

Type 8756

Mass Flow Meter for liquids Industrial Ethernet



Operating Instructions for specific variant

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1 About this document

The document is an important part of the product and guides the user to safe installation and operation. The information and instructions in this document are binding for the use of the product.

- ▶ Before using the product for the first time, read and observe the whole safety chapter.
- ▶ Before starting any work on the product, read and observe the respective sections of the document.
- ▶ Keep the document available for reference and give it to the next user.
- ▶ Contact the Bürkert sales office for any questions.



Further information concerning the product at [Products](#).

- ▶ Enter the article number from the type label in the search bar.

The illustrations in these instructions may vary depending on the product variant.

1.1 Symbols



DANGER!

Warns of a danger that leads to death or serious injuries.



WARNING!

Warns of a danger that can lead to death or serious injuries.



CAUTION!

Warns of a danger that can lead to minor injuries.

NOTICE!

Warns of property damage on the product or the installation.



Indicates important additional information, tips and recommendations.



Refers to information in this document or in other documents.

▶ Indicates a step to be carried out.

✓ Indicates a result.

Menu Indicates a software user-interface text.

1.2 Terms and abbreviations

The terms and abbreviations are used in this document to refer to following definitions.

Device	Type 8756
MFM	Mass flow meter
bar	Unit for relative pressure
bar abs	Unit for absolute pressure
Ex area	Potentially explosive atmosphere
Ex approval	Approval for potentially explosive atmosphere

1.3 Manufacturer

Bürkert SAS

20, rue du Giessen

67220 TRIEMBACH-AU VAL

FRANCE

The contact addresses are available at [Contact](#).



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2 Safety

2.1 Intended use

The device MFM is designed to measure the mass flow rate of liquids.

The permitted media are listed in [Technical data \[▶ 16\]](#).

Prerequisites for safe and trouble-free operation are proper transport, storage, installation, commissioning, operation and maintenance.

The instructions are part of the device. The device is intended exclusively for use within the scope of these instructions. Uses of the device that are not described in these instructions, the contractual documents or the type label can lead to severe personal injury or death, damage to the device or property and dangers for the surrounding area or the environment.

- ▶ Only trained and qualified personnel may install, operate and maintain the device. See qualification of persons in [Safety instructions \[▶ 7\]](#)
- ▶ Use the device only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- ▶ Use the device only when it is in perfect condition.
- ▶ Only use the device indoors.
- ▶ Only use devices that are approved for this type of potentially explosive atmosphere. These devices are labelled with the ATEX label on the type label. When using, always observe the details on the type label and the instructions for the potentially explosive atmosphere included in the scope of delivery for the device.
- ▶ Do not open the device.
- ▶ Do not use the device in high-vibration areas.

2.2 Safety instructions

Qualification of personnel working with the device

Improper use of the device can lead to serious personal injury or death. To avoid accidents when working with the device, the following minimum requirements must be met:

- ▶ Carry out work on the device within the scope of these instructions in a safety-compliant manner.
- ▶ Detect and avoid dangers when working on the device.
- ▶ Understand the instructions and implement the information contained therein accordingly.

Responsibility of the operator

The operator is responsible for observing the location-specific safety regulations, also in relation to personnel.

- ▶ Observe the general rules of technology.
- ▶ Install the device according to the regulations applicable in the respective country.
- ▶ The operator must make hazards arising from the location of the device avoidable by providing appropriate operating instructions.

Electrostatically sensitive components and assemblies

The device contains electronic components that are susceptible to the effects of electrostatic discharging (ESD). Components that come into contact with electrostatically charged persons or objects are at risk. In the worst case scenario, these components will be destroyed immediately or fail after start-up.

- ▶ Meet the requirements specified by EN 61340-5-1 to minimise or avoid the possibility of damage caused by a sudden electrostatic discharge.
- ▶ Do not touch electronic components when the supply voltage is connected.

Electric shock due to electrical components

Touching live parts can result in severe electric shock. This can lead to serious personal injury or death.

- ▶ Before working on the device or system, switch off the power supply. Secure it against reactivation.
- ▶ Observe any applicable accident prevention and safety regulations for electrical devices.

Changes and other modifications, spare parts and accessories

Changes to the device, incorrect installation or use of non-approved devices or components create hazards that can lead to accidents and injuries.

- ▶ Do not make any changes to the device.
- ▶ Do not mechanically load the device.
- ▶ Observe the operating instructions of the device or component used.
- ▶ Only use the devices in conjunction with devices and components recommended or approved by Bürkert.

Spare parts and accessories that do not meet Bürkert's requirements may impair the operational safety of the device and cause accidents.

- ▶ To ensure operational safety, only use original parts from Bürkert.

Operation only after proper transport, storage, installation, start-up or maintenance.

Improper transport, storage, installation, start-up or maintenance endanger the operational safety of the device and can cause accidents. This can lead to serious personal injury or death.

- ▶ Only carry out works which are described in these instructions.
- ▶ Only carry out works using suitable tools.
- ▶ Have all other works carried out by Bürkert only.

Working on the device

Working on the device that has not been powered down, unauthorised switching on or uncontrolled start-up of the system can cause accidents. This can lead to serious personal injury or death.

- ▶ Only work on the device when it is not in use.
- ▶ Ensure that the device or system cannot be switched on unintentionally.
- ▶ Only start the process in a controlled manner following disruptions. Observe sequence:
 1. Apply supply voltage or pneumatic supply.
 2. Charge the device with medium.

Technical limit values and media

Non-compliance with technical limit values or unsuitable media can damage the device and lead to leaks. This can cause accidents and seriously injure or kill people.

- ▶ Comply with limit values. See [Technical data \[▶ 16\]](#) and information on the type label.
- ▶ Only feed media into the media ports that are listed in the chapter [Technical data \[▶ 16\]](#).
- ▶ Observe the safety data sheet for the media used.

Only use authorised devices in potentially explosive atmospheres

Devices that may be used in potentially explosive atmospheres are labelled with an Ex marking. Additional instructions with Ex labelling are included with these devices.

- ▶ Only use devices that are approved for use in a potentially explosive atmosphere.
- ▶ For use in potentially explosive atmospheres, observe the information on the device.
- ▶ For use in potentially explosive atmospheres, observe the additional instructions with Ex labelling.
- ▶ Do not use devices that do not have this Ex labelling and additional instructions in potentially explosive atmospheres under any circumstances.

Medium under pressure

Medium under pressure can seriously injure people. In the event of overpressure or pressure surges, the device or lines can burst. Pneumatic lines that are defective or not securely fastened can come loose and swing around.

- ▶ Before working on the device or system, switch off the pressure. Vent or empty the lines.
- ▶ Adhere to the permitted pressure ranges of the medium.
- ▶ Comply with the permitted temperature ranges of the medium.

Hot surfaces and fire hazard

The surface of the device can become hot with fast-switching actuators or with hot media.

- ▶ Wear suitable protective gloves.
- ▶ Keep highly flammable substances and media away from the device.

3 Product description

3.1 Product overview

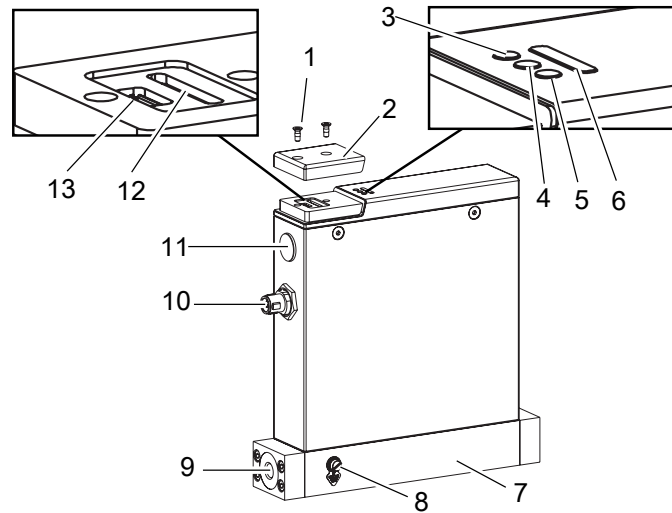


Fig. 1: Example of a variant

1 Screw	2 Cover
3 Status indicator - ETH port 1	4 Communication indicator
5 Status indicator - ETH port 2	6 Status indicator
7 Base block	8 Functional earth connection
9 Medium connection	10 Electrical connection
11 Electrical connection - 2 x M8	12 Slot for memory card
13 bus interface	

3.2 Product identification

3.2.1 Type label

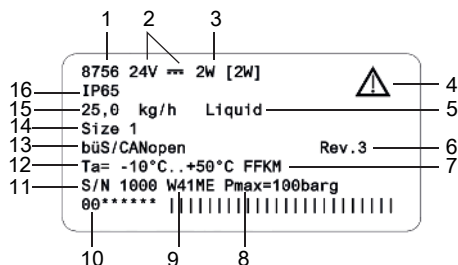


Fig. 2: Example of type label Type 8756

1 Type	2 Operating voltage
3 Power consumption	4 Note: Observe the operating instructions
5 Calibration medium	6 Bürkert internal version
7 Sealing material	8 Maximum operating pressure
9 Manufacture code	10 Article number
11 Serial number	12 Ambient temperature
13 Protocol	14 Size of the sensor
15 Nominal mass flow rate (Q nominal)	16 Degree of protection

3.2.2 Calibration label

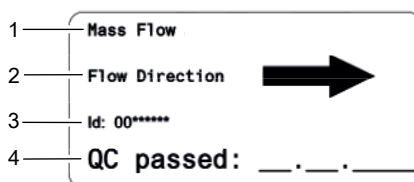


Fig. 3: Example of calibration label

1 Variant	2 Flow direction
3 Article number	4 Manufacturing date

3.2.3 Conformity marking

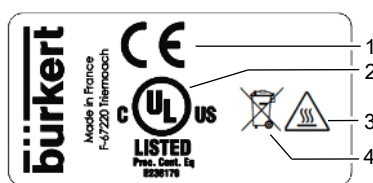




Fig. 4: Conformity label

1 CE marking	2 Certification marking for USA and/or Canada
3 Warning: hot surface	4 Indication for disposal

3.2.4 Symbols and markings on device

	Earth terminal
	Direct current
DC-B0-58-FF-FF- FF	Example of marking of the MAC address
ETH1, ETH2	Ethernet connections

3.3 Display elements

3.3.1 Status indicator

The status indicator changes its colour based on the NAMUR recommendation NE 107. Refer to [NAMUR mode \[▶ 13\]](#).

The colour of the status indicator indicates:

- Whether device diagnostics are active or not. Diagnostics are active on the device and cannot be deactivated.
- If diagnostics are active, then the status indicator shows whether diagnostics events have been generated or not. If several diagnostics events have been generated, then the status indicator shows the diagnostics event with the highest priority.

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

- ▶ To solve a problem indicated by the status indicator, refer to [Troubleshooting \[▶ 36\]](#)

3.3.2 NAMUR mode

The status indicator shows the status of the device and its peripherals, based on NAMUR recommendation 107 (NE 107).

If various alerts are present, the status indicator always shines in the colour of the highest prioritised alert (red = outage = highest priority).

Colour	Colour code	Status signal	Description
Red	5	Failure	Due to a malfunction in the device or its periphery, normal operation is not possible.
Orange	4	Check function	Work is being carried out on the device, which means that normal operation is temporarily not possible.
Yellow	3	Out of specification	The environmental or process conditions for the device are outside the specified range. Internal device diagnosis indicate problems in the device or process characteristics.
blue	2	Maintenance required	The device is in normal operation, although a function is briefly restricted. ▶ Service device
Green	1	Diagnosis active	Device is running faultlessly, diagnosis are active.
White	0	Diagnosis passive	Device is switched on, diagnosis are inactive.

Tab. 1: Status indicator according to NE 107

3.3.3 Network status indicator

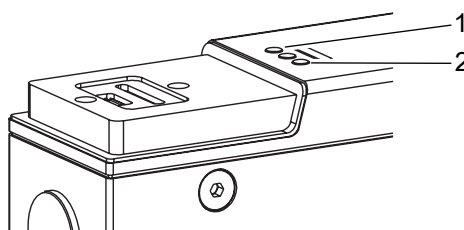


Fig. 5: Location and description of the LED's

1 Ethernet Port 1	2 Ethernet Port 2
-------------------	-------------------

3.3.4 Communication indicator

This LED shows the status of the communication between the device and the PLC (Programmable Logical Controller).

LED indicator	Description	Meaning
Green	RUN	Connection to the PLC is active.
Red	ERROR	Connection to the PLC is inactive.

Tab. 2: Description of the communication indicator

3.4 Functionality

3.4.1 Service-büS interface

The Service-büS interface is used for short-term servicing of the device with the Bürkert Communicator.

The Bürkert Communicator runs under Windows. Refer to [Connect to the Bürkert Communicator \[▶ 31\]](#)

The USB-büS-Interface set, available as an accessory, is necessary. Refer to [Spare parts and accessories \[▶ 41\]](#)

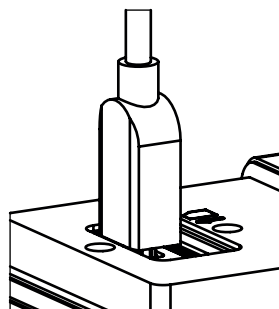


Fig. 6: büS stick, inserted in the related connector of the device

3.4.2 Memory card



If the memory card is defective or has been lost, contact the Bürkert sales office to purchase a new one.

The device can be delivered with a memory card that is inserted in the device. When the device is energised, there are two possibilities:

- If the inserted memory card contains device-specific data, the device automatically adopts this data. At the time of delivery, the memory card is preloaded with device-specific information. To view the stored data, refer to the file Device Description File.
- If the inserted memory card is empty, the device saves its own data onto the card. A new memory card is empty.

To download the file Device Description File:

- ▶ Access the page [Type 8756](#)
- ▶ Scroll down to **Downloads** > **Software**

The data stored on the memory card can be transferred to another device with the same article number. For example, data from a defective device can be transferred to a replacement device.

4 Technical data

4.1 Standards and directives

This product complies with the legal requirements applicable at the time of placing on the market and has been developed and tested in accordance with the relevant European directives/regulations and harmonized standards. The conformity is documented and, if necessary, supported by evidence. The EU Declaration of Conformity can be found behind the respective type on the home page country.burkert.com

4.2 Operating conditions

Ambient temperature	-10...+70 °C
Storage temperature	-10...+70 °C
Degree of protection (EN 60529 / IEC 60529)	IP65 ¹⁾
Altitude	Up to 2000 m above sea level
Medium temperature	-10...+70 °C, only in liquid state
Medium	Clean and homogeneous liquids
Operating pressure	G-internal-threaded FFKM or PCTFE: max. 100 bar Metal: max. 50 bar
Operating pressure	NPT-internal-threaded FFKM or PCTFE: max. 100 bar Metal: max. 50 bar
Operating pressure	External-threaded vacuum fittings max. 50 bar
Operating pressure	External-threaded compression fittings max. 50 bar
Operating pressure	Tri-Clamp max. 25 bar
Relative ambient humidity	Max. 95% at 55 °C (non-condensing)

¹⁾ When cables or plugs and sockets are connected correctly, verified by Bürkert, not evaluated by UL.

4.3 Medium data

4.3.1 Calibration conditions

Calibration medium	Water
Temperature of the calibration medium	25 °C
Calibration pressure	4 bar

4.3.2 Operating medium

Maximum particle size	10 µm
Minimum dynamic viscosity	0.3 mPa.s
Maximum dynamic viscosity	1500 mPa.s Take the pressure loss into account. Refer to chapter Pressure loss.

4.3.3 Density measurement

Density range	0...5 kg/l
Measurement accuracy	DN1: ±0.005 kg/l (for mass flow rate values higher than 1.5 kg/h) DN2: ±0.005 kg/l (for mass flow rate values higher than 5.7 kg/h)
Repeatability	DN1: ±0.0025 kg/l (for mass flow rate values higher than 1.5 kg/h) DN2: ±0.0025 kg/l (for mass flow rate values higher than 5.7 kg/h)

4.3.4 Temperature measurement

Temperature range	-10...70 °C
Measurement accuracy	DN1: ±1.0 K (for mass flow rate values higher than 1.5 kg/h) DN2: ±1.0 K (for mass flow rate values higher than 5.7 kg/h)
Repeatability	DN1: ±0.5 K (for mass flow rate values higher than 1.5 kg/h) DN2: ±0.5 K (for mass flow rate values higher than 5.7 kg/h)

4.3.5 Mass flow rate measurement

Maximum mass flow rate	DN1: 30 kg/h DN2: 150 kg/h
Nominal mass flow rate	DN1: factory setting 30 kg/h (minimum reducible to Q _{nom} = 1 kg/h) DN2: factory setting 150 kg/h (minimum reducible to Q _{nom} = 5 kg/h)
Minimum measurable mass flow rate	DN1: factory setting 0.05 kg/h (can be reduced to 0.01 kg/h) DN2: factory setting 0.25 kg/h (can be reduced to 0.05 kg/h)
Measurement accuracy after 1 minute warm-up time	DN1: ±0.1% of the measured value or ±1.4 g/h. 1.4 g/h = zero-point stability ²⁾ DN2: ±0.1% of the measured value or ±10 g/h. 10 g/h = zero-point stability ³⁾
Maximum measurement range	1:3000 The measurement range is defined as the ratio of Q _{nominal} of the device to Q _{min} . Refer to following figure. DN1: Q _{min} = 0.05 kg/h DN2: Q _{min} = 0.25 kg/h
Repeatability	DN1: ±0.05% of the measured value or ±0.7 g/h DN2: ±0.05% of the measured value or ±5 g/h
Response time (t _{95%})	< 750 ms The response time depends on the medium used

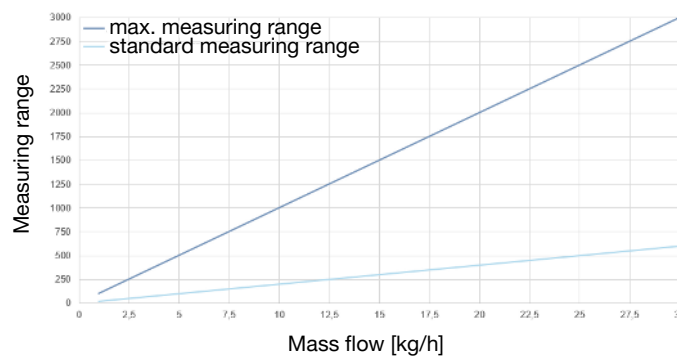


Fig. 7: Measurement range depending on nominal flow rate for DN1

²⁾ Zero point applies to water at calibration conditions; for flows of <1.4 kg/h and deviating medium, please consult Bürkert.

³⁾ Zero point applies to water at calibration conditions; for flows of <15 kg/h and deviating medium, please consult Bürkert.

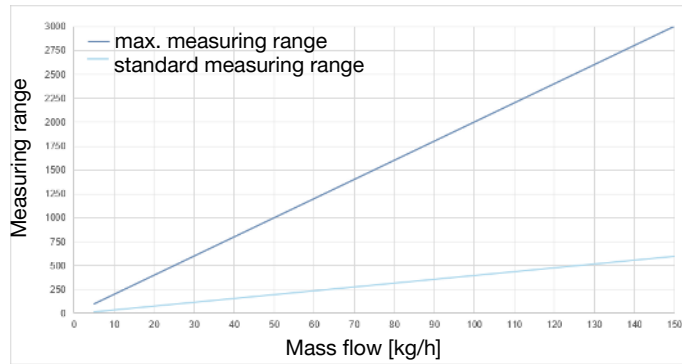


Fig. 8: Measurement range depending on nominal flow rate for DN2

4.3.6 Pressure loss

A MFM has a pressure loss that depends on the following parameters:

- the flow-rate value
- the size of the medium connections
- the type of the medium connections
- the size of the device base block
- the type of medium

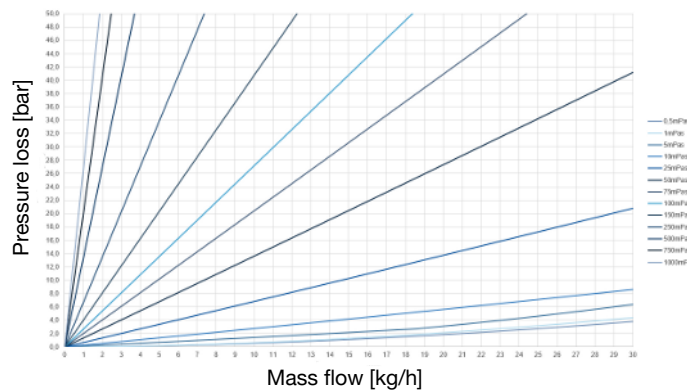


Fig. 9: Pressure loss diagram for DN1

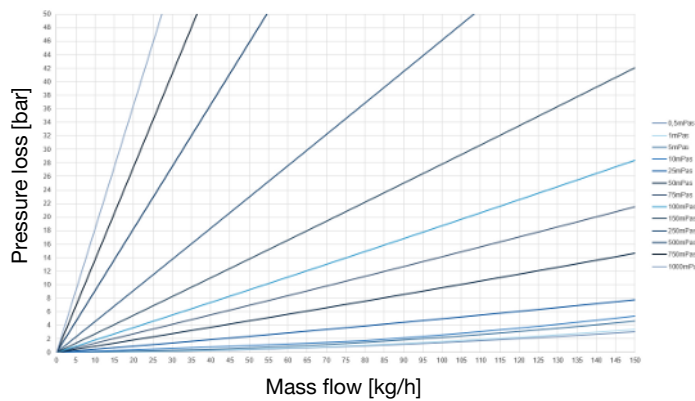


Fig. 10: Pressure loss diagram for DN2

4.4 Electrical data

Operating voltage	24 V \pm 10 %
Power consumption	< 2 W
Communication interface	Industrial Ethernet: PROFINET, EtherNet/IP, EtherCAT, Modbus TCP
Electrical connections	<ul style="list-style-type: none">• M12 plug 5-pin A-coding• 2 M8 socket 4-pin D-coding• service bÜS interface
Minimum temperature rating of the cable to be connected to the field wiring terminals:	75 °C

4.5 Communication

4.5.1 Industrial Ethernet: EtherCAT



Ethernet interface Port 1, Port 2	Port 1: EtherCAT IN Port 2: EtherCAT OUT
Acyclic communication (CoE)	SDO
Type	Complex Slave
FMMUs	8
Sync Managers	4
Transmission speed	100 Mbit/s
Data transport layer	Ethernet II, IEEE 802.3

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

4.5.2 Industrial Ethernet: EtherNet/IP

Pre-defined standard objects	Identity Object (0x01) Message Router Object (0x02) Assembly Object (0x04) Connection Manager (0x06) DLR Object (0x47) QoS Object (0x48) TCP/IP Interface Object (0xF5) Ethernet Link Object (0xF6)
DHCP	supported
BOOTP	supported
Transmission speed	10 and 100 Mbit/s
Duplex modes	Half duplex, full duplex, auto-negotiation
MDI modes	MDI, MDI-X, Auto-MDI-X
Data transport layer	Ethernet II, IEEE 802.3
Address Conflict Detection (ACD)	supported
DLR (ring topology)	supported
CIP reset service	Identity Object Reset Service Type 0 and Type 1

4.5.3 Industrial Ethernet: Modbus TCP

Modbus function codes	1, 2, 3, 4, 16
Transmission speed	10 and 100 Mbit/s
Data transport layer	Ethernet II, IEEE 802.3

4.5.4 Industrial Ethernet: PROFINET IO

Topology recognition	LLDP, SNMP V1, MIB2, Physical Device
Minimum cycle time	2 ms
IRT	not supported
MRP media redundancy	MRP client is supported
Other supported functions	DCP, VLAN Priority Tagging, Shared Device
Transmission speed	100 Mbit/s
Data transport layer	Ethernet II, IEEE 802.3
PROFINET IO specification	V2.43
Application Relations (AR)	The device can simultaneously process up to 2 IO ARs, 1 Supervisor AR, and 1 Supervisor DA AR.

4.6 Mechanical data

Dimensions	Refer to data sheet
Base block	Stainless steel 316L
Housing	Painted aluminium, stainless steel
Seal	Refer to the type label
Status indicator	Polycarbonate
Parts in contact with the medium (sensor)	stainless steel 1.4404

MFM Alloy C22

Base block	Alloy C22
Parts in contact with the medium (sensor)	Alloy C22

5 Medium connection



Risk of injury or material damage when working on the device or system.

- ▶ Read and observe the chapter [Safety \[▶ 7\]](#) before working on the device or system.

5.1 Possible medium connections

- G-internal-threaded connections according to DIN ISO228/1
- NPT-internal-threaded connections according to ASME/ ANSI B 1.20.1
- connections with external-threaded vacuum fittings
- connections with external-threaded compression fittings
- Tri-Clamp

MFM Alloy C22

- connections with external-threaded compression fittings

5.2 Installation procedure



CAUTION!

Risk of injury that is due to leakage in an MFM.

- ▶ At a low mass flow rate and a high pressure, make sure that the installation is tight. The tightness prevents incorrect measurements or the leakage of the medium.
- ▶ To make sure that the installation is tight, observe the following instruction: Use pipes with a diameter that is adapted to the medium connection of the device, and with a smooth surface.

NOTICE!

Malfunction that is due to contamination.

- ▶ If a contaminated medium is used, then install a filter upstream of the device. The filter ensures problem-free functioning of the device. Refer to [Medium data \[▶ 17\]](#)

NOTICE!

Cavitation of gas in the liquid and degassing must be avoided.

- ▶ To avoid cavitation and degassing, make sure that the medium is an homogeneous liquid and that the pressure in the pipe is high enough.
- ▶ When installing the device in the pipe, observe the flow direction that is given on the calibration plate of the device.
- ▶ If a external pump is used, then install the pump upstream of the device.

NOTICE!

- ▶ Do not use any pump in the installation because the flow rate must not pulsate.

No inlet section and no outlet section for flow conditioning are required.

- ▶ We recommend to install the device in a horizontal pipe or in a vertical pipe as shown in the following figures.

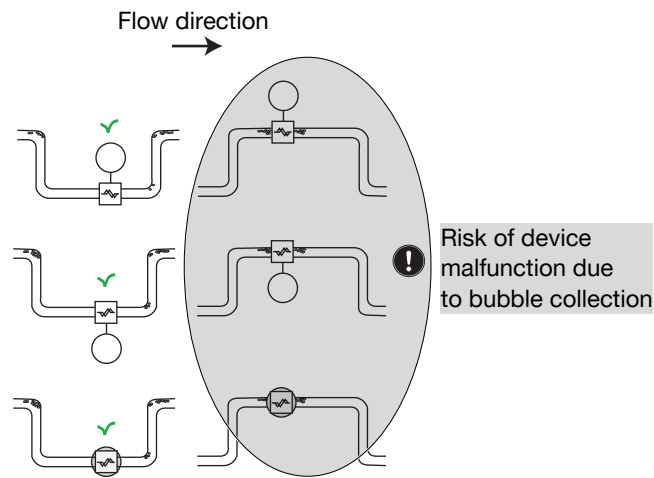


Fig. 11: Horizontal mounting positions

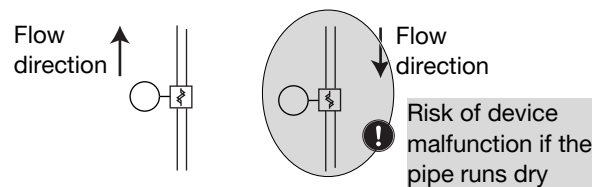


Fig. 12: Vertical mounting positions

5.2.1 G1/8"-internal-threaded connections

- ▶ Remove the protective cap that closes the threaded connection.
- ▶ Do the medium connection on one side of the device.
- ▶ Obey the instructions that are given by the manufacturer of the fitting used.
- ▶ Obey the torques that are given by the manufacturer of the fitting used.
- ▶ Do the medium connection on the other side of the device in the same way.

5.2.2 NPT1/8"-internal-threaded connections

- ▶ Do the medium connection on one side of the device.
- ▶ Obey the instructions that are given by the manufacturer of the fitting used.
- ▶ Obey the torques that are given by the manufacturer of the fitting used.
- ▶ Do the medium connection on the other side of the device in the same way.

5.2.3 Connections with external-threaded vacuum fittings

- ▶ Remove the protective cap that closes the connection.
- ▶ Do the medium connection on one side of the device.
- ▶ Obey the instructions that are given by the manufacturer of the fitting used.

- ▶ **CAUTION! To avoid damage on the sealing of the medium connection, please make sure to lock the hexagonal part in place with a second wrench.**
Obey the torques that are given by the manufacturer of the fitting used.
- ▶ Do the medium connection on the other side of the device in the same way.

5.2.4 Connections with external-threaded compression fittings

- ▶ Do the medium connection on one side of the device.
- ▶ Obey the instructions that are given by the manufacturer of the fitting used.
- ▶ **CAUTION! To avoid damage on the sealing of the medium connection, please make sure to lock the hexagonal part in place with a second wrench.**
Obey the torques that are given by the manufacturer of the fitting used.
- ▶ For the variant Alloy C22: screw the fitting in the base block and tighten it to a torque of 20 N·m.
- ▶ Do the medium connection on the other side of the device in the same way.

5.2.5 Tri-clamp connections

- ▶ Remove the protective cap that closes the threaded connection.
- ▶ Do the medium connection on one side of the device.
- ▶ Obey the instructions that are given by the manufacturer of the fitting used.
- ▶ Do the medium connection on the other side of the device in the same way.

6 Electrical connection



Risk of injury or material damage when working on the device or system.

- ▶ Read and observe the chapter [Safety \[▶ 7\]](#) before working on the device or system.

6.1 Additional documentation

Further documentation concerning the product:

- ▶ Access the page [Type 8756](#)
- ▶ Scroll down to **Downloads**
- ▶ Or enter the article number from the type label in the search bar.

6.2 Wire the variant Industrial Ethernet

NOTICE!

Requirements for the correct operation of the device.

- ▶ Use a power supply unit with sufficient power.
- ▶ Use only Industrial Ethernet shielded cables with a category CAT-5e or higher.
- ▶ Connect each cable end to the functional earth.

NOTICE!

UL approved versions must be supplied in one of the following ways:

- ▶ "Limited Energy Circuit" (LEC), according to UL / IEC61010-1
- ▶ "Limited Power Source" (LPS), according to UL / IEC60950
- ▶ SELV / PELV with UL-approved overcurrent protection, designed according to UL / IEC61010-1, Table 18 (e.g. Block PM-0124-020-0)
- ▶ NEC Class 2 power supply unit

5-pin M12 male connector (A coding)	Pin	Assignment
	1	Shielding
	2	24 V \equiv
	3	GND
	4	Not connected
	5	Not connected
	M12 thread is internally connected to FE	6

Tab. 3: Pin assignment, 5-pin M12 male connector (A coding) of the device

4-pin M8 female connector (D coding)	Pin	Assignment
	1	Tx +
	2	Rx +
	3	Tx -
	4	Rx -
	5	Coding lug

M8 thread is internally connected to FE

Tab. 4: Pin assignment, 4-pin M8 (D coding) of the device

- ▶ If a protocol other than EtherCAT is used, plug an Ethernet cable in one or both sockets.
- ▶ If the EtherCAT protocol is used, plug the incoming Ethernet cable (coming from the PLC) into the socket marked ETH1 and plug the outgoing Ethernet cable into the socket marked ETH2.

6.3 Change the network parameters



The Industrial Ethernet variants Ethernet/IP and ModbusTCP have the same default IP address 192.168.1.100, Profinet devices have 0.0.0.0 by default.

- ▶ Before commissioning the device, change its network parameters.
- ▶ If several devices must be connected to the same Industrial Ethernet network, then connect one device at a time and change its network parameters.

6.3.1 Over the product web server

NOTICE!

Security risk due to default passwords.

Unauthorised persons can log in to the web server and change the parameters.

- ▶ Change the default passwords.
- ▶ If the web server is not required, disable access using Bürkert Communicator. Refer to [Configuration with Bürkert Communicator \[▶ 31\]](#).

Prerequisites:

- The industrial Ethernet variant is not EtherCAT
- Digital device (PC, tablet,...) with a web browser.
- Possibly, a USB-Ethernet adapter.
- ▶ Connect the device to the digital device with an Ethernet cable. Alternatively, connect the device to the PC with a USB-Ethernet adapter.
- ▶ Energise the digital device and the device.
- ▶ If the device is connected to the digital device over a USB-Ethernet adapter, then configure the IP address of the USB-Ethernet adapter. Else, configure the IP address of the network card of the digital device.

- ▶ Change the IP address to 192.168.1.xxx, where xxx is different from 100.
- ▶ Open the web browser. In the address bar of the web browser, enter 192.168.1.100.
 - ✓ The home page of the web server opens. Some device data are shown.
- ▶ Open a web server session, to configure the network parameters of the device.
- ▶ If you are not automatically invited to log in, select **Login**.
- ▶ **User name**: enter admin
- ▶ **User password**: enter admin
- ▶ Click **Login**.
- ▶ Change the default passwords with customised passwords.
- ▶ Change the network parameters of the device.
- ▶ Select **Industrial communication** > **Configuration**.
- ▶ Change the parameters.
- ▶ To save the changes, select **Apply**.
- ▶ To update the parameters, select **Restart**.
- ✓ The device restarts.
- ✓ The network parameters of the device are changed.

6.3.2 Over the Bürkert Communicator software

- ▶ Connect the device to the Bürkert Communicator software. Refer to **Configuration with Bürkert Communicator** [▶ 31].
- ▶ Change the network parameters of the device.
- ▶ Select **Industrial communication** > **Parameter**.
- ▶ Change the parameters.
- ▶ To update the parameters, restart the device.
- ✓ The device restarts.
- ✓ The network parameters of the device are changed.

6.4 Connect the functional earth



WARNING!

Risk of ignition and risk of fire that are due to electrostatic discharge.

An electrostatic discharge of the device can ignite combustible gas vapours.

- ▶ To avoid a build up of electrostatic charge, connect the housing to the functional earth.
- ▶ If the functional earth is not attached, then the requirements of the EMC directive are not met.

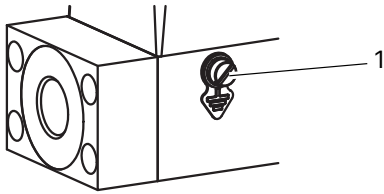


Fig. 13: Location of the M4 screw for the connection of the functional earth

1 M4 screw

- ▶ Use a green-and-yellow cable that is as short as possible. And the cable cross-section must be at least equal to the cross section of the power-supply cable.
- ▶ With a flat screwdriver of size 6.5 mm, loosen the M4 screw.
- ▶ Attach the green-and-yellow cable to the M4 screw with a cable lug.
- ▶ Tighten the M4 screw to a torque of 1,8 N·m...2 N·m (1,33 lbf·ft...1,47 lbf·ft).

7 Commissioning



Risk of injury or material damage when working on the device or system.

- ▶ Read and observe the chapter **Safety** [▶ 7] before working on the device or system.
-

7.1 Commissioning procedure



The operation of the device is tested at the factory with medium. Residual medium can remain in the device.



If the memory card is defective or lost, then buy a new one from your Bürkert sales office.

- ▶ No zero adjustment is needed.
- ▶ Pressurise the pipes with medium.
- ▶ Flush the pipes with medium.
- ▶ Vent the pipes completely.
- ▶ Check if the memory card is inserted.
- ▶ Energise the device.

8 Configuration with Bürkert Communicator

8.1 Setting tools



The MassFlowCommunicator is another PC software that is not compatible with the device. The MassFlowCommunicator software cannot be used to configure or operate the device.

Settings can be made with the Type 8920 Bürkert Communicator. For general information about the Bürkert Communicator, refer to the operating instructions of Type 8920.


- ▶ Access the page [Type 8920](#)
- ▶ Scroll down to **Downloads** > **User Manuals**

8.2 Connect to the Bürkert Communicator

- ▶ Use the USB-büS-Interface set, article number 00772551.
- ▶ Download the latest version of the Type 8920 Bürkert Communicator.
- ▶ Access the page [Type 8920](#)
- ▶ Scroll down to **Downloads** > **Software**
- ▶ Install the Bürkert Communicator on a PC. During installation, the büS stick must not be connected to the PC.
- ▶ Assemble the parts of the USB-büS-Interface set.



Fig. 14: Assembled parts of the USB-büS-Interface set

- ▶ Set the termination-resistance switch of the büS stick to ON.
- ▶ Insert the büS stick into a USB port of the PC.
- ▶ Energise the device. Refer to [Electrical connection \[▶ 26\]](#)
- ▶ Insert the micro-USB connector into the büS interface of the device. Refer to [Product description \[▶ 10\]](#)
- ▶ Wait until the driver of the büS stick has been completely installed on the PC.
- ▶ Start the Bürkert Communicator.
- ▶ Click on  in the Bürkert Communicator to establish the communication with the device.
 - ✓ A window opens.
- ▶ Select **Connect via USB (büS Stick)**.

- ▶ Select the port Bürkert USB büS stick, click on **Finish** and wait until the device symbol appears in the list of devices.
- ▶ In the navigation area, click on the symbol related to the device: The device menu appears.

8.3 Functions

8.3.1 Empty-pipe detection

To detect when the pipe is empty, the device monitors the density value of the liquid.

If the density value is lower than 0.2 kg/l, then the pipe is empty and there is a warning with the following means:

- The status indicator is yellow.
- An out-of-specification event is generated.

8.3.2 Bubble detection

The device detects when there are bubbles in the liquid.

If there are bubbles in the liquid, then there is a warning with the following means:

- The status indicator is yellow.
- An out-of-specification event is generated.
- ▶ Increase the medium pressure.
- ▶ Do not use a medium that is saturated with air.
- ▶ Observe the installation procedure.

8.3.3 Cut-off

If the device measures a mass flow rate value that is under a set limit, then the device transmits a zero mass flow rate.

Cut-off limit	DN1: 0.05 kg/h
Default value	DN2: 0.25 kg/h

Set the cut-off limit with the Bürkert Communicator software:

- ▶ Connect the device to the Bürkert Communicator software. Refer to [Connect to the Bürkert Communicator \[▶ 31\]](#)
- ▶ In the Bürkert Communicator software, select the device.
 - ✓ The status indicator flashes.
- ▶ Select **Sensor** > **Parameter** > **Advanced** > **Limit on low cutoff**
- ▶ Set the cut-off limit in the range that is displayed.
 - ✓ The cut-off limit is set.

8.4 Set-point values without communication

The function makes it possible to specify the set-point values of the device even if the communication with the external set-point value provider (for example a PLC) is broken. If the function is used, then the set-point is kept constant.



By using the function, the medium can continue to flow even if the communication is broken.

- ▶ Make sure the process is safe when the function is used.
-
- ▶ To use the function, refer to the file Device Description File.
 - ▶ Access the page [Type 8756](#)
 - ▶ Scroll down to **Downloads** > **Software**
 - ▶ The configuration is available under **Controller** > **Parameter** > **Setpoint** > **Advanced settings** > **Connection abort behaviour**

9 Maintenance

If the device is operated according to the Operating instructions, then the device is maintenance-free.



Risk of injury or material damage when working on the device or system.

- ▶ Read and observe the chapter [Safety \[▶ 7\]](#) before working on the device or system.

9.1 Replace the memory card

- ▶ De-energise the device.
- ▶ With a TX8 screwdriver loosen the screws of the cover. Remove the cover.

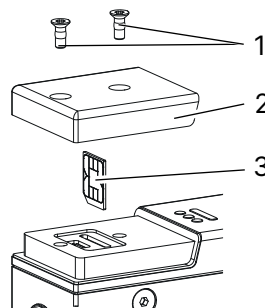


Fig. 15: Insertion direction of the memory card

1 Screws	2 Cover
3 Memory card: make sure the insertion direction is correct.	

- ▶ Remove the old memory card from its slot.
- ▶ Pay attention to the insertion direction of the memory card.

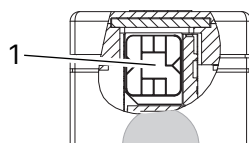


Fig. 16: Cross-sectional drawing

1 Inserted memory card

- ▶ With a TX8 screwdriver, screw the cover to a torque of 1.2 N·m (0.9 lbf·ft).
- ▶ Restart the device to write the data on the new memory card. Possible problems related to the memory card are given in [Troubleshooting \[▶ 36\]](#)

9.2 Sterilising the device with hot water



The sterilisation procedure is only valid for an MFM with seals in metal or PCTFE.

- ▶ De-energise the device.
- ▶ Let water at a temperature of 90°C flow through the device for maximum 30 minutes.
- ▶ Let the device cool down for 2 hours.
- ▶ Commission the device.

9.3 Sterilising the device with steam



The sterilisation procedure is only valid for an MFM with seals in FFKM.

- ▶ De-energise the device.
- ▶ Let steam at a temperature of 120°C flow through the device for maximum 30 minutes.
- ▶ Let the device cool down for 2 hours.
- ▶ Commission the device.

10 Troubleshooting

10.1 Status indicator is red

Cause	Solution
The supply voltage is out of the error range. The device can be damaged.	<ul style="list-style-type: none"> ▶ Operate the device within the specifications. <p>If the status indicator does not change, then send the device back to Bürkert.</p>
The sensor, the internal memory or the device is defective.	<p>Maintenance is needed.</p> <ul style="list-style-type: none"> ▶ Contact the manufacturer.
No proper connection to the PLC.	<ul style="list-style-type: none"> ▶ Check the wiring. ▶ Check the status of the PLC.
EtherCAT variant	
	<ul style="list-style-type: none"> ▶ If the EtherCAT protocol is used, make sure the incoming cable (reception from the PLC) is inserted in the ETH1 port and the outgoing cable is inserted in the ETH2 port.

10.2 Status indicator is orange

Cause	Solution
A calibration procedure is in progress.	<ul style="list-style-type: none"> ▶ Wait until the procedure is completed.
PROFINET variant	
PLC is in Stop mode.	<ul style="list-style-type: none"> ▶ Activate the PLC.

10.3 Status indicator is yellow



The yellow state is displayed for about 15 seconds after electrical power up. The device needs this time to reach the normal operation mode. After this initialisation the device will change to the green state.

Cause	Solution
<p>One of the following values is out of specification. The sensor or the device can be damaged.</p> <ul style="list-style-type: none"> • the medium temperature • the device temperature • the supply voltage 	<ul style="list-style-type: none"> ▶ Operate the device within the specifications. <p>If the status indicator does not change, then send the device back to Bürkert.</p>
The device has detected that the pipe is empty.	<ul style="list-style-type: none"> ▶ Vent the pipe. ▶ Fill the pipe completely with medium. <p>Refer to Commissioning [▶ 30]</p>

Cause	Solution
The device has detected bubbles in the liquid.	<ul style="list-style-type: none"> ▶ Increase the medium pressure. ▶ Do not use a medium that is saturated with air. ▶ Observe the installation procedure.
A change of the Ethernet protocol is in progress.	<ul style="list-style-type: none"> ▶ Wait until the procedure is completed.

10.4 Status indicator is blue

Cause	Solution
Error in the internal memory.	<p>Maintenance is needed.</p> <ul style="list-style-type: none"> ▶ Contact the manufacturer.

10.5 Status indicator is off

Cause	Solution
The device is not energised.	<ul style="list-style-type: none"> ▶ Check the wiring. ▶ Make sure that the voltage supply is 24 V $\overline{---}$. ▶ Make sure that the power supply source is working properly.

10.6 Status indicator flashes

Cause	Solution
The power supply source is not working properly.	<ul style="list-style-type: none"> ▶ Make sure that the power supply source is working properly. <p>After max. 10 seconds, the device automatically returns to the previous status.</p>
The device is selected in the Bürkert Communicator.	<p>After max. 10 seconds, the device automatically returns to the previous status.</p>

10.7 Status indicator goes out periodically

Cause	Solution
The power supply is intermittently dropping and the device restarts.	<ul style="list-style-type: none"> ▶ Use a power supply with sufficient power output.
The voltage drop in the connecting cable is too high.	<ul style="list-style-type: none"> ▶ Increase the cross-section of the cable and reduce the cable length.

10.8 Replacement device adopts none of the values from the defective device

Cause	Solution
The article number of the replacement device is different from the article number of the defective device.	<ul style="list-style-type: none"> ▶ Use a replacement device that has the same article number than the defective device. <p>Values can only be transferred between devices with the same article numbers.</p>
The memory card is defective. The device could not write any values to the memory card.	<ul style="list-style-type: none"> ▶ Replace the memory card. <p>Refer to Replace the memory card [▶ 34].</p>

10.9 Replacement device does not adopt all of the values from the defective device

Cause	Solution
The device description of the replacement device is different from the device structure of the defective device. Only the existing values of the defective device can be adopted by the replacement device.	<ul style="list-style-type: none"> ▶ Use the Bürkert Communicator to configure the new values of the replacement device.

10.10 No mass flow rate

Cause	Solution
The pipes are too large or not yet fully vented.	<ul style="list-style-type: none"> ▶ Vent the pipe. ▶ Change the pipe diameter.
The flow-rate value is below the cut-off limit.	<ul style="list-style-type: none"> ▶ If the cut-off limit is too high, decrease the value of the cut-off limit. <p>Refer to Cut-off [▶ 32].</p>

10.11 Unstable measured value

Cause	Solution
Functional earth (FE) is not connected properly.	<ul style="list-style-type: none"> ▶ To connect the functional earth, use a green-and-yellow cable that is as short as possible. <p>the cable cross-section must be at least equal to the cross section of the power-supply cable. Refer to Connect the functional earth [▶ 28]</p>

10.12 Network status indicator

LED indicator	Meaning	Action
Link/Act-LED (green) fast blinking	Connection to the parent protocol layer is established.	-
Link/Act-LED (green) slow blinking (directly after restart)	Connection to the protocol layer is searched.	-
Link/Act-LED (green) slow blinking (20 s after restart)	No connection to the parent protocol layer.	▶ Check the cable.
Link/Act-LED (green) is OFF.	No connection to the network.	▶ Check the cable.
Link-LED (yellow) is ON	Connection to the network is established.	-
Link LED (yellow) is not lit	Not connected to network.	▶ Check cable.

Tab. 5: Meaning of the LED indicator

11 Uninstallation

11.1 Dismantling

- ▶ Relieve the medium pressure in the installation.
- ▶ Flush the device with distilled water.
- ▶ Relieve the flushing medium pressure in the installation.
- ▶ De-energise the device.
- ▶ Remove the mating female connectors and the mating male connectors.
- ▶ Disconnect the medium connections.

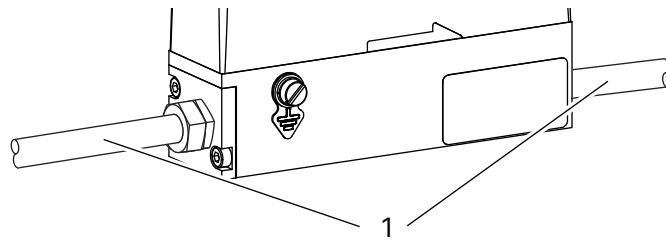


Fig. 17: Medium connections, for example internal-threaded connections

1 Medium connections

- ▶ Remove the device.

12 Spare parts and accessories



Risk of injury and/or damage due to incorrect parts.

- ▶ Use only original accessories and original spare parts from Bürkert.



Order the parts directly on our [eShop](#).

12.1 Electrical accessories

- ▶ For further accessories, refer to the data sheet.

USB-büS-interface set, without power supply	772551
Straight 5-pin M12 female connector	772416
Bent 5-pin M12 female connector	772418
Memory card	on request
Connection cable with M12 female connector (A-coded) and free cable end, 5 m	560365
Connection cable with M12 female connector (A-coded) and free cable end, 10 m	563108
Bent 8-pin M12 male connector	775070
Adapter M8 - M12 D coded	576314

12.2 Mounting accessories

Alloy C22 compression fitting	907 203
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12.3 Additional software

Bürkert Communicator software	Download from country.burkert.com
büS LabView-driver	Download from country.burkert.com

13 Logistics

13.1 Transport and storage

- ▶ Protect the device against moisture and dirt in the original packaging during transportation and storage.
- ▶ Avoid UV radiation and direct sunlight.
- ▶ Protect connections, if present, from damage with protective caps.
- ▶ Observe the permitted storage temperature.
- ▶ Remove cables, connectors, external filters and installation equipment.
- ▶ Clean and vent contaminated devices.

13.2 Return



No work or tests will be carried out on the device until a valid Contamination Declaration has been received.

- ▶ To return a used device to Bürkert, contact the Bürkert sales office. A return number is required.

13.3 Disposal

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 at country.burkert.com