU02

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

6.2.3 EHEDG certification

- EL class I
- The following device variants are EHEDG certified:

Process connections	Diameters
• Clamp [1] connections according to ASME BPE (DIN 32676 series C)	• 3/8", 1/2", 3/4", 1", 1 1/2", 2", 2 1/2", 3"
• Clamp connections according to DIN 11864-3 series C	• 1/2", 3/4", 1", 1 1/2", 2"
• Flange connections according to DIN 11864-2 series C	• 1/2", 3/4", 1", 1 1/2", 2"
• Clamp [1] connections according to DIN 32676 series B	• DN08, DN15 (except device variants with a clamp diameter of 34.0 mm), DN25, DN40, DN50, DN65, DN80
• Clamp [1] connections according to DIN 32676 series A	• DN08, DN15, DN25, DN40, DN50, DN65, DN80
• Clamp connections according to DIN 11864-3 series A, DIN 11864-3 series B	• DN08, DN15, DN25, DN40, DN50
• Clamp [1] connections according to SMS 3017 / ISO 2852 for pipes according to SMS 3008	• DN25, DN40, DN50
• Flange connections according to DIN 11864-2 series A, DIN 11864-2 series B	• DN08, DN15, DN25, DN40, DN50, DN65, DN80
• External-threaded [2] connections according to DIN 11851 series A	• DN65, DN80

[1] The EHEDG compliance is only valid if the process connections are used in combination with EHEDG-compliant gaskets from Combifit International B.V.

[2] The EHEDG compliance is only valid if the process connections are used in combination with EHEDG-compliant gaskets:

- ASEPTO-STAR k-flex upgrade gaskets from Kieselmann GmbH, Germany
- SKS gaskets set DIN 11851 EHEDG with EPDM or FKM inner gasket from Siersema Komponenten Service (S.K.S.) B.V., Netherlands

→ To make sure you use EHEDG-compliant gaskets, refer to the "EHEDG Position Paper" available on the EHEDG website.

The manufacturer of the device does not supply any gaskets for the process connections.

6.2.4 ATEX / IECEx certification

→ Refer to the ATEX / IECEx supplement for the device. The supplement is available at country.burkert.com.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

6.3 Liquid data

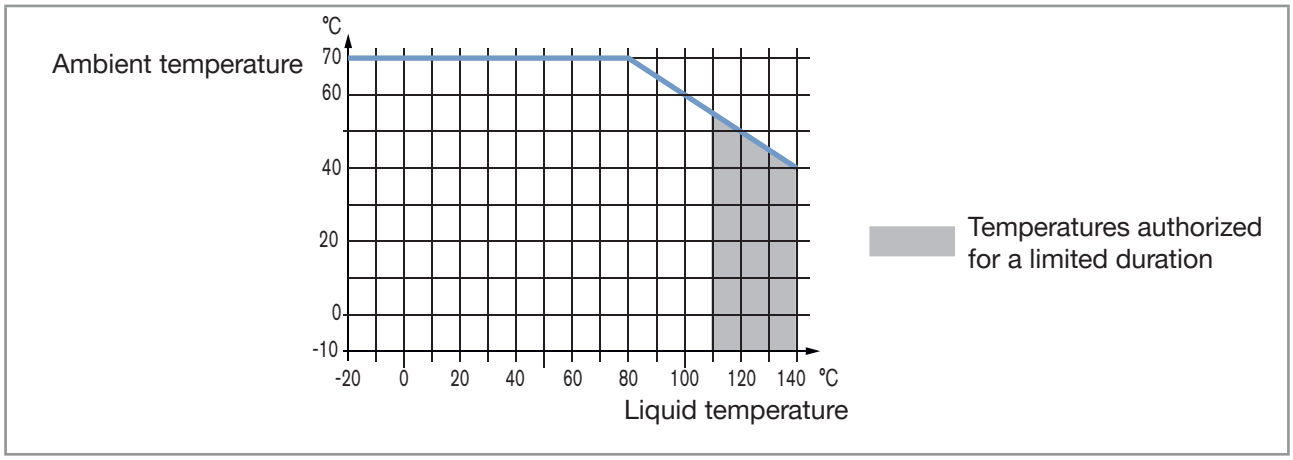


Fig. 9: Dependency between the liquid temperature and the ambient temperature, device variant with two M20x1.5 cable glands and one 5-pin M12 male connector

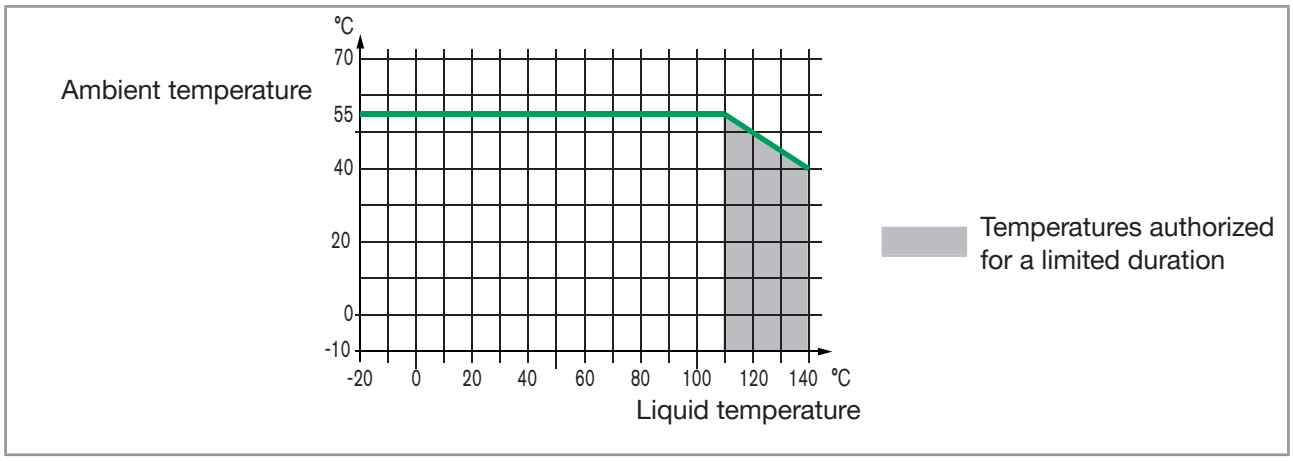


Fig. 10: Dependency between the liquid temperature and the ambient temperature, device variant with two 4-pin M12 female connectors and one 5-pin M12 male connector (Ethernet device variant)

Liquid temperature	–20...+110 °C. Up to 140 °C for maximum 60 minutes for a sterilisation process. Maximum temperature gradient: 10 °C/s [measured by the sensor integrated in the device]. The maximum liquid temperature can be restricted by the ambient operating temperature. Depending on your device variant, see Fig. 9 or Fig. 10.
Type of liquids	Non-dangerous liquids according to Article 4, Paragraph 1 of Directive 2014/68/EU
Speed of sound in the liquid	
• DN08 • 3/8", 1/2"	• 1000...2000 m/s
• from DN15 and above • from 3/4" and above	• 800...2300 m/s

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

Table 2: Liquid pressure, depending on the pipe diameter, the type of process connections and the process connection standard

Size of the process connection	Type of process connection	Standards the process connections conform to	PN
DN08, DN15, DN25	clamp	• DIN 11864-3 series B • DIN 32676 series A • DIN 32676 series B	PN25
	flange	DIN 11864-2 series B	PN25
DN15, DN25	clamp	DIN 11864-3 series A	PN25
	flange	DIN 11864-2 series A	PN25
DN25	clamp	SMS 3017 / ISO 2852 for pipes according to SMS 3008	PN25
3/8", 1/2", 3/4", 1", 1 1/2"	clamp	ASME BPE (DIN 32676 series C)	PN25
1/2", 3/4", 1", 1 1/2"	clamp	DIN 11864-3 series C	PN25
	flange	DIN 11864-2 series C	PN25
DN40	clamp	• DIN 11864-3 series B • DIN 32676 series B	PN16
		• DIN 11864-3 series A • DIN 32676 series A • SMS 3017 / ISO 2852 for pipes according to SMS 3008	PN25
	flange	DIN 11864-2 series B	PN16
		DIN 11864-2 series A	PN25
DN50	clamp	• DIN 11864-3 series A • DIN 11864-3 series B • DIN 32676 series A • DIN 32676 series B • SMS 3017 / ISO 2852 for pipes according to SMS 3008	PN16
	flange	• DIN 11864-2 series A • DIN 11864-2 series B	PN16
2"	clamp	• ASME BPE (DIN 32676 series C) • DIN 11864-3 series C	PN16
	flange	DIN 11864-2 series C	PN16

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

Size of the process connection	Type of process connection	Standards the process connections conform to	PN
DN65, DN80	clamp	• DIN 32676 series A • DIN 32676 series B	PN10
	flange	• DIN 11864-2 series A • DIN 11864-2 series B	PN10
	external threaded	• DIN 11851	PN10
ASME 2 1/2", 3"	clamp	• DIN 32676 series C	PN10

6.4 Measurement data

In the current section, the term "full scale" refers to full scale of volume flow rate, i.e. the flow rate corresponding to 10 m/s flow velocity.

6.4.1 Volume flow rate

Table 3: Volume flow rate measurement

• Measurement range	• 0...1.7 m^3/h to 0...200 m^3/h, depending on the DN of the sensor
• Measurement deviation[1) 2)] for a volume flow rate between 10 % of the full scale and the full scale	• ±0.4 % of the measured value
• Measurement deviation[1) 2)] for a volume flow rate between 1 % of the full scale and 10 % of the full scale	• < ±0.08 % of the full scale
• Repeatability[2)] for a volume flow rate between 10 % of the full scale and the full scale	• ±0.2 % of the measured value
• Repeatability[2)] for a volume flow rate between 1 % of the full scale and 10 % of the full scale	• ±0.04 % of the full scale
• Refresh time	• Adjustable.

[1)] "Measurement bias" as defined in standard JCGM 200:2012.

[2)] Determined under the following reference conditions: liquid = water, free of gas bubbles and solids; water and ambient temperatures = 23 °C ±1 °C (73.4 °F ±1.8 °F), device settings with their default values, short refresh time, while maintaining turbulent or laminar flow, applying the minimum inlet (40xDN) and minimum outlet (1xDN) straight pipe lengths, appropriate pipe dimensions.

6.4.2 Temperature

Table 4: Temperature measurement

• Measurement range	• –20 °C...+140 °C
• Measurement deviation[1)] for temperatures up to 100 °C	• ±1 °C
• Measurement deviation[1)] for temperatures in 100...140 °C	• ±1.5 %
• Refresh time	• 1 s

[1)] "Measurement bias" as defined in standard JCGM 200:2012.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

6.4.3 Differentiation factor

Table 5: DF measurement (optional feature)

• Measurement range	• 0.8...1.3
• Resolution	• 0.00001
• Repeatability	• ±0.5 % of the measured value
• Refresh time	• Adjustable.

6.4.4 Acoustic transmission factor

Table 6: Acoustic transmission factor measurement (optional feature)

• Measurement range	• 10 %...120 %
• Resolution	• 0.01 %
• Repeatability	• ±2 % of the measured value
• Refresh time	• Adjustable.

6.4.5 Density

Table 7: Density measurement (optional feature)

• Measurement range	• 0.78...1.3 g/cm^3
• Measurement deviation [1)]	• ±2 % of the measured value
• Repeatability [1)]	• ±1 % of the measured value
• Refresh time	• Adjustable.

[1)] Determined under the following reference conditions: liquid free of gas bubbles and solids; medium and ambient temperatures = 23 °C ±1 °C (73.4 °F ±1.8 °F), device settings with their default values, refresh time short.

6.4.6 Mass flow rate

Table 8: Mass flow rate measurement (optional feature)

• Measurement range	• 0...1360 kg/h to 0...260000 kg/h, depending on the DN of the sensor
• Measurement deviation[1) 2)] for a mass flow rate between 10 % of the full scale and the full scale of the volume flow rate	• ±2.4 % of the measured value
• Measurement deviation[1) 2)] for a mass flow rate between 10 % of the full scale and the full scale	• ±(2 % of the measured value + 0.08 % of full scale)
• Repeatability[2)] for mass flow rate between 10 % of the full scale and the full scale	• ±1.2 % of the measured value
• Repeatability[2)] for mass flow rate between 1 % of the full scale and 10 % of the full scale	• ±(1 % of the measured value + 0.04 % of full scale)
• Refresh time	• Adjustable.

[1)] "Measurement bias" as defined in standard JCGM 200:2012.

[2)] Determined under the following reference conditions: liquid = water, free of gas bubbles and solids; water and ambient temperatures = 23 °C ±1 °C (73.4 °F ±1.8 °F), device settings with their default values, short refresh time, while maintaining turbulent or laminar flow, applying the minimum inlet (40xDN) and minimum outlet (1xDN) straight pipe lengths, appropriate pipe dimensions.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

6.5 Electrical data

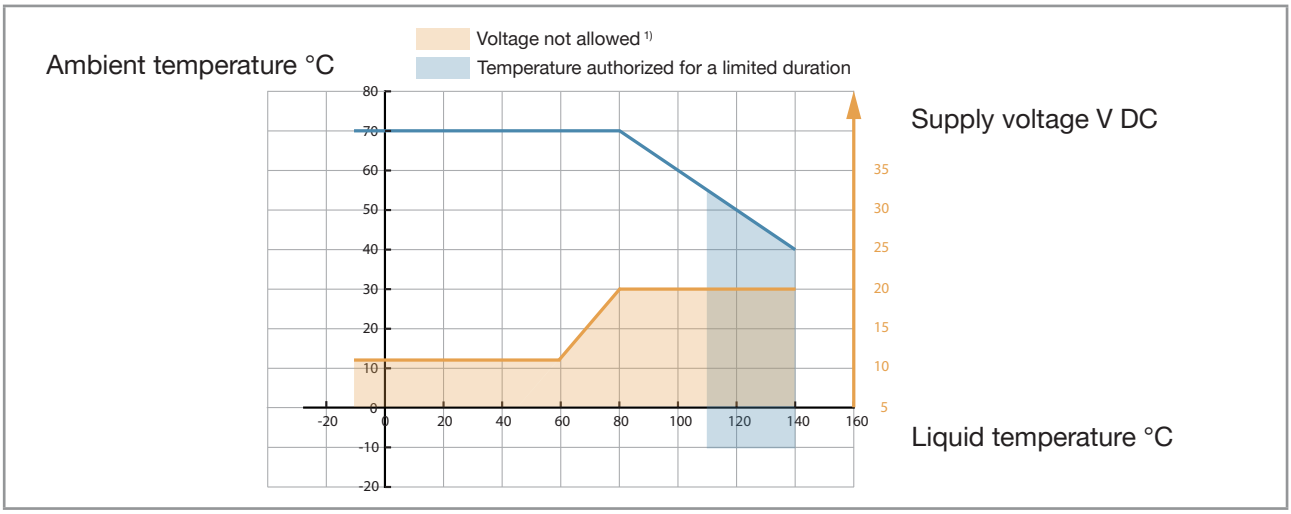


Fig. 11: Minimum supply voltage depending on the ambient temperature and the liquid temperature, device variant with two M20x1.5 cable glands and one 5-pin M12 male connector

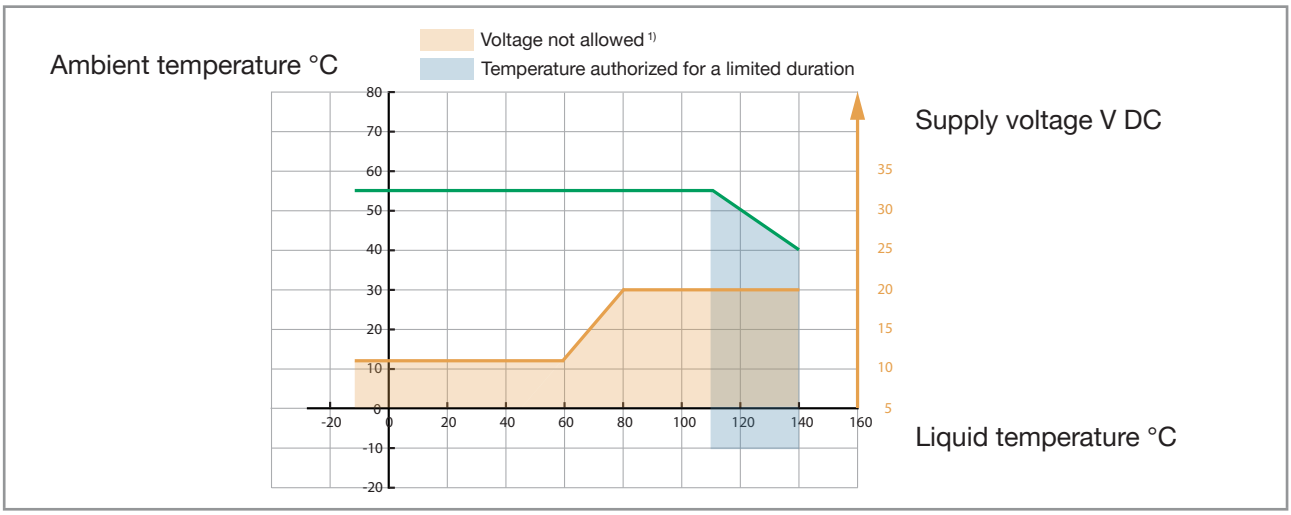


Fig. 12: Minimum supply voltage depending on the ambient temperature and the liquid temperature, device variant with two 4-pin M12 female connectors and one 5-pin M12 male connector (Ethernet device variant)

1) Only for products with measure board index lower than G (meaning approximatively manufactured before 2019)

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

Operating voltage	• 12...35 V DC; the minimum voltage to be supplied depends on the liquid temperature and on the ambient operating temperature: depending on your device variant, see Fig. 11 or Fig. 12. • Current consumption: ≤ 2 A • Filtered and regulated • Tolerance: ±10 % • The device must be connected permanently to a Safety Extra-Low Voltage circuit (SELV circuit). • Energize the device through a Limited Power Source (LPS) according to standards UL/EN 60950-1 or through a limited-energy circuit according to standards UL/ EN 61010-1.
Power consumption (without the consumption of the outputs)	
• Device with 2 x M20x1.5 cable glands and 1 x 5-pin M12 connector	• ≤ 5 W
• Device with 2 x 4-pin M12 connectors and 1 x 5-pin M12 connector, Ethernet version	• ≤ 8 W
• Device with 2 x 4-pin M12 connectors and 1 x 5-pin M12 connector, Ethernet version, with display module	• ≤ 9 W
Polarity reversal	Protected
Analogue output 1, also output 3 if configured as an analogue output	• 4...20 mA current; 3.6 mA or 22 mA to indicate an error • Uncertainty: ±0.04 mA • Resolution: 0.8 µA • Open loop detection through diagnostics software function • Any connection mode, in sink or source mode • Galvanically isolated, passive • Protected against polarity reversal • Maximum loop impedance 1300 Ω at 35 V DC, 1000 Ω at 30 V DC, 700 Ω at 24 V DC, 450 Ω at 18 V DC
Digital output 2, also output 3 if configured as a digital output	• Transistor • Any connection mode, in NPN or PNP mode • Pulse (by default), can be changed by the user • 0...2000 Hz • 5...35 V DC, ≤ 700 mA • Galvanically isolated, passive • Overload information through diagnostics software function • Protected against overloads • Protected against polarity reversals

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

6.6 Mechanical data

Dimensions and weight of the device: refer to the technical data sheet regarding Type 8098 FLOWave L available at country.burkert.com.

Table 9: Materials in contact with ambient air

Component	Material
Transmitter housing[1)]	Stainless steel 304 / 1.4301, outer surface finish Ra < 1.6 µm
Sensor housing (depending on the device variant)	Stainless steel 304 / 1.4301, outer surface finish Ra < 1.6 µm
	Stainless steel 316L / 1.4435, outer surface finish Ra < 1.6 µm
Cable glands / Blind plugs / Sealing (depending on the device variant)	Stainless steel / PA6 / TPE
	Nickel plated brass / Black polyoxymethylene (POM) / HNBR and TPE
5-pin M12 male connector / Screwed plug / Sealing (depending on the device variant)	Stainless steel / Stainless steel / NBR
	Nickel plated brass / Nickel plated brass / NBR
4-pin M12 female connector / Screwed plug / Sealing	Stainless steel / Stainless steel / EPDM
Pressure compensating element	Stainless steel
External M4 screw for earth connection	Stainless steel A4
Display	Float glass, stainless steel 304 / 1.4301
Seals	VMQ silicone
Adhesive labels	Polyester

[1)] The housing may have slight machining marks due to the manufacturing process. These marks do not affect the operation of the device and are not a manufacturing defect.

Table 10: Materials in contact with the liquid

Component	Material
• Sensor measurement tube • Pipe connections	Stainless steel 316L / DIN 1.4435 with low delta-ferrite rate

Table 11: Available surface finish

Component	Surface finish according to ISO 4288
Measurement tube (inner surface)	• Ra < 0.8 µm (30 µin) • Ra < 0.4 µm (15 µin) (electro-polished)
• Measurement tube (outer surface) • Housing	Ra < 1.6 µm (excluding welding seams)

6.7 Specifications of the Ethernet Industrial communication

→ For the specifications of the Ethernet Industrial communication, refer to the Type 8098 FLOWave L Operating Instructions at country.burkert.com.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

7 INSTALLATION IN A PIPE

7.1 Safety instructions

DANGER

Risk of injury due to electrical voltage.

- Before carrying out work on the system, disconnect the electrical power for all the conductors and isolate it.
- In accordance with standard UL/EN 61010-1, all equipment connected to the Type 8098 FLOWave L flowmeter shall be double insulated with respect to the mains and all circuits connected to the Type 8098 FLOWave L flowmeter must be limited energy circuits.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury due to pressure in the installation.

- Before any intervention in the installation, stop the circulation of liquid, cut off the pressure and drain the pipe.
- Before any intervention in the installation, make sure there is no pressure in the pipe.
- Observe the dependency between the liquid temperature and the liquid pressure for the fitting used.

If switched on for a prolonged time, risk of burns or fire due to hot device surfaces

- Do not touch with bare hands.
- Keep the device away from highly flammable substances and liquids.

Risk of burns due to high liquid temperatures.

- Do not touch with bare hands the parts of the device that are in contact with the liquid.
- Use safety gloves to handle the device.
- Before opening the pipe, stop the circulation of liquid and drain the pipe.
- Before opening the pipe, make sure the pipe is completely empty.

Risk of injury due to the nature of the liquid.

- Respect the prevailing regulations on accident prevention and safety relating to the use of dangerous liquids.

WARNING

Risk of injury due to non-conforming installation.

- The electrical and liquid installations must only be carried out by qualified and authorized personnel with the appropriate tools.

WARNING

Risk of injury due to unintentional switch-on of the power supply or uncontrolled restart of the installation.

- Take appropriate measures to avoid unintentional activation of the installation.
- Guarantee a set or controlled process restart after carrying out any device intervention.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

CAUTION

Risk of injury due to a heavy device.

A heavy device can fall down during transport or during installation and cause injuries.

- ▸ Transport, install and dismantle a heavy device with the help of another person.
- ▸ Use appropriate tools.

NOTICE

The device will be damaged if you use a tool to turn the blind cover or the display module.

- ▸ Do not use a tool to turn the blind cover or the display module.

Risk of failure or risk of accelerated ageing of electrical components.

- ▸ Observe the dependence between liquid temperature and ambient temperature (see Fig. 9 and Fig. 10).

7.2 Additional documentation

→ If the device is an ATEX / IECEx device variant, then refer to the ATEX / IECEx supplement for Type 8098 FLOWave L available on the internet at country.burkert.com.

7.3 Preparing the device before installation into the pipe

The device is delivered as described in chapter 5.1.

Before installing the device into the pipe, you may:

- change the position of the transmitter on the sensor. Refer to chapter 7.3.1.
- switch positions of the display module or of the Wi-Fi module and the blind cover. Refer to chapter 7.3.2.

7.3.1 Changing the position of the transmitter on the sensor

These instructions are valid for all the device variants.

The transmitter can have four positions on the Type S097 flow sensor. See Fig. 13.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

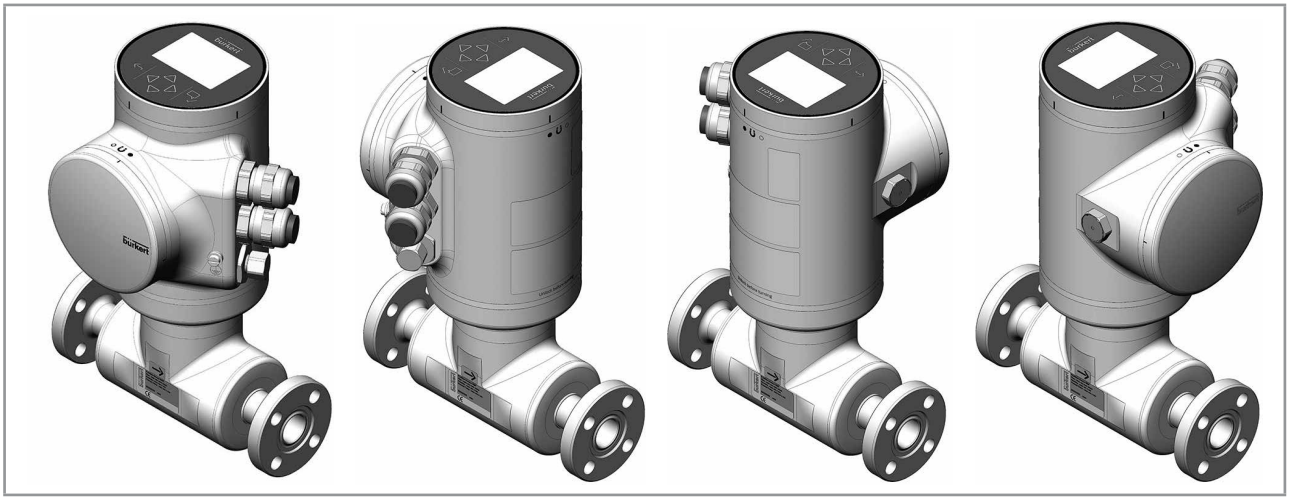
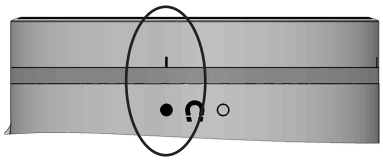
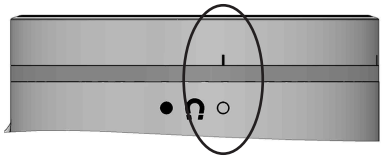
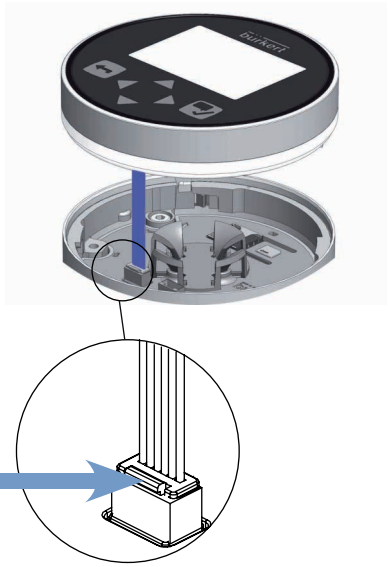
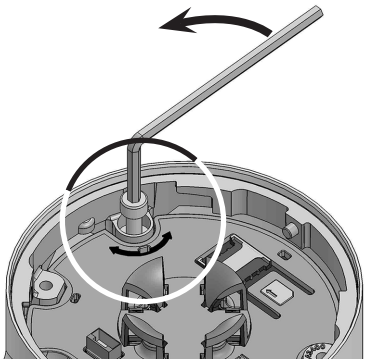
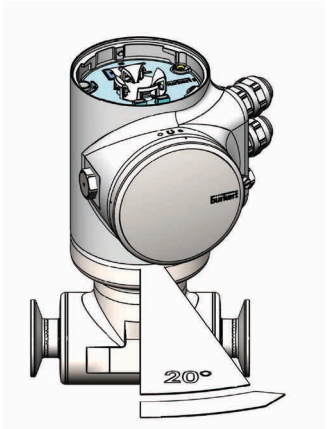


Fig. 13: Possible positions of the transmitter

→ To change the position of the transmitter, do the following:

For safety reasons and to comply with standard UL 61010-1, the blind cover and the display module or the Wi-Fi module are locked. → Prepare the unlocking magnetic key, which is delivered with the device, to change the position of the transmitter.	 The blind cover, the display module or the Wi-Fi module is locked
1. Put the magnetic key on the mark related to the display module. You should hear a soft click indicating that the display module or the Wi-Fi module is unlocked. Do not use a tool to turn the display module.	
2. While the magnetic key is on the mark, turn the display module or the Wi-Fi module by hand only from the locked position to the unlocked position. If you cannot turn the display module or the Wi-Fi module by hand, contact Bürkert.	 The blind cover, the display module or the Wi-Fi module is unlocked

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

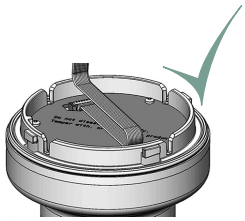
3. ⚠ Carefully lift the display module or the Wi-Fi module because a cable connects the display module or the Wi-Fi module to the transmitter. 4. Push the tab of the cable connector to disconnect the display module or the Wi-Fi module from the transmitter. 5. Remove the display module or the Wi-Fi module and put it on a clean surface to protect the seal from dirt.	
6. Use a size 3 hexagonal key to loosen the screw that is marked with the arrow and that locks the transmitter to the flow sensor.	
7. Hold the flow sensor with one hand and, with the other hand, turn the transmitter by about 20 degrees counterclockwise.	

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

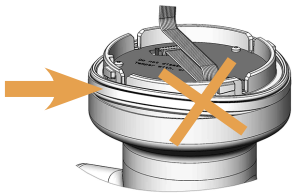
8. ⚠ Lift the transmitter carefully because a cable connects the transmitter to the flow sensor.

9. If the seal is damaged, replace it. Apply a layer of lithium soap grease to the new seal before you put it in place.

10. If the seal is not located in the groove, put it back in the groove.



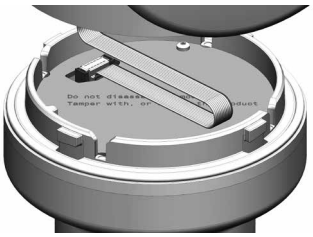
Seal in the groove: correct



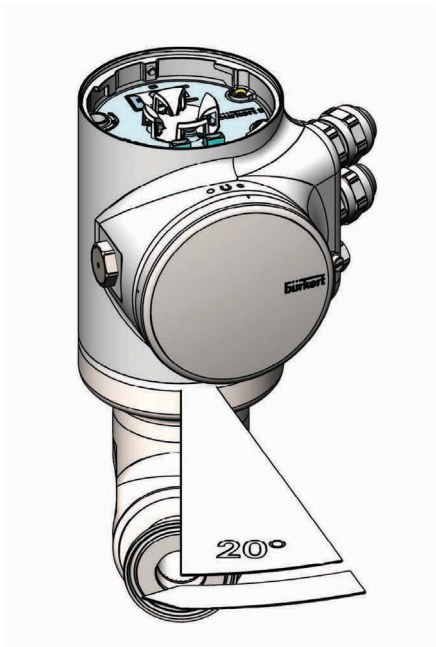
Seal not in the groove: NOT correct

11. Turn the transmitter to the desired position.

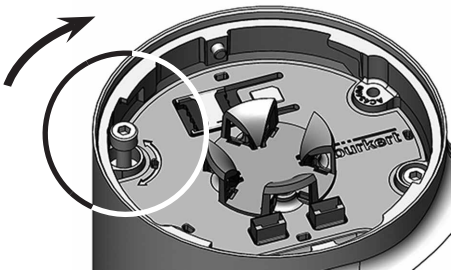
12. ⚠ Fold the cable in a Z-shape and make sure the cable stays inside the transmitter.



13. Turn the transmitter by about 20 degrees clockwise.



MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

14. Screw the transmitter clockwise on the flow sensor until the blind cover is perfectly parallel or perpendicular to the axis of the pipe.	
15. Fasten the screw with a size 3 hexagonal key to a tightening torque of 1.3 Nm ±0.5 Nm (0.9 ft·lbf ±0.4 ft·lbf).	
16. Connect the display module or the Wi-Fi module to the transmitter. 17. Put the mark of the cover on the unlocked marking of the housing and screw the cover clockwise on the transmitter housing until the mark is on the locked position. You should hear a click.	

7.3.2 Switching positions of the blind cover and the display module or the Wi-Fi module

CAUTION

Risk of injury due to a heavy device.

A heavy device can fall down during transport or during installation and cause injuries.

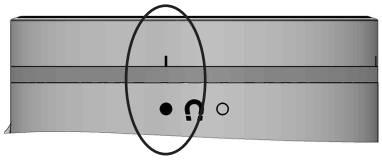
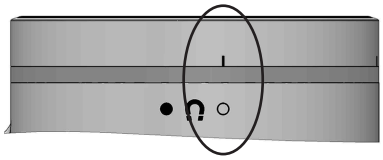
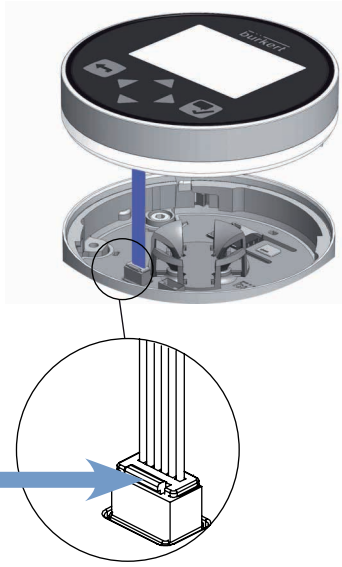
- ▸ Transport, install and dismantle a heavy device with the help of another person.
- ▸ Use appropriate tools.

These instructions are valid for all the device variants.

Upon delivery, a display module is screwed on the top and a blind cover is screwed on the housing side.

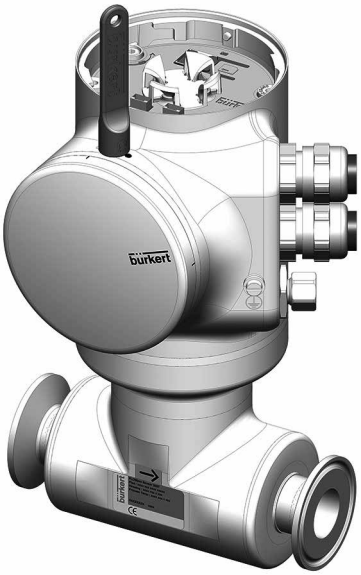
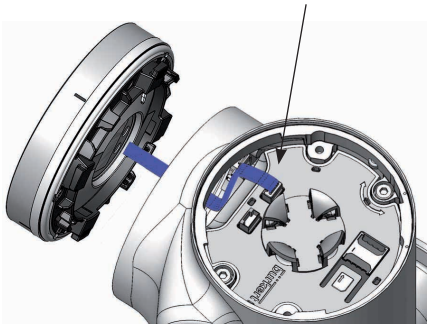
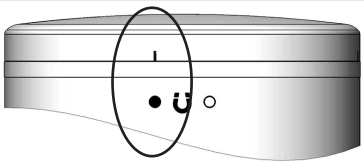
→ To switch positions of the display module or the Wi-Fi module and the blind cover, do the following:

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

For safety reasons and to comply with standard UL 61010-1, the blind cover and the display module or the Wi-Fi module are locked. → Prepare the unlocking magnetic key, which is delivered with the device.	 The blind cover, the display module or the Wi-Fi module is locked
1. Put the magnetic key on the mark related to the display module or the Wi-Fi module. You should hear a soft click indicating that the display module or the Wi-Fi module is unlocked. Do not use a tool to turn the display module or the Wi-Fi module.	
2. While the magnetic key is on the mark, turn the display module or the Wi-Fi module by hand only from the locked position to the unlocked position. If you cannot turn the display module or the Wi-Fi module by hand, contact Bürkert.	 The display module or the Wi-Fi module is unlocked
3. Carefully lift the display module or the Wi-Fi module because a cable connects the display module or the Wi-Fi module to the transmitter. 4. Push the tab of the cable connector to disconnect the display module or the Wi-Fi module from the transmitter. 5. Remove the display module or the Wi-Fi module and put it on a clean surface to protect the seal from dirt.	 Push the tab to unlock the cable connector

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

6. Put the magnetic key on the mark related to the blind cover. You should hear a click indicating that the blind cover is unlocked. Do not use a tool to turn the blind cover. 7. Turn the blind cover by hand only to the unlocked position and remove it. If you cannot turn the blind cover by hand, contact Bürkert.	
8. Put the cable of the display module or the Wi-Fi module through the front opening. 9. Connect the cable to the connector, as shown in the figure. 10. Put the mark of the display module or the Wi-Fi module on the unlocked marking of the transmitter housing and screw the cover clockwise on the transmitter until the mark is on the locked position.	Connect the cable here 
11. Put the mark of the blind cover on the unlocked marking of the top of the transmitter housing.	
12. Screw the blind cover clockwise on the transmitter until the mark is on the locked position. You should hear a click.	 The blind cover is locked.

7.4 Recommendations for the installation into the pipe

The device can be installed into either horizontal, oblique or vertical pipes. But an installation on a vertical pipe is better to prevent air bubbles or gas bubbles to remain in the sensor measurement-tube.

In any case and according to the device variant, respect the following recommendations:

→ Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of climatic conditions.

→ If the mass of the device could kink the pipe, install adapted pipe supports before mounting the device in the pipe.

→ Always install a heavy device with the help of another person and with the use of appropriate tools.

→ If the liquid temperature is subject to variations, make sure that the device can expand freely.

→ Make sure the DN of the measurement tube is suited to the flow velocity: refer to the data sheet of the device, available at country.burkert.com.

The device is not intended to measure the flow rate of liquids if gas bubbles are present, whatever the origin of the bubbles (air intake, cavitation, degassing, …).

→ Choose a location with enough free space to put the magnetic key on the symbol at the side of the device.

→ Install the device upstream a valve or any equipment that changes the pipe diameter or the pipe direction.

→ If you cannot install the device upstream a valve or any equipment that changes the pipe diameter or the pipe direction, observe the straight downstream distances depending on the design of the pipes. Refer to standard ISO 9104:1991 and Fig. 14. If these recommendations cannot be complied with, contact Bürkert.

IF YOU CANNOT INSTALL THE DEVICE UPSTREAM A VALVE OR ANY EQUIPMENT THAT CHANGES THE PIPE DIAMETER OR THE PIPE DIRECTION, THEN OBSERVE THE FOLLOWING DISTANCES

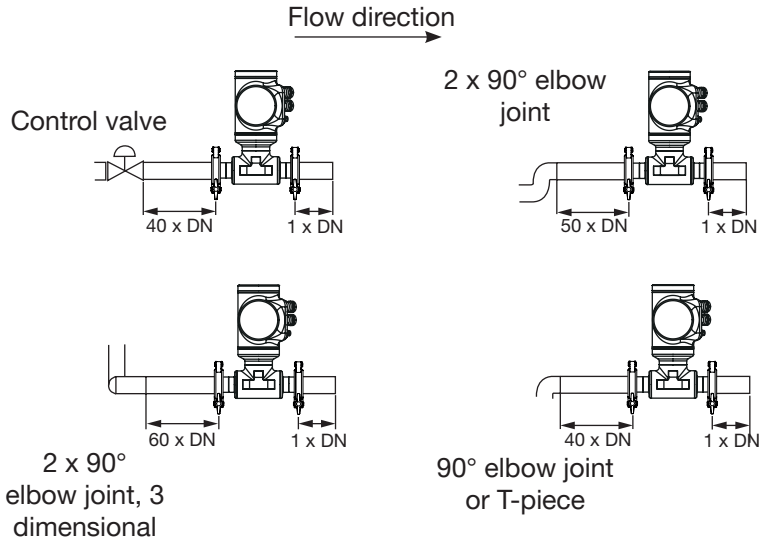


Fig. 14: Upstream and downstream straight distances for special pipe designs (example for a horizontal installation)

→ To make sure that neither air bubbles nor gas bubbles trouble the measuring, install the device as recommended in Fig. 15.

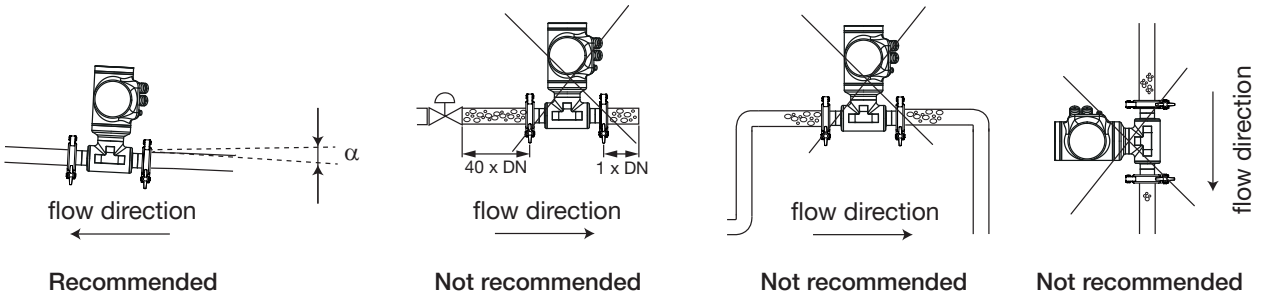


Fig. 15: Orientation of a device to avoid air bubbles and gas bubbles

→ To allow proper self-draining and to respect the 3A and EHEDG requirements, install the device into a pipe with a minimum angle against the horizontal. See Table 12.

Table 12: Minimum angle against the horizontal for proper self-draining

Type of process connection	Standards the process connections conform to	Angle against the horizontal
clamp	• DIN 32676 series A • DIN 11864-3 series A • SMS 3017 / ISO 2852 for pipes according to SMS 3008	For DN15 to DN50: minimum 5°
		For DN8 and DN65 to DN100: minimum 3°
flange	DIN 11864-2 series A	For DN15 to DN50: minimum 5°
		For DN8 and DN65 to DN100: minimum 3°
clamp	• ASME BPE (DIN 32676 series C) • DIN 32676 series B • DIN 11864-3 series B • DIN 11864-3 series C	minimum 3°
flange	• DIN 11864-2 series B • DIN 11864-2 series C	minimum 3°
external threaded	DIN 11851 series A	minimum 3°

→ If the pipe is fitted with a thermal insulation, do not thermally insulate the measurement tube of the device to make sure that the temperature in the device is less than 70°C. Refer to Fig. 16 and, for the minimum supply voltage, to chapter 8.3.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

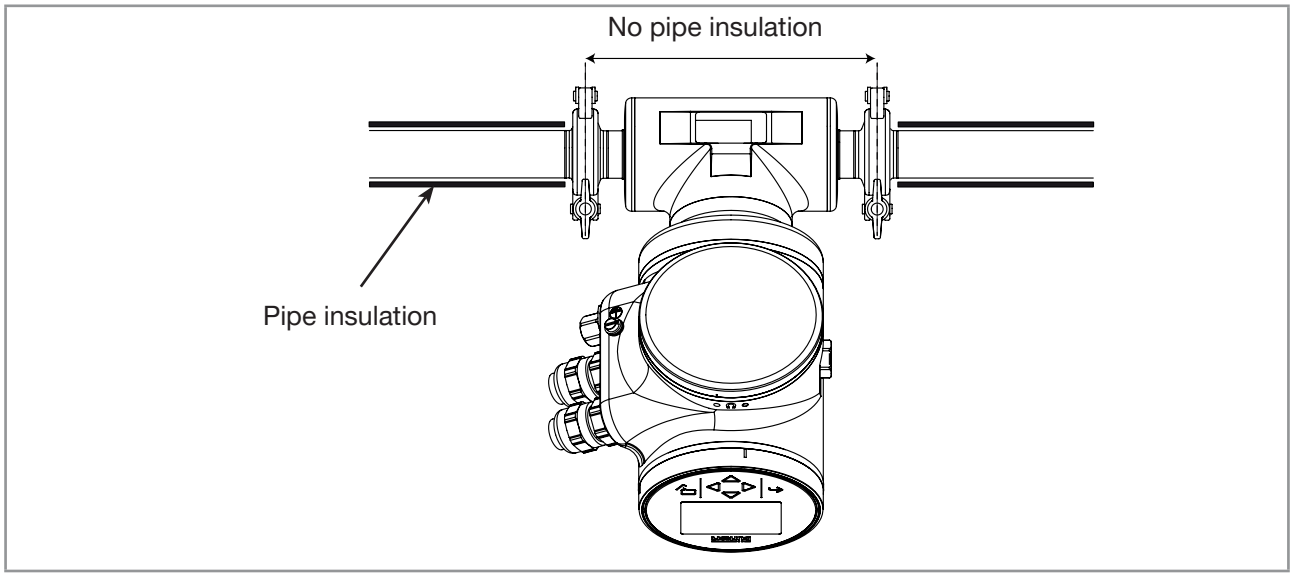


Fig. 16: Thermal insulation of the pipe

→ To make sure the internal temperature of the transmitter with cable glands does not exceed the authorized maximum value, install the device as recommended in Fig. 17.

→ To make sure the internal temperature of the transmitter does not exceed the authorized maximum value, install an Ethernet device variant as recommended in Fig. 18.

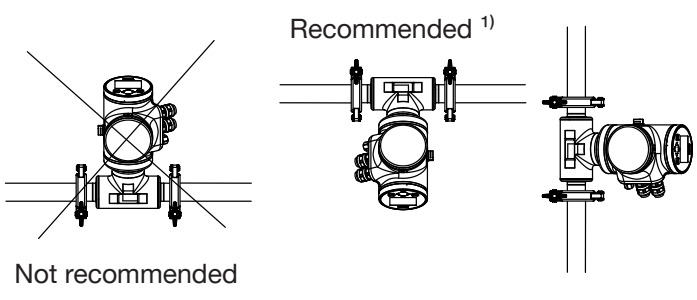
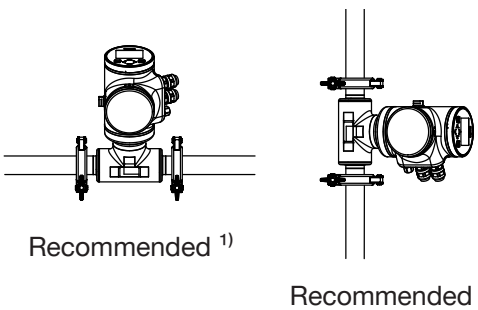
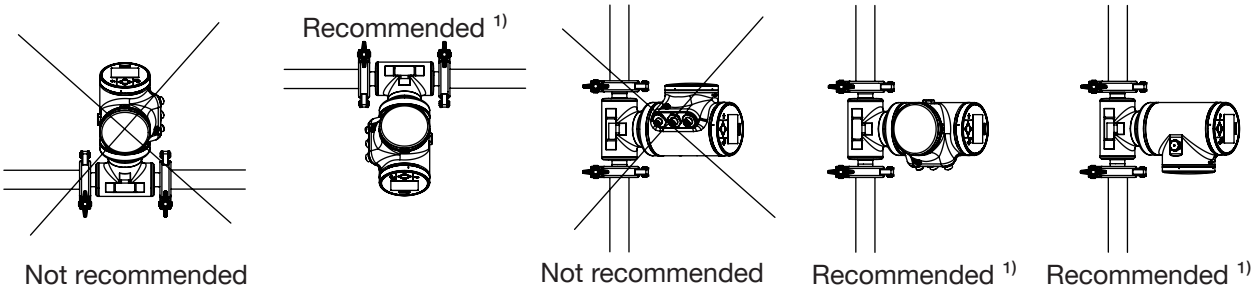
To avoid effects of high liquid temperatures:	To limit the effects of low liquid temperatures, or in case of high relative humidity / possible condensation:
	
1) *These orientations are valid for all the positions of the transmitter on the Type S097 flow sensor. Refer to Fig. 13: Possible positions of the transmitter, page 32*	

Fig. 17: Orientation of a device variant with cable glands to avoid effects of high liquid temperatures

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023



1) *These orientations are valid for all the positions of the transmitter on the Type S097 flow sensor.*
Refer to Fig. 13: Possible positions of the transmitter, page 32

Fig. 18: Orientation of an Ethernet device variant to permit the heat dissipation

7.5 Installing the device into the pipe

CAUTION

Risk of injury due to a heavy device.

A heavy device can fall down during transport or during installation and cause injuries.

- ▸ Transport, install and dismantle a heavy device with the help of another person.
- ▸ Use appropriate tools.

7.5.1 Before installing the device into the pipe

- Prepare the device as described in chapter 7.3.
- Follow the recommendations given in chapter 7.4.

7.5.2 Installing a device with clamp connections

The device manufacturer does not supply any gaskets for the process connections.

→ If the installation must be EHEDG-compliant and the device is fitted with clamp connections according to ASME BPE (DIN 32676 series C), DIN 32676 series A, DIN 32676 series B or SMS 3017 / ISO 2852 for pipes according to SMS 3008, then use EHEDG-compliant gaskets from Combifit International B.V.

→ To make sure that you use EHEDG-compliant gaskets, refer to the "EHEDG Position Paper" available on the EHEDG website.

→ The clamp connections according to DIN 11864-3 series A, B and C are hygienic connections. You can use any gaskets that are adapted to the process.

→ Make sure that the gaskets on the clamp connections are in good condition.

→ Place gaskets adapted to the process (temperature, liquid type) in the grooves of the clamp connections.

→ Attach the clamp connections to the pipe with clamp collars. Make sure that tightening the clamp collar does not create bulges at the gaskets. Gasket bulges can lead to wrong measurements.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

7.5.3 Installing a device with flange connections

→ The flange connections according to DIN 11864-2 series A, B and C are hygienic connections. You can use any gaskets that are adapted to the process.

→ Make sure that the gaskets on the flange connections are in good condition.

→ Place gaskets adapted to the process (temperature, liquid type) in the grooves of the flange connections.

→ Use bolts with dimensions as given in the relevant flange standard and adapted to the process.

→ Tighten the bolts to a torque as given in the relevant flange standard to fix the fitting to the pipe.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

7.5.4 Installing a device with external-threaded connections according to DIN 11851 series A for pipes according to DIN 11850

To install this device variant, respect the mounting standards that are applicable to the process.

→ Supply the following accessories that are not delivered by the device manufacturer. The accessories must be adapted to the process and to the device:

- 2 round slotted nuts
- 2 conical ferrules
- 2 gaskets that respect the standard DIN 11851. If the installation must be EHEDG-compliant, then supply EHEDG-compliant gaskets. For an EHEDG-compliant use, Burkert recommends gaskets of one of the following type:
  - ASEPTO-STAR k-flex upgrade gaskets from Kieselmann GmbH, Germany
  - SKS gaskets set DIN 11851 EHEDG with EPDM or FKM inner gasket from Siersema Komponenten Service (S.K.S.) B.V., Netherlands

Installation procedure:

1. Put the round slotted nuts on the pipe. Respect the mounting direction of the round slotted nuts so that they can be screwed on the external-threaded connections of the device. Refer to Fig. 19.

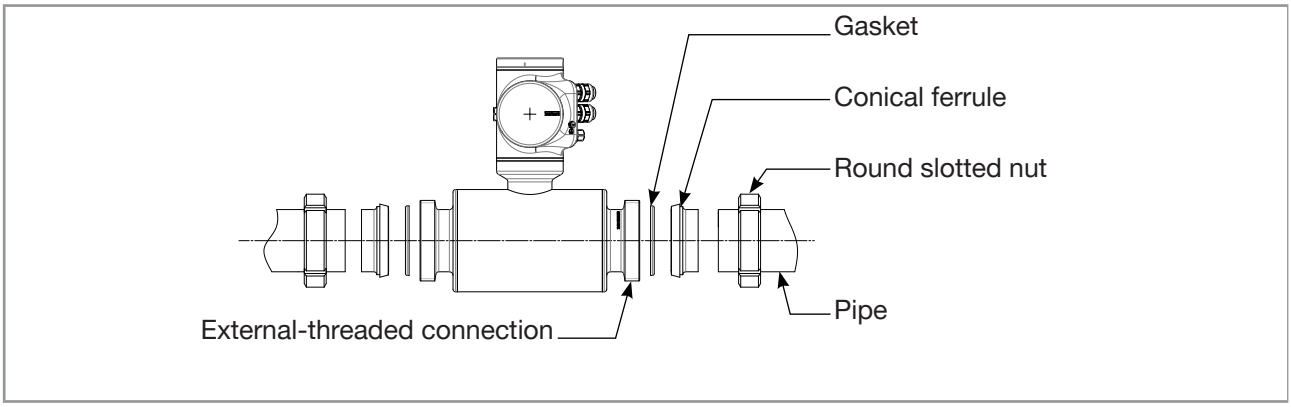


Fig. 19: Mounting order of the accessories

2. Weld the conical ferrules to the pipe.
3. Place the gaskets in the grooves of the external-threaded connections of the device. Respect the mounting direction of the gaskets.
4. Screw the round slotted nuts and tighten them according to the mounting standards that are applicable to the process.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

8 ELECTRICAL INSTALLATION

8.1 Safety instructions

DANGER

Risk of injury due to electrical voltage.

- Before carrying out work on the system, disconnect the electrical power for all the conductors and isolate it.
- In accordance with standard UL/EN 61010-1, all equipment connected to the Type 8098 FLOWave L flowmeter shall be double insulated with respect to the mains and all circuits connected to the Type 8098 FLOWave L flowmeter must be limited energy circuits.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury due to pressure in the installation.

- Before any intervention in the installation, stop the circulation of liquid, cut off the pressure and drain the pipe.
- Before any intervention in the installation, make sure there is no pressure in the pipe.
- Observe the dependency between the liquid temperature and the liquid pressure for the fitting used.

If switched on for a prolonged time, risk of burns or fire due to hot device surfaces

- Do not touch with bare hands.
- Keep the device away from highly flammable substances and liquids.

Risk of burns due to high liquid temperatures.

- Do not touch with bare hands the parts of the device that are in contact with the liquid.
- Use safety gloves to handle the device.
- Before opening the pipe, stop the circulation of liquid and drain the pipe.
- Before opening the pipe, make sure the pipe is completely empty.

Risk of injury due to the nature of the liquid.

- Respect the prevailing regulations on accident prevention and safety relating to the use of dangerous liquids.

WARNING

Risk of injury due to non-conforming installation.

- The electrical and liquid installations must only be carried out by qualified and authorized personnel with the appropriate tools.
- Fit a circuit breaker or a switch to the electrical installation of the building in which the device is installed.
- Install the circuit breaker or the switch in an easily accessible place.
- Identify the circuit breaker or the switch as the disconnecting component for the electrical power supply to the device.
- Install overload devices that are appropriate for electrical installation.
- Observe standard NF C 15-100 / IEC 60364.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

WARNING

Risk of injury due to unintentional switch on of the power supply or uncontrolled restart of the installation.

- Take appropriate measures to avoid unintentional activation of the installation.
- Guarantee a set or controlled process restart after carrying out any intervention on the device.

CAUTION

Risk of injury due to a heavy device.

A heavy device can fall down during transport or during installation and cause injuries.

- Transport, install and dismantle a heavy device with the help of another person.
- Use appropriate tools.

NOTICE

The device will be damaged if you use a tool to turn the blind cover or the display module.

- Do not use a tool to turn the blind cover or the display module.

NOTICE

If you try to remove the nut from a stainless steel M20x1.5 cable gland, the device is no longer tight.

- Do not remove the nut of a stainless steel M20x1.5 cable gland. The nut of a stainless steel M20x1.5 cable gland cannot be removed.
- Turn the nut until the stop. If you turn beyond the stop, the cable gland unscrews from the device and the device is no longer tight.

NOTICE

If the screwed plug of a 5-pin M12 male connector is removed, the device is not tight.

- If the 5-pin M12 male connector is not used, do not remove the screwed plug.
- Screw the plug to the 5-pin M12 male connector to a torque of 2 Nm (1.47 ft·lbf).

NOTICE

If the screwed plug of a 4-pin M12 female connector is removed, the device is not tight.

- If the 4-pin M12 female connector is not used, do not remove the screwed plug.
- Screw the plug to the 4-pin M12 female connector to a torque of 1.3 Nm (0.96 ft·lbf).

NOTICE

The device with M20x1.5 cable glands is not tight if a cable gland is not used

- Make sure the unused M20x1.5 cable glands are sealed with the supplied plugs.
- When the blind plug is inserted, screw the cable-gland nut in stainless steel to a torque of 3 Nm (2.21 ft·lbf).
- When the blind plug is inserted, screw the cable-gland nut in nickel plated brass to a torque of 8 Nm (5.90 ft·lbf).

- Use a high quality electrical power supply, filtered and regulated.
- Do not install the cables near high voltage or high frequency cables; if this cannot be avoided, observe a minimum distance of 30 cm.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

On a device with M20x1.5 cable glands, put only one cable in each cable gland.

To do the electrical installation of a device with two 4-pin M12 female connectors (Ethernet device variant) that is connected to an Ethernet network, observe standard ISO / IEC 61918.

8.2 Additional documentation

- For more information on büS, read the cabling guide available in English and in Japanese (Cabling_guide_for_büS/EDIP.pdf) at country.burkert.com.
- For more information on CANopen that is related to the device, refer to the Operating Instructions "CANopen Network configuration" at country.burkert.com.
- If the device is an an ATEX / IECEx device variant, then refer to the ATEX / IECEx supplement for Type 8098 FLOWave L available on the internet at country.burkert.com.

8.3 Connecting the device to a power supply

The device is wired in the factory to be easily energized through the 5-pin M12 male connector.

→ Connect the device with two 4-pin M12 female connectors (Ethernet device variant) to a 12...35 V DC power supply through the 5-pin M12 male connector; refer to chapter 8.4.

A device with two 4-pin M12 female connectors (Ethernet device variant) must be energized through the 5-pin M12 male connector.

→ Connect the device with M20x1.5 cable glands to a 12...35 V DC power supply:

- either through the 5-pin M12 male connector, refer to chapter 8.4.
- or through the M20x1.5 cable glands and the terminal strip located in the transmitter housing. Refer to chapter 8.13 for the wiring procedure.

The minimum voltage to be supplied depends on the device variant, on the liquid temperature and on the ambient operating temperature: see Fig. 20 and Fig. 21.

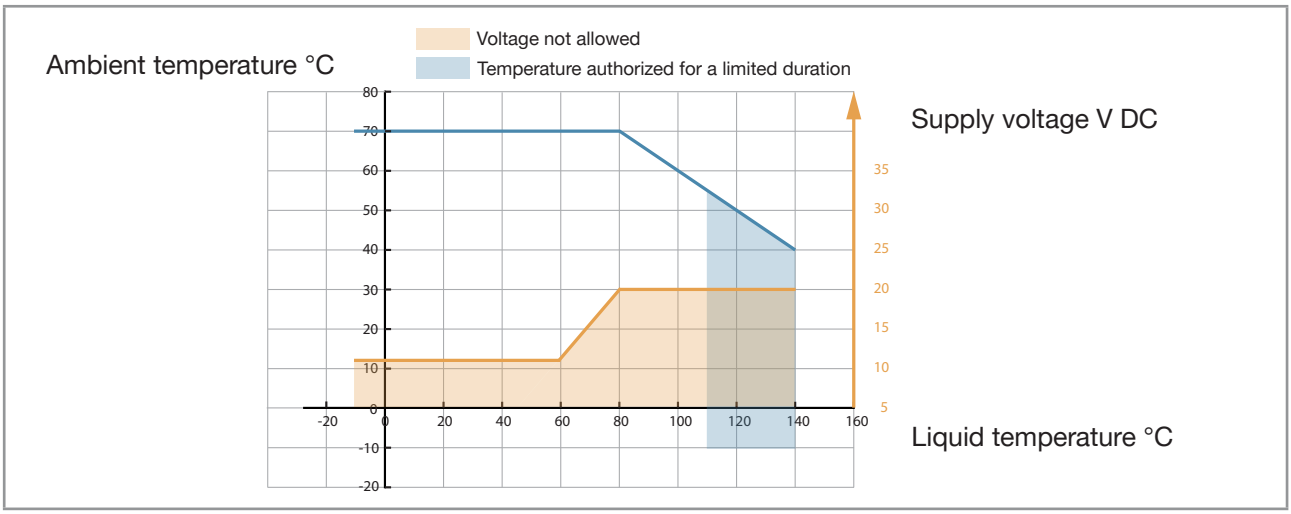


Fig. 20: Minimum supply voltage depending on the ambient temperature and the liquid temperature, device variant with two M20x1.5 cable glands and one 5-pin M12 male connector

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

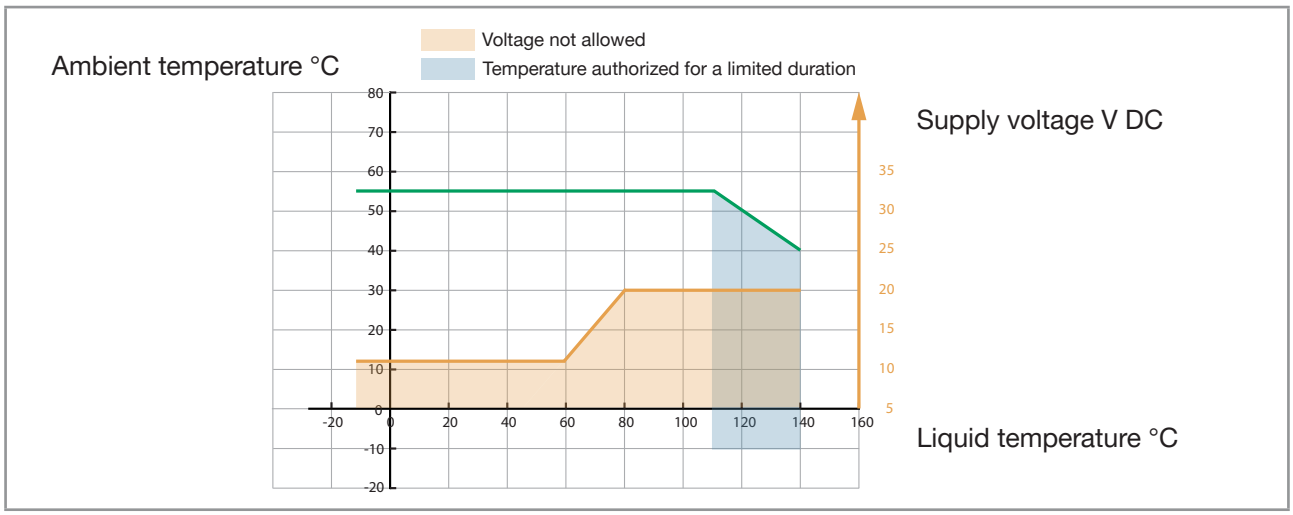


Fig. 21: Minimum supply voltage depending on the ambient temperature and the liquid temperature, device variant with two 4-pin M12 female connectors and one 5-pin M12 male connector (Ethernet device variant)

8.4 Connecting the device to a büS / CANopen network

For a correct operation of the device, use a 5-pin M12 female connector in stainless steel with shield connection. The büS cable that is available from Bürkert has an external diameter of 8.2 mm.

→ Make sure that the büS cable passes through the 5-pin M12 female connector.

→ Observe the specifications for the cable and conductors, that are given by the manufacturer of the 5-pin female connector.

The 5-pin M12 male connector (A-coding) is used to connect the device:

- To a 12...35 V DC power supply and/or
- To the büS / CANopen network.

→ To connect the device, remove the screwed plug of the 5-pin M12 male connector and store the screwed plug in a safe and clean place.

Risk of damage to the device if an M12 connector is unused.

▸ Put a screwed plug on all the unused M12 connectors.

Malfunction of the internal and external communication if the 5-pin M12 male connector is not used to connect the device to a büS fieldbus or a CANopen fieldbus.

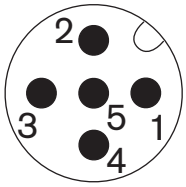
▸ Make sure pin 4 (CAN_H) and pin 5 (CAN_L) are both contact free if the 5-pin M12 male connector is not connected to a büS fieldbus or a CANopen fieldbus.

→ If the device is connected to a büS network or to a CANopen network and installed at one end of the büS network or of the CANopen network, either install one or two 120 Ω termination resistors in the line or activate the device internal termination resistor: see chapter 8.5. The büS or CANopen line must be adapted to reached 60 Ω.

The internal termination resistor is no more available after 12/2022. Nevertheless it could happen that the termination resistor activation menu is still visible on the display.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

If a device with two 4-pin M12 female connectors (Ethernet device variant) is connected to an Ethernet network, you must connect it to a büS / CANopen network for the configuration of the device with the software Bürkert Communicator.



- Pin 1: CAN shield
- Pin 2: 12...35 V DC
- Pin 3: GND
- Pin 4: CAN_H
- Pin 5: CAN_L

Fig. 22: Pin assignment of the 5-pin M12 male connector

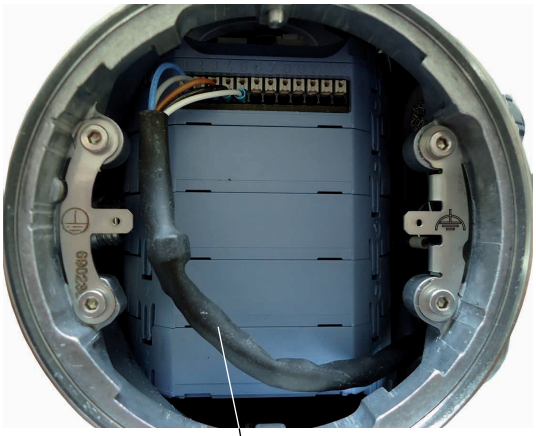


Fig. 23: Wiring ex works of the 12 push-in terminal strip to the 5-pin M12 male connector

8.5 Activating the device internal termination resistor

The internal termination resistor is no more available after 12/2022. Nevertheless it could happen that the termination resistor activation menu is still visible on the display.

The device has an internal termination resistor that can be activated if the device is installed at one end of a büS network or of a CANopen network.

If you activate the device internal termination resistor, do not install more than one termination resistor at the same end of the büS network or of the CANopen network.

To have an adapted network, connect one termination resistor at each end of the network.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

→ Go to the CONFIGURATION view.

→ General settings

→ Confirm to access the Parameter view.

→ büS ----►

→ Advanced ----► Termination resistor ----►

→ On

→ Save.

✓ The internal termination resistor is activated.

8.6 Specifications of the cables for the M20x1.5 cable glands (device variant with cable glands)

Table 13: Specifications of the cables for the M20x1.5 cable glands in nickel plated brass

Specification of the cables	Recommended value
Electromagnetic protection (EMC)	Shielded
Diameter	5...14 mm
Maximum operating temperature	80 °C or higher

Table 14: Specifications of the cables for the M20x1.5 cable glands in stainless steel

Specification of the cables	Recommended value
Electromagnetic protection (EMC)	Shielded
Diameter	6...12 mm
Maximum operating temperature	80 °C or higher

8.7 Specifications of the conductors for the 12 push-in terminal strip

Table 15: Specifications of the conductors for the terminal strip

Specification of the conductors	Recommended value range
Cross section of a solid conductor H05(07) V-U	0.25...1.5 mm^2
Cross section of a stranded conductor H05(07) V-K, with a wire ferrule but without collar	0.25...1.5 mm^2
Cross section of a stranded conductor H05(07) V-K, with a wire ferrule with a plastic collar	0.25...0.75 mm^2
Cross section of other kinds of conductors	0.2...1.5 mm^2 (AWG24...AWG16)

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

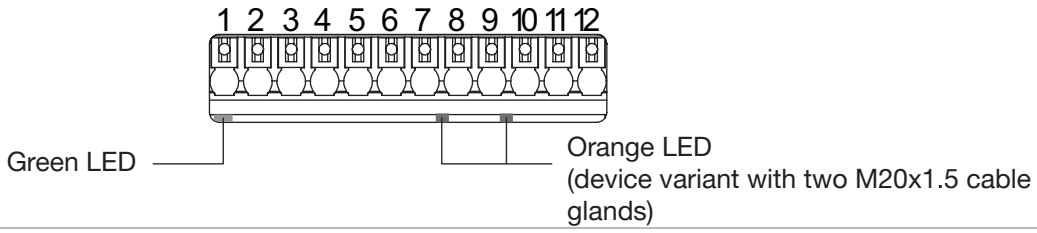
8.8 Terminal assignment of the 12 push-in terminal strip

The terminal strip located in the transmitter housing has 12 push-in terminals.

Fig. 24: Wiring ex works of the 12 push-in terminal strip

→ To access the 12 push-in terminal strip, open the front of the transmitter; see chapter 8.9.

→ If you need to disconnect a conductor, first push the terminal with a slot screwdriver 3.0 mm (any length) and a force of max. 40 N.



- Green LED:
  - flashes slowly if the operation of the device is correct.
  - flashes quickly if there is a communication problem with the measurement board.
- Orange LED lit if the related digital output is switched to ON (device variant with two M20x1.5 cable glands)
- Terminal 1: GND (blue conductor, factory wired, internally connected to the 5-pin M12 male connector)
- Terminal 2: CAN_L (grey conductor, factory wired, internally connected to the 5-pin M12 male connector)
- Terminal 3: CAN_shield (brown conductor, factory wired, internally connected to the 5-pin M12 male connector)
- Terminal 4: CAN_H (black conductor, factory wired, internally connected to the 5-pin M12 male connector)
- Terminal 5: 12...35 V DC (white conductor, factory wired, internally connected to the 5-pin M12 male connector)

On a device with two 4-pin M12 female connectors (Ethernet device variant), do not use terminals 6 to 12.

- Terminal 6: GND (for the connection of the power supply through the M20x1.5 cable glands)
- Terminal 7: negative output 3 (analogue output or digital output)
- Terminal 8: positive output 3 (analogue output or digital output)
- Terminal 9: negative output 2 (digital output)
- Terminal 10: positive output 2 (digital output)
- Terminal 11: negative output 1 (analogue output)
- Terminal 12: positive output 1 (analogue output)

Fig. 25: Terminal assignment of the 12 push-in terminal strip located in the transmitter housing

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

8.9 Opening the front of the transmitter

To open the front of the transmitter housing, remove either the blind cover or the display module or the Wi-Fi module.

Procedure to open the front of the transmitter if the blind cover is on the front of the device

1. Put the magnetic key on the  mark related to the blind cover. You should hear a click indicating that the blind cover is unlocked. Do not use a tool to turn the blind cover. 2. Turn the blind cover by hand to the unlocked position and remove it.	

Fig. 26: Procedure to open the front of the transmitter if the blind cover is on the front of the device

Procedure to open the front of the transmitter if the display module or the Wi-Fi module is on the front of the device

1. Remove the blind cover from the top of the transmitter. 2. Put the magnetic key on the  mark related to the display module or the Wi-Fi module. You should hear a click indicating that the display module or the Wi-Fi module is unlocked. Do not use a tool to turn the display module or the Wi-Fi module. 3. Turn the display module or the Wi-Fi module by hand to the unlocked position.	

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

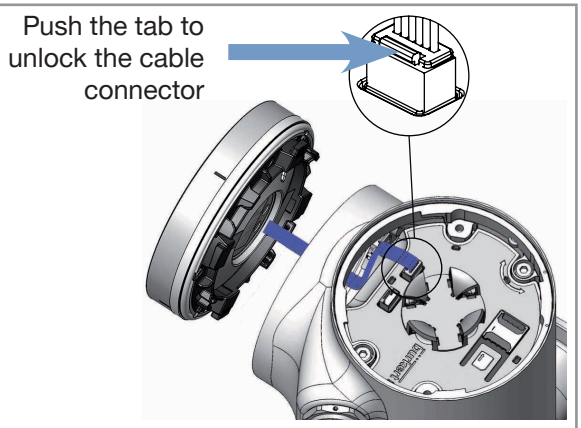
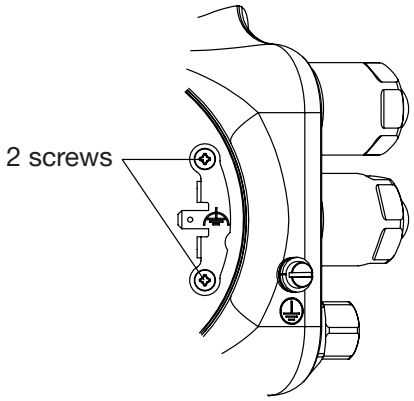
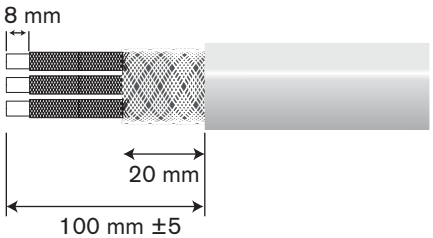
4. ⚠ Carefully pull the display module or the Wi-Fi module because a cable connects the display module or the Wi-Fi module to the transmitter. 5. Push the tab of the cable connector to disconnect the display module or the Wi-Fi module from the transmitter. 6. Remove the display module or the Wi-Fi module and put it on a clean surface to protect the seal from dirt.	

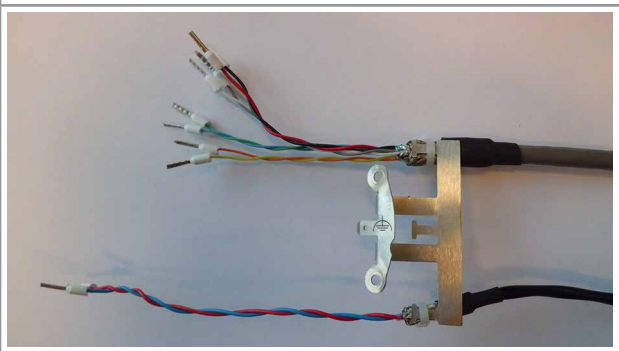
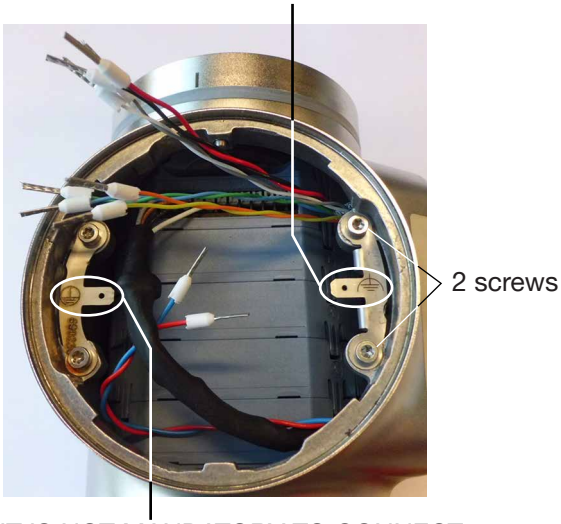
Fig. 27: Procedure to open the front of the transmitter if the display module or the Wi-Fi module is on the front of the device

8.10 Wiring the device through the M20x1.5 cable glands in stainless steel (device variant with cable glands)

❗ Put only one cable in each cable gland.

→ Prepare cables that obey the specifications given in chapter 8.6 and chapter 8.7. → To open the front of the transmitter, follow the instructions given in chapter 8.9. 1. Use a size 2 hexagonal key to loosen the 2 screws of the functional earth plate.	
2. Strip 100 mm of the cable. 3. Reduce the shield to 20 mm. 4. Expose 8 mm of the conductors.	

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

5. Loosen the nut of the cable gland. 6. Do not remove the nut of a stainless steel M20x1.5 cable gland. The nut of a stainless steel M20x1.5 cable gland cannot be removed. 7. Turn the nut until the stop. If you turn beyond the stop, the cable gland unscrews from the device and the device is no longer tight. 8. Remove the blind plug of the cable gland and store the blind plug in a safe and clean place. 9. Put the cable through the cable gland as shown in the figure. 10. Use a size 22 hexagonal key to tighten the cable gland to a torque of 5 Nm (3.7 ft·lbf).	
11. Attach each cable to the functional earth plate. The shield must be in contact with the functional earth plate.	
12. Put the functional earth plate in its original place. 13. Use a size 10 hexagonal key to tighten the 2 screws of the functional earth plate to a torque of 0.2 Nm (0.15 ft·lbf).	

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

14. Put each conductor in the correct terminal of the terminal strip.
15. To connect the 12...35 V DC power supply through the cable glands, refer to chapter 8.13.
16. To connect the outputs, refer to chapter 8.14 and chapter 8.15.
17. Connect the functional earth conductor. See chapter 8.12.
18. If the display module or the Wi-Fi module is removed, connect it back.
19. Close the front and the top of the transmitter housing.

Fig. 28: Wiring the device through the M20x1.5 cable glands in stainless steel

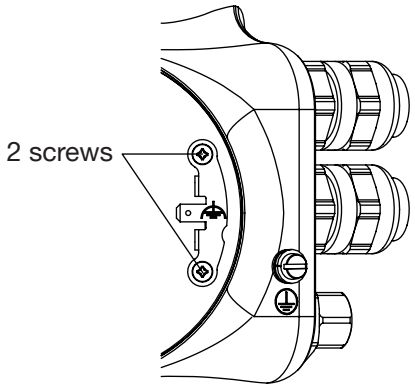
8.11 Wiring the device through the M20x1.5 cable glands in nickel plated brass (device variant with cable glands)

Put only one cable in each cable gland.

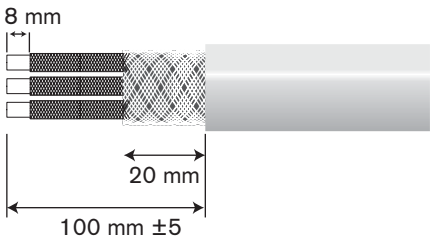
→ Prepare cables that obey the specifications given in chapter 8.6 and chapter 8.7.

→ To open the front of the transmitter, follow the instructions given in chapter 8.9.

1. Use a size 10 hexagonal key to loosen the 2 screws of the functional earth plate.

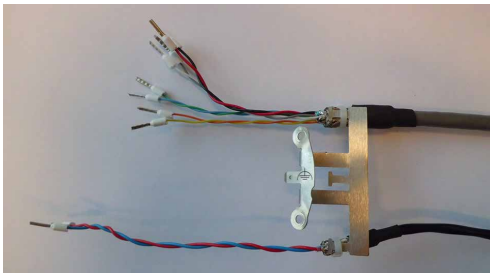
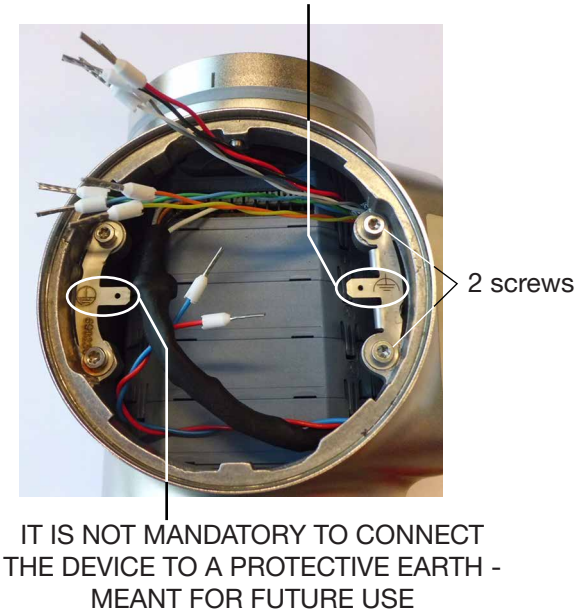


2. Strip 100 mm of the cable.
3. Reduce the shield to 20 mm.
4. Expose 8 mm of the conductors.



5. Loosen the nut of the cable gland.
6. Remove the blind plug of the cable gland and store the blind plug in a safe and clean place.
7. If the cable diameter is between 5 and 9 mm, put the cable through the cable gland as shown in the figure.
8. Use a size 24 hexagonal key to tighten the cable gland to a torque of 10 Nm (7.4 ft·lbf).

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

9. If the cable diameter is between 9 and 14 mm: → Vertically put a screwdriver between the two seals. → Lift the inner seal and remove it. → Put the cable through the cable gland. → Use a size 24 hexagonal key to tighten the cable gland to a torque of 10 Nm (7.4 ft·lbf).	 
10. Attach each cable to the functional earth plate. The shield must be in contact with the functional earth plate.	
11. Put the functional earth plate in its original place. 12. With an hexagonal key size 10, tighten the 2 screws of the functional earth plate to a torque of 0.2 Nm (0.15 ft·lbf).	

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

13.Put each conductor in the correct terminal of the terminal strip.

14.To connect the 12...35 V DC power supply through the cable glands, refer to chapter 8.13.

15.To connect the outputs, refer to chapter 8.14 and chapter 8.15.

16.Connect the functional earth conductor. See chapter 8.12.

17.If the display module or the Wi-Fi module is removed, connect it back.

18.Close the front and the top of the transmitter housing.

Fig. 29: Wiring the device through the M20x1.5 cable glands in nickel plated brass

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

8.12 Connecting the functional earth (device variant with two M20x1.5 cable glands)

→ For a proper function of device always connect the yellow/green functional earth conductor:

- either to the functional earth plate in the transmitter housing (see Fig. 31 in chapter 8.13),
- or to the functional earth screw on the outer surface of the transmitter housing (see Fig. 30).

If you connect the conductor to the functional earth screw:

→ Use a ring cable lug for M4 screw.

→ Tighten the M4 screw to a torque between 1.8...2 Nm (1.3...1.4 ft·lbf).

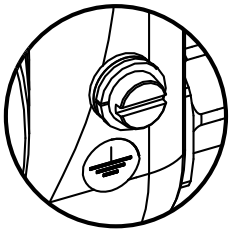


Fig. 30: Functional earth screw on the outer surface of the device

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

8.13 Connecting the device to a 12...35 V DC power supply through the M20x1.5 cable glands (device variant with cable glands)

1. Use a 3.0 mm slot screwdriver (any length) and a force of max. 40 N to push the terminal 5 and disconnect the white conductor. Do not cut the white conductor.
2. Insulate the white conductor.
3. Connect the power supply as shown in Fig. 31.

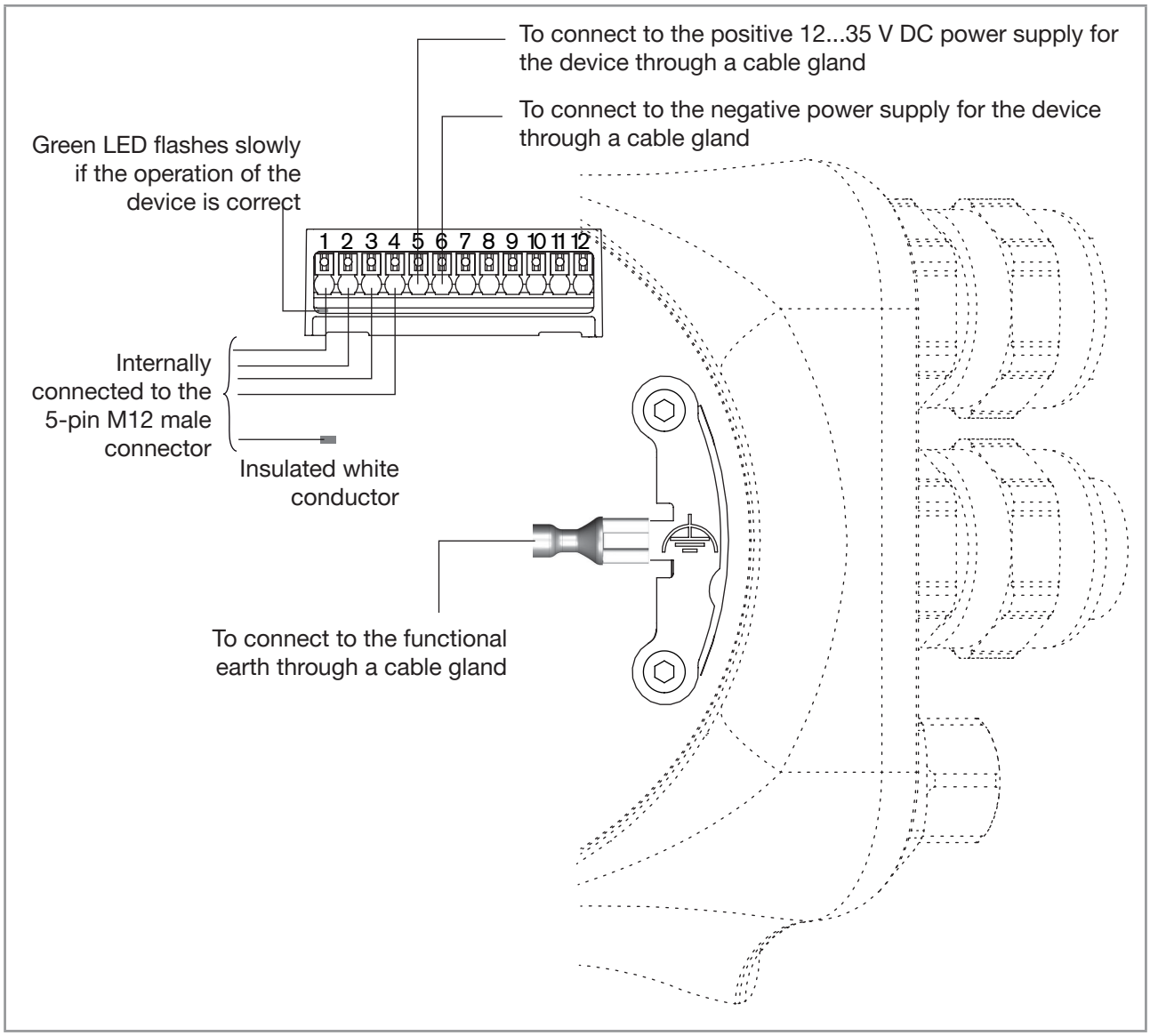


Fig. 31: Connecting the 12...35 V DC power supply through the M20x1.5 cable glands

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

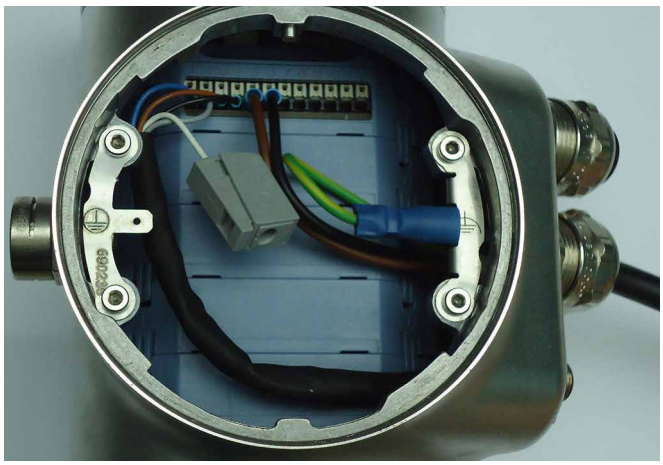


Fig. 32: Device connected to a 12...35 V DC power supply through the M20x1.5 cable glands

8.14 Wiring output 1 (analogue) and output 3 configured as an analogue output (device variant with cable glands)

NOTICE

Risk of short-circuit if the configuration of output 3 is wrong.

- Before wiring output 3 as an analogue output, make sure output 3 is configured as an analogue output in the Parameter menu of the outputs. See chapter 9.8 Changing the type of output 3.

An analogue output can be wired either in sourcing mode or in sinking mode.

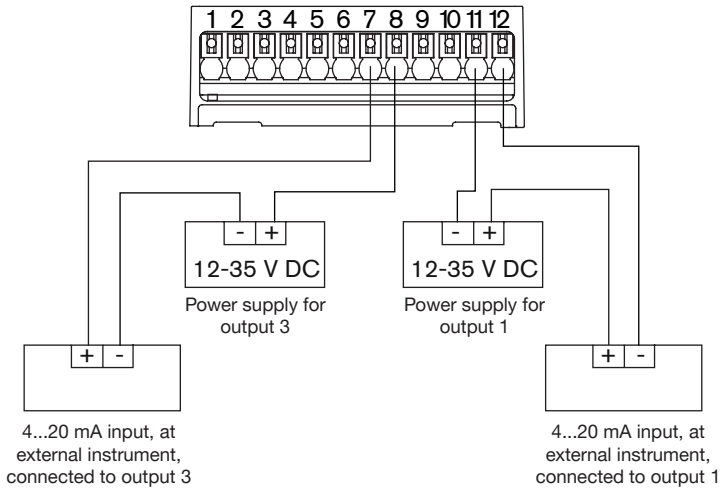


Fig. 33: Wiring the analogue outputs (left, sourcing; right, sinking)

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

8.15 Wiring output 2 (digital) and output 3 configured as a digital output (device variant with cable glands)

NOTICE

Risk of short-circuit if the configuration of output 3 is wrong.

- Before wiring output 3 as a digital output, make sure output 3 is configured as a digital output in the Parameter menu of the outputs. See chapter 9.8 Changing the type of output 3.

A digital output can be wired either in NPN mode or in PNP mode.

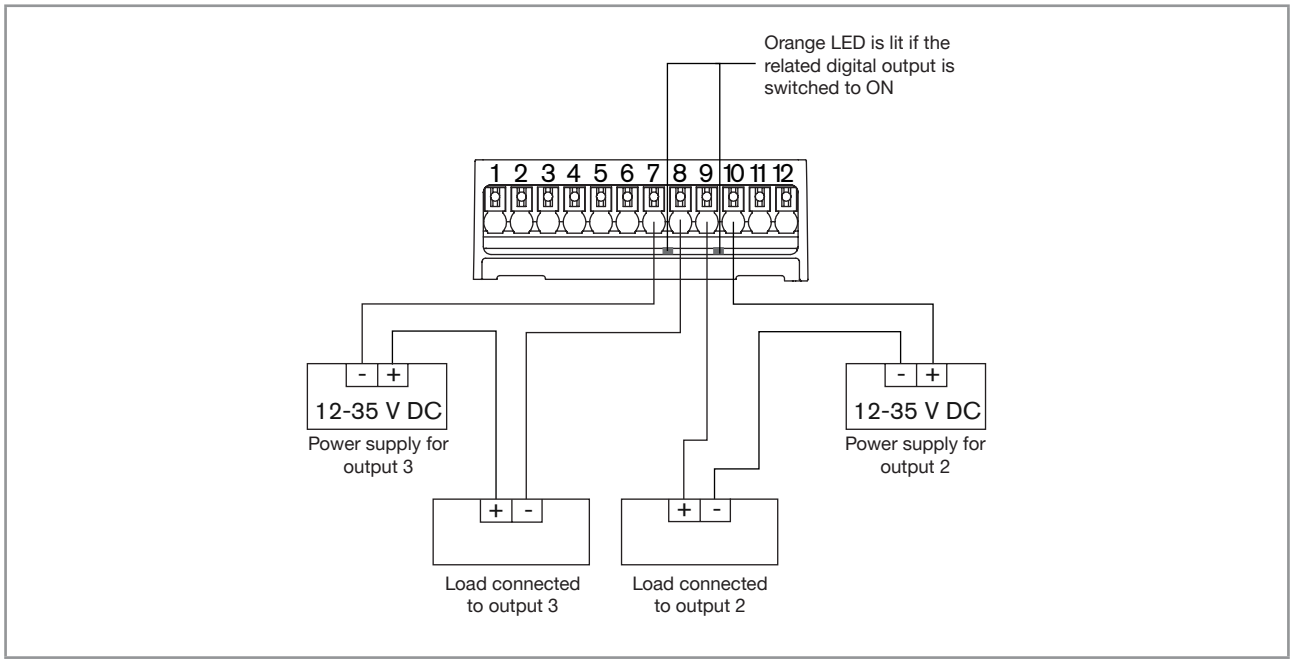


Fig. 34: Wiring the digital outputs (left, NPN; right, PNP)

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

8.16 Knowing the status of the Ethernet network (device variant with two 4-pin M12 female connectors - Ethernet device variant)

The status of the Ethernet network is indicated by LEDs. The LEDs are located on the industrial communication module in the transmitter housing.

→ To see the LEDs, open the front of the transmitter housing by removing either the blind cover or the display module or the Wi-Fi module; see chapter 8.9.

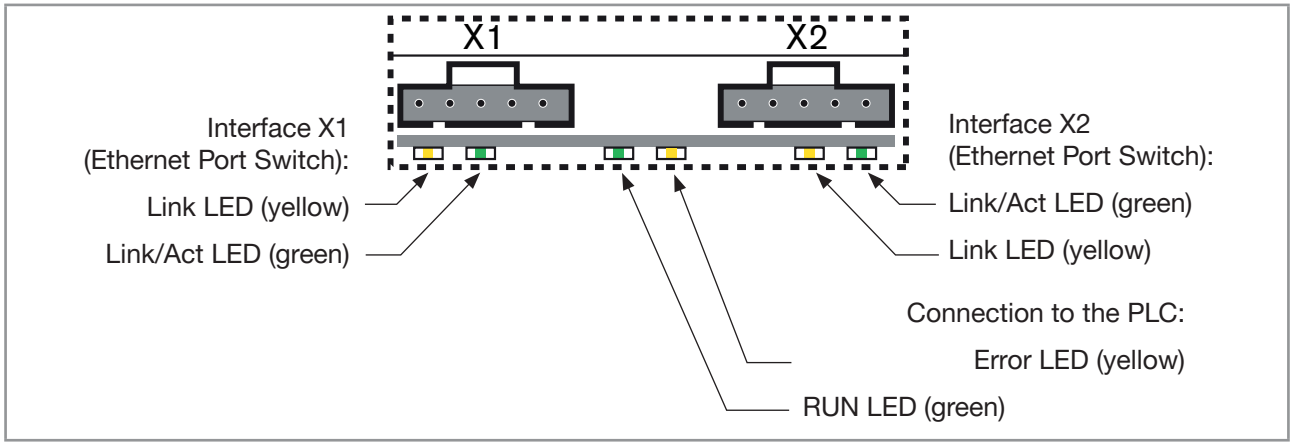


Fig. 35: Status LEDs of the industrial communication module

Description of the LEDs:

Table 16: Status LEDs for the connection to the PLC

LED status		Connection status	What to do?
RUN LED (green)	Error LED (yellow)		
ON	OFF	Connection active.	-
OFF	ON	Connection not active.	Check cables

Table 17: Status LEDs for the connection to the Ethernet network

LED status		Connection status	What to do?
Link/Act LED (green)	ON	Rapid flashing: connection to the higher-level protocol layer EtherNet/IP has been established. Data is being transmitted. Slow flashing: there is no connection to the protocol layer. This is usually the case for approx. 20 seconds following a restart.	-
	OFF	No connection to the network is available.	Check cables
Link LED (yellow)	ON	Connection to the network is available.	-
	OFF	No connection to the network is available.	Check cables

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

8.17 Specifications of the cables and conductors for the 4-pin M12 female connectors

Table 18: Specifications of the cables and conductors for the 4-pin M12 female connectors

Specification of the cables and conductors	Recommended value
Electromagnetic protection (EMC)	Shielded conductor with minimum STP
Minimum category	CAT-5
Maximum length	100 m
Maximum operating temperature	80 °C or higher

8.18 Connecting the device to an Ethernet network (device variant with two 4-pin M12 female connectors - Ethernet device variant)

The two 4-pin M12 female connectors (D-coding) are used to connect the device to an Ethernet network.

Risk of damage to the device if any M12 connector is unused.

- Put a screwed plug on all the unused M12 connectors. Screw the plug to the 4-pin M12 female connector to a torque of 1.3 Nm (0.96 ft·lbf).

If a device with two 4-pin M12 female connectors (Ethernet device variant) is connected to an Ethernet network, you must connect it to a büS / CANopen network for the configuration of the device with the software Bürkert Communicator.

If a device is connected to an Ethernet network, the measured process values are transmitted via the Ethernet network.

Each 4-pin M12 female connector (D-coding) has the same pin assignment: See Fig. 36.

Fig. 36: Pin assignment of the 4-pin M12 female connector

→ Loosen the screwed plug of the 4-pin M12 female connector and store the screwed plug in a safe and clean place.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

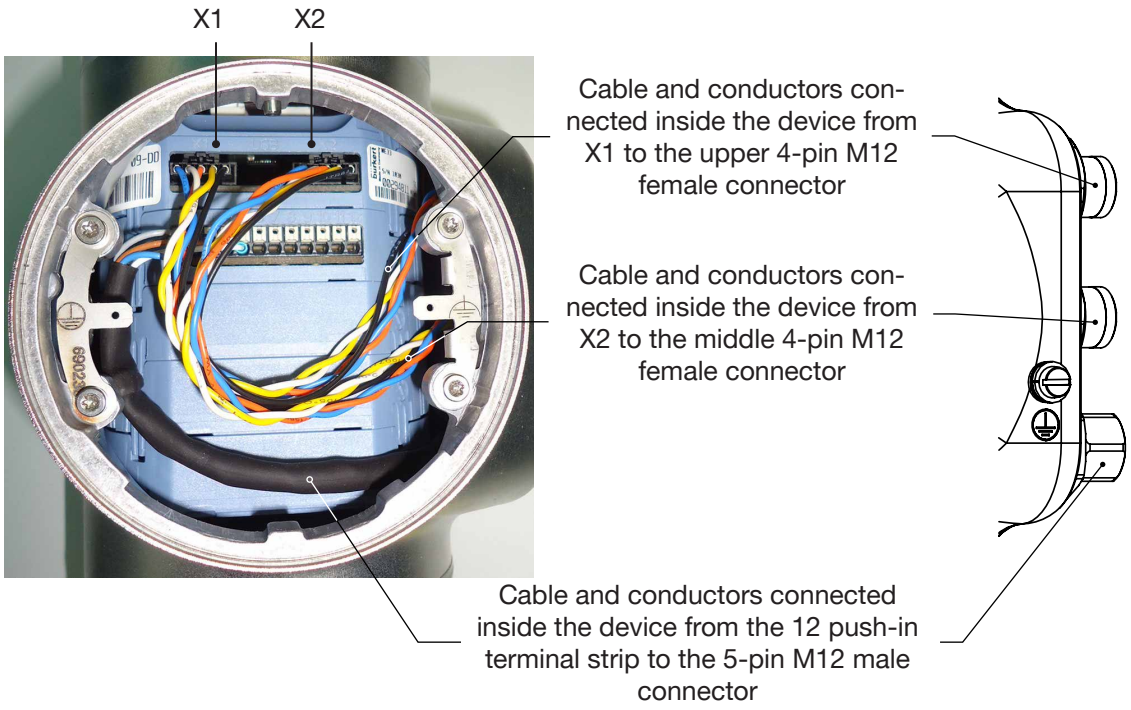


Fig. 37: Wiring ex works of the device with two 4-pin M12 female connectors (Ethernet device variant)

8.19 Connecting the functional earth (device variant with two 4-pin M12 female connectors - Ethernet device variant)

For a proper function of device always connect the yellow/green functional earth conductor to the functional earth screw on the outer surface of the transmitter housing.

→ Use a ring cable lug for M4 screw.

→ Connect the functional earth conductor to the functional earth screw, see Fig. 38.

→ Tighten the M4 screw to a torque between 1.8...2 Nm (1.3...1.4 ft·lbf).

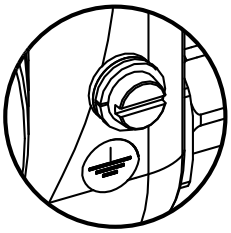


Fig. 38: Functional earth screw on the outer surface of the device

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

9 HOW TO DO THE SETTINGS

9.1 Safety instructions

WARNING

Risk of injury due to non-conforming adjustment.

Non-conforming adjustment could lead to injury and damage the device and its surroundings.

- The operators in charge of adjustment must have read and understood the contents of the Operating Instructions.
- In particular, observe the safety recommendations and intended use.
- The device/installation must only be adjusted by suitably trained staff.

9.2 Available software to do the settings

The settings of the device can be done with:

- the Type ME31 display module. The device can be equipped with a display module or not.
- the Type 8920 Bürkert Communicator software, which must be installed on a PC.

The menu structure is the same in the display module and in the Bürkert Communicator software.

→ To do the settings of the device with the Type ME31 display module, refer to the Type 8098 FLOWave L Operating Instructions.

→ To use the Bürkert Communicator software, first prepare the necessary hardware and the software. Refer to chapter 9.3. Then do the settings as described in the Operating Instructions.

→ To use some specific functions that are only available with the Bürkert Communicator software, refer to the Type 8920 Operating Instructions, available on the internet at country.burkert.com.

→ To get detailed information on the software of the Type ME31 display module, refer to the related Operating Instructions, available on the internet at country.burkert.com.

9.3 Connect the device to the Bürkert Communicator software

To do the settings with the Type 8920 Bürkert Communicator software, do the following steps:

1. Buy the USB-büS interface set with article number 772426 from Bürkert.
2. Download the latest version of the Type 8920 Bürkert Communicator software from country.burkert.com.
3. Install the Bürkert Communicator software on a PC. Obey the installation recommendations given in the USB-büS interface set. During installation, the büS stick must not be inserted at the PC.
4. Screw the termination resistance into the Y plug or activate the device internal termination resistor (see chapter 8.5).

The internal termination resistor is no more available after 12/2022. Nevertheless it could happen that the termination resistor activation menu is still visible on the display.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

5. Screw the female M12 connector at the end of the delivered cable into the Y plug.
6. Insert the mini-USB of the cable into the delivered büS stick.
   Do not insert the mini-USB of the cable into any equipment other than the büS stick.
7. Insert the appropriate power adapter into the AC/DC adapter.
8. Connect the cable of the AC/DC adapter to the related connector of the female M12 connector.

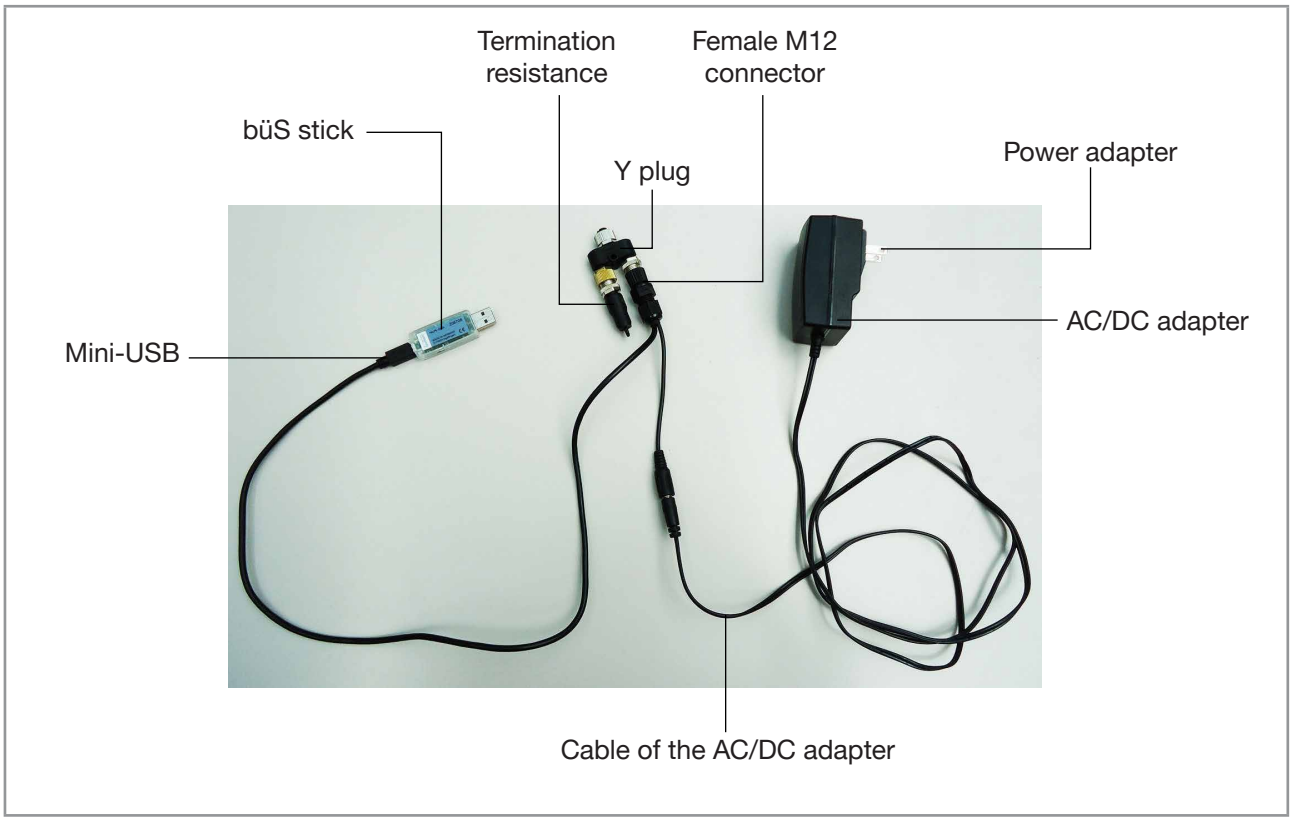


Fig. 39: Assembled connection cables, plugs and büS stick

9. Screw the Y plug on the male M12 connector of the device.
10. Insert the büS stick into a USB port of the PC.
11. Wait until the Windows pilot of the büS stick has been completely installed on the PC.
12. Connect the AC/DC adapter to the power supply.
13. Start the Bürkert Communicator software.
14. Click on in the Bürkert Communicator software to establish the communication between the Bürkert Communicator software and the device. A window opens.
15. Select büS-Stick.
16. Choose the port Bürkert büS Stick, click on Finish and wait until the device symbol appears in the list of devices.
17. In the list of devices, click on the symbol related to the device. The menu structure for the device is displayed.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

9.4 Display module: description of the user interface

For a complete description of the display module, refer to the Type 8098 FLOWave L Operating Instructions, available on the internet at country.burkert.com.

To get detailed information on the display software, refer to the Operating Instructions of the Type ME31 display software, available on the internet at country.burkert.com.

The user interface is made up of a display and touch sensitive keys.

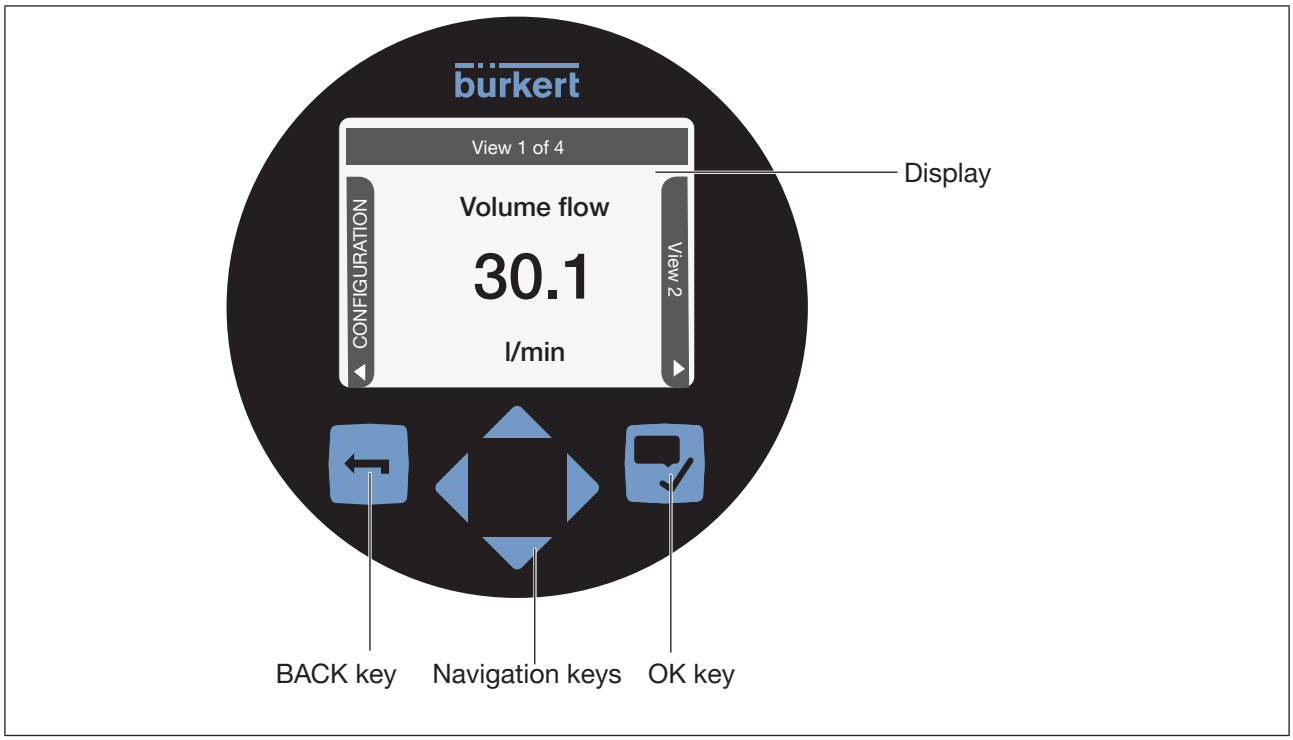


Fig. 40: Overview of the user interface

9.5 Available login user levels

The following 4 login user levels are available to operate or adjust the device:

- the basic user level, which is the level with the least functions,
- the Advanced User user level,
- the Installer user level (default),
- the Bürkert user level.

By default, the device adjustment is not protected by passwords.

Table 19 shows the symbol displayed in the information bar, depending on the user level that is active on the device, and what can be done with each type of user level.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

Table 19: Possible login user levels

Symbol[1)]	User level	Description
No symbol	Basic user	• No password is required. • The menu items with the symbol enable read-only access. • Not all the menu items that are available with a higher user level are displayed.
	Advanced user	• Password required, if the password protection is active. Default password is 005678. • The menu items with the symbol enable read-only access. • Not all the menu items that are available with a higher user level are displayed.
	Installer	• Password required, if the password protection is active. Default password is 001946. • This level is active by default (and by default, password protection is switched off). • All the available menu items can be adjusted.
	Bürkert	• Password required, if the password protection is active. • Only for Bürkert service.

[1)] displayed in the information bar, only if the adjustment is protected through passwords.

→ If you have forgotten your passwords, you can restore the default passwords with the Type 8920 Bürkert Communicator software. Refer to the related Operating Instructions.

9.5.1 Changing the login user level if the adjustment is not protected through passwords

By default:

- the Installer user level is active on the device,
- the adjustment is not protected through passwords,
- the symbol related to the Installer user level is not displayed in the information bar.

You can only change to the Bürkert user level.

→ To change the login user level in the Bürkert Communicator software, refer to the Type 8920 Operating Instructions, available on the internet at country.burkert.com.

Do the following to change the login user level on the display module:

→ Long press, to open the context menu.

→ Change user level ----► Confirm.

→ Choose the Bürkert user level ----► Confirm.

→ Enter the password ----► Confirm.

✔ The user level is changed.

→ To activate the adjustment protection through passwords, refer to the Type 8098 FLOWave L Operating Instructions.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

9.5.2 Changing the login user level if the adjustment is protected through passwords

If the adjustment is protected through passwords, the symbol related to the active user level is displayed in the information bar.

→ To change the login user level in the Bürkert Communicator software, refer to the Type 8920 Operating Instructions, available on the internet at country.burkert.com.

Do the following to change the login user level on the display module:

→ Long press, to open the context menu.

→ Change user level ----► Confirm.

→ Choose Logout (not available if the basic user is logged in) ----► Confirm.

→ Long press, to open the context menu.

→ Change user level ----► Confirm.

→ Choose the user level ----► Confirm.

→ Enter the password ----► Confirm.

✓ The user level is changed. The related symbol is displayed in the information bar.

→ To deactivate the adjustment protection through passwords, refer to the Type 8098 FLOWave L Operating Instructions.

9.5.3 Logging out from the Advanced user, Installer or Bürkert user level

If the adjustment is protected through passwords:

- the symbol related to the active user level is displayed in the information bar.
- you are automatically logged out after the activation delay of the screen saver has elapsed.

→ To log out from the active user level in the Bürkert Communicator software, refer to the Type 8920 Operating Instructions, available on the internet at country.burkert.com.

Do the following to log out from the Advanced user, the Installer or the Bürkert user level and to go to the basic user level:

→ Long press, to open the context menu.

→ Change user level ----► Confirm.

→ Choose Logout ----► Confirm.

✓ The basic user level is active.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

9.6 Reading out the access path to a menu item (display module only)

If you are lost in the menu structure, you can display the access path.

→ Long press, to open the context menu.

→ Where am I? ----► Confirm.

✓ Read out the access path to the displayed menu item.

9.7 Doing the Quick start adjustments when energizing the device for the first time (display module only)

When the device is energized for the first time, the user is guided to make the following mandatory settings:

- Choosing the display language,
- Choosing the time zone,
- Choosing whether daylight saving (summer time) is automatically taken into account or not,
- Setting the date and time,
- Choosing the unit system for all the measurements.

When the device has finished the uploading step, the first screen of the Quick start is displayed.

→ Display

→ Choose the display language ----► Confirm. The current date and time settings are displayed in the chosen language.

→ Choose the time zone ----► Confirm.

→ Choose whether daylight saving (summer time) is automatically taken into account (On) or not (Off) for the display of the time. ----► Confirm.

→ Set the year ----► Confirm.

→ Set the month ----► Confirm.

→ Set the day ----► Confirm.

→ Set the hours ----► Confirm.

→ Set the minutes ----► Confirm. The new date and time settings are displayed.

→ Choose the unit system for all the measurements ----► Confirm.

→ Save the Quick start settings or go back to the parent menu without saving the new settings.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

9.8 Changing the type of output 3

NOTICE

Risk of short-circuit if the configuration of output 3 is wrong.

▸ Before wiring output 3, make sure output 3 is correctly configured.

The output parameters can be set with the Installer user level.

Even if the menu Outputs is available on an Ethernet device variant, we recommend to not use the outputs.

By default, output 3 is configured as analog output, output 2 is configured with temperature as value.

To change the type of output 3, do the following:

→ Go to the CONFIGURATION view.

→ Outputs

→ Confirm to access the Parameter view.

→ Output 3 type ----► .

→ Choose the type of output 3.

→ Save.

✓ The configuration and the name of the output 3 are changed.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

10 MAINTENANCE AND TROUBLESHOOTING

10.1 Safety instructions

Risk of injury due to electrical voltage.

- Before carrying out work on the system, disconnect the electrical power for all the conductors and isolate it.
- In accordance with standard UL/EN 61010-1, all equipment connected to the Type 8098 FLOWave L flowmeter shall be double insulated with respect to the mains and all circuits connected to the Type 8098 FLOWave L flowmeter must be limited energy circuits.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury due to pressure in the installation.

- Before any intervention in the installation, stop the circulation of liquid, cut off the pressure and drain the pipe.
- Before any intervention in the installation, make sure there is no pressure in the pipe.

If switched on for a prolonged time, risk of burns or fire due to hot device surfaces

- Do not touch with bare hands.
- Keep the device away from highly flammable substances and liquids.

Risk of burns due to high liquid temperatures.

- Do not touch with bare hands the parts of the device that are in contact with the liquid.
- Use safety gloves to handle the device.
- Before opening the pipe, stop the circulation of liquid and drain the pipe.
- Before opening the pipe, make sure the pipe is completely empty.

Risk of injury due to the nature of the liquid.

- Respect the prevailing regulations on accident prevention and safety relating to the use of dangerous liquids.

WARNING

Risk of injury due to non-conforming maintenance.

- Maintenance must only be carried out by qualified and skilled staff with the appropriate tools.
- Ensure that the restart of the installation is controlled after any interventions.

CAUTION

Risk of injury due to a heavy device.

A heavy device can fall down during transport or during installation and cause injuries.

- Transport, install and dismantle a heavy device with the help of another person.
- Use appropriate tools.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

10.2 Information on returning the device to the manufacturer or to the reseller

→ To return the device for calibration or any after sales service, use the original packaging.

→ Send the device back to your local Bürkert sales office. The addresses of our international sales offices are available on the internet at country.burkert.com.

10.3 Cleaning the outer surface of the device

- Always use a cleaning agent compatible with the materials from which the device is made.
- Pay special attention to the cable glands which are made of nickel plated brass.

The outer surface device can be cleaned with a cloth slightly dampened water or with a detergent compatible with the materials the device is made of.

Please feel free to contact your Bürkert supplier for any additional information.

10.4 Troubleshooting when no message is displayed

Problem	The display is OFF.
Possible cause	The device is not energized.
What to do?	1. Check the wiring. 2. Make sure that the voltage supply at the device terminals is 12...35 V DC. To read the actual value, refer to the Operating Instructions. 3. Check that the power supply source is working properly.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

10.5 Troubleshooting when a message is displayed

→ If the message displayed on your device is not explained in the Operating Instructions, contact Bürkert.

If a message has been generated:

- a symbol is displayed in the information bar: see Table 20.
- Ex works and if the status indicator is not switched off, the device status indicator changes its colour and state based on the NAMUR NE 107 recommendation: see chapter 5.8.
- The message is displayed in a list called Messages overview. The list can be accessed via the context menu. See chapter 9.5.1.

Table 20: Device status symbols

Symbol	Status	Description
	Failure, error or fault	• Malfunction, • or monitored values in the error range.
	Function check	Ongoing work on the device (for example, checking the correct behaviour of the outputs by simulating measurement values); the output signal is temporarily invalid (e.g. frozen).
	Out of specification	The ambient conditions or process conditions for the device are outside the permitted ranges. Device internal diagnostics point to problems in the device or with the process properties.
	Maintenance required	The device is in controlled operation; however, the function is briefly restricted. → Do the required maintenance operation.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

11 SPARE PARTS AND ACCESSORIES

CAUTION

Risk of injury and/or damage caused by the use of unsuitable parts.

Incorrect accessories and unsuitable replacement parts may cause injuries and damage the device and the surrounding area.

▸ Use only original accessories and original replacement parts from Bürkert.

Spare part or accessory		Article number
Unlocking magnetic key		690309
5-pin M12 female and 5-pin M12 male straight cable plugs, moulded at each end of a 1 m shielded cable		772 404
5-pin M12 female and 5-pin M12 male straight cable plugs, moulded at each end of a 3 m shielded cable		772 405
Female M12 connector with a 120 Ω termination resistor		772424
Y plug adapter for the male M12 connector		772420
büS cable, 50 m		772413
büS cable, 100 m		772414
USB-büS interface set		772426

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

12 PACKAGING, TRANSPORT

CAUTION

Risk of injury due to a heavy device.

A heavy device can fall down during transport or during installation and cause injuries.

- ▸ Transport, install and dismantle a heavy device with the help of another person.
- ▸ Use appropriate tools.

NOTICE

Damage due to transport

Transport may damage an insufficiently protected device.

- ▸ Transport the device in shock-resistant packaging and away from humidity and dirt.
- ▸ Do not expose the device to temperatures that may exceed the admissible storage temperature range.
- ▸ Protect the electrical interfaces using protective plugs.

13 STORAGE

CAUTION

Risk of injury due to a heavy device.

A heavy device can fall down during transport or during installation and cause injuries.

- ▸ Transport, install and dismantle a heavy device with the help of another person.
- ▸ Use appropriate tools.

NOTICE

Poor storage can damage the device.

- ▸ Store the device in a dry place away from dust.
- ▸ Storage temperature of the device: –20 °C...+70 °C.

14 DISPOSAL OF THE DEVICE

Environmentally friendly disposal

- ▸ Follow national regulations regarding disposal and the environment.
- ▸ Collect electrical and electronic devices separately and dispose of them as special waste.

Further information: country.burkert.com.

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

bürkert
FLUID CONTROL SYSTEMS

MAN 1000273179 EN Version: J Status: RL (released | freigegeben) printed: 05.04.2023

www.burkert.com