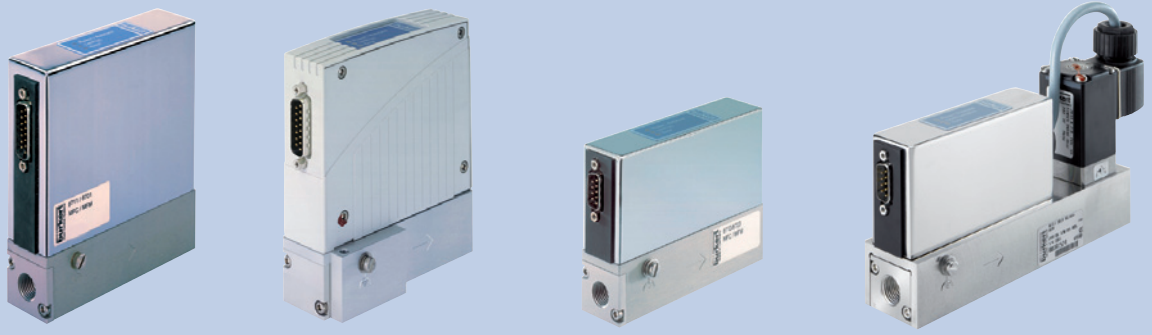
bürkert
FLUID CONTROL SYSTEMS

Type 8700 / 8701 / 8703 / 8705
MFM, Mass Flow Meter IP40

Type 8710 / 8711 / 8713 / 8715
MFC, Mass Flow Controller IP40



Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

MAN 1000204686 EN Version: - Status: RL (released | freigegeben) printed: 19.01.2015

Operating Instructions 1307/0_EU-ML 00563582

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1. ABOUT THIS MANUAL

This manual describes the entire life cycle of the device. Please keep this manual in a safe place, accessible to all users and any new owners.

This manual contains important safety information.

Failure to comply with these instructions can lead to hazardous situations.

- This manual must be read and understood.

1.1. Symbols used

DANGER

Warns against an imminent danger.

- Failure to observe this warning can result 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.

ATTENTION

Warns against a possible risk.

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

NOTE

Warns against material damage.

- Failure to observe this warning may result in damage to the device or system.

Indicates additional information, advice or important recommendations.

Refers to information contained in this manual or in other documents.

→ Indicates a procedure to be carried out.

1.2. Definition of the word "device"

The word "device" used within this manual refers to a Mass Flow Meter (MFM) type 8700, 8701, 8703 or 8705, or a Mass Flow Controller (MFC) type 8710, 8711, 8713 or 8715.

2. INTENDED USE

Nonconforming use of the MFM / MFC types 8700, 8701, 8703, 8705 / 8710, 8711, 8713, 8715 may be a hazard to people, nearby equipment and the environment.

- Mass flow meter types 8700, 8701, 8703 and 8705 are designed exclusively for measuring the mass flow-rate of clean, dry gases.
- Mass flow controller types 8710, 8711, 8713 and 8715 are used for controlling the mass flow-rate of clean, dry gases.
- Only use the fluids stated on the name plate and the calibration protocol.
- Protect this device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of the climatic conditions.
- This device must be used in compliance with the characteristics and commissioning and use conditions specified in the contractual documents and in the user manual.
- Requirements for the safe and proper operation of the device are proper transport, storage and installation, as well as careful operation and maintenance.
- Only use the device as intended.
- Observe any existing restraints when the device is exported.

3. BASIC SAFETY INFORMATION

This safety information does not take into account:

- any contingencies or occurences that may arise during installation, use and maintenance of the devices.
- the local safety regulations for which the operating company is responsible including the staff in charge of installation and maintenance.

Danger from the heated surfaces when used for prolonged periods.

- The device must be kept away from any highly flammable materials or fluids.
- Wear protective gloves to handle the device.

Danger due to high pressure in the installation.

- Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

Danger due to electrical voltage.

- Shut down and isolate the electrical power source before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Danger from the outflow of operating fluid

Observe all applicable accident protection and safety regulations for electrical equipment.

Various dangerous situations

To avoid injury take care:

- to prevent any unintentional power supply switch-on.
- to ensure that installation and maintenance work are carried out by qualified, authorised personnel in possession of the appropriate tools.
- to keep the device away from any highly flammable materials or fluids and avoid any contact with bare hands,
- to guarantee a defined or controlled restarting of the process, after a power supply or a medium supply interruption,
- to use the device only if in perfect working order and in compliance with the instructions provided in the instruction manual,
- to observe best industry practice for the installation and use of these devices,
- not to use the MFM / MFC types 8700, 8701, 8703, 8705 / 8710, 8711, 8713, 8715 for controlling and/or measuring the flow-rate of contaminated (particle size > 25 µm) or humid or contaminated fluids,
- not to operate the device without the stainless steel mesh filter disc installed at the factory,
- not to operate the device in a mounting position which deviates from the calibration conditions,
- not to operate the device with higher pressures than the specified tightness pressure (MFC) respectively calibration pressure (MFM),
- not to subject the device to mechanical loads (e.g. by placing objects on top of it or by using it as a step).
- not to make any external modifications to the device. Do not paint or varnish any part of the device. Do not feed any other fluids into the system other than the designated operating fluid indicated on the device name plate. Exception: Agent for cleaning and decontaminating the device (see also chap. 9.2.1). In doing so, observe the compatibility of the materials used for the device. A chemical compatibility chart can be found on the Internet at:
  www.burkert.com → Documentation → Brochures → Chemical Resistance Chart
  If in doubt, contact the manufacturer.

NOTE

Elements / Components sensitive to electrostatic discharges

- This device contains electronic components sensitive to electrostatic discharges. They may be damaged if they are touched by an electrostatically charged person or object. During electrostatic discharge, they will become defective immediately or will fail when energized.
- To minimise or even avoid all damage due to an electrostatic discharge, take all the precautions described in the EN 61340-5-1 and 5-2 norms.
- Also ensure that you do not touch any of the live electrical components.

4. GENERAL INFORMATION

4.1. Manufacturer's address and international contacts

To contact the manufacturer of the device, use following address:
Bürkert SAS
Rue du Giessen
F-67220 TRIEMBACH-AU VAL

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

4.2. Warranty conditions

The condition governing the legal warranty is the conforming use of the MFM / MFC in observance of the operating conditions specified in this manual.

4.3. Information on the Internet

You can find the user manuals and technical data sheets regarding the type MFM / MFC at: www.burkert.com

5. DESCRIPTION OF THE SYSTEM

5.1. General description

- Mass flow meter types MFM 8700, 8701, 8703 and 8705 are devices designed for measuring the mass flow-rate of clean, dry gases.
- Mass flow controller types MFC 8710, 8711, 8713 and 8715 are devices designed for controlling the mass flow-rate of clean, dry gases.

Type of the device		Type of sensor
MFM	8700	Capillary/Bypass channel
	8701	MEMS
	8703	MEMS
	8705	Capillary/Bypass channel
MFC	8710	Capillary/Bypass channel
	8711	MEMS
	8713	MEMS
	8715	Capillary/Bypass channel

5.1.1. General operation of the Mass Flow Meter (MFM)

The MFM integrates a sensor for measuring the flow-rate. The measured value for the mass flow-rate is transmitted to a remote device via an analogue or a digital output (field bus).

5.1.2. General operation of the Mass Flow Controller (MFC)

The MFC comprises:

- a sensor for measuring the mass flow-rate,
- control electronics,
- an actuating element: low-friction solenoid control valve with a high response sensitivity.

5.2. Operation of an MFM or MFC sensor

- The integrated flow-rate sensors use the thermal measurement process (anemometric and calorimetric) to measure the mass flow-rate. The main components are a heating resistor and a temperature probe. The gas which passes through the device modifies the temperature difference measured between both resistors.
- The thermal measurement principle allows the MFC to control the required mass flow-rate completely independently of the pressure and temperature fluctuations in the application concerned.

The damping of the output signal can be changed with the "Mass Flow Communicator" (see chap. 10.1.3).

On the MFC types 8710, 8711, 8713, 8715, the technology for the integrated sensor requires filters to be fitted upstream of the product when highly soiled fluids are present.

5.3. Detailed operation of an MFC

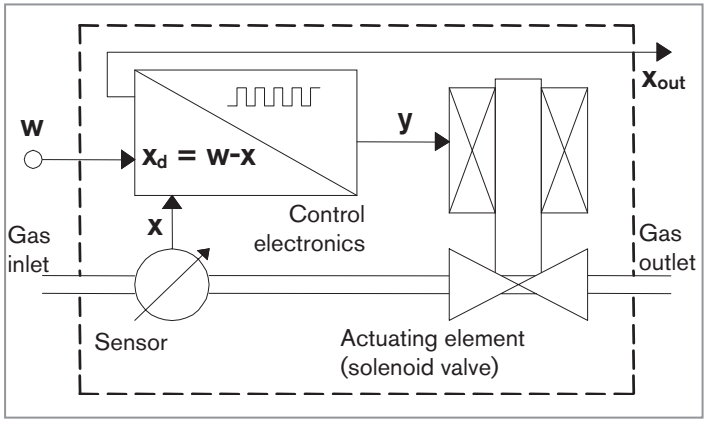


Fig. 1: Operating principle for the Mass Flow Controller

The control electronics compare the mass flow-rate (x) measured by the integrated flow sensor with the mass flow-rate set-point value (w) supplied to the MFC. The control electronics then calculate the actuating variable (y) to be supplied to the solenoid valve to control its opening. The flow-rate is either maintained at a constant value, or modified to a predefined profile.

The control operates independently of fluctuations in pressure or increases in the flow resistance which may be caused by soiling of the filter. The rapidly responding solenoid valve and the sensor dynamics define the overall responding time.

The measured value for the mass flow-rate is also transmitted (xout) to a remote device via an analogue output or a digital output (field bus).

5.3.1. Control electronics

The control electronics:

- process the mass flow-rate set-point values and measured values,
- control the solenoid valve.

Set-point value

The set-point value (w) is either transmitted either by an analogue, normalized input signal, or digitally via the serial interface or the field bus interface. If the set-point value is supplied by analogue transmission, the following assignments are applied:

Signal range	Set-point associated with the range min.	Set-point associated with the range max.
4...20 mA	4 mA, w = 0 %	20 mA, w = 100 %
0...20 mA	0 mA, w = 0 %	20 mA, w = 100 %
0...5 V	0 V, w = 0 %	5 V, w = 100 %
0...10 V	0 V, w = 0 %	10 V, w = 100 %

For the control of a system where quick flow-rate changes are not permitted, a ramp function can be activated. The settings for an ascending and a descending set-point value can be set separately.

More detailed information on the ramp function and on all other functions can be found in the software documentation for the MFM / MFC.

Control settings

The initial control settings are set at the factory.

- Amplification factors:

After start-up, the controller operates with amplification factors dependent on the loop properties. When the autotune function runs, these are determined automatically. This function enables the control settings to be optimized for the system's actual conditions.

- Control dynamics setting:

The device has a setting which can change the control dynamics with the aid of the "Mass Flow Communicator" software (see chap. 10.1.3). Its extreme effects are:

1. a very quick adjustment in which overshoots are possible. This enables the controller to respond immediately to very low control deviations, causing the control to be very turbulent,
2. a slower adjustment to the required flow-rate. If the system is less dynamic, the behavior of the controller may be damped so that minor fluctuations of the measured value or set-point value are adjusted slowly.

Zero point shut-off

A zero point shut-off is integrated to ensure the sealing function of the valve. This is activated if the following conditions occur at the same time:

Set-point value < 2 % of nominal flow-rate Q_{nom} (with control range 1:50)	and	Measured value < 2 % of nominal flow-rate Q_{nom} (with control range 1:50)

If the zero point shut-off is active, the PWM signal is set to 0 % so that the valve is completely closed.

5.3.2. MFC solenoid valve

The solenoid valve used for an MFC is a direct-acting, normally closed solenoid control valve.

The ND (nominal diameter) of the solenoid control valve is determined by the required nominal flow-rate Q_{nom}, the pressure conditions in the process and the density of the operating fluid.

If the device is operated within the specified pressure range, the solenoid valve also takes over the sealing function together with the control function. Limitation: in the case of special, hard seal materials, the seal function cannot be ensured. In this case an additional shut-off valve may be required.

6. TECHNICAL DATA

ATTENTION

Risk of injury from pressure and discharge of fluid.

Important device-specific technical data is indicated on the name plate and the calibration plate (see chap. 6.1).

- Observe the permitted fluid according to the name plate (depending on seal material).
- Observe the permitted pressure range on the calibration plate of the device.

6.1. Markings on the device

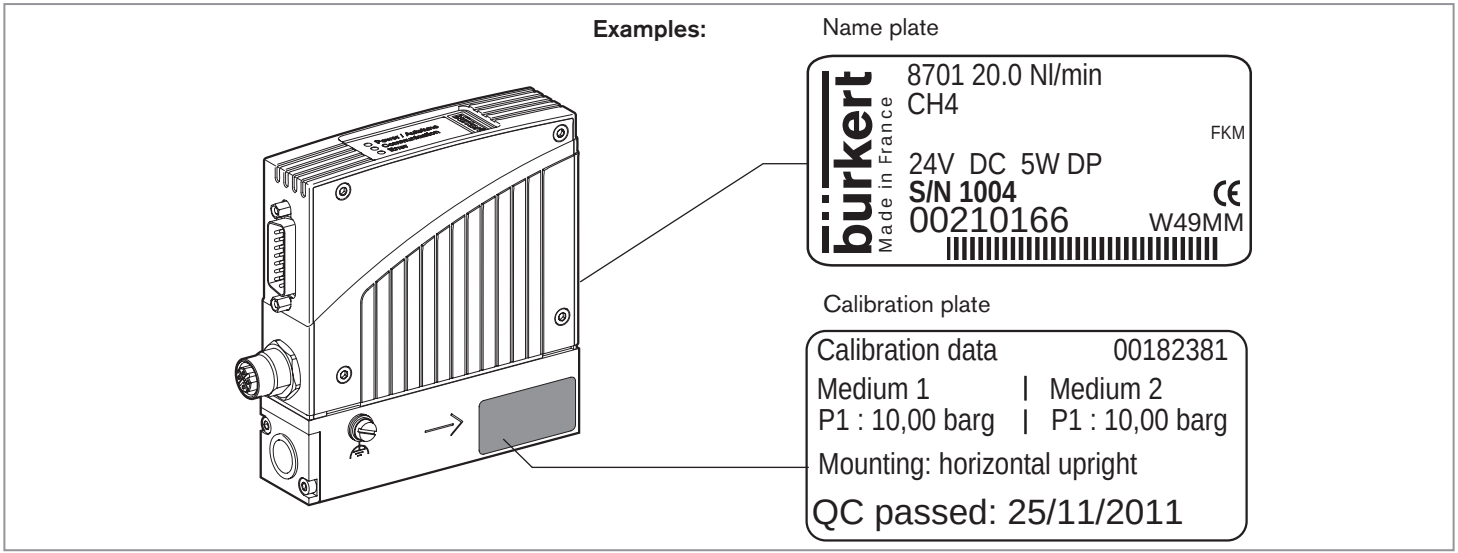


Fig. 2: Name plate, calibration plate

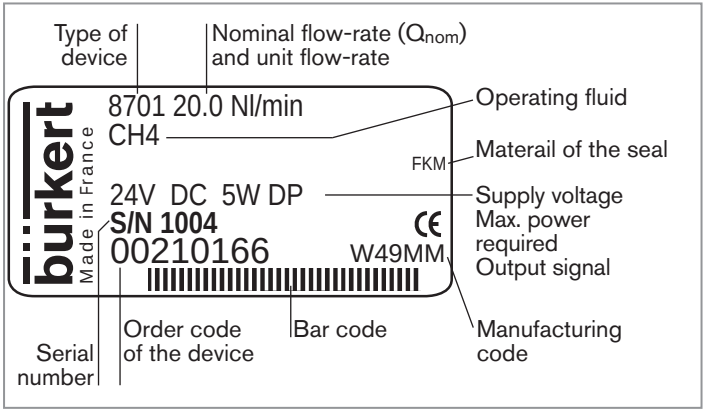


Fig. 3: Detail of a name plat

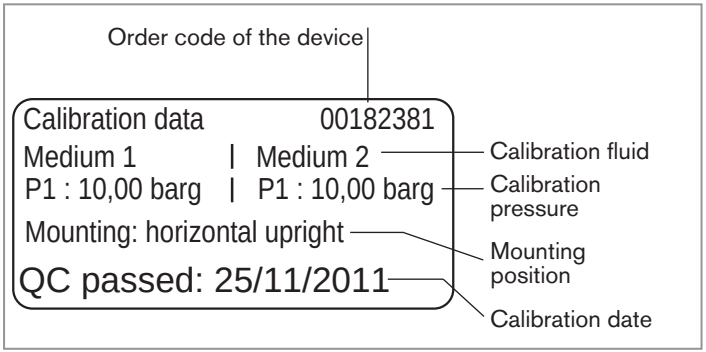


Fig. 4: Details of a calibration plate

6.2. Conditions of use

WARNING

Risk of injury from malfunction due to effects of weather!

The MFM / MFC is not designed for unrestricted use outdoors.

- Protect the device from direct sunlight.
- Observe the ambient temperature permitted for the device.
- Protect the device from humidity.

Setting	Value
Ambient temperature	-10 °C to +55 °C For UL devices: 0 °C to 40 °C
Fluid temperature	for oxygen: -10 °C to +60 °C for the other fluids: -10 °C to +70 °C
Air humidity	< 95%, without condensation
Relative humidity for UL devices	80% up to a temperature of 31°C, with a linear decrease to a relative humidity of 50% at 40°C
Protection rating acc. to EN 60529	Only if devices are cabled and the connectors are plugged in and tightened: IP40
Absolute height above sea level for UL devices	2000 m max.
Operating environment	Indoors, with pollution degree 2

6.3. Conformity to standards and directives

The device conforms to the EC directives through the following standards:

- EMC: EN 61000-6-2, EN 61000-6-3

The MFM / MFC UL devices conform to the following standards:

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

6.4. Mechanical data

The device may be mounted in a horizontal or vertical position: see the calibration plate and/or the calibration protocol.

Type	Base block material	Material of the housing	Port connections
8700, 8710	Stainless steel 1.4305	Polycarbonate (PC) or sheet stainless steel 1.4301	G 1/4, NPT 1/4, flange
8701, 8711	Stainless steel 1.4305 or aluminium	Polycarbonate (PC) or sheet stainless steel 1.4301	G 1/4, NPT 1/4, flange
8703, 8713	Stainless steel 1.4305 or aluminium	Sheet stainless steel 1.4301	G 1/4, NPT 1/4, flange
8705, 8715	Stainless steel 1.4305	Sheet stainless steel 1.4301	G 1/4, NPT 1/4, flange

Sealing material FKM, FFKM, EPDM (see name plate)
Other parts in contact with fluids, proportional valve: 1.4310, 1.4113 and 1.4305.

6.5. Dimensions

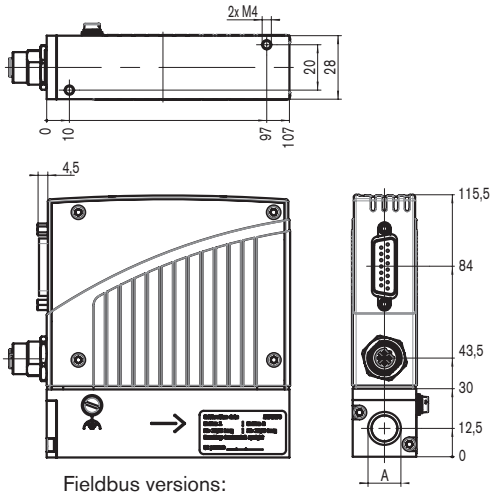


Fig. 5: Dimensions of MFM types 8700 and 8701 and MFC types 8710 and 8711

Weight aluminium (kg)	Weight stainless steel (kg)
ca. 0.8	ca. 1.1

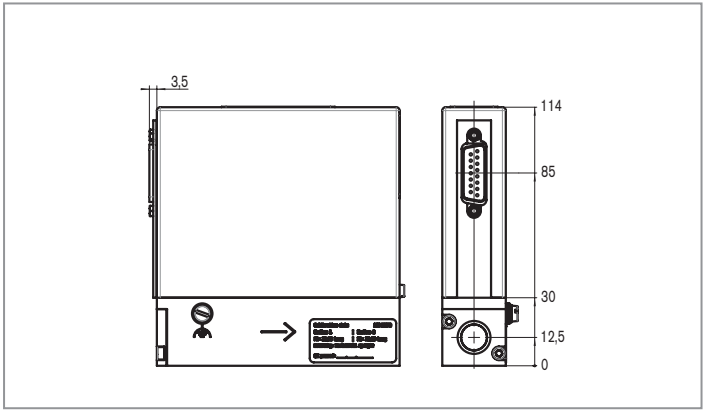


Fig. 6: Dimensions of MFM with metal housing, types 8700 and 8701, and MFC with metal housing, types 8710 and 8711

Weight aluminium (kg)	Weight stainless steel (kg)
ca. 0.8	ca. 1.1

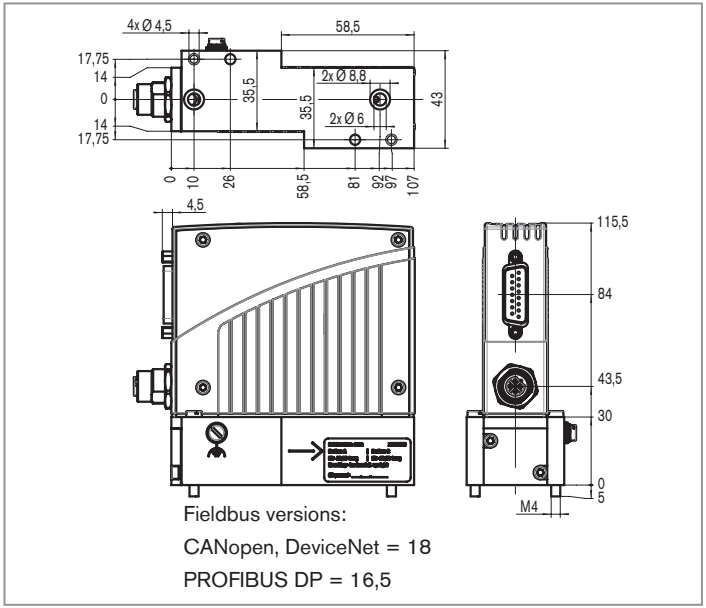


Fig. 7: Dimensions of MFM with flanges, types 8700 and 8701, and MFC with flanges, types 8710 and 8711

Weight aluminium (kg)	Weight stainless steel (kg)
ca. 0.8	ca. 1.1

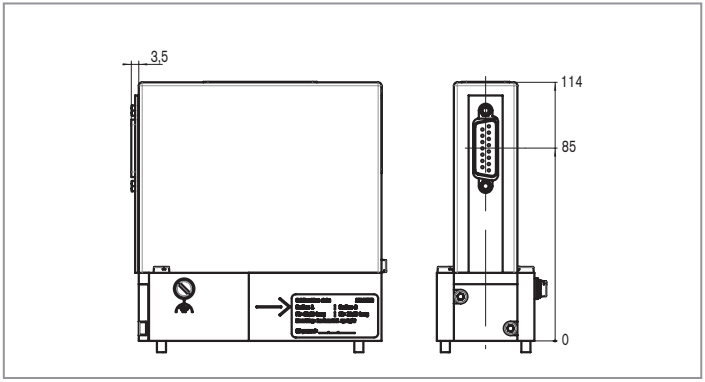


Fig. 8: Dimensions of MFM with flanges and metal housing, types 8700 and 8701, and MFC with flanges and metal housing, types 8710 and 8711

Weight aluminium (kg)	Weight stainless steel (kg)
ca. 0.8	ca. 1.1

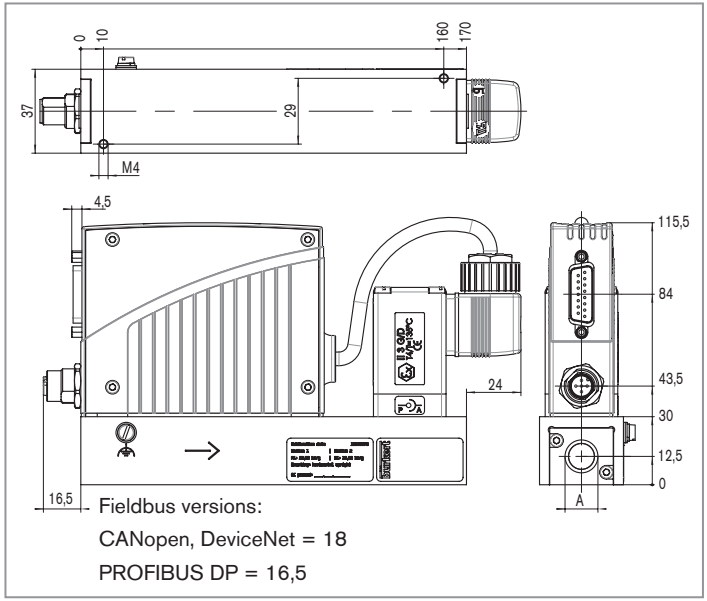


Fig. 9: Dimensions of MFC with external solenoid valve, type 8711

Weight aluminium (kg)	Weight stainless steel (kg)
ca. 1.2	ca. 1.5

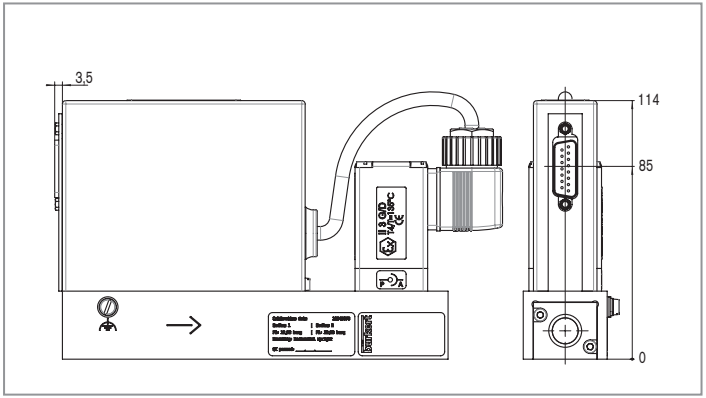


Fig. 10: Dimensions of MFC with metal housing and external solenoid valve, type 8711

Weight aluminium (kg)	Weight stainless steel (kg)
ca. 1.2	ca. 1.5

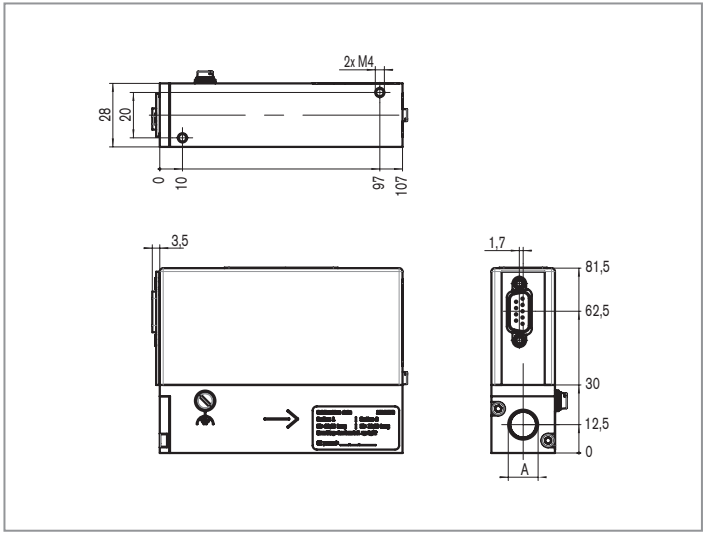


Fig. 11: Dimensions of MFM types 8703 and 8705 and MFC types 8713 and 8715

Weight aluminium (kg)	Weight stainless steel (kg)
ca. 0.8	ca. 1.1

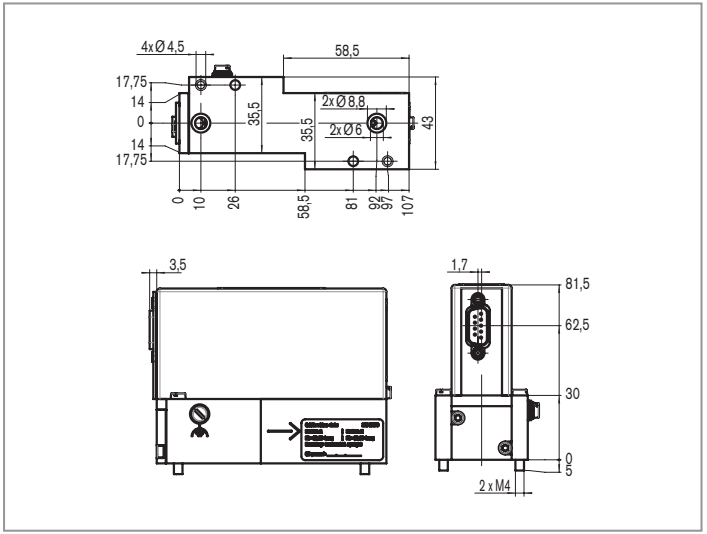


Fig. 12: Dimensions of MFM with flanges, types 8703 and 8705, and MFC with flanges, types 8713 and 8715

Weight aluminium (kg)	Weight stainless steel (kg)
ca. 0.8	ca. 1.1

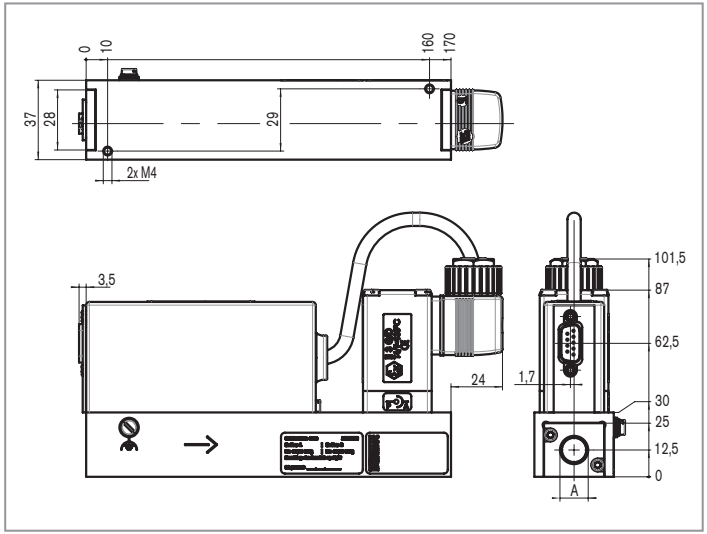


Fig. 13: Dimensions of MFC with external solenoid valve, type 8713

Weight aluminium (kg)	Weight stainless steel (kg)
ca. 1.2	ca. 1.5

6.6. Fluidic data

6.6.1. Overview of measurement specifications

Device types	Full scale range, ref. to N2 (lN/min)	Measuring accuracy (after heating time)	Span/control range	Settling time (MFC) or response time (MFM) (ms)
8700, 8710 **8705, 8715**	0.01 … 15	± 1.5 % of the measured value ± 0.3 % of the full scale	1 : 50	< 3000
8701, 8710 **8703, 8713**	0.01 … 80	± 0.8 % of the measured value ± 0.3 % of the full scale	1 : 50 *)	< 300

*) Higher span (e.g. 1:100) possible on request

Repeatability: ± 0.1% of the full scale.

6.6.2. Operating fluids

- Operating fluids: clean, dry gas.
- Operating fluid for UL devices: neutral, uncontaminated gas. Other hazardous gases are possible on request; the devices do not release any hazardous gases under normal operating conditions.
- Calibration fluid: operating gas or air.
- Max. operating pressure: 10 bar (depending on the nominal size of the valve).

To obtain the required measuring accuracy or control quality, but also to respect the safety requirements, the gas or gaseous mixture must conform to the following safety criteria, compliant with ISO standard 8573-1 (Compressed air - Part 1: Contaminants and purity classes):

- Particle size and maximum density: class 2:
  Maximum particle size: 1 µm [1)]
  Maximum particle density: 1 mg/m³ [1)]
- Maximum dewpoint under pressure: class 4: 3°C
- Maximum oil concentration: class 1: 0.01 mg/m³ [1)]

[1)] For more information refer to ISO 8573-1

6.6.3. Pressure loss characteristics

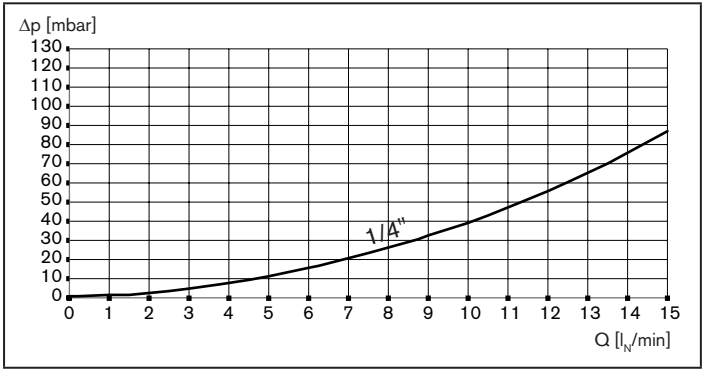


Fig. 14: Pressure loss diagram (reference air, with a 250 µm inlet mesh filter), types 8700 / 8705

The diagram shows exemplarily the pressure loss characteristics when air flowing through.

For determining the pressure loss with another gas first calculate the air equivalent of the other gas.

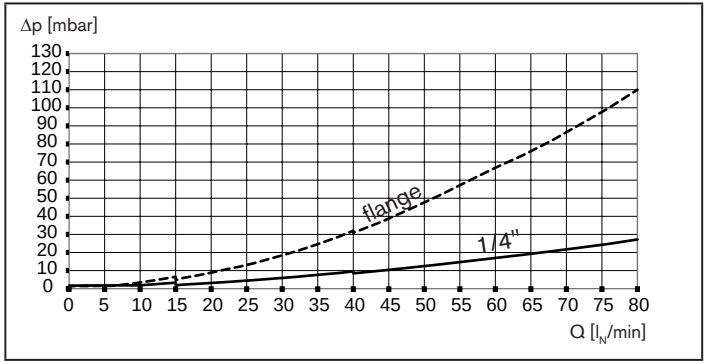


Fig. 15: Pressure loss diagram (reference air, with a 250 µm inlet mesh filter), types 8701 / 8703

The diagram shows exemplarily the pressure loss characteristics when air flowing through.

Further it differentiates two designs, first one with ¼ inch connectors and second one with connections on the bottom of the flowmeter (used for assembly on manifolds).

For determining the pressure loss with another gas first calculate the air equivalent of the other gas and respect the fluidics needed with the other gas.

6.7. Electrical data

6.7.1. Electrical data for types 8703 / 8705 / 8713 / 8715

Specification	Type		
Power supply	24 V DC ± 10%; residual ripple < 2% (5% for UL devices)		
Power supply (not provided) for UL devices	Power supply limited to class 2		
Type of device	8703 / 8705	8713	8715
Power required (max. in Watt)	2.5	11.5	7.5
Binary input (configurable)	1, active at the trailing edge, to be connected to DGND for activation		
Communication interface	RS485 supporting the MODBUS protocol		
Relay output (configurable)	1, potential-free changer, 60 V, 1 A, 60 VA		
LEDs (configurable)	3 LEDs, status display for Power, Communication, Error		
Electrical connections	Sub-D 9-pin male fixed connector		

6.7.2. Electrical data for types 8700 / 8701 / 8710 / 8711

Specification	Type		
Power supply	24 V DC ± 10%; residual ripple < 2% (5% for UL devices)		
Power supply (not provided) for UL devices	Power supply limited to class 2		
Type of device	8700 / 8701	8710	8711
Power required (max. in Watt)	5	10	14
MFC 8710 and 8711 only: Analogue input (configurable)	▪ 0/4 - 20 mA, input impedance max.: 300 Ω, resolution : 5 µA ▪ 0 - 5/10 V, input impedance min. : 20 kΩ, resolution: 2.5 mV		
Binary inputs (configurable)	2, active at the trailing edge, to be connected to DGND for activation		
Analogue output (configurable)	▪ 0/4 - 20 mA, max. load: 600 Ω, resolution: 20 µA ▪ 0 - 5/10 V, max. current: 10 mA, resolution : 10 mV		
Communication interface (alternative to analogue input + output)	PROFIBUS DP V1, DeviceNet or CANopen		
Relay output (configurable)	1, potential-free changer, 60 V, 1 A, 60 VA		
LEDs (configurable)	3 LEDs, status display for Power, Communication or Limit, Error		
Electrical connections	Sub-D 15-pin male fixed connector		
Additional connections for version with field bus	M12 5-pin female or male fixed connector		

7. INSTALLATION AND COMMISSIONING

7.1. Safety instructions

DANGER

Risk of injury due to high pressure in the installation.

- Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

Danger due to electrical voltage.

- Shut down and isolate the electrical power source before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury from the outflow of operating fluid

- Respect the prevailing regulations on accident prevention and safety relating to the operating fluids used.

WARNING

Danger due to nonconforming installation or commissioning.

- Installation and commisioning can only be carried out by qualified and skilled staff with the appropriate tools.

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

- Take appropriate measures to avoid unintentional activation of the installation.
- Guarantee a set or controlled restarting of the process subsequent to any intervention on the device.

7.2. Prior to installation

→ Before installing the MFM / MFC, remove dirt from the pipes and fluid system components.

→ Connect a suitable filter (≤ 25 µm mesh size) upstream to ensure that the operating fluid is kept clean.

NOTE

- Use a power supply unit with adequate power.
- Observe the maximum permitted residual ripple of the operating voltage.

7.3. Description of the MFM / MFC

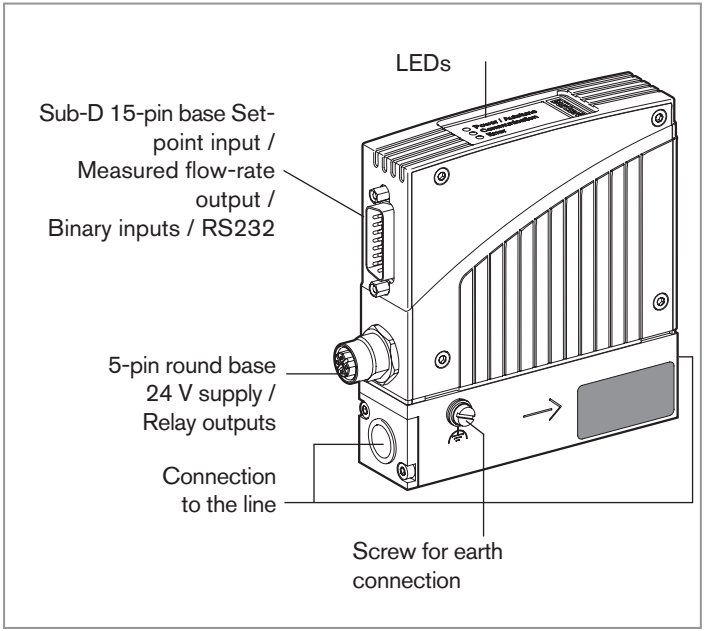


Fig. 16: Description of the MFM / MFC

7.4. Sequence of the steps to be performed

1. Mechanical installation
2. Fluid installation
3. Electrical installation
4. Set the device parameters
5. Pressurize the lines with operating fluid
6. Flush and completely deaerate the lines with operating fluid at the calibration pressure

7.5. Setting the parameters

7.5.1. Setting the bus address

To ensure trouble-free setting, reset the device by switching off the power supply to the device.

The bus address of the device can be set either via the Bürkert configuration tool "Mass Flow Communicator" in the "Views" window → PROFIBUS / DeviceNet / CANopen or directly via the master bus.

The address must be reinitialized after a change on the slave and on the master. It may be necessary, depending on the bus, to send a corresponding telegram.

7.5.2. Setting the bus address on a device with rotary switches for setting the address (type 8700 / 8701 / 8710 / 8711)

To set an address via the master bus:

→ Set the switches on an address outside the permitted range.

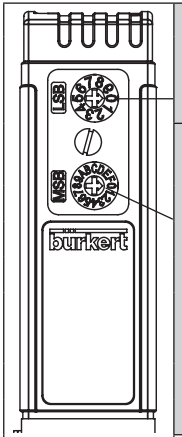
→ Restart the device.

→ Set the address via the Mass Flow Communicator.

When the device is switched on, the address set with the rotary switches is accepted as a slave address.

Valid addresses are:
- PROFIBUS 0 – 126
- DeviceNet 0 – 63
- CANopen 1 – 127

If the address was set outside the permitted range, the address setting has the validity as described in chapter 7.5.1



LSB Unit position (x 1)	Unit position	Digit times 1	
	0 – 9	→	0 – 9
MSB Decade position (x 10)	Decade position	Digit times 10	
	0 – 9	→	0 – 90
	A	→	100
	B	→	110
	C	→	120
	D	→	130
	E	→	140
	F	→	150

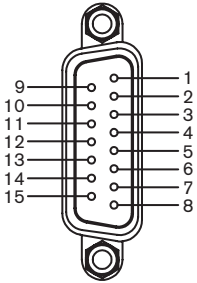
The address is composed of LSB + MSB

Example:

Address:	MSB setting	LSB setting
1	0	1
63	6	3
100	A	0
127	C	7

Fig. 17: Setting the bus address on devices with rotary switch (types 8700 / 8701 / 8710 / 8711)

7.5.3. Pin assignment

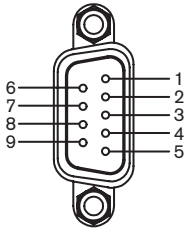


MFM types 8700, 8701: 15-pin Sub-D plug	Pin	Assignment MFM Typ 8700, 8701	Assignment MFC Typ 8710, 8711
	1	Relay - Normally closed contact	
	2	Relay - Normally open contact	
	3	Relay - Center contact	
	4	GND for 24 V - Supply and binary inputs	
	5	24 V - Supply +	
	6	8 V - Output (for internal use only)	
	7[1)]	Not used	Set-point value input GND
	8[1)]	Not used	Set-point value input +
	9[2)]	Measured value output GND	
	10[2)]	Measured value output +	
	11	DGND (for RS232)	
	12	Binary input 1	
	13	Binary input 2	
	14[3)]	RS232 R x D (without controller)	
	15[3)]	RS232 T x D (without controller)	

[1)] In the field bus version of MFC types 8710 / 8711 these connections are not used.

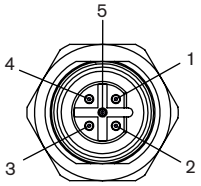
[2)] In the field bus version of MFC types 8710 / 8711 and MFM types 8700 / 8701 these connections are not used.

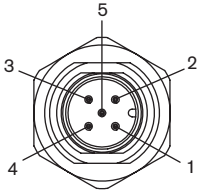
[3)] To use the RS232 interface, use an adapter (item no.: see chap. 10.1.1, Electrical accessories).

MFM types 8703, 8705 and MFC types 8713, 8715: 9-pin Sub-D plug	Pin	Assignment
	1	Binary input
	2	GND
	3	24 V - Supply +
	4	Relay - C Contact
	5	Relay - NC Contact
	6 [1)]	TX+ (RS485 - Y)
	7 [1)]	TX- (RS485 - Z)
	8 [1)]	RX- (RS485 - B)
	9 [1)]	RX+ (RS485 - A)

[1)] For operation in Half-Duplex mode, connect pin 6 to 9 and pin 7 to 8.

Pin assignment for field bus version

PROFIBUS DP socket, B encoded M12 (DP V1 max. 12 MBaud)	Pin	Assignment
	1	VDD
	2	R x D / T x D - N (line A)
	3	DGND
	4	R x D / T x D - N (line B)
	5	Not used

DeviceNet or CANopen M12 connector	Pin	Assignment
	1	Shield
	2	Not used
	3	DGND
	4	CAN_H
	5	CAN_L

7.6. Mechanical installation

Observe the mounting position shown on the calibration plate or the calibration protocol.

7.7. Fluid installation

DANGER

Risk of injury due to high pressure in the installation.

- Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

Select the fluid connections suitable for the maximum flow-rate. There is no minimum upstream distance to be observed.

On request, the device may be supplied with the fluid connections fitted.

WARNING

Danger from leaks

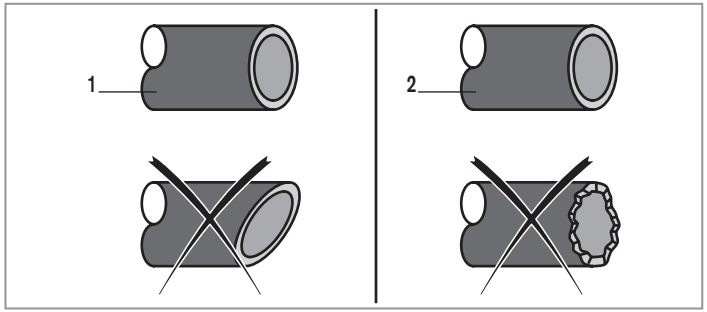
If flow-rates are low and pressures high, ensure that the system is sealed to prevent incorrect metering or the operating fluid from leaking.

- To ensure that the seal is secure, observe the operations described below.

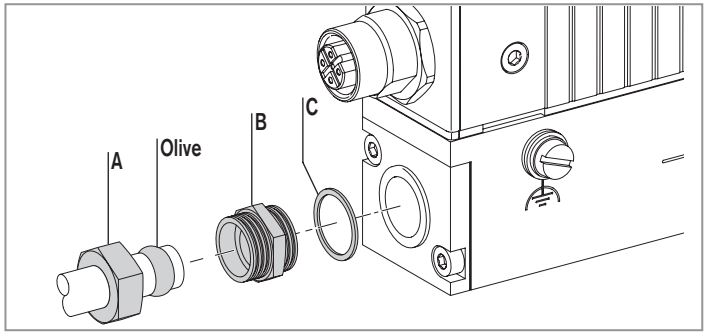
Install the fittings without subjecting them to any stresses. To seal the system properly, use fittings with olives.

Use a line with a suitable diameter and a smooth surface.

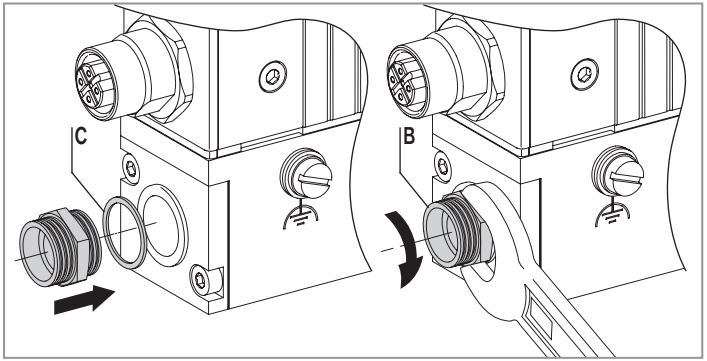
→ Cut the line squarely **[1]** and deburr **[2]**.



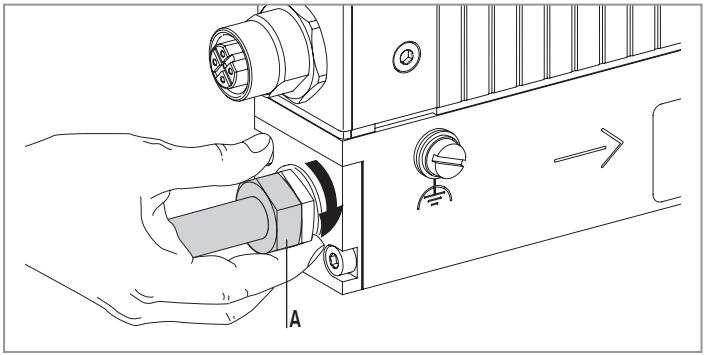
→ In order, fit the nut **[A]** and the olive onto the line.



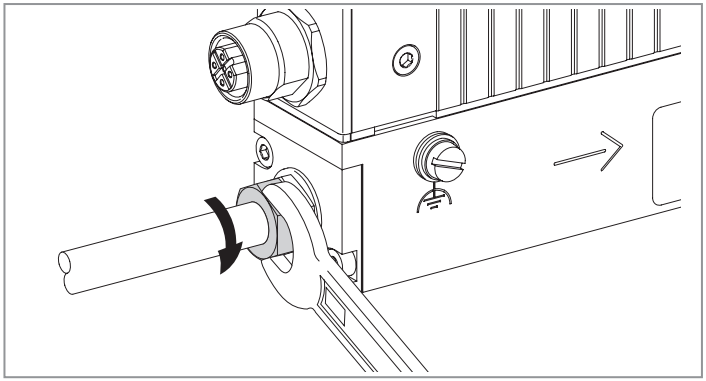
→ Fit the washer **[C]** and screw the fitting **[B]** to the device.



→ Insert the line and manually tighten the nut **[A]**.



→ Finish tightening the nut with a suitable wrench to ensure the mounting is sealed.



7.8. Electrical installation

DANGER

Risk of injury due to electrical shock

- Shut down and isolate the power supply before carrying out any work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

WARNING

Risk of fire and ignition due to electrostatic discharge

If the device is electrostatically charged, highly flammable fluid vapors may ignite if electrostatic discharge occurs.

- To avoid electrostatic charges, connect the device to the functional earth (FE) using the shortest possible cable with the largest possible cross section.

Danger from electromagnetic fields

If the FE connection is not connected, electromagnetic compatibility is not assured.

- Connect the device to the functional earth (FE) via the shortest possible cable (largest possible cross section).

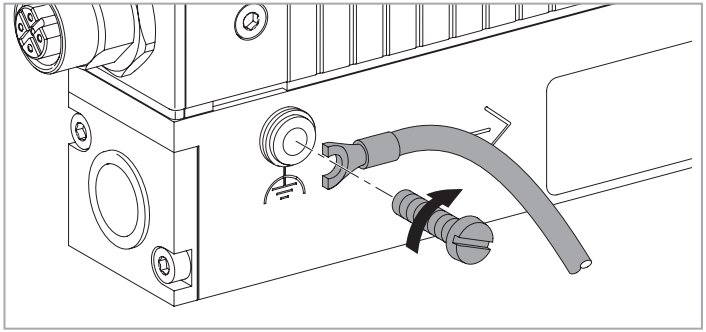
NOTE

Important information for problem-free functioning of the device

The GND or earth connections of the MFM / MFC must always be connected individually.

If all the GND connections are connected together and only a single common connection fed to the control, the analogue signals risk being subjected to fluctuations and interference.

→ Connect the functional earth (FE) to the screw indicated, for example using an earth terminal. The connection cable must be as short as possible and its cross section must be as large as possible.



8. OPERATION AND FUNCTION

8.1. Safety instructions

WARNING

Risk of injury due to non-conforming operating.

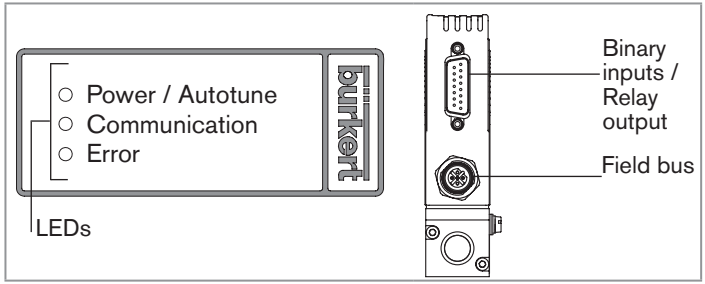
Non-conforming operating could lead to injuries and damage the device and its surroundings.

- Operating personnel must familiarize themselves with the contents of the operating instructions.
- Observe the safety instructions and use the devices as indicated in this manual.
- Only adequately trained personnel may operate the device.

8.2. Operation of the MFM / MFC

The MFM / MFC is operated by means of analogue standard signals or field bus communication as well as binary inputs. Three LEDs and a relay output are used for operation and status displays.

There is a serial interface via which a connection to a PC can be established, using the "Mass Flow Communicator" software.



- **Selecting the standard signals / Assigning the binary inputs**

  The standard signal type as well as the assignment of the binary inputs can be specified on order placement or configured via the "Mass Flow Communicator" PC software (see also chap. 10.1.3).

- **Assigning LEDs / Assigning the relay output**

  The assignment of the "Communication" and "Limit(y)" LEDs as well as the assignment of the relay outputs can also be configured via the software (see also chap. 10.1.3).

8.2.1. LED default assignment

Indicator light status	Possible cause
Power indicator (green) on ● Power / Autotune ○ Limit (y) ○ Error	The device is energized.
Power indicator (green) flashing ✺ Power / Autotune ○ Limit (y) ○ Error	The *Autotune* function is in progress.
Communication light (yellow) on ○ Power / Autotune ● Communication ○ Error	The device is communicating via the field bus or the serial interface.
Limit (y) light (blue) on ○ Power / Autotune ● Limit (y) ○ Error	MFM: indicates that the measured value has almost reached the nominal flow-rate. MFC: indicates that the actuating variable of the proportional valve has almost reached 100%. In practice this usually means that the pressure on the controller is not adequate to reach the required flow-rate.
Limit (y) light (blue) flashing ○ Power / Autotune ✺ Limit (y) ○ Error	The device is in an operating state other than the control mode or *Autotune* function.
Error light (red) on ○ Power / Autotune ○ Limit (y) ● Error	Minor fault, for example the *Autotune* function has failed.
Error light (red) flashing ○ Power / Autotune ○ Limit (y) ✺ Error	Major fault, sensor damaged, internal power supply voltage incorrect or operating pressure too high.

8.2.2. Inputs

Analogue input/output

The analogue input (MFC only) allows the set-point value, i.e. the required flow-rate value in the line, to be received.

The analogue output enables the measured flow-rate value to be supplied to the device to which it is connected.

Bus connection (field bus version only)

The set-point value received and the measured value are sent digitally via the field bus. It is possible to choose between PROFIBUS DP, DeviceNet and CANopen (see also the additional operating instructions for field bus devices).

Binary inputs

If the binary inputs are activated, different operations can be run on the MFC and the latter can be switched to a specific operating mode. This is achieved by connecting the binary input to DGND for at least 0.5 s.

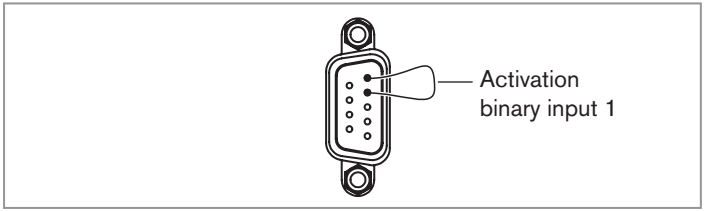


Fig. 18: Types 8703, 8705, 8713 and 8715

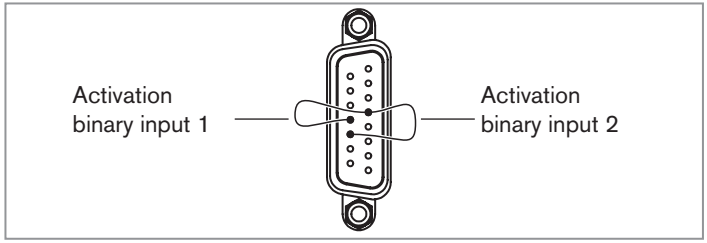


Fig. 19: Types 8700, 8701, 8710, 8711

Input	Default assignment
Binary input 1	Autotune actuation
Binary input 2	Not used

Table 1: Default assignment of binary inputs.

Function	Description
Actuate Autotune	Start of Autotune function for optimization of the control settings to the conditions available in the system (see chap. 8.3).
Switch to specification 2	The calibration curve saved under Gas 2 as well as all settings entered there are used.
Totalizer Reset	The integrated totalizer (quantity integrator) is reset.
Start set-point value profile	Start of the saved set-point value profile (see chap. 8.3).
Control mode	Enables the solenoid valve to be opened at a given value (see chap. 8.3).
Correct safety value*	The safety value stored in the device is used as a flow-rate set-point value. In this case, the flow-rate set-point value received by the analogue input or field bus is ignored.
Close valve completely*	Valve completely closed. In this case, the flow-rate set-point value is ignored.
Open valve completely*	Valve completely opened. In this case, the flow-rate set-point value is ignored.

Table 2: Possible binary input functions.

* The operating principle of the binary input (active / inactive) can be selected for these functions

8.2.3. Relay outputs

The MFM / MFC have a relay output to indicate the operating state, limit values outside the maximum / minimum or a fault.

Output	Assignement
Relay output	y2 Limit

Table 3: Relay output default assignment

Function	Description
Not used	No function is assigned to the relay output
Power ON	The device is energized.
Autotune activated	The *Autotune* function is in progress.
Gas 1 or 2 active	Calibration curve 1 or 2 is used.
User-defined calibration active	The device operates at the calibration adjusted by customer.
Binary input 1 or 2 active	Binary input 1 or 2 has been activated.
Activate relay output by field bus	The status of the relay outputs is specified via the field bus or the serial interface.
Correct safety value active	The safety value is used as the set-point value.
Set-point value profile active	The set-point value profile stored in the device is used as the set-point value.
Control mode active	The control mode is active, i.e. the solenoid valve is opened at a given value.
Close valve completely active	The close valve completely function is activated.

Function	Description
Open valve completely active	The open valve completely function is activated.
Defective power requirement	The power requirement of the device is monitored. If this value is outside defined limits, this function is actuated. An excessively high or low power requirement may indicate a defective device.
Defective internal power supply	The operating voltage of the device is monitored. If the defined limits exceed the maximum or drop below the minimum, this function is actuated.
Defective power supply to the sensor	The power supply voltage to the sensor is monitored. If the defined limits exceed the maximum or drop below the minimum, this function is actuated.
Defective data storage	If data storage is in the non-volatile memory of the device, a fault has occurred.
Sensor fault	The device is able to detect a defective sensor via a self-test. If this is the case, this function is activated.
MFI fault	The field bus module (MFI) is defective or incorrectly equipped. Field bus communication is not possible.
x Limit	The measured value has exceeded or dropped below a limit value which can be configured.
w Limit	The set-point value has exceeded or dropped below a limit value which can be configured.
y2 Limit	The actuating variable has exceeded or dropped below a limit value which can be configured.
Totalisator Limit	The totalizer has exceeded or dropped below a limit value which can be configured.

Table 4: Possible relay output functions

8.3. MFC operating modes

The MFC can adopt different operating modes:

Operating mode	Status of the LEDs (default setting)	Binary input activation mode	This operating mode may be interrupted or ended by
Standard control mode (see chap. 8.3.1)	Power indicator (green) on ● Power / Autotune ○ Communication ○ Error		▪ *Autotune* function ▪ Safety function ▪ Set-point value profile ▪ Control mode
Function *Autotune* (see chap. 8.3.2)	Power indicator (green) flashing ✳ Power / Autotune ○ Communication ○ Error	Input active for at least 0.5 s (permanent input activation leads to a function restart)	▪ Safety function ▪ Device reset
Safety function (see chap. 8.3.3)	Limit light (blue) flashing ○ Power / Autotune ✳ Limit (y) ○ Error	As long as the input is active	-

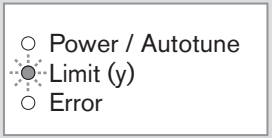
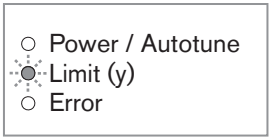
Operating mode	Status of the LEDs (default setting)	Binary input activation mode	This operating mode may be interrupted or ended by
Set-point value profile (see chap. 8.3.4)	Limit light (blue) flashing 	Input active for at least 0.5 s (permanent input activation leads to a function restart)	▪ Function *Autotune* ▪ Safety function ▪ Device reset
Control mode (see chap. 8.3.5)	Limit light (blue) flashing 	As long as the input is active	▪ Function *Autotune* ▪ Safety function ▪ Device reset

Table 5: Overview of the operating modes.

8.3.1. Standard control mode

In this operating mode, the flow-rate is corrected to the specified set-point value at a high dynamic.

The MFC is in this operating mode once energized, after a brief initialization phase. The green power indicator is on.

The set-point value is specified via the analogue input or the field bus, depending on the device version.

The controller settings are set in such a way that set-point value changes or actuating variables are corrected as quickly as possible without appreciable overshoot occurring.

The measured flow-rate value is available on the analogue output or the field bus, depending on the device version.

For the MFC:

If the blue Limit (y) LED is on, this means that the control signal of the proportional solenoid valve is approaching the 100% limit (see chap. 9.3).

The cause may be:

- either an insufficient pressure difference around the MFC, for example an insufficient inlet pressure,
- or a dirty inlet filter
- This means that the set point cannot be achieved and a difference between the set point and the measured value (w-x) persists.

For the MFM:

If the blue Limit (y) LED is on, the measured mass flow is approaching the nominal flow-rate or has even exceeded it (see chap. 9.3).

If a high exceeding of the nominal flow rate occurs, a difference between the measured and the real flow rates may appear.

To permit an external reaction to this gap, a binary output is activated.

8.3.2. *Autotune* function

The *Autotune* function is run through during the final inspection in the factory, at the operating pressure and with the calibration fluid indicated in the calibration protocol.

Therefore, the re-actuation of this function is not essential.

However, the *Autotune* function should be activated if:

- the pressure conditions in the system have changed significantly,
- the calibration fluid does not correspond with the operating fluid.

In this operating mode, the device calculates and optimizes the control settings to the conditions present in the system.

The proportional solenoid valve is activated according to a predefined profile resulting in flow-rate changes. Thereby several control settings are adjusted to the conditions on-site. These settings are stored in the non-volatile memory of the device at the end of a successfully run *Autotune* function.

This function of the MFC is obtained by activating a binary input (configured on this function) for at least 0.5 s. The Power LED (green) flashes to signal that the function is in progress.

WARNING

Various flow-rate changes occur when the *Autotune* is run.

- Do not switch off the power supply to the MFC.
- Keep the supply pressure constant.

→ Before activating the *Autotune* function, bring the medium pressure to a pressure close to the calibration pressure.

While the *Autotune* function is running, the MFC is not controlling.

When the *Autotune* function ends, the MFC returns to the operating mode it was in prior to activation.

8.3.3. Safety function

In this operating mode, the device behaves as in control mode, except that the set-point value is ignored and replaced by a predefined safety set-point value. The default safety set-point value is 0%. This can be modified with the "Mass Flow Communicator" PC software.

This function of the MFC is obtained by activating a binary input or via the field bus, depending on the configuration of the device. The Limit LED (blue) flashes to signal that the function is in progress.

8.3.4. Set-point value profile

In this operating mode, the device behaves as in standard control mode, except that the external set-point value is ignored and replaced by a predefined chronology of up to 30 flow-rate values (configurable with the "Mass Flow Communicator" PC software).

This function of the MFC is obtained by activating a binary input (configured on this function) for at least 0.5 s. The Limit LED (blue) flashes to signal that the function is in progress.

If the set-point value profile has been activated by binary input and the input has been reset, once the set-point value profile has been executed, the device returns to the operating mode it was in prior to activation.

8.3.5. Control mode

In this operating mode, the set-point value enables a duty cycle to be directly supplied to the proportional valve, for example set-point value 10% → duty cycle of the valve = 10%.

This function of the MFC is obtained by activating a binary input or via the field bus, depending on the configuration of the device (configurable with the "Mass Flow Communicator" PC software). The Limit LED (blue) flashes to signal that the function is in progress..

9. MAINTENANCE, TROUBLESHOOTING

9.1. Safety instructions

DANGER

Risk of injury due to high pressure in the installation.

- Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

Risk of injury due to electrical voltage.

- Shut down and isolate the electrical power source before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

WARNING

Risk of injury due to non-conforming maintenance.

- This work may only be carried out by qualified, authorized technicians trained for working in environments where there is a risk of explosion and using the appropriate tools.
- Ensure that the restart of the installation is controlled after any interventions.

9.2. Maintenance

The MFM / MFC does not required any maintenance if used as indicated in this manual. Routine recalibration is not required.

ATTENTION

Risk of injury from operating faults and device failure if the device is opened.

Inside the device are elements to condition the flow and measure the flow-rate. It is permitted to enter the device, for example for cleaning, only as described in chap. 9.2.1.

Extensive device intervention causes a change to the sensor signal, requiring recalibration at the factory.

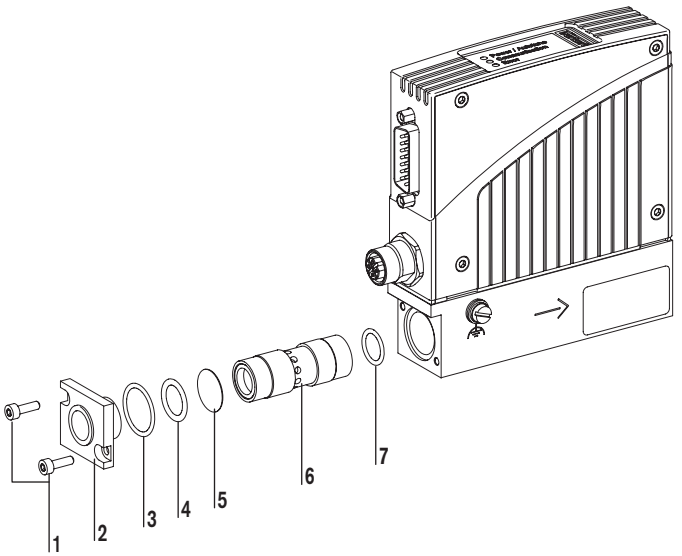
- Do not open the device.
- Cleaning other than that described in chap. 9.2.1 and calibration may only be performed by the manufacturer.

9.2.1. Maintenance if used with highly soiled fluids

If highly soiled fluids are used:

→ Regularly check that the stainless steel mesh filter disc **[5]** is not soiled.

→ Clean or replace it if necessary.



1 - Screws
2 - Inlet flange plate
3 - O-ring
4 - O-ring
5 - Stainless steel mesh filter
6 - Orifice tube
7 - O-ring

Fig. 20: Maintenance, Cleaning

Procedure:

→ To gain access to the stainless steel mesh filter disc, detach the input flange plate **[2]** (see Fig. 20).

→ Take out the stainless steel mesh filter disc.

→ Clean the stainless steel mesh filter disc **[5]** using distilled water (not tap water), acetone, isopropanol or compressed air.

→ Dry the parts after cleaning.

→ Re-insert parts in the correct sequence and position (see Fig. 20). The fine mesh of the filter disc **[5]** must face the input flange plate **[2]**.

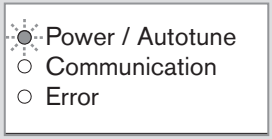
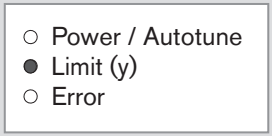
9.2.2. Cleaning and recalibration at the factory

If the sensor is excessively soiled or damaged by the operating gas, the device may deviate significantly from the mass flow-rate measurement. Cleaning or replacement followed by recalibration at the factory will then be required.

NOTE

- Recalibration must be carried out at the factory as it requires the use of very precise references and a specific digital communication system.

9.3. Troubleshooting

Problem	Possible cause	Recommended action
The Power LED is off	No power supply.	Check the electrical connections.
The Power LED flashes 	The *Autotune* function is in progress.	See chap. 8.3.
The Power LED goes out periodically	The Power supply cuts out periodically; the device implements a reset.	Use a power supply with adequate power.
	The voltage drop in the connection cable is too high.	Increase the cable cross section. Reduce the cable length.
The Limit (y) LED comes on 	MFC: the solenoid valve adjustment has almost reached 100%. The set-point value has not been obtained.	Increase the operating pressure (observe the maximum permitted supply pressure). Check the cable resistance and reduce if required. Check the system dimensions. Check the filters installed in the line and clean if required.
	MFM: the measured flow-rate has almost reached or exceeded the nominal flow-rate.	Reduce the flow-rate.

Problem	Possible cause	Recommended action
The limit (y) LED is flashing ○ Power / Autotune ◉ Limit (y) ○ Error	The device is in an operating state other than standard control mode or the *Autotune* function.	See chap. 8.3.
The Error LED is on ○ Power / Autotune ○ Limit (y) ● Error	Minor fault, for example the last *Autotune* function has failed.	Repeat *Autotune* function or reset the device to acknowledge the fault.
The Error LED flashes ○ Power / Autotune ○ Limit (y) ◉ Error	The residual ripple of the supply voltage is too high.	Use a power supply with a smooth output voltage at the required power.
	A serious fault has occurred, e.g.: defective sensor or fault in the internal power supply.	Return the device to the manufacturer to have the fault repaired.
	The sensor was operated above the permitted maximum operating pressure.	Reduce the operating pressure. Return the device to the manufacturer to have the fault repaired.
No flow-rate available	The set-point value is below the limit for the zero point shut-off.	Increase the set-point value to > 2% of the nominal flow-rate.
	The device is in an operating state other than standard control mode.	Check the operating state; see also chap. 8.3.
	The lines have been sized too large or may not yet have been completely deaerated.	Deaerate the lines. Change the line diameter.

Problem	Possible cause	Recommended action
The measured value fluctuates	The earth connection (FE) is not correct.	Connect the FE to the earthing point (cable as short as possible, wire at least 2.5 mm²).
	The controller must continuously correct fluctuations in an unstable pressure supply, e.g. by pumping.	Connect a suitable pressure controller upstream. Install a buffer tank to absorb pressure fluctuations.
	The residual ripple of the supply voltage is too high.	Use a power supply with a smooth output voltage at the required power.
Set-point value at 0%, but the fluid is circulating	The operating pressure is above the operating pressure maintained by the proportional valve.	Reduce the operating pressure. Return the device to the manufacturer to have the fault repaired.
Set-point value = 0%, valve is closed, no flow-rate in the line; but the measured flow-rate is not zero	The mounting position of the device is incorrect.	Install the MFC in the mounting position shown in the calibration protocol or the calibration plate and run an *Autotune* function to adjust to the operating conditions.
	A fluid other than that designated by the calibration is used.	Return device to the manufacturer for recalibration for the operating fluid.
Set-point value is not reached	The filter is blocked.	Clean or replace the filter.
	The primary pressure is too low.	Increase primary pressure to calibration pressure.
	The back pressure is too high.	Check components for soiling downstream of the device and if required clean.

10. ACCESSORIES / SPARE PARTS

ATTENTION

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 from Bürkert..

10.1. Accessoiries

The Bürkert accessories indicated below are recommended for problem-free operation, maintenance and repair of the device.

10.1.1. Electrical accessories

Types	Item	Order code
8700, 8701, 8710, 8711	SUB-D 15-pin plug (to be soldered)	918 274
	Cover for SUB-D 15-pin plug	918 408
	Sub-D 15-pin plug with 5 m cable, with stripped end	787 737
	Sub-D 15-pin plug with 10 m cable, with stripped end	787 738
	RS232 adapter for connection to a PC	654 748
	Extension cable for Sub-D 9-pin plug, RS232, 2 m	917 039
	RS422 adapter	666 371
	USB adapter	670 639
	Configuration software (Mass Flow Communicator)	Can be downloaded at www.burkert.com
Profibus versions of types 8700, 8701, 8710 and 8711	Straight M12 plug (code B)	918 198
	Straight M12 socket (coupling) (code B)	918 447
	PROFIBUS* Y-piece	902 098
	PROFIBUS terminal resistor (code B)	902 553

Types	Item	Order code
Profibus versions of types 8700, 8701, 8710 and 8711	GSD sheet	Download from www.burkert.com
DeviceNet, CANopen version of types 8700, 8701, 8710 and 8711	Straight M12 plug (code A)	917 115
	Straight M12 socket (coupling) (code A)	917 116
	DVN/CAN* Y-piece	788 643
	DVN/CAN terminal resistor (code A)	On request
	EDS sheet for DeviceNet	Download from www.burkert.com
8703, 8705, 8713, 8715	SUB-D 9-pin base (to be soldered)	917 623
	RS232 adapter for connection to a PC	667 530
	Extension cable for Sub-D 9-pin plug, RS232, 2 m	917 039
	USB adapter	670 693
	Sub-D 9-pin adapter with 2 terminal blocks (for 2 connection cables)	919 465

* The two previous M12 connectors cannot be used together on the same side of the Y-junction. At least one of the two M12 connectors must be a prefabricated cable with a thinner connector.

10.1.2. Fluid accessories

The MFM / MFC are equipped with a connection plate which uses a DIN ISO 228/1 thread process connection.

A threaded fitting available as an accessory is used to connect the device to a line:

- the connection to the device side has a DIN ISO 228/1 thread,
- the connection to the line side is available in a range of dimensions.

A sealing ring must be ordered for each screw fitting!

Connection to the device, with DIN ISO 228/1 thread	Diameter of the line	Material	Order code	Order code, sealing ring
G 1/4	6 mm	Stainless steel	901 538	901 575
G 1/4	8 mm		901 540	901 575
G 1/4	1/4 "		901 551	901 579
G 1/4	3/8 "		901 553	901 579

Other accessories for the fluid connection of an MFM / MFC can be found under Type 1013 in the Bürkert accessories catalog.

10.1.3. Mass Flow Communicator (PC software)

The "Mass Flow Communicator" PC software designed for communication with the devices from the Mass Flow Controller and Liquid Flow Controller families supplied by Bürkert.

The software runs on the Windows platform and communicates with the MFM / MFC via a serial interface.

This software enables:

- information specific to the device to be read,
- the assignment of binary inputs and outputs to be changed,
- the assignment of LEDs to be changed,
- various functions to be activated,
- certain dynamic properties to be modified,
- a user specific calibration to be performed,
- the firmware to be updated,
- ...

10.1.4. Additional documentation

Item	Order code
Supplement to the operating instructions for field bus devices	804 553
Contamination Declaration	806 075
"Configuration via PROFIBUS with GDS file" addendum	805 923

10.2. Spare part

Item	Order code
Stainless steel mesh filter, mesh size 250 µm, for 8700, 8701, 8703 / 8710, 8711, 8713	654 733
Stainless steel mesh filter, mesh size 25 µm, for 8700 / 8710, 8711, 8713	676 329

11. SHUTDOWN

11.1. Safety instructions

DANGER

Danger due to high pressure in the installation.

- Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

Danger from the outflow of operating fluid.

- Respect the prevailing regulations on accident prevention and safety relating to the operating fluids used.

Danger due to electrical voltage.

- Shut down and isolate the electrical power source before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

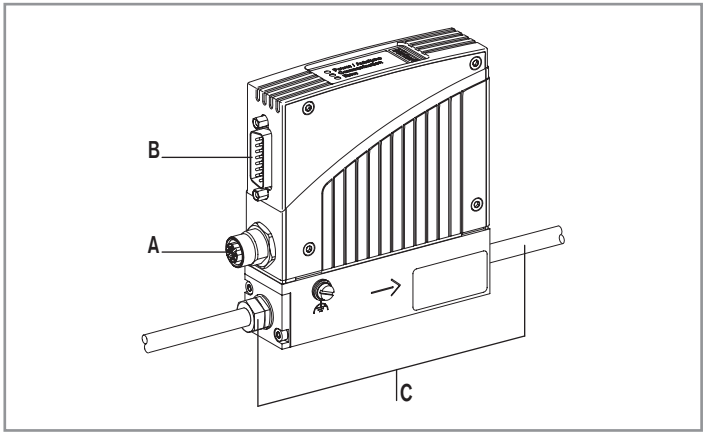
WARNING

Risk of injury from nonconforming dismounting.

- Maintenance must only be carried out by qualified and skilled staff with the appropriate tools.

11.2. Dismounting of the MFM / MFC

Procedure:



→ Relieve the operating medium pressure in the system.
→ Clean the device using a neutral fluid (nitrogen, for example).
→ Relieve the rinsing medium pressure in the system.
→ Switch off the power supply **[A]**.
→ Disconnect the electrical connections **[B]**.
→ Disconnect the fluid connections **[C]**.
→ Remove the MFM / MFC.

12. PACKAGING, STORAGE, TRANSPORT

12.1. Packaging, Transport

NOTE

Damage due to transport

Inadequately protected equipment may be damaged during transport.

- Remove all cables, connections, separate filters and installation material.
- Clean and air contaminated devices.
- Protect fluid connections from damage by fitting protective caps and seal.
- Pack the device in two suitable bags, sealed with protective film.
- During transportation protect the device against humidity and dirt in shock-resistant packaging.
- Do not expose the device to temperatures outside the storage temperature range.

12.2. Storage

NOTE

Poor storage can damage the device.

- Store the device in a dry place away from dust.
- Storage temperature: -10 °C to +70 °C.

13. RETURNING THE DEVICE

No work or tests will be carried out on the device until there is a valid Contamination Declaration.

The Contamination Declaration can be downloaded from our Homepage or requested from your local after-sales service.

www.buerkert.fr → Service → Servicing/Maintenance/ Commissioning → Contamination Declaration

To return a device already in use, a returns number is required.

If you would like to return a device already in use to Bürkert, proceed as follows:

→ Complete the Contamination Declaration.

→ Send the declaration to the address indicated on the form: Bürkert will fax or e-mail you a returns number.

→ Pack the device in consideration of the information in chap. 12.1.

→ Return the device to Bürkert with the Contamination Declaration, quoting this returns number.

Adress:

Bürkert Fluid Control Systems
Corporate Quality / Complaint Management
Chr.-Bürkert-Str. 13-17
D-74653 Ingelfingen
Tél. + 49 (0) 7940 - 10 91 599
Fax + 49 (0) 7940 - 10 91 490
E-mail: service.international@burkert.com

14. DISPOSAL OF THE PRODUCT

→ Sort used products according to their type.

→ Dispose of the device and its packaging in an environmentally-friendly way.

NOTE

Damage to the environment caused by products contaminated by fluids.

- Keep to the existing provisions on the subject of waste disposal and environmental protection.

Comply with the national and/or local regulations which concern the area of waste disposal.

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