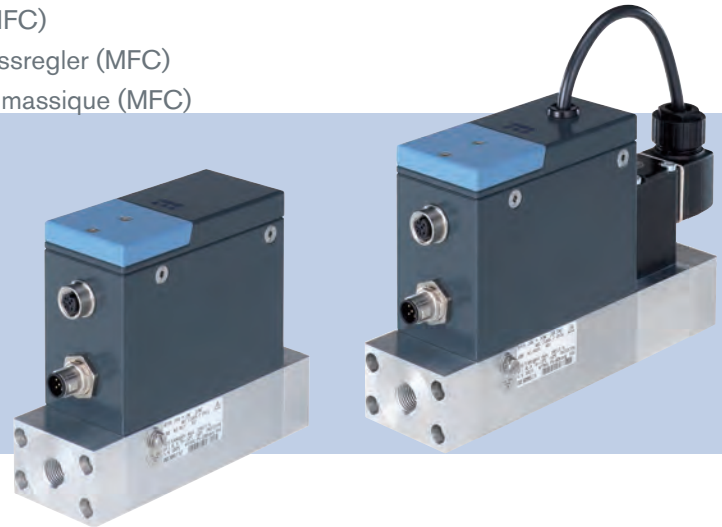


## Type 8746

### Profibus Analogue

Mass Flow Meter (MFM) / Mass Flow Controller (MFC)  
Massendurchflussmesser (MFM) / Massendurchflussregler (MFC)  
Débitmètre massique (MFM) / Régulateur de débit massique (MFC)



## Operating Instructions

Bedienungsanleitung  
Manuel d'utilisation

We reserve the right to make technical changes without notice.  
Technische Änderungen vorbehalten.  
Sous réserve de modifications techniques.

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Operating Instructions 2103/01\_EU-ML\_00573732 / Original EN

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## 1 THE OPERATING INSTRUCTIONS

The Operating Instructions describe the entire life cycle of the product. Please keep the Operating Instructions in a safe place, accessible to all users and any new owners.

### Important safety information.

- ▶ Read the Operating Instructions. If you do not understand the content of the Operating Instructions, then contact Bürkert.
- ▶ Pay particular attention to the chpt. [Basic safety information](#) and to the chpt. [Intended use](#).

### 1.1 Definition of the term product

The term "product" as used in the Operating Instructions, refers to one or several of the following devices:

- Mass Flow Meter (MFM) Type 8746 Profibus
- Mass Flow Meter (MFM) Type 8746 Analogue
- Mass Flow Controller (MFC) Type 8746 Profibus
- Mass Flow Controller (MFC) Type 8746 Analogue

### 1.2 About NAMUR and the NAMUR Recommendation NE 107

Standards committee for measurement and control technology (NAMUR) is an international association of users of automation systems for the process industry.

NAMUR recommendation (NE) 107: self-monitoring and diagnosis of field devices.

## 1.3 Symbols used



### DANGER

Warns of an immediate danger.

- ▶ Failure to observe the warning results in death or in serious injuries.



### WARNING

Warns of a potentially dangerous situation.

- ▶ Failure to observe the warning can result in serious injuries or in death.



### CAUTION

Warns of a possible danger.

- ▶ Failure to observe the warning can result in moderate or minor injuries.

### NOTICE

Warns of damage to property.

- ▶ Failure to observe the warning may result in damage to the product or system.



The symbol indicates important additional information, tips and recommendations.



The symbol refers to information in the Operating Instructions, or in other documents.

- ▶ Designates an instruction for risk prevention.
- Designates a work step that you must carry out.
- ✔ Indicates a result.
- Menu** Designates a text of a user interface.

## 2 INTENDED USE

Improper use of the product may be a hazard to people, nearby equipment and the environment.

**MFM Type 8746 Profibus or MFM Type 8746 Analogue** is used exclusively to measure the mass flow rate of clean and dry gases.

**MFC Type 8746 Profibus or MFC Type 8746 Analogue** is used exclusively to regulate the mass flow rate of clean and dry gases.

- ▶ Observe the data in the contract documents, in the Operating Instructions, on the Type label and on the calibration plate:
  - additional data
  - operating conditions
  - service conditions
- ▶ Only use the product for the fluids indicated on the Type label and in the calibration protocol.
- ▶ Only use the product indoors.
- ▶ Only use the product up to an altitude of 2000 m.
- ▶ Only use the product with external instruments that the product manufacturer recommends.
- ▶ Only use the product with components that the product manufacturer recommends.
- ▶ Operate the product carefully and ensure regular and professional maintenance.
- ▶ Operate the product only in perfect working order. Ensure appropriate storage, transport, installation and use.
- ▶ Only use the product for its intended purpose.

## 2.1 Product variant with ATEX certification



### DANGER

**Risk of explosion that is due to improper use of the product in potentially explosive areas.**

- ▶ Observe the specifications of the ATEX-conformity certificate.
- ▶ Observe the specifications in the ATEX supplement for Type 8746. The supplement is available at [country.burkert.com](http://country.burkert.com).

The ATEX certification is only valid if the product is used as described in the ATEX supplement.

If unauthorized changes are made to the product, then the ATEX certification becomes invalid.

## 3 BASIC SAFETY INFORMATION

This safety information does not take into account any contingencies or occurrences that may arise during installation, use and maintenance of the product.

The operating company is responsible for the respect of the local safety regulations including for the personnel safety.



**Risk of injury that is due to pressure in the installation or in the product.**

- ▶ Before working on the installation or product, cut the pressure. Vent and drain the pipes.

**Risk of injury from electric shocks.**

- ▶ Before working on the installation or product, switch off the power supply. Make sure that nobody can switch the power supply on.
- ▶ Observe all applicable accident protection and all applicable safety regulations for electrical equipment.

**Burn hazard and fire hazard that are due to hot surface of the product.**

- ▶ Do not touch the hot surface with bare hands.
- ▶ Wear safety gloves to touch the product.
- ▶ Keep the product away from any highly flammable materials or fluids.

**Risk of injury that is due to escape of the fluid.**

- ▶ Observe all applicable accident protection and all applicable safety regulations relating to the operating fluid used.



#### Various dangerous situations.

To avoid personal injury, obey the following instructions:

- ▶ Do not operate the product without its mesh filter.
- ▶ Only operate the product in the installation position that is given on the calibration plate.
- ▶ Make sure that the operating pressure of the MFM is not higher than the maximum calibration pressure that is given on the calibration plate.
- ▶ Make sure that the operating pressure of the MFC is not higher than the tight sealing pressure of the control valve.
- ▶ Only use the product for the fluid specified as the operating fluid in the calibration protocol.
- ▶ Only use agents that are stable with the product materials for cleaning and decontamination  
Find the compatibility chart on our homepage:  
[country.burkert.com](http://country.burkert.com)  
In the event of any ambiguity please contact your local sales office.
- ▶ Do not make any modifications to the product and do not subject the product to mechanical stress.
- ▶ Protect the installation and the product from accidental actuation.
- ▶ Only trained personnel may perform the installation work and the maintenance work.
- ▶ After an interruption in the electrical supply or in the fluid supply, ensure a controlled restart of the process.
- ▶ Observe best industry practice.

#### NOTICE

##### Components or assemblies at risk from electrostatic charges.

The product contains electronic components which are susceptible to electrostatic discharge (ESD). Contact with electrostatically charged persons or objects endangers these components. In the worst case, they will become defective immediately or will fail when energised.

- To minimise or even avoid any damage caused by an electrostatic discharge, take all the precautions described in the EN 61340-5-1.
- Do not touch any of the live electrical components.

## 4 GENERAL INFORMATION

### 4.1 Contact

The name of the manufacturer is displayed as inset writing on the cover and the housing of the product.

To contact the manufacturer of the product, use the 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: [country.burkert.com](http://country.burkert.com)

### 4.2 Warranty

The warranty is conditional on compliant use of the product in observance of the operating conditions specified in the Operating Instructions.

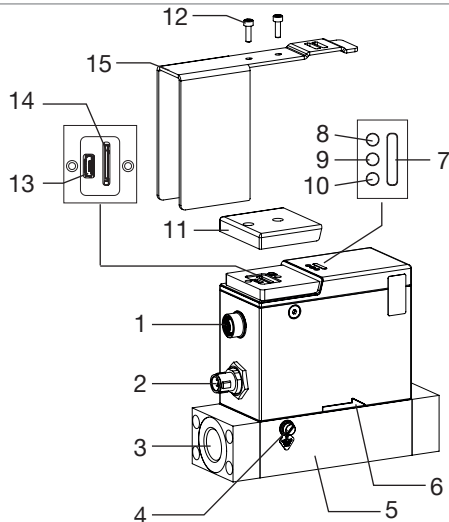
### 4.3 Information on the Internet

Operating Instructions and data sheets for the product can be found online at: [country.burkert.com](http://country.burkert.com)

## 5 DESCRIPTION

### 5.1 Product variants

#### 5.1.1 Mass Flow Meter (MFM)



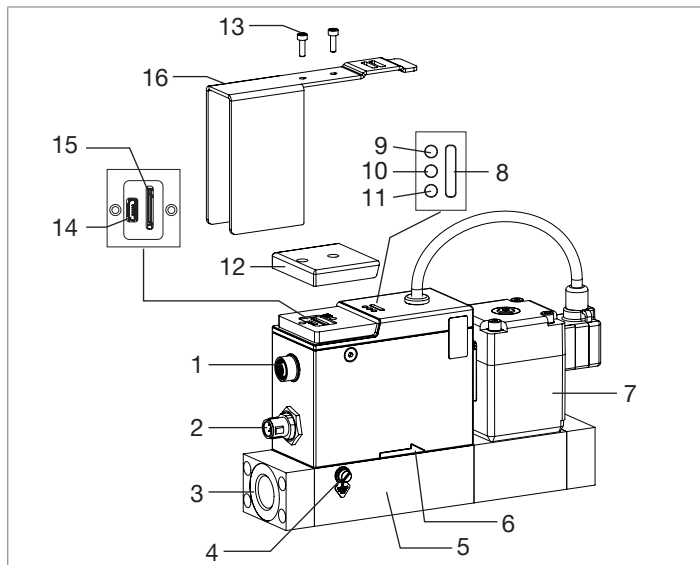
#### 1. Electrical connection:

- Product variant Profibus: 5-pin M12 female connector, B coding
- Product variant Analogue: 5-pin M12 female connector, A coding

- |                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2. Electrical connection: 5-pin M12 male connector, A coding                                                                                                                                                                                            |
| 3. Possible fluid connections: <ul style="list-style-type: none"> <li>- G-internal-threaded connections according to DIN ISO 228/1</li> <li>- NPT-internal-threaded connections according to ASME/ANSI B 1.20.1</li> <li>- flange connection</li> </ul> |
| 4. M4 screw for functional earth connection                                                                                                                                                                                                             |
| 5. Base block                                                                                                                                                                                                                                           |
| 6. Flow direction                                                                                                                                                                                                                                       |
| 7. Product status indicator. The indicator operates according to NAMUR NE 107.                                                                                                                                                                          |
| 8. Not used                                                                                                                                                                                                                                             |
| 9. Status LED for the fieldbus communication                                                                                                                                                                                                            |
| 10. Not used                                                                                                                                                                                                                                            |
| 11. Cover                                                                                                                                                                                                                                               |
| 12. M3 screw                                                                                                                                                                                                                                            |
| 13. bus interface for the Bürkert Communicator software                                                                                                                                                                                                 |
| 14. Slot for the memory card                                                                                                                                                                                                                            |
| 15. Impact protection-cover. The impact protection-cover is only delivered with an ATEX product variant.                                                                                                                                                |

Fig. 1: Product variants of a Mass Flow Meter

### 5.1.2 Mass Flow Controller (MFC) with proportional valve



#### 1. Electrical connection:

- Product variant Profibus: 5-pin M12 female connector, B coding
- Product variant Analogue: 5-pin M12 female connector, A coding

#### 2. Electrical connection: 5-pin M12 male connector, A coding

#### 3. Possible fluid connections:

- G-internal-threaded connections according to DIN ISO228/1
- NPT-internal-threaded connections according to ASME/ANSI B 1.20.1
- flange connection

#### 4. M4 screw for functional earth connection

#### 5. Base block

#### 6. Flow direction

#### 7. Proportional valve. The proportional valve can be built inside the product.

#### 8. Product status indicator. The indicator operates according to NAMUR NE 107.

#### 9. Not used

#### 10. Status LED for the fieldbus communication

#### 11. Not used

#### 12. Cover

#### 13. M3 screw

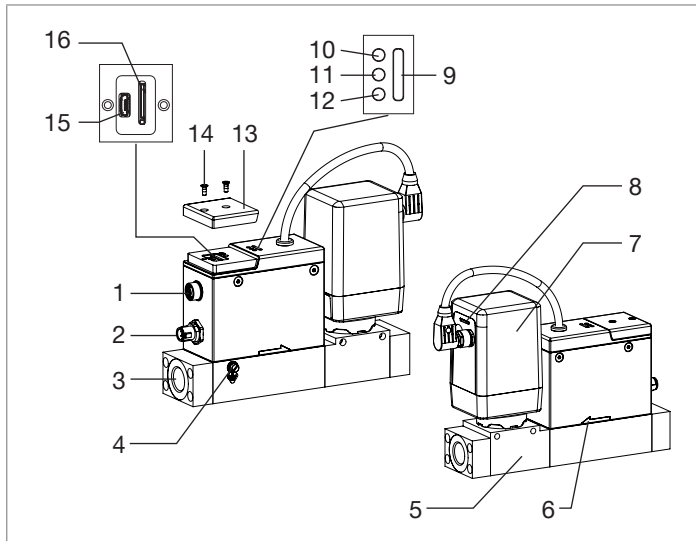
#### 14. bÜS interface for the Bürkert Communicator software

#### 15. Slot for the memory card

#### 16. Impact protection-cover. The impact protection-cover is only delivered with an ATEX product variant.

*Fig. 2: Product variants of a Mass Flow Controller*

### 5.1.3 Mass Flow Controller (MFC) with motor valve



1. Electrical connection:

- Product variant Profibus: 5-pin M12 female connector, B coding
- Product variant Analogue: 5-pin M12 female connector, A coding

2. Electrical connection: 5-pin M12 male connector, A coding

3. Possible fluid connections:

- G-internal-threaded connections according to DIN ISO228/1
- NPT-internal-threaded connections according to ASME/ANSI B 1.20.1
- flange connection

4. M4 screw for functional earth connection

5. Base block

6. Flow direction

7. Motor valve.

8. Status LED for the motor valve.

9. Product status indicator. The indicator operates according to NAMUR NE 107.

10. Not used

11. Status LED for the fieldbus communication

12. Not used

13. Cover

14. M3 screw

15. büS interface for the Bürkert Communicator software

16. Slot for the memory card

Fig. 3: Product variants of a Mass Flow Controller

### 5.2 Product status indicator

The product status indicator changes its colour based on the NAMUR recommendation NE 107. The colour of the product status indicator gives the following pieces of information:

- Whether product diagnostics are active or not. Diagnostics are active on the product and cannot be deactivated.
- If product diagnostics are active, then the product status indicator shows whether diagnostics events have been generated or not. If several diagnostics events have been generated, then the product status indicator shows the diagnostics event with the highest priority. Refer to [Tab. 1](#).

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

Tab. 1: Product status indicator in accordance with NAMUR NE 107, edition 2006-06-12, for active diagnostics

Colour according to NE 107	Colour code (for a PLC)	Diagnostics event according to NE 107	Meaning for the product
Red	5	Failure, error or fault	MFM: Due to a malfunction of the product or its periphery, the measured values are not valid. MFC: Due to a malfunction of the product or its periphery, the measured values are not valid and the product cannot regulate any more.
Orange	4	Check function	The product is being worked on. <ul style="list-style-type: none"> <li>• MFM: The output signal is temporarily invalid.</li> <li>• MFC: The product cannot regulate temporarily.</li> </ul>
Yellow	3	Out of specification	The ambient conditions or process conditions for the product are outside the specified ranges. Product internal diagnostics point to problems in the product or with the process properties.
Blue	2	Maintenance required	→ Do the required maintenance operation. MFM: The product continues to measure. MFC: The product continues to regulate, but a function is temporarily restricted.
Green	1	-	Diagnostics are active and no diagnostics event has been generated. The MFC product variant operates in the normal operating mode or in <b>Stored set-point value</b> operating mode. Refer to <a href="#">chpt. 10.7 Normal operating mode (MFC)</a> and <a href="#">chpt. 10.9 Choose the source giving the set-point value (MFC)</a> .

→ To solve a problem that is indicated by the product status indicator, refer to [chpt. 12.1 Problems shown by the product status indicator](#).

### 5.3 Motor valve status LED

The colour and status of the motor valve status LED give the following pieces of information:

- Whether the motor valve faces a problem or not.
- Whether the motor valve is completely open or closed.

Tab. 2: Status of the motor valve depending on the colour of the status LED

Colour of the LED	Status of the LED	Status of the motor valve
-	LED out	Motor valve is not energised
white	LED lit	Motor valve operates normally
yellow	LED lit	Motor valve is completely open
	LED flashing. The colour alternates with the colour that indicates the position of the motor valve.	The ambient conditions or the process conditions for the motor valve are outside the specified ranges.
green	LED lit	Motor valve is closed
red	LED flashing. The colour alternates with the colour that indicates the position of the motor valve.	Error

### 5.4 Status LED for the fieldbus communication

A product variant Profibus has an LED to show the status of the connection to the network.



Fig. 4: Location of the status LED for the fieldbus communication

Tab. 3: Description of the status LED for the fieldbus communication

Colour of the LED	Meaning
green	Cyclic data is being exchanged between the product and the fieldbus master
red	No cyclic data is being exchanged between the product and the fieldbus master

## 5.5 Memory card

### NOTICE

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

The product is delivered with a memory card that is inserted in the product.

When the product is energised, there are two possibilities:

- If product-specific data is stored on the inserted memory card, the product adopts the data. At product delivery, the memory card contains product-specific data. To get a list of the stored data, refer to the Help for the Initiation file that can be downloaded from [country.burkert.com](http://country.burkert.com).
- If the inserted memory card is empty, the product loads its own data on the memory card. A new memory card is empty.

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

## 5.6 bÜS-interface

The bÜS-interface is used for short-term servicing of the product with the Bürkert Communicator software.

→ To connect the product to the Bürkert Communicator software, refer to chpt. [10.4](#).

## 5.7 Control valve of an MFC

The MFC is equipped with one of the following control valve types:

- A direct-acting and normally-closed proportional valve.
- A motor-driven valve that is called motor valve. If de-energised, the motor valve remains in its latest position.

The control valve provides the sealing function when the following conditions are met:

- The product is used within the specified pressure range.
- The product is equipped with a valve seat seal that is made of a soft material such as FKM or EPDM.

### NOTICE

If the valve seat seal is made of a hard material such as PCTFE, then the control valve may not be tight.

Products with a nominal valve diameter of 0.05 mm or 0.1 mm have a valve seat seal made of a hard material.



## 6 TECHNICAL DATA

### 6.1 Conformity

The product complies with the EU directives according to the EU declaration of conformity (if applicable).

### 6.2 Standards

The applied standards, which verify conformity with the EU directives, can be found on the EU type examination certificate and/or the EU declaration of conformity (if applicable).

### 6.3 Operating conditions



#### WARNING

Risk of injury from malfunction that is due to outdoor use.

- ▶ Do not use the product in outdoor areas.



#### WARNING

Risk of injury caused by pressure, fluid escape.

Important product-specific data is indicated on the Type label and the calibration plate.

- ▶ Only use the product for the specified operating fluid.
- ▶ Do not exceed the specified calibration pressure.

→ For the special operating conditions of products with ATEX certification, refer to the ATEX supplement for the product.

### 6.3.1 Mass Flow Meter

Tab. 4: Operating conditions of an MFM

Ambient temperature	-10 °C...+50 °C
Fluid temperature	<ul style="list-style-type: none"> <li>• -10 °C...+70 °C</li> <li>• -10 °C...+60 °C for oxygen</li> </ul>
Ambient humidity	< 95%, non-condensing
Protection class according to EN 60529	IP65 <sup>1)</sup>  If the following conditions are met: <ul style="list-style-type: none"> <li>• Cables must be connected.</li> <li>• Mating connectors must be plugged in and tightened.</li> </ul>
1) The IP-Code is determined by Bürkert. The IP-Code is not evaluated by UL.	
Operating pressure	Max. 22 bar

### 6.3.2 Mass Flow Controller with proportional valve

Tab. 5: Operating conditions of an MFC with proportional valve

Ambient temperature	-10 °C...+50 °C
Fluid temperature	<ul style="list-style-type: none"> <li>• -10 °C...+70 °C</li> <li>• -10 °C...+60 °C for oxygen</li> </ul>
Ambient humidity	< 95%, non-condensing
Protection class according to EN 60529	<p>IP65<sup>2)</sup></p> <p>If the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Cables must be connected.</li> <li>• Mating connectors must be plugged in and tightened.</li> </ul>
<p>2) The IP-Code is determined by Bürkert. The IP-Code is not evaluated by UL.</p>	
Operating pressure	<p>Max. 10 bar</p> <p>Depends on the nominal diameter of the proportional valve</p>

### 6.3.3 Mass Flow Controller with Type 3280 motor valve

Tab. 6: Operating conditions of an MFC with Type 3280 motor valve

Ambient temperature	<ul style="list-style-type: none"> <li>• -10 °C...+50 °C</li> <li>• UL-certified product variant: -10 °C...+40 °C</li> </ul>
Fluid temperature	<ul style="list-style-type: none"> <li>• 0 °C...+70 °C</li> <li>• 0 °C...+60 °C for oxygen</li> </ul>
Ambient humidity	< 95%, non-condensing
Protection class according to EN 60529	<p>IP54<sup>3)</sup></p> <p>If the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Cables must be connected.</li> <li>• Mating connectors must be plugged in and tightened.</li> </ul>
<p>3) The IP-Code is determined by Bürkert. The IP-Code is not evaluated by UL.</p>	
Operating pressure	<p>Max. 22 bar</p> <p>Depends on the nominal diameter of the motor valve</p>

### 6.3.4 Mass Flow Controller with Type 3285 motor valve

Tab. 7: Operating conditions of an MFC with Type 3285 motor valve

Ambient temperature	<ul style="list-style-type: none"> <li>-10 °C...+50 °C</li> <li>UL-certified product variant: -10 °C...+40 °C</li> </ul>
Fluid temperature	<ul style="list-style-type: none"> <li>0 °C...+70 °C</li> <li>0 °C...+60 °C for oxygen</li> </ul>
Ambient humidity	< 95%, non-condensing
Protection class according to EN 60529	<ul style="list-style-type: none"> <li>IP50<sup>4)</sup></li> </ul> <p>If the following conditions are met:</p> <ul style="list-style-type: none"> <li>Cables must be connected.</li> <li>Mating connectors must be plugged in and tightened.</li> </ul>
4) The IP-Code is determined by Bürkert. The IP-Code is not evaluated by UL.	
Operating pressure	<p>Max. 22 bar</p> <p>Depends on the nominal diameter of the motor valve</p>

### 6.4 Markings



#### WARNING

Risk of injury caused by pressure, fluid escape.

Important product-specific data is indicated on the Type label and on the calibration plate.

- ▶ Only use the product for the specified operating fluid.
- ▶ Do not exceed the specified calibration pressure.

#### 6.4.1 Calibration plate

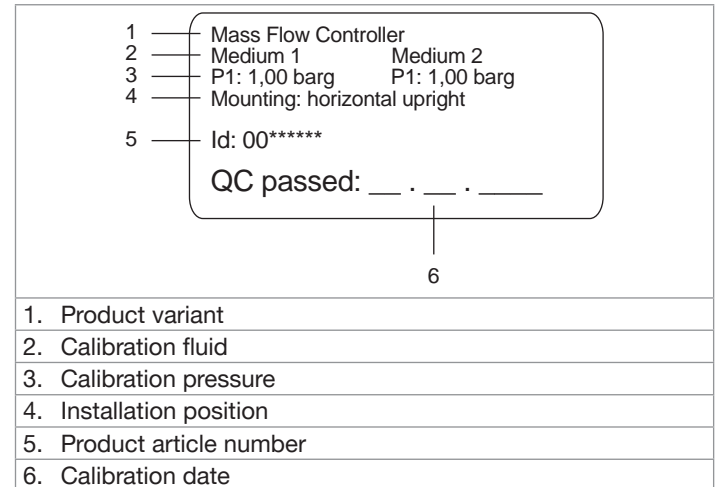
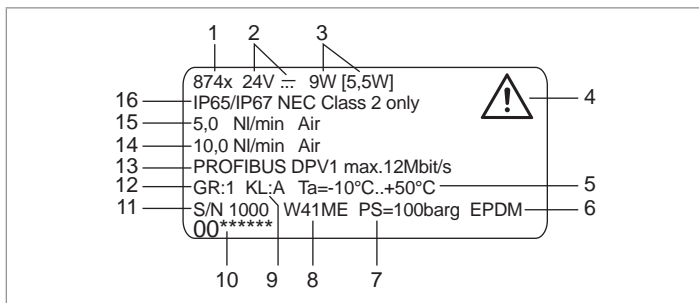


Fig. 5: Description of the calibration plate

## 6.4.2 Type label



1. Type of the product
2. Supply voltage, direct current
3. Consumption according to UL 61010-1 [proportional valve: typical consumption <sup>1)</sup>; motor valve: power consumption <sup>1)</sup> to hold the position of the motor valve]

<sup>1)</sup> Conditions: ambient temperature 23 °C, nominal flow rate 100%, regulation for 30 minutes

4. Warning symbol: Observe the Operating Instructions delivered with the product.
5. Ambient temperature
6. Sealing material
7. Burst pressure
8. Manufacturing code
9. Class of the control valve according to the DVGW (Deutscher Verein des Gas- und Wasserfaches)

10. Product article number
11. Serial number
12. Category of the product
13. Product variant Profibus: communication interface Product variant Analogue: input and output
14. Nominal flow rate (Q <sub>nominal</sub> ), units and operating gas 2
15. Nominal flow rate (Q <sub>nominal</sub> ), units and operating gas 1
16. IP-Code

Fig. 6: Description of the Type label (example)

## 6.4.3 Conformity marking, certification marking

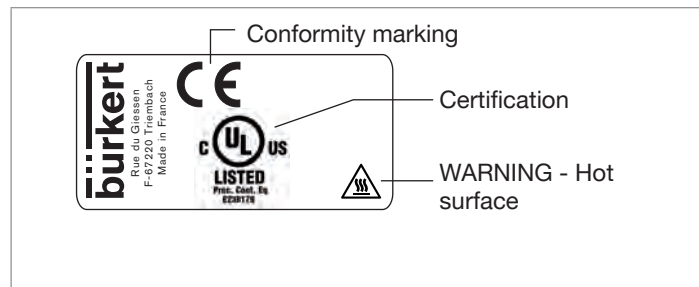


Fig. 7: CE marking and UL-certification

## 6.5 Product materials

Tab. 8: Product materials, common to all product variants

Product part	Material
Base block	<ul style="list-style-type: none"> <li>Aluminium</li> <li>Stainless steel 1.4305</li> </ul>
Housing	Aluminium
Seal	Refer to the Type label
Product status indicator	Polycarbonate
Parts in contact with the fluid (sensor)	1.4404, Al <sub>2</sub> O <sub>3</sub> , PPS GF40, epoxy resin, silicon, silicon nitride

Tab. 9: Specific materials of an MFC with proportional valve

Parts in contact with the fluid	1.4310, 1.4113, 1.4305
---------------------------------	------------------------

Tab. 10: Specific materials of an MFC with motor valve

Parts in contact with the fluid	1.4310, 1.4305, Al <sub>2</sub> O <sub>3</sub> , PPS GF40, PEEK
---------------------------------	-----------------------------------------------------------------

Tab. 11: Specific materials of an ATEX product variant

Impact protection-cover	Stainless steel 1.4301
-------------------------	------------------------

## 6.6 Dimensions, weight

→ Refer to the data sheet of the related product.

## 6.7 Fluid data

### 6.7.1 Mass Flow Meter

Tab. 12: Fluid data, MFM

Calibration fluid	Operating gas or air
Mass flow-rate range (reference to N <sub>2</sub> (l <sub>N</sub> /min))	20...2500 l <sub>N</sub> /min
Exact range depends on the product base-block size and on the gas used. Refer to the datasheet related to the product Type.	
Measuring range	1:50 Larger measuring range available on request.
Repeatability	±0.1% of the full scale
Operating fluid	See Type label
Measurement accuracy, after 15 minute warm-up time and with the calibration fluid	± 1.5% <sup>5)</sup> of the measured value ± 0.3% <sup>5)</sup> of the full scale
Response time	< 500 ms

5) If the operating fluid is different from the calibration fluid, then the measurement accuracy can be lower. If the operating gas is nitrogen or oxygen, then the given measurement accuracy is correct. But if the operating gas is natural gas, then the measurement accuracy may be different because the composition of natural gas varies depending on the season and origin.

## 6.7.2 Mass Flow Controller with proportional valve

Tab. 13: Fluid data, MFC with proportional valve

Calibration fluid	Operating gas or air
Mass flow-rate range (reference to N <sub>2</sub> (I <sub>N</sub> /min))	20...1500 I <sub>N</sub> /min
Exact range depends on the product base-block size and on the gas used. Refer to the datasheet related to the product Type.	
Measuring range/closed-loop control range	1:50 Larger measuring range available on request.
Repeatability	±0.1% of the full scale
Operating fluid	See Type label
Measurement accuracy, after 15 minute warm-up time and with the calibration fluid	± 1.5% <sup>6)</sup> of the measured value ± 0.3% <sup>6)</sup> of the full scale
Settling time	< 500 ms

6) If the operating fluid is different from the calibration fluid, then the measurement accuracy can be lower. If the operating gas is nitrogen or oxygen, then the given measurement accuracy is correct. But if the operating gas is natural gas, then the measurement accuracy may be different because the composition of natural gas varies depending on the season and origin.

## 6.7.3 Mass Flow Controller with motor valve

Tab. 14: Fluid data, MFC with motor valve

Calibration fluid	Operating gas or air
Mass flow-rate range (reference to N <sub>2</sub> (I <sub>N</sub> /min))	20...2500 I <sub>N</sub> /min
Exact range depends on the product base-block size and on the gas used. Refer to the datasheet related to the product Type.	
Measuring range/closed-loop control range	1:50 Larger measuring range available on request.
Repeatability	±0.1% of the full scale
Operating fluid	See Type label
Measurement accuracy, after 15 minute warm-up time and with the calibration fluid	± 2% <sup>7)</sup> of the measured value ± 0.5% <sup>7)</sup> of the full scale
Settling time	< 5 s

7) If the operating fluid is different from the calibration fluid, then the measurement accuracy can be lower. If the operating gas is nitrogen or oxygen, then the given measurement accuracy is correct. But if the operating gas is natural gas, then the measurement accuracy may be different because the composition of natural gas varies depending on the season and origin.

### 6.7.4 Quality of the operating fluid

Use the operating fluid that is given on the product Type-label. The operating fluid must be clean and dry.



The gas or gas mixture must obey the quality criteria in [Tab. 15](#). The quality criteria are given in standard ISO 8573-1, Compressed Air - Part 1: Contaminants and purity classes. The operating gas must obey the quality criteria to obey the following requirements:

- the necessary measurement accuracy of the product
- to meet the safety requirements
- to meet the closed-loop control accuracy of an MFC

For further information on the quality criteria, refer to ISO 8573-1.

Tab. 15: Quality criteria of the fluid

Criteria	Quality class	Value
Maximum particle size	2	1 $\mu\text{m}$
Maximum particle density	2	1 $\text{mg}/\text{m}^3$
Maximum dew point under pressure	4	3 $^{\circ}\text{C}$
Maximum oil concentration	1	0.01 $\text{mg}/\text{m}^3$

### 6.7.5 Pressure loss (MFM)

A Mass Flow Meter has a pressure loss that depends on the following parameters:

- the flow-rate value
- the size of the product fluid-connections
- the type of the product fluid-connections
- the size of the product base-block
- the type of operating gas

→ Determine the pressure-loss value depending on whether the operating fluid is air or a gas other than air.

### 6.7.6 Operating gas is air

If the operating gas is air, then read the pressure-loss value directly from the diagrams in [Fig. 8](#) or in [Fig. 9](#).

For example, if the flow rate through an MFM with 1/2" internal-threaded fluid connections is 1400  $\text{l}_\text{N}/\text{min}$  then the pressure loss for air, as given in [Fig. 8](#), is 140 mbar.

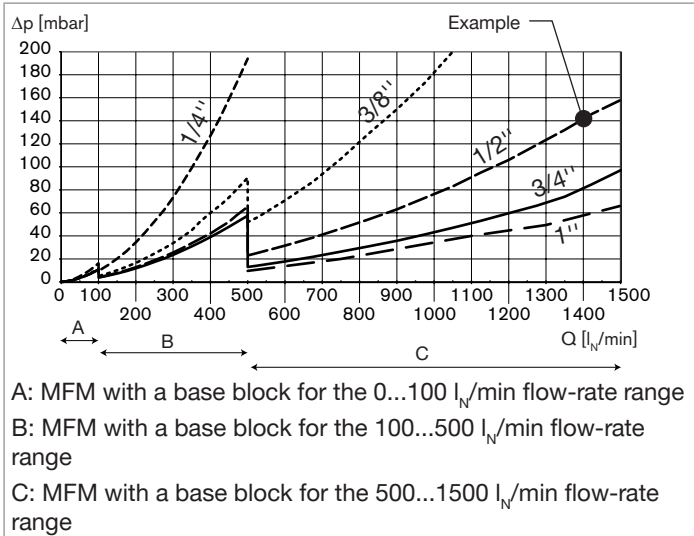
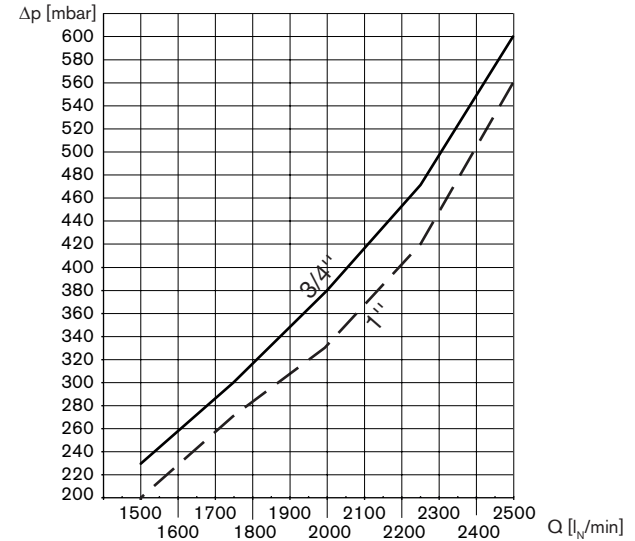


Fig. 8: Pressure loss diagram for air, MFM with a 250- $\mu m$  mesh filter, flow-rate ranges 0...100  $l_N/min$ , 100...500  $l_N/min$ , 500...1500  $l_N/min$



MFM with a base block for the 1500...2500  $l_N/min$  flow-rate range

Fig. 9: Pressure loss diagram for air, MFM, with a 250- $\mu m$  mesh filter, flow-rate range 1500...2500  $l_N/min$



### 6.7.7 Operating gas is not air

If the operating gas is not air, determine the pressure loss as follows:

1. Read the air pressure-loss  $\Delta p_{\text{air}}$  from the diagrams in [Fig. 8](#) or in [Fig. 9](#).
2. Calculate the pressure loss  $\Delta p_{\text{gas}}$  with the formula that is given in [Fig. 10](#).

$$\Delta P_{\text{Gas}} = \Delta P_{\text{air}} \cdot \sqrt{\frac{\rho_N^{\text{Gas}}}{\rho_N^{\text{air}}}}$$

$\Delta P_{\text{Gas}}$  = pressure loss of the operating gas

$\Delta P_{\text{air}}$  = pressure loss of air

$\rho_N^{\text{Gas}}$  = density of the operating gas at the standard conditions according to DIN 1343 ( $P_N = 1013.25 \text{ mbar}$ ,  $T_N = 273.15 \text{ K}$ )

$\rho_N^{\text{air}}$  = density of air at the standard conditions according to DIN 1343 ( $P_N = 1013.25 \text{ mbar}$ ,  $T_N = 273.15 \text{ K}$ )

Fig. 10: Formula to calculate the pressure loss in an MFM

Example for argon gas that flows through an MFM with 1/2" internal-threaded fluid connections:

1. If the flow rate is 1400 l<sub>N</sub>/min then the air pressure-loss  $\Delta p_{\text{air}}$  as given in [Fig. 8](#) is 140 mbar.
2. The pressure loss for argon gas at a flow rate of 1400 l<sub>N</sub>/min is 164.4 mbar as given by the calculation in [Fig. 11](#).

$$\Delta P_{\text{argon}} = 140 \text{ mbar} \cdot \sqrt{\frac{1.784}{1.294}} = 164.4 \text{ mbar}$$

Fig. 11: Calculation of the pressure loss for argon gas

## 6.8 Electrical data

### 6.8.1 Product variant Analogue



#### WARNING

- ▶ For UL-certified components, only use limited power circuits of "NEC Class 2".

Tab. 16: Electrical data of an MFM

Operating voltage	24 V DC $\pm 10\%$ (15 V DC $\pm 10\%$ on request)
Maximum power consumption	1 W
Digital input	
• 0...0,2 V	• to activate level 1
• 1...4 V or open	• to activate level 2
• 5...28 V	• to activate level 3
Analogue output for the measured value	
• 0/4...20 mA	• Maximum loop impedance: 600 $\Omega$ at an operating voltage of 24 V DC (200 $\Omega$ at an operating voltage of 15 V DC); Resolution: 20 $\mu$ A
• 0...5/10 V	• Maximum current: 20 mA Resolution: 10 mV
Relay output	Normally closed contact (break contact), free of potential

Tab. 17: Electrical data of an MFC

Operating voltage	24 V DC $\pm 10\%$ (15 V DC $\pm 10\%$ on request); residual ripple < 2 %
Maximum power consumption	Refer to the Type label
Set-point analogue input	
• 0/4...20 mA	• Maximum input impedance: 200 $\Omega$ Resolution: 5 $\mu$ A
• 0...5/10 V	• Minimum input impedance: 20 k $\Omega$ Resolution: 2,5 mV
Analogue output for the measured value	
• 0/4...20 mA	• Maximum loop impedance: 600 $\Omega$ at an operating voltage of 24 V DC (200 $\Omega$ at an operating voltage of 15 V DC); Resolution: 20 $\mu$ A
• 0...5/10 V	• Maximum current: 20 mA Resolution: 10 mV
Digital input	
• 0...0,2 V	• to activate level 1
• 1...4 V or open	• to activate level 2
• 5...28 V	• to activate level 3
Relay output	Normally closed contact (break contact), free of potential

## 6.8.2 Product variant Profibus



### WARNING

- ▶ For UL-certified components, only use limited power circuits of "NEC Class 2".

Tab. 18: Electrical data of an MFM

Operating voltage	24 V DC $\pm 10$ %
Maximum power consumption	3 W
Communication interface	PROFIBUS-DP-V1

Tab. 19: Electrical data of an MFC

Operating voltage	24 V DC $\pm 10$ %; residual ripple < 2 %
Maximum power consumption	Refer to the Type label
Communication interface	PROFIBUS-DP-V1

## 6.9 Communication interface (product variant Profibus)

Tab. 20: PROFIBUS-DP-V1 data

Acyclic communication	<ul style="list-style-type: none"> <li>• DP-V1 Class 1 Read/Write</li> <li>• DP-V1 Class Alarm</li> <li>• DP-V1 Class 2 Read/Write/Data transport</li> </ul>
Transmission speed	9.6 kbit/s...12 Mbit/s, auto-detect mode

## 7 FLUID INSTALLATION

### 7.1 Safety instructions



### DANGER

Risk of injury that is due to pressure in the installation or in the product.

- ▶ Before working on the installation or product, cut the pressure. Vent and drain the pipes.

Risk of injury from electric shocks.

- ▶ Before working on the installation or the product, switch off the power supply. Make sure that nobody can switch the power supply on.
- ▶ Observe all applicable accident protection and all applicable safety regulations for electrical equipment.

Risk of injury that is due to fluid escape.

- ▶ Observe all applicable accident protection and all applicable safety regulations relating to the operating fluid used.



### WARNING

Risk of injury that is due to improper installation.

- ▶ Only trained personnel can carry out the installation. Personnel must use suitable tools.
- ▶ Secure the installation against unintentional actuation.
- ▶ Ensure a controlled restart after installation.

## NOTICE

### Risk of breakage of a product with motor valve.

- Do not use the actuator housing of the motor valve as a lever arm.



Vibrations have an unwanted effect on the control valve of the MFC.

- ▶ Avoid severe vibrations.

## 7.2 Installation steps

1. Do the fluid installation depending on the fluid connections. Refer to the relevant chapter:
  - chpt. [7.3 Product variant with G-internal-threaded fluid connections](#)
  - chpt. [7.4 Product variant with NPT-internal-threaded connections](#)
  - chpt. [7.5 Product variant with flange connections](#)
2. Do the electrical installation. Refer to chpt. [8](#).
3. Commission the product. Refer to chpt. [9 Commissioning](#).

## 7.3 Product variant with G-internal-threaded fluid connections



### WARNING

#### Risk of injury that is due to leakage.

- ▶ 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 operating fluid.

To make sure that the installation is tight, observe the following instructions:

- ▶ Use compression fittings. Mount the compression fittings, in a way that they are not subject to any stresses.
- ▶ Use pipes with a diameter that is adapted to the fluid connection of the product, and with a smooth surface.



If the compression fittings are not delivered with the product, then choose pipe fittings from another manufacturer. The pipe fittings must be adapted to the fluid connection of the product. Compression fittings for G-internal-threaded connections are available as accessories, see [Tab. 21](#). Also buy the seal for each fluid connection.

Tab. 21: Stainless steel compression fittings and related seals

Product inter- threaded connections in accordance with DIN ISO 228/1	Pipe diameter	Article number	
		Stainless steel compression-fitting	Seal (1 piece)
G 1/4	6 mm	901538	901575
G 1/4	8 mm	901540	
G 1/4	1/4"	901551	901579
G 1/4	3/8"	901553	
G 3/8	8 mm	901542	901576
G 3/8	10 mm	901544	
G 3/8	1/4"	901555	901580
G 3/8	3/8"	901556	
G 1/2	10 mm	901546	901577
G 1/2	12 mm	901548	
G 1/2	1/2"	901557	901581
G 1/2	3/4"	901558	
G 3/4	12 mm	901549	901578
G 3/4	3/4"	901559	901582
G 1	On request		

Installation procedure



The procedure is given for the compression fittings available from Bürkert.

- If you use pipe fittings from another manufacturer, obey the instructions from this manufacturer.

No inlet section is required.

The connection to the pipe is explained for one side of the product. The same procedure applies on the other side of the product.

- Remove all dirt from the pipes and from the fluid carrying components of the installation.
- Cut the pipe squarely [1] and deburr [2]. See Fig. 12.

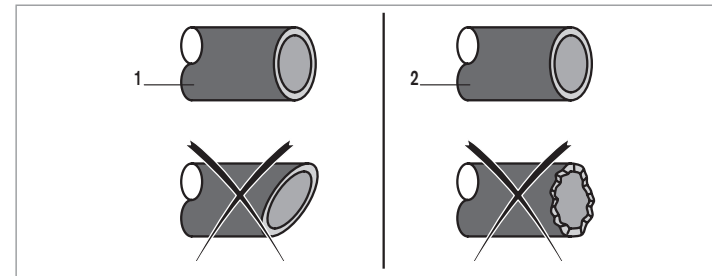


Fig. 12: Pipe cut and deburred

**NOTICE**

**Malfunction that is due to contamination.**

- ▶ If a contaminated operating fluid is used, then install a filter upstream of the product. The filter mesh-size must be smaller than 25 µm. The filter ensures problem-free functioning of the product. See chpt. 6.7 Fluid data.

- Remove the protective cap that closes the internal-threaded connection.
- Observe the installation position that is given on the calibration plate or in the calibration protocol.

→ Slide the nut [A] and then the ferrule onto the pipe. See Fig. 13.

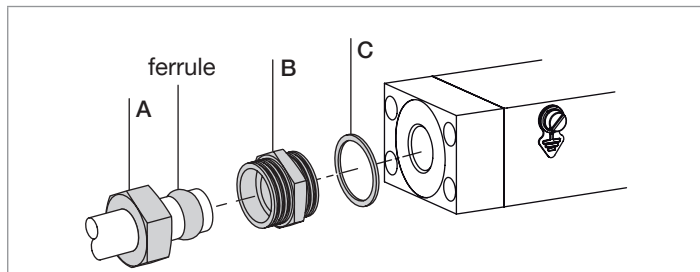


Fig. 13: Nut and ferrule on the pipe

→ Place the seal [C] on the product fluid-connection.  
→ Screw the compression-fitting body [B] in the fluid connection. Tighten to a torque of 25...28 N·m, that is 18.44...20.65 lbf·ft. See Fig. 14.

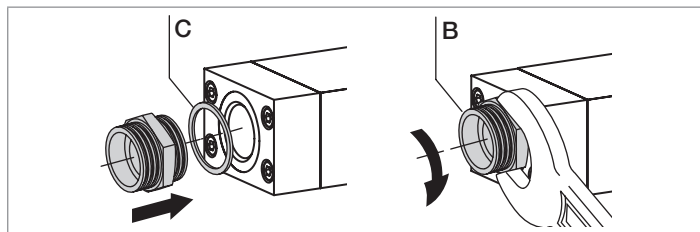


Fig. 14: Screw on the compression-fitting body

→ Insert the pipe in the compression-fitting body. Tighten the nut [A] by hand. See Fig. 15.

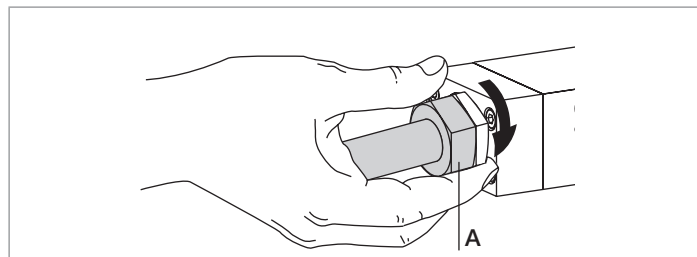


Fig. 15: Nut screwed by hand

→ Tighten the nut with an open-end spanner to a torque of 25...28 N·m, that is 18.44...20.65 lbf·ft. See Fig. 16.

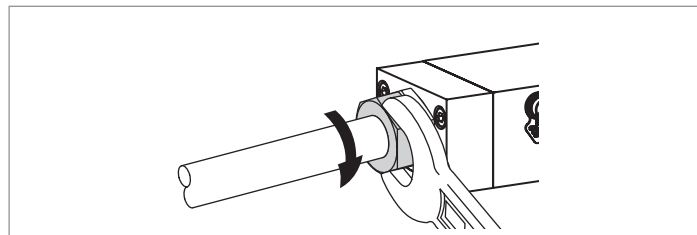


Fig. 16: Nut tightened with an open-end spanner

→ Do the fluid connection on the other side of the product in the same way.

## 7.4 Product variant with NPT-internal-threaded connections



### WARNING

Risk of injury that is due to leakage.

- ▶ 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 operating fluid.

To make sure that the installation is tight, observe the following instructions:

- ▶ Use compression fittings. Mount the compression fittings, in a way that they are not subject to any stresses.
- ▶ Use pipes with a diameter that is adapted to the fluid connection of the product, and with a smooth surface.

No inlet section is required.

- Remove all dirt from the pipes and from the fluid carrying components of the installation.
- Cut the pipe squarely [1] and deburr [2]. See [Fig. 17](#).

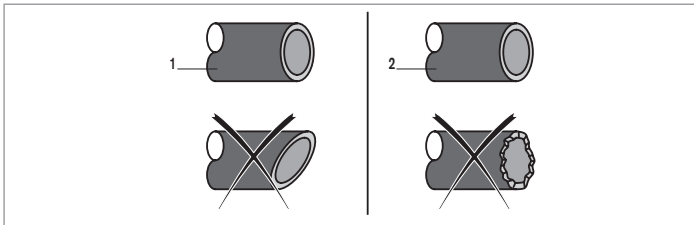


Fig. 17: Pipe cut and deburred

### NOTICE

**Malfunction that is due to contamination.**

- ▶ If a contaminated operating fluid is used, then install a filter upstream of the product. The filter mesh-size must be smaller than 25 µm. The filter ensures problem-free functioning of the product. See [chpt. 6.7 Fluid data](#).

- Observe the installation position that is given on the calibration plate or in the calibration protocol.
- Remove the protective cap that closes the internal-threaded connection.
- Do the fluid connection on one side of the product.
- 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 fluid connection on the other side of the product in the same way.

## 7.5 Product variant with flange connections



### WARNING

**Risk of injury that is due to leakage.**

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 operating fluid.



Vibrations have an unwanted effect on the control valve of the MFC.

- ▶ Avoid severe vibrations.

A product variant with flange connections is mounted on a process connection plate by the manufacturer. The process connection plate is fitted with fluid connections of various types:

- internal-threaded connections
- external-threaded connections
- clamp connections
- ...

→ Install the product depending on the fitted fluid connections.

## 8 ELECTRICAL INSTALLATION

### 8.1 Safety instructions



### DANGER

**Risk of injury from electric shocks.**

- ▶ Before working on the installation or the product, switch off the power supply. Make sure that nobody can switch the power supply on.
- ▶ Observe all applicable accident protection and all applicable safety regulations for electrical equipment.



### WARNING

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

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

- ▶ To avoid a build up of electrostatic charge, connect the housing to the functional earth (FE). 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.



**WARNING****Risk of injury from electromagnetic fields.**

If the functional earth (FE) is not attached, then the requirements of the EMC directive are not met.

- ▶ Connect the housing to the functional earth (FE). 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.

**NOTICE****Requirements for the proper function of the product.**

- ▶ Use only shielded cables.
- ▶ Use a power supply with sufficient power.
- ▶ For an MFC pay attention to the maximum permissible residual ripple on the operating voltage. The residual ripple is given in chpt. 6.8 [Electrical data](#).

**8.2 Additional documentation****8.2.1 Product variant Analogue**

- Product-specific help in the Bürkert Communicator software
- For an ATEX product variant: ATEX supplement for Type 8746 (download from [country.burkert.com](http://country.burkert.com)).

**8.2.2 Product variant Profibus**

- Product-specific help in the Bürkert Communicator software
- For an ATEX product variant: ATEX supplement for Type 8746 (download from [country.burkert.com](http://country.burkert.com)).
- Product description file and object description for the related product Type must be downloaded from [country.burkert.com](http://country.burkert.com)

**8.3 Wiring the product variant Analogue**

To wire the product, you can use mating male or female connectors from Bürkert. Refer to [Tab. 22](#).

*Tab. 22: Accessories: male connector and female connector*

Item	Article number
Straight 5-pin M12 female connector	772416
Straight 5-pin M12 male connector	772417



- Observe the specifications for the cable and conductors, that are given by the manufacturer of the mating male or female connector.
- Use cables with a cable shielding that is either a braid shielding or a foil shielding.

→ If your product is an MFM, wire the mating female connector according to the pin assignment of the M12 male connector in [Fig. 18](#).

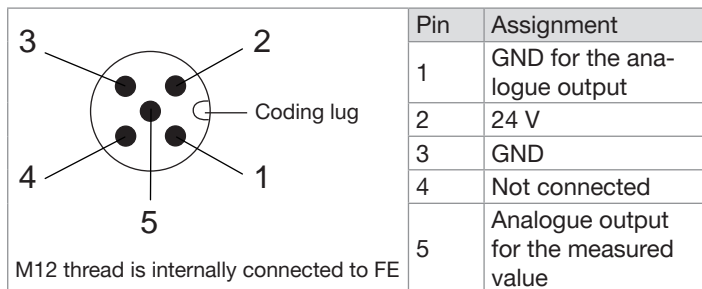


Fig. 18: MFM Analogue: Pin assignment, 5-pin M12 male connector (A coding)

→ If your product is an MFC, wire the mating female connector according to the pin assignment of the M12 male connector in Fig. 19.

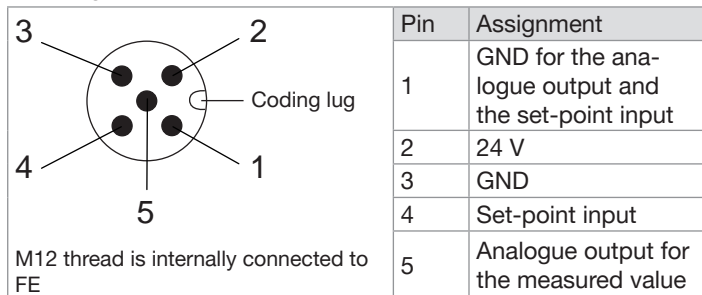


Fig. 19: MFC Analogue: Pin assignment, 5-pin M12 male connector (A coding)

→ Observe the instructions that are given by the manufacturer of the mating female connector.

- Screw the mating female connector to the 5-pin male connector, to the torque that is given by the manufacturer of the mating female connector.
- Wire the mating male connector according to the pin assignment of the M12 female connector in Fig. 20. Observe the instructions that are given by the manufacturer of the mating male connector.

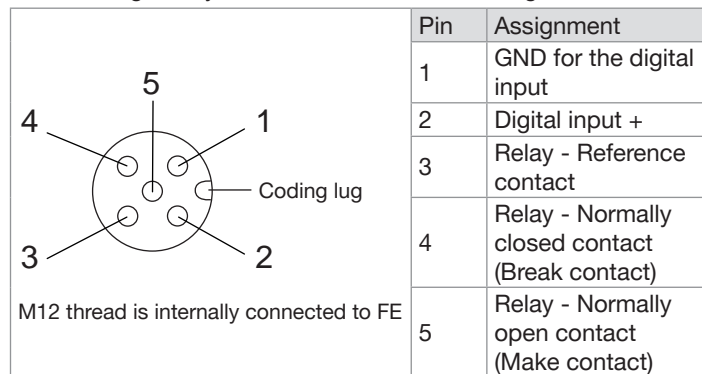


Fig. 20: MFM Analogue or MFC Analogue: Pin assignment, 5-pin M12 female connector (A coding)

- Screw the mating male connector to the 5-pin female connector, to the torque that is given by the manufacturer of the mating female connector.
- Do the functional earthing of the product. Refer to chpt 8.5.

### 8.3.1 Digital input

The 5-pin M12 female connector has a digital input. A digital input is used to remotely trigger a function. The following functions are available:

- MFC: Start the function autotune.
- MFC: Trigger the remote control of the actuator or trigger the control of the actuator by the product.
- MFM or MFC: Reset the totaliser for the active gas.
- MFM or MFC: Select which gas is active among 3 gases.

[Tab. 23](#) shows the function that is assigned by default to the digital input of the 5-pin M12 female connector of an MFM or an MFC.

*Tab. 23: Default assignment of the digital input of the 5-pin M12 female connector*

Product variant Analogue	Default assignment
MFM	No assignment
MFC	<b>Start autotune</b>

→ To choose the function to be remotely triggered over the digital input, use the Bürkert Communicator software. To connect the product to the Bürkert Communicator software, refer to [chpt. 10.4](#). Only one of the available functions can be associated to the digital input.

A function has 1, 2 or 3 possible switching levels. If a function has several switching levels, then each switching level triggers another action. [Tab. 24](#) gives the actions that are associated to the switching levels, and how each level is activated.

Tab. 24: Actions triggered by the switching levels

Function	Action depending on the activated switching level		
	Level 1	Level 2	Level 3
	Activation: Short-circuit the digital input with the digital-input ground	Activation: 1...4 V DC (alternatively: not connected)	Activation: 5...28 V DC
MFC: <b>Start autotune</b>	Triggers the function	Not used	Not used
MFC: <b>Actuator control</b>	Triggers the closing of the actuator	Triggers the normal operating mode	Triggers the opening of the actuator
MFM or MFC: <b>Reset totalizer</b>	Triggers the function	Not used	Not used
MFM or MFC: <b>Gas selection</b>	Changes to gas number 2	Changes to gas number 1	Changes to gas number 3

### 8.3.2 Relay output

The 5-pin M12 female connector has a relay output. The switching of the relay can show the following events:

- MFC: The set-point value cannot be reached.
- MFC: The product is doing an Autotune.
- MFC: The **Set-point value source** has changed.
- MFM or MFC: A warning message has been generated. For example if the supply voltage is too high, then a warning message is generated.
- MFM or MFC: A failure message has been generated. For example if a sensor failure is detected, then a failure message is generated.

Tab. 25 shows the events that are assigned by default to the relay output of the 5-pin M12 female connector of an MFM or an MFC.

Tab. 25: Default assignment of the relay output of the 5-pin M12 female connector

Product variant Analogue	Default assignment
MFM	No assignment
MFC	The set-point value cannot be reached

→ To choose the events that are assigned to the relay output, use the Bürkert Communicator software. To connect the product to the Bürkert Communicator software, refer to chpt. 10.4. Several events can be associated to the relay output.

### 8.4 Wiring the product variant Profibus

To wire the product, you can use mating male or female connectors from Bürkert. Refer to [Tab. 26](#).

Tab. 26: Accessories: male connector and female connector

Item	Article number
Straight 5-pin M12 female connector	772416
Straight 5-pin M12 male connector (B coding)	918198
Straight 5-pin M12 female connector (B coding)	918447
Profibus* Y-piece	902098
Profibus T-piece	918531
Profibus termination resistor, male connector (B coding)	902553



- Observe the specifications for the cable and conductors, that are given by the manufacturer of the mating female connector and by the manufacturer of the mating male connector.
- Use cables with a cable shielding that is either a braid shielding or a foil shielding.

→ To wire the mating female connector, refer to the pin assignment of the M12 male connector in [Fig. 21](#). Observe the instructions that are given by the manufacturer of the mating female connector.

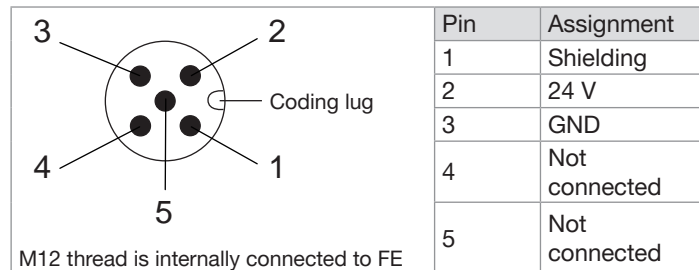


Fig. 21: MFM Profibus or MFC Profibus: Pin assignment, 5-pin M12 male connector (A coding)

→ Screw the mating female connector to the 5-pin male connector, to the torque that is given by the manufacturer of the mating female connector.

→ To wire the mating male connector, refer to the pin assignment of the M12 female connector in [Fig. 22](#). Observe the instructions that are given by the manufacturer of the mating male connector.

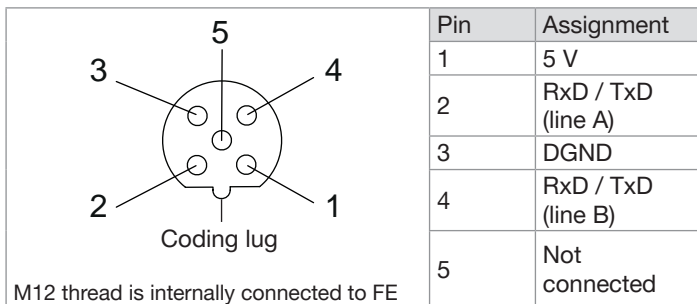


Fig. 22: MFM Profibus or MFC Profibus: Pin assignment, 5-pin M12 female connector (B coding)

- Screw the mating male connector to the 5-pin female connector, to the torque that is given by the manufacturer of the mating female connector.
- Do the functional earthing of the product. Refer to [chpt 8.5](#).

## 8.5 Connecting the functional earth

To do the functional earthing of the product, obey the following instructions:

- 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. See [Fig. 23](#).

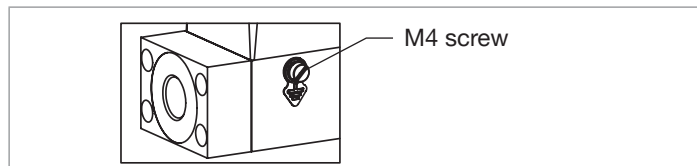


Fig. 23: Location of the M4 screw for the connection of the functional-earth cable

- Attach the functional-earth 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, that is 1,33 lbf·ft...1,47 lbf·ft.
- If an ATEX product is used in a potentially explosive area, then fit the impact protection-cover back if you have removed it.

## 9 COMMISSIONING

### 9.1 Safety instructions



#### WARNING

**Risk of injury from improper commissioning and operation.**

Improper commissioning and operation can lead to injuries and damage to the product and its environment.

- ▶ Before commissioning, make sure that the operating personnel are familiar with, and fully understand the content of the Operating Instructions.
- ▶ Observe the safety information and the intended use.
- ▶ Only properly trained personnel may commission the installation and the product.
- ▶ Only properly trained personnel may do the settings with the help of the Bürkert Communicator software.

### 9.2 Commissioning steps

1. Pressurise the pipes with operating fluid
  2. Flush the pipes with operating fluid at the calibration pressure.
  3. Vent the pipes completely.
  4. Energise the product.
- ✔ If product-specific data is stored on the inserted memory card, then the product adopts the data. To get a list of the stored data at product delivery, refer to the Help for the Initiation file that can be downloaded from [country.burkert.com](http://country.burkert.com).

- ✔ If the inserted memory card is empty, then the product loads its own data on the memory card. Possible problems related to the memory card are given in chpt. [12.3.4](#) and chpt. [12.3.5](#).

#### NOTICE

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

5. If the product is an MFC, and the operating fluid is not the calibration fluid or the pressure conditions have changed, then run the Autotune function. See chpt. [10.8 Optimise the closed-loop control parameters \(MFC\)](#).
- ✔ The product operates normally.

## 10 SETTING AND OPERATION

### 10.1 Safety instructions



#### DANGER

**Risk of injury that is due to pressure in the installation or in the product.**

- ▶ Before working on the installation or product, cut the pressure. Vent and drain the pipes.

**Risk of injury from electric shocks.**

- ▶ Before working on the installation or product, switch off the power supply. Make sure that nobody can switch the power supply on.
- ▶ Observe all applicable accident protection and all applicable safety regulations for electrical equipment.

**Burn hazard and fire hazard that are due to hot surface of the product.**

- ▶ Do not touch the hot surface with bare hands.
- ▶ Wear safety gloves to touch the product.
- ▶ Keep the product away from any highly flammable materials or fluids.

**Risk of injury that is due to escape of the fluid.**

- ▶ Observe all applicable accident protection and all applicable safety regulations relating to the operating fluid used.



#### WARNING

**Risk of injury that is due to improper operation.**

Improper operation can lead to injuries and damage to the product and its environment.

- ▶ The operating personnel must have read and understood the content of the Operating Instructions.
- ▶ Observe the safety information and the intended use.
- ▶ Only properly trained personnel may operate the installation and the product.
- ▶ Only properly trained personnel may do the settings with the help of the Bürkert Communicator software.

### 10.2 Functions

#### 10.2.1 Zero-point shut-off (MFC)

A zero-point shut-off ensures the sealing function of the control valve. The zero-point shut-off is activated if the following conditions occur simultaneously:

1. Set-point value < 2 % of nominal flow rate  $Q_{\text{nominal}}$  (with measuring range 1:50)
2. Measured value < 2 % of nominal flow rate  $Q_{\text{nominal}}$  (with measuring range 1:50)

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



## 10.2.2 Flush mode (MFC Profibus)

### NOTICE

If the control valve is fully open, then the internal product temperature increases. And if the internal product temperature increases, then the product can be damaged.

- Do not let the control valve fully open for more than 10 minutes.

To open the control valve completely, send one of the following commands to the product:

- an acyclic command
- a cyclic command with the double nominal flow rate

## 10.3 Tools for doing settings



The MassFlowCommunicator is another PC software that is not compatible with the product. You cannot use the MassFlowCommunicator software to configure or operate the product.

Settings can be done with the Type 8920 Bürkert Communicator software.

- To connect the product to the Bürkert Communicator software, refer to chpt. 10.4.
- For general information about the Bürkert Communicator software, refer to the Type 8920 Operating Instructions.

## 10.4 Connect the product to the Bürkert Communicator software


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

- Buy the USB-büS-interface set with article number 00772551 from Bürkert.
- Download the latest version of the Type 8920 Bürkert Communicator software from [country.burkert.com](http://country.burkert.com)
- Install the Bürkert Communicator software on a PC. During installation, the büS stick must not be inserted at the PC.
- Assemble the parts of the USB-büS-interface set. Refer to [Fig. 24](#).



Fig. 24: Assembled parts of the USB-büS-interface set with article number 00772551

- Set the termination-resistance switch of the büS stick to ON.
- Insert the büS stick into a USB port of the PC.

- Energise the product. Refer to chpt. 8 [Electrical installation](#).
- Insert the micro-USB connector into the bÜS-interface for the Bürkert Communicator software. The location of the bÜS-interface on the product is given in chpt. 5.1.
- Wait until the Windows pilot of the bÜS stick has been completely installed on the PC.
- Start the Bürkert Communicator software.
- Click on  in the Bürkert Communicator software to establish the communication between the Bürkert Communicator software and the product. A window opens.
- Select **bÜS stick**.
- Choose the port **Bürkert USB bÜS Stick**, click on **Finish** and wait until the product symbol appears in the list of devices.
- In the list of devices, click on the symbol related to the product. The menu structure for the product is displayed.

## 10.5 User-defined adjustment

- At delivery the product is calibrated by the manufacturer. With the Bürkert Communicator software, you can define an adjustment procedure with up to 32 calibration points. The user-defined adjustment procedure is described in the product-specific Help of the Bürkert Communicator software.
- To connect the product to the Bürkert Communicator software, refer to chpt. [10.4](#).

## 10.6 Operating modes of an MFC

When energising the product for the first time, the product enters a short initialisation phase and then switches to the normal operating mode. The normal operating mode is described in chpt. [10.7](#).

The possible operating modes are described in [Tab. 27](#).

*Tab. 27: Names of the operating modes of an MFC in the Bürkert Communicator software*

Operating mode	Description
Product variant Profibus: <b>Automatic</b>	Refer to chpt. <a href="#">10.7</a>
Product variant Analogue: <b>Analog set-point value</b>	Refer to chpt. <a href="#">10.7</a>
<b>Manual set-point value</b>	Refer to chpt. <a href="#">10.9</a>
<b>Stored set-point value</b>	Refer to chpt. <a href="#">10.9</a>
<b>Open-loop control mode</b>	Refer to chpt. <a href="#">10.9</a>
<b>Analyze system</b>	Refer to chpt. <a href="#">10.9</a>

- To change the operating mode, change the source for the set-point values. Refer to chpt. [10.9](#).

The operating mode is kept after a product restart, except when the product performs the function **Analyze system**.

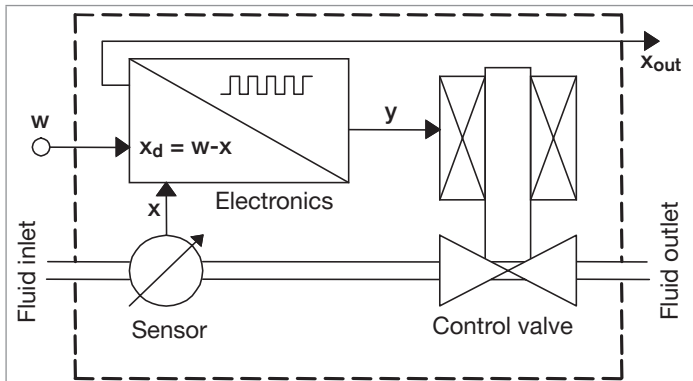
## 10.7 Normal operating mode (MFC)

The normal operating mode is active when energising the product for the first time. Fig. 25. shows the normal operating mode of an MFC.

### NOTICE

If the valve seat seal is made of a hard material such as PCTFE, then the control valve may not be tight.

Products with a nominal valve diameter of 0.05 mm or 0.1 mm have a valve seat seal made of a hard material.



$w$  = set-point value of the mass flow rate

$x$  = measured value of the mass flow rate

$y$  = set-point position of the control valve

Fig. 25: Function diagram of the MFC with control valve

The sensor measures the mass flow rate and compares the measured value  $x$  with the set-point value  $w$ . Then the product calculates the set-point position value  $y$  of the control valve. The set-point position value  $y$  determines the opening of the control valve. For example, if the set-point position value  $y$  is equal to 10%, then the opening of the control valve is 10%.

The transmission means of the set-point value  $w$  and the measured value of the flow rate depend on the product. Refer to chpt. [10.7.1 Product variant Profibus](#) or to chpt. [10.7.2 Product variant Analogue](#).

- If the operating fluid is not the calibration fluid then run the Autotune function. Refer to chpt. [10.8 Optimise the closed-loop control parameters \(MFC\)](#).
- If the pressure conditions have changed, then run the Autotune function. Refer to chpt. [10.8 Optimise the closed-loop control parameters \(MFC\)](#).
- To change the operating mode, change the source for the set-point values. Refer to chpt. [10.9](#).

### 10.7.1 Product variant Profibus

After applying the operating voltage, the product enters a short initialisation phase and then switches to the normal operating mode. The normal operating mode of a product variant Profibus is the **Automatic** operating mode. The set-point value is set via the fieldbus.

### 10.7.2 Product variant Analogue

After applying the operating voltage, the product enters a short initialisation phase and then switches to the normal operating mode. The normal operating mode of a product variant Analogue is the

**Analog set-point value** operating mode.

- The set-point value  $w$  is transmitted over the set-point analogue input according to the ranges in [Tab. 28](#).
- The measured value of the flow rate is transmitted over the analogue output according to the ranges in [Tab. 28](#).

Tab. 28: Analogue-input ranges and analogue-output ranges

Analogue output range	Minimum value of the input ranges and output ranges	Maximum value of the input ranges and output ranges
4...20 mA	4 mA, $w = 0\%$	20 mA, $w = 100\%$
0...20 mA	0 mA, $w = 0\%$	
0...5 V	0 V, $w = 0\%$	5 V, $w = 100\%$
0...10 V		10 V, $w = 100\%$

## 10.8 Optimise the closed-loop control parameters (MFC)

The product is calibrated at the factory with the calibration fluid under the pressure conditions that are specified on the calibration protocol.

If the operating fluid is not the calibration fluid or if the pressure conditions have changed, then the closed-loop control parameters must be optimised. The function Autotune adapts the product to the new operating conditions.

When the Autotune is running:

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



### WARNING

**Risk of injury from flowing gas.**

While the Autotune function is running, the gas flow can be higher than the nominal flow.

- ▶ Before running the Autotune function, make sure that no danger can occur if the gas flow increases.

→ Trigger the Autotune function with one of the following means:

- over the fieldbus (product variant Profibus)
- over the digital input (product variant Analogue)
- with the Bürkert Communicator software. To connect the product to the Bürkert Communicator software, refer to [chpt. 10.4](#).

- ✓ The Autotune runs and the product status indicator is orange.
- ✓ The MFC temporarily stops regulating the flow rate in the pipe.
- ✓ When the function is completed, the product returns to its previous operating mode.
- ✓ If the function is completed successfully, then the optimised closed-loop control parameters are transferred to the hard memory of the product.

## 10.9 Choose the source giving the set-point value (MFC)

The process set-point value can be set by different sources. You can choose which source is active at a time. The source for the set-point value can be changed during operation.

If you change the source for the set-point value, then the operating mode of the MFC is changed.

To change the source for the set-point value, change the setting of the parameter **Set-point value source** with the Bürkert Communicator software. To connect the product to the Bürkert Communicator software, refer to chpt. 10.4.

On a product variant Profibus you can alternatively change the related object. Refer to the related procedure in the product-specific help in the documentation of the initiation files. Download the initiation files and the related documentation at [country.burkert.com](http://country.burkert.com).



The setting of the parameter **Set-point value source** is kept after a restart, except when the product performs the function **Analyze system**.

The possible choices for the parameter **Set-point value source** are:

- Product variant Profibus: **Automatic**: the set-point value is set via the fieldbus.
- Product variant Analogue: **Analog set-point value**: the set-point value is set via the analogue input.
- **Manual set-point value**: to manually give in a set-point value for testing purposes or to make sure that the set-point value is not

overwritten by other fieldbus participants.

- **Stored set-point value**: to use a fixed set-point value (w). When the product is restarted the fixed set-point value remains active.
- **Open-loop control mode**: to directly set the set-point position (y) to the control valve. The value that is given in the menu **Actuator** -----> **Parameter** -----> **Actuating variable** is the set-point position (y) that is used. A restart of the product sets the set-point position (y) to zero.
- **Analyze system**: the product operates in the normal operating mode, but according to a predefined chronological sequence with set-point values. Use the resulting diagram in combination with the graphical representation of process values to analyse the system with the Bürkert Communicator software.

## 10.10 Set-point values without communication (MFC Profibus)

The function makes it possible to specify the set-point values of an MFC 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 fluid can continue to flow even if the communication is broken.

- ▶ Make sure that the process is safe when you use the function.

→ To use the function, refer to the related procedure in the product-specific help in the documentation of the initiation files.

Download the initiation files and the related documentation at [country.burkert.com](http://country.burkert.com).

## 11 MAINTENANCE

If no heavily contaminated fluids are used and if the product is operated according to the Operating Instructions, then the product is maintenance-free.

### 11.1 Maintenance for operation with heavily contaminated fluids



#### DANGER

**Risk of injury that is due to pressure in the installation or in the product.**

- ▶ Before working on the installation or product, cut the pressure. Vent and drain the pipes.

**Risk of injury from electric shocks.**

- ▶ Before working on the installation or product, switch off the power supply. Make sure that nobody can switch the power supply on.
- ▶ Observe all applicable accident protection and all applicable safety regulations for electrical equipment.

**Burn hazard and fire hazard that are due to hot surface of the product.**

- ▶ Do not touch the hot surface with bare hands.
- ▶ Wear safety gloves to touch the product.
- ▶ Keep the product away from any highly flammable materials or fluids.

**Risk of injury that is due to fluid escape.**

- ▶ Observe all applicable accident protection and all applicable safety regulations relating to the operating fluid used.

**WARNING**

Risk of injury that is due to improper maintenance work.

- ▶ Only trained personnel can do the maintenance work. Personnel must use suitable tools.
- ▶ Secure the installation against unintentional actuation.
- ▶ Ensure a controlled restart after maintenance.

**WARNING**

If you open the housing, risk of injury from malfunction and risk of product failure.

Sensitive product parts are used to measure the flow rate and to regulate the flow rate.

- ▶ Do not open the product housing.
- ▶ Only carry out the cleaning work and maintenance work on the product that are described in the Operating Instructions.
- ▶ Only the manufacturer can carry out further work and calibration.

If a heavily contaminated operating fluid is used, then do the following maintenance operations:

- At regular intervals inspect the stainless steel mesh-filter for contamination. Refer to chpt. 11.1.1.
- If the stainless steel mesh-filter is contaminated, then clean the mesh filter or replace the mesh filter with a new one, as described in chpt. 11.1.1. If you need spare parts, refer to

chpt. 13 Accessories, Spare Parts.

### 11.1.1 Inspect and clean the stainless steel mesh-filter

The inspection and possibly cleaning of the stainless steel mesh-filter must be done at regular intervals. The inspection frequency and cleaning frequency depend on the measured fluid.

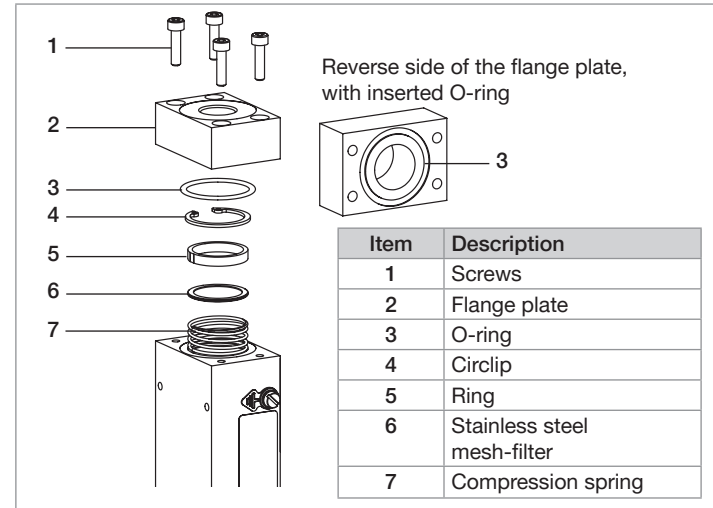




Fig. 26: Exploded view – Parts in contact with the operating fluid

To inspect and clean the mesh filter, do the following steps:

- Position the product upright with the fluid inlet at the top.

- With an hexagon key of size 3 mm, loosen the screws [1] and remove the flange plate [2]. The O-ring [3] remains in the groove on the rear side of the flange plate.
- With a pair of tweezers, remove the circlip [4] because the mesh filter [6] and the ring [5] will be pushed out by the compression spring [7].
-  Do not clean the mesh filter with tap water.
- Clean the stainless steel mesh-filter [4] with acetone, isopropanol or compressed air.
- Dry the mesh filter.
-  Before mounting the parts back, make sure that the fine side of the mesh filter [6] faces the flange plate [2]
- Push back the compression spring [7] together with the mesh filter [6] into the base block and secure them with the circlip [4].
- Make sure that the mesh filter and the O-ring are seated flat and not tilted.
- Insert the flange plate [2] and the screws [1].
- Tighten the screws to a torque of 2.8 N·m, that is 2.06 lbf·ft

## 11.2 Cleaning and recalibration at the factory

If the product sensor is contaminated or damaged by operation, then the measured mass flow rate could no longer correspond to the actual mass flow rate.

- Send the product back to the manufacturer because the sensor must be replaced and recalibrated. Observe the return procedure in chpt. [17 Returning the product](#).

## 11.3 Replace the memory card

To replace the memory card on the product, do the following:

- De-energise the product.
- With a TX8 key for hexalobular-internal screw loosen the screws of the cover. Remove the cover and, if fitted, the impact protection-cover.

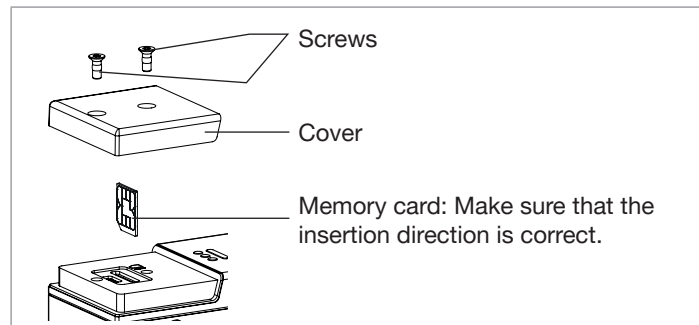


Fig. 27: Insertion direction of the memory card



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

Fig. 28 shows the final position of the memory card in the product.

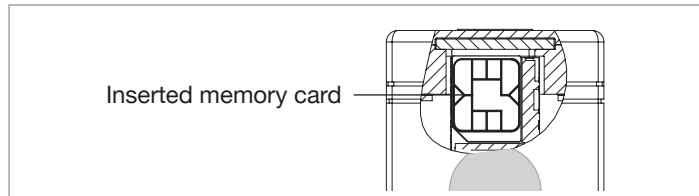


Fig. 28: Cross-sectional drawing of a product Type 8746

- Fit the cover back.
- If an ATEX product is used in a potentially explosive area, then fit the impact protection-cover back.
- With a TX8 key for hexalobular-internal screw, tighten the cover screws to a torque of 1.2 N·m, that is 0.9 lbf·ft.
- Restart the product to write the product data on the new memory card. Possible problems related to the memory card are given in chpt. [12.3.4](#) and chpt. [12.3.5](#).

## 12 TROUBLESHOOTING

### 12.1 Problems shown by the product status indicator

The product status indicator changes its colour based on the NAMUR recommendation NE 107 to show diagnostics events. If several diagnostics events have been generated, then the product status indicator shows the diagnostics event with the highest priority.

If the product is connected to a fieldbus, then the codes that are related to the product states are transmitted on the fieldbus. Refer to chpt. [5.2](#).

#### 12.1.1 Product status indicator is red (MFM Analogue)

Identify the cause to solve the problem:

1. The supply voltage is out of the error range. The product can be damaged.
  - Operate the product within the specifications. If the product status indicator is still red, then send the product back to Bürkert.
2. The sensor, the internal memory or the product is defective.
  - Contact the manufacturer, because maintenance is needed.

### 12.1.2 Product status indicator is red (MFM Profibus)

Identify the cause to solve the problem:

1. The supply voltage is out of the error range. The product can be damaged.
  - Operate the product within the specifications. If the product status indicator is still red, then send the product back to Bürkert.
2. The product variant Profibus is not correctly connected to the PLC.
  - Check the wiring.
  - Check the PLC status.
3. The sensor, the internal memory or the product is defective.
  - Contact the manufacturer, because maintenance is needed.

### 12.1.3 Product status indicator is red (MFC Analogue)

Identify the cause to solve the problem:

1. The supply voltage is out of the error range. The product can be damaged.
  - Operate the product within the specifications. If the product status indicator is still red, then send the product back to Bürkert.
2. Incorrect Autotune or Autotune aborted.
  - Make sure that the fluid flows through the product.
  - Do the Autotune again.

3. The sensor, the internal memory or the product is defective.
  - Contact the manufacturer, because maintenance is needed.

### 12.1.4 Product status indicator is red (MFC Profibus)

Identify the cause to solve the problem:

1. The supply voltage is out of the error range. The product can be damaged.
  - Operate the product within the specifications. If the product status indicator is still red, then send the product back to Bürkert.
2. Incorrect Autotune or Autotune aborted.
  - Make sure that the fluid flows through the product.
  - Do the Autotune again.
3. The product is not correctly connected to the PLC.
  - Check the wiring.
  - Check the PLC status.
4. The sensor, the internal memory or the product is defective.
  - Contact the manufacturer, because maintenance is needed.

### 12.1.5 Product status indicator is orange (MFM)

A calibration procedure is in progress.

- Wait until the calibration procedure is completed.

### 12.1.6 Product status indicator is orange (MFC)

Identify the cause:

1. A calibration procedure is in progress.  
→ Wait until the calibration procedure is completed.
2. The Autotune is in progress.  
→ Wait until the Autotune is completed.
3. The parameter **Set-point value source** is set to one of the following choices:
  - **Open-loop control mode**
  - **Manual set-point value**
  - **Analyze system**

### 12.1.7 Product status indicator is yellow (MFM)

One of the following values is out of specification. The sensor or the product can be damaged.

- the fluid temperature
  - the product temperature
  - the supply voltage
- Operate the product within the specifications. If the product status indicator is still yellow, then send the product back to Bürkert.

### 12.1.8 Product status indicator is yellow (MFC)

Identify the cause:

1. One of the following values is out of specification. The sensor or the product can be damaged.
  - the fluid temperature
  - the product temperature
  - the supply voltage

→ Operate the product within the specifications. If the product status indicator is still yellow, then send the product back to Bürkert.
2. The set-point position for the control valve has (almost) reached 100%. The set-point value cannot be reached.
  - Increase the inlet pressure or decrease the back pressure.
  - If the pressure drop in the pipe is too high, reduce the pressure drop.
  - If the filters that are installed in the pipe are dirty, clean the filters.

### 12.1.9 Product status indicator is blue

There is an internal memory error.

- Contact the manufacturer, because a maintenance operation is needed.

## **12.2 Problems shown by the status LED of the motor valve**

### **12.2.1 LED is red and flashes, LED is red and ON**

Identify the cause:

1. The fluid temperature or the ambient temperature is too high.
  - Respect the maximum ambient temperature and the maximum fluid temperature.
  - Restart the product to turn off the red blinking LED. To restart the product, de-energise then energise the product again.
2. A cable is broken.
  - Make sure that the electrical connections between the product housing and the motor valve are not loose.

### **12.2.2 LED is yellow and flashes**

The ambient conditions or the process conditions for the motor valve are outside the authorized range.

- Operate the product in the authorized range.

## **12.3 Miscellaneous problems**

### **12.3.1 Product status indicator is off**

If the product status indicator is off, then the product is not energised. To solve this issue, do the following:

- Make sure that the product is correctly wired.
- Make sure that the voltage supply is 24 V DC.
- Make sure that the power supply source is working properly.

### **12.3.2 Product status indicator flashes**

If the product status indicator flashes, then the product is selected in the Bürkert Communicator software.

After 10 seconds, the product automatically returns to the previous status.

### **12.3.3 Product status indicator goes out periodically**

Identify the cause to solve the problem:

1. The power supply is intermittently dropping and the product restarts.
  - Use a power supply with sufficient power output.
2. The voltage drop in the connecting cable is too high.
  - Increase the cross-section of the cable
  - Reduce the cable length.

### 12.3.4 Replacement product adopts none of the values from the defective product

Identify the cause to solve the problem:

1. The article number of the replacement product is different from the article number of the defective product.  
→ Use a replacement product that has the same article number than the defective product. Values can only be transferred between products with the same article numbers.
2. The memory card is defective. The product could not write any values to the memory card.  
→ Replace the memory card. Refer to chpt. [11.3](#).

### 12.3.5 Replacement product does not adopt all of the values from the defective product

The product description of the replacement product is different from the product structure of the defective product. Only the existing values of the defective product can be adopted by the replacement product.

- Use the Bürkert Communicator software to configure the new values of the replacement product. To connect the product to the Bürkert Communicator software, refer to chpt. [10.4](#).

### 12.3.6 No mass flow rate (MFM)

The pipes are too large or not yet fully vented.

- Vent the pipes.
- Change the pipe diameter.

### 12.3.7 No mass flow rate (MFC)

Identify the cause to solve the problem:

1. The product is possibly running one of the functions described in chpt. [10.9 Choose the source giving the set-point value \(MFC\)](#). The product is not in the normal operating mode. Refer to chpt. [10.7](#).  
→ Wait until the product goes back to the normal operating mode.
2. The pipes are too large or not yet fully vented.  
→ Vent the pipes.  
→ Change the pipe diameter.
3. The set-point value is lower than the zero-point shut-off limit.  
→ Increase the set-point value until it is higher than 2% of the nominal flow rate.

### 12.3.8 Unstable measured value (MFM)

You have not connected the functional earth (FE) properly.

- To connect the functional earth, 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. Refer to chpt. [8.5](#).

### 12.3.9 Unstable measured value (MFC)

Identify the cause to solve the problem:

1. You have not connected the functional earth (FE) properly.
  - To connect the functional earth, 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. Refer to chpt. [8.5](#).
2. The residual ripple on the voltage supply is too high.
  - Use a supply voltage that conforms to the technical data given in chpt. [6.8 Electrical data](#).
3. The product must compensate for irregularities in an unstable pressure supply caused, for example, by pumps.
  - Install a suitable pressure regulator in front of the product.
  - Install a buffer tank to absorb the pressure fluctuations.

### 12.3.10 Set-point value at 0 %, but operating fluid still flows (MFC)

The operating pressure is above the tight sealing pressure of the control valve.

- Reduce the operating pressure.
- To eliminate the defect, return the product to the manufacturer.

### 12.3.11 Set-point value at 0 %, control valve is closed, no mass flow, but a non-zero mass flow rate is measured (MFC)

Identify the cause to solve the problem:

1. The installation position of the product is incorrect.
  - Install the product in the position indicated on the calibration plate or in the calibration protocol.
  - Run the Autotune function to adapt to the operating conditions.
2. The operating fluid is different from the fluid specified during the calibration.
  - Use the specified operating fluid or send the product to the manufacturer for calibration with the new operating fluid.

### 12.3.12 Set-point value is not reached (MFC)

Identify the cause to solve the problem:

1. The mesh filter is clogged.
  - Clean or replace the mesh filter.
  - Run the Autotune function to adapt to the operating conditions.
2. The inlet pressure is too low.
  - Increase the inlet pressure to the calibration pressure value.
3. The outlet pressure is too high.
  - If the fluid connection pipes after the product are dirty, then clean them.

## 13 ACCESSORIES, SPARE PARTS



### CAUTION

Risk of injury and risk of material damage that are due to unsuitable parts.

Incorrect accessories and unsuitable replacement parts can cause injuries and damage to the product and its environment.

- ▶ Only use original accessories and original spare parts from Bürkert.

### 13.1 Electrical accessories

Tab. 29: Electrical accessories, product variant Analogue

Item	Article number
USB-büS-interface set, without power supply	772551
Straight 5-pin M12 female connector	772416
Straight 5-pin M12 male connector	772417
Memory card	On request

Tab. 30: Electrical accessories, product variant Profibus

Item	Article number
USB-büS-interface set, without power supply	772551
Straight 5-pin M12 female connector	772416
Straight 5-pin M12 male connector (B coding)	918198

Item	Article number
Straight 5-pin M12 female connector (B coding)	918447
Profibus* Y-piece	902098
Profibus T-piece	918531
Profibus termination resistor, male connector (B coding)	902553
Memory card	On request

→ For further accessories, refer to the product data-sheet.

### 13.2 Compression fittings for a product variant with internal-threaded fluid connections

Tab. 31: Spare parts – Stainless steel compression fittings and related seals

Product internal-threaded connections in accordance with DIN ISO 228/1	Pipe diameter	Article number	
		Stainless steel compression fitting	Seal (1 piece)
G 1/4	6 mm	901538	901575
G 1/4	8 mm	901540	901579
G 1/4	1/4"	901551	
G 1/4	3/8"	901553	901576
G 3/8	8 mm	901542	
G 3/8	10 mm	901544	

Product internal-threaded connections in accordance with DIN ISO 228/1	Pipe diameter	Article number	
		Stainless steel compression fitting	Seal (1 piece)
G 3/8	1/4"	901555	901580
G 3/8	3/8"	901556	
G 1/2	10 mm	901546	901577
G 1/2	12 mm	901548	
G 1/2	1/2"	901557	901581
G 1/2	3/4"	901558	
G 3/4	12 mm	901549	901578
G 3/4	3/4"	901559	901582
G 1	On request		

### 13.3 Mesh filters

Tab. 32: Spare parts – Mesh filters

Item	Article number
MFC: Stainless steel mesh-filter, mesh size 25 µm	676329

### 13.4 Additional software

Tab. 33: Documentation and software

Product variant Profibus: GSD file	Download from <a href="http://country.burkert.com">country.burkert.com</a>
Bürkert Communicator software	Download from <a href="http://country.burkert.com">country.burkert.com</a>

## 14 DECOMMISSIONING

### 14.1 Safety instructions



#### DANGER

Risk of injury that is due to pressure in the installation or in the product.

- ▶ Before working on the installation or product, cut the pressure. Vent and drain the pipes.

Risk of injury from electric shocks.

- ▶ Before working on the installation or the product, switch off the power supply. Make sure that nobody can switch the power supply on.
- ▶ Observe all applicable accident protection and all applicable safety regulations for electrical equipment.



#### WARNING

Risk of injury from improper dismantling.

- ▶ Dismantling must only be performed by trained personnel using suitable tools.

Risk of injury from dangerous fluids.

- ▶ Before you disconnect pipes or valves, flush out dangerous fluids, release pressure in the pipes and drain.
- ▶ Observe the applicable accident protection and safety regulations relating to the operating fluid used.



## 14.2 Dismantling the product

- Relieve the operating fluid pressure in the installation.
- Flush the product with a neutral fluid (for example nitrogen)
- Relieve the flushing fluid pressure in the installation.
- De-energise the product.
- Remove the electrical wiring.
- Disconnect the fluid connections.
- Remove the product.

## 15 TRANSPORT

### NOTICE

#### Transport damage.

If the product is not protected in transport, then the product can be damaged.

- Remove cables, connectors, product-external filters and installation equipment.
- Protect the electrical interfaces with protective plugs.
- Clean and vent contaminated products.
- Close the fluid connections with protective caps. Protective caps ensure protection and sealing.
- Pack the product in two suitable zip lock bags, to avoid any contamination during the transport.
- Transport the product in an impact-resistant package, protected from moisture and dirt.
- Avoid storage above or below the recommended storage temperature.

## 16 STORAGE, DISPOSAL

### NOTICE

**Incorrect storage can cause damage to the product.**

- Close fluid connections with protective caps.
- Store the product dry and dust-free in sealed zip-lock bags.
- Storage temperature:  $-10...+70$  °C.

**Environmental damage that is due to parts contaminated by fluids.**

- Dispose of the product and its packaging in an environmentally-friendly manner.
- Comply with applicable environmental and disposal regulations.

## 17 RETURNING THE PRODUCT



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



To return a used product, a returns number is required.

To return a used product to Bürkert, contact your Bürkert sales office.



[www.burkert.com](http://www.burkert.com)