FINE CONTROLS (UK) LTD

Fine Controls have been supplying process controls & instrumentation equipment since 1994, & now serves an ever expanding customer base, both in the UK & globally.

We offer a full range of valve & instrumentation products & services, with our product rangerepresenting leading technologies & brands:

Flow: Flow Meters & Transmitters, Flow Switches, Flow Control Valves & Batch Control Systems

Temperature: Temperature Probes & Thermowells, Temperature ransmitters,Temperature Regulators & Temperature Displays

Level: Level Transmitters & Switches

Pressure: Pressure Gauges &Transmitters, Precision & High Pressure Regulators & I-P Converters, Volume boosters.

Precision Pneumatics: Pressure Regulators, I-P Converters, Volume Boosters, Vacuum Regulators

Valves: Solenoid & Pneumatic Valves, Control Valves & Positioners, Actuated Ball, Globe or Diaphragm Valves & Isolation Valves

Services: Repair, Calibration, Panel Build, System Design & Commissioning

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FLUID CONTROL SYSTEMS

Mass Flow Meter (MFM) for gases

- Direct flow measurement with CMOSens®, technology for nominal flow rates from 20 ml_N/min to 80 lN/min
- High accuracy and fast response time
- Protection class IP65
- Fieldbus option

Type 8702 can be combined with...

Type 1150
Multi-channel program controller

Type 0330
Solenoid valve

Type 6013
Solenoid valve

MFC
Communication software

Mass flow meters are used in Process Technology for the direct measurement of the mass flow of gases. In case of volumetric flow meters, it is necessary to measure the temperature and the pressure either the density, because gases change their density or rather their volume depending on the pressure. The measurement of the mass flow, on the other hand, is independent of the pressure and the temperature.

The digital mass flow meter Type 8702 uses a sensor on silicon chip basis (see the description on page 2) located directly in the bypass channel. Due to the fact that the sensor is directly in the bypass channel a very fast response time of the MFM is reached. The actual flow is given as an analog output signal or could be read out over Fieldbus communication.

Type 8702 can optionally be calibrated for two different gases, the user is able to switch between these two gases.
The materials of the parts that come into contact with the medium are selected according to customer specification so that the unit can be operated with the complete range of standard process gases.

Typical application areas are gas flow measurement in
- Test benches
- Packaging and foodstuff industry
- Environmental technology
- Pharmaceutical
- Biotechnology

Technical Data			
Full scale ranges[1] (Q_{nom})	0.02 to 80 l_N/min (N_2 equivalent)	**Power supply**	24V DC
Operating media	neutral, non-contaminated gases, other gases on request	**Voltage tolerance**	±10%
Max. operating pressure	10 bar (145 psi)	**Residual ripple**	<2%
Max. pressure drop	30 mbar	**Power consumption**	max. 2.5 W at 24V DC, max. 5 W at 24V DC with fieldbus communication
Calibration medium	operating gas or air with conversion factor	**Output signal** Max. current (voltage output) Max. load (current output)	0–5 V, 0–10 V, 0–20 mA or 4–20 mA 10 mA 600 Ω
Medium temperature	-10 to +70°C	**Fieldbus communication**	PROFIBUS-DP, DeviceNet, CANopen, others on request
Ambient temperature	-10 to +50°C	**Protection class**	IP65
Accuracy (after 1 min. warm up time)	±0.8% o.R. ±0.3% F.S.	**Dimensions [mm]** (without fitting)	115 x 137.5 x 37 mm
Linearity	±0.1% F.S.	**Total weight**	1000 g
Repeatability	±0.1% F.S.	**Mounting position**	horizontal or vertical
Control range	1:50; higher span on request	**Light emitting diodes** (Default, other functions possible)	indication for Power, Communication, Limit, Error
Response time ($t_{95\%}$)	<300ms	**Binary input** (Default, other functions possible)	three, different functions
Body material	stainless steel	**Binary output** (Default, other functions possible)	two relay-outputs for 1. Limit (Q_{nom} almost reached) 2. error (e.g. sensor fault) max.load: 60 V, 1 A, 60 VA
Electr. housing material	PBT		
Sealing material	FKM, EPDM, others on request		
Port connections	G 1/4, NPT 1/4 or screw-in fitting		
Electr. connection	round socket 8-pin sub-HD socket 15-pin sub-D socket 9-pin (for fieldbus comm.)		

[1] at reference conditions 1.013 bar(a) and 0°C

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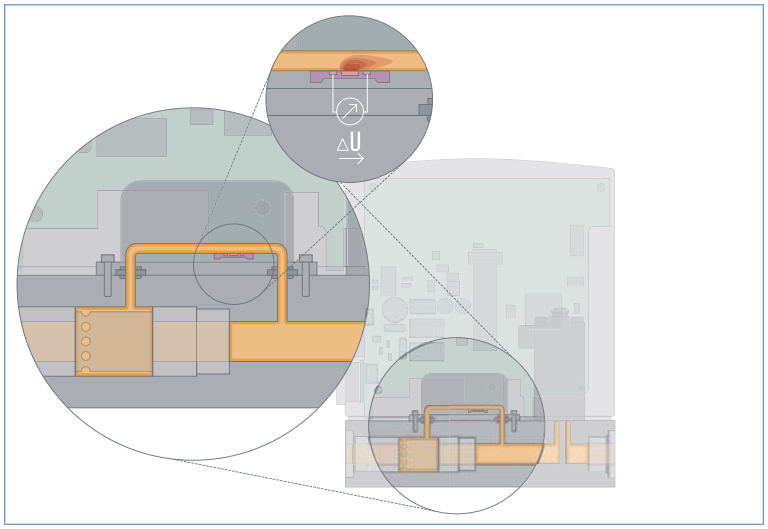
Measuring principle



The actual flow rate is detected by a sensor operating according to a thermal principle which has the advantage of delivering the mass flow without any corrections for pressure or temperature being needed.

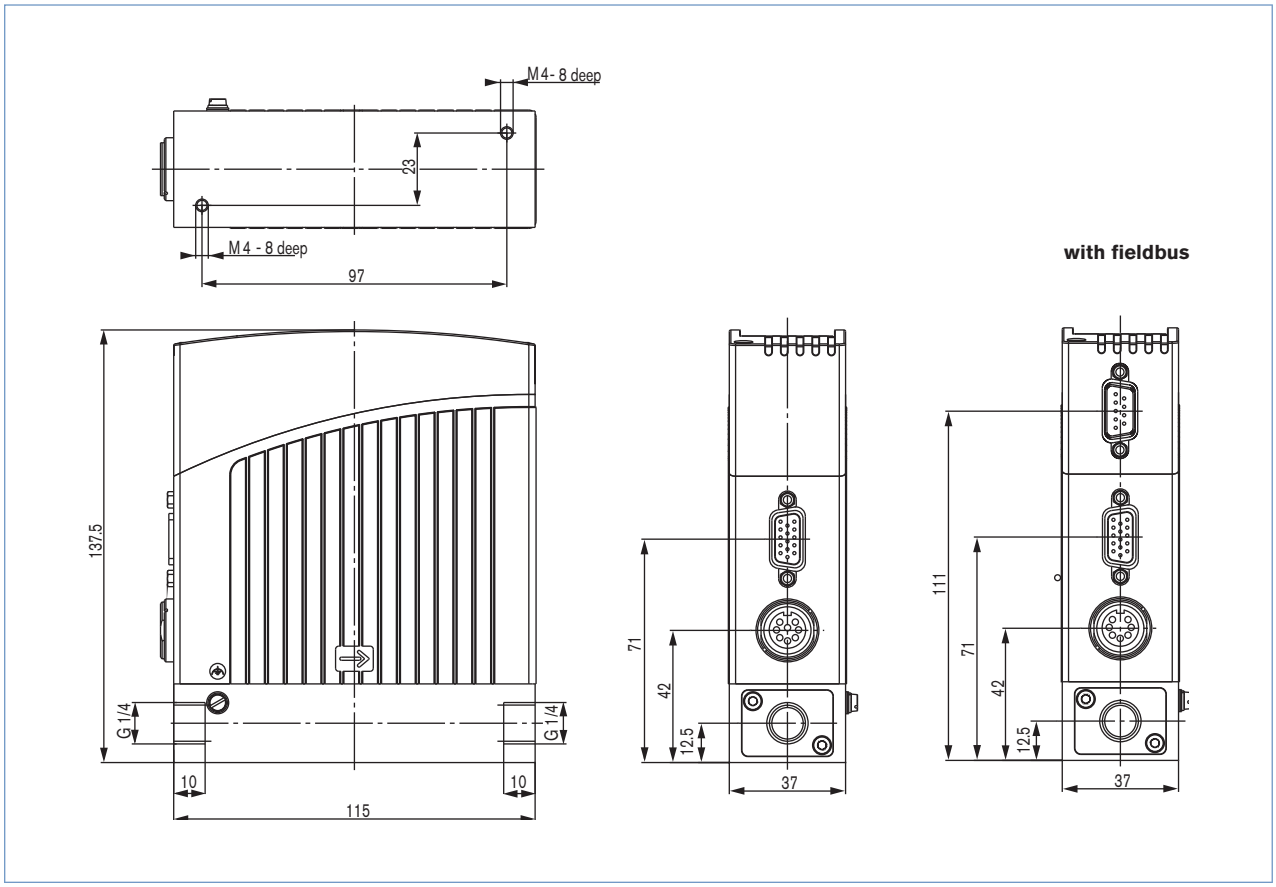
A small part of the total gas stream is diverted into a small, specifically designed bypass channel, that ensures laminar flow conditions. The sensor element is a chip immersed into the wall of this channel. The chip, produced in CMOS technology, contains a heating resistor and two temperature sensors (thermopiles) being arranged symmetrically upstream and downstream of the heater. The differential voltage of the thermopiles is a measure of the mass flow rate passing this bypass channel. The calibration procedure effectuates an unique assignment of the sensor signal to the total flow rate passing the device.

Notes regarding the selection of the unit

The decisive factors for the perfect functioning of an MFM within the application are the fluid compatibility, the normal inlet pressure and the correct choice of the flow meter range. The pressure drop over the MFM depends on the flow rate and the operating pressure.

The questionnaire on page 4 contains the relevant fluid specification. Please use in this way the experience of Burkert engineers already in the design phase and provide us with a copy of the questionnaire containing the data of your application together with your inquiry or order.

Dimensions [mm]



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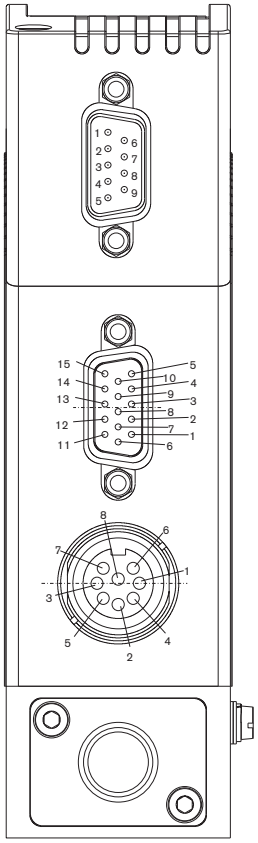
Pin Assignment



9-pin Sub-D socket

with PROFIBUS DP

Pin	Connection
1	shield
2	not used
3	RxD/TxD - P (B-line)
4	RTS (control signal for repeater)
5	GND
6	VDD
7	not used
8	RxD/TxD - N (A-line)
9	not used

with DeviceNet, CANopen

Pin	Connection
1	shield
2	CAN_L
3	GND
4	not used
5	not used
6	not used
7	CAN_H
8	not used
9	not used

15-pin Sub-HD socket

Pin	Connection
1	not used
2	not used
3	signal output +
4	binary input 2
5	12V-output (only company internal use)
6	RS232 TxD (direct connection to PC)
7	binary input 1
8	DGND (for binary inputs)
9	only company internal use (do not connect!)
10	12V-output (only company internal use)
11	12V-output (only company internal use)
12	binary input 3
13	signal output GND
14	RS232 R x D (direct connection to PC)
15	DGND (for RS232)

(with bus version 3 and 13 not used)

8-pin socket round

Pin	Connection
1	supply 24V +
2	relay 1 - middle contact
3	relay 2 - middle contact
4	relay 1 - opener
5	relay 1 - closer
6	supply GND
7	relay 2 - closer
8	relay 2 - opener

Ordering chart for accessories (Connectors are not included in the delivery)

Article	Item no.
Round 8-pin binder plug (solder connection)	918 299
round 8-pin plug with prefabricated 5m cable on one side	787 733
Round 8-pin plug with prefabricated 10m cable on one side	787 734
SUB-HD 15-pin plug with prefabricated 5m cable on one side	787 735
SUB-HD 15-pin plug with prefabricated 10m cable on one side	787 736
RS232 adapter for connection to a PC, connection with an extension cable (item no. 917039)	654 757
Extension cable for RS232 9-pin. Buchse/Stecker 2m	917 039
RS485 adapter	658 499
USB adapter	670 696
Communicaton software (Mass Flow Communicator)	Download at www.burkert.com

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Note

You can fill out the fields directly in the PDF file before printing out the form.

MFC/MFM applications - request for quotation

Please fill out and send to your nearest Bürkert facility* with your inquiry or order

Company	Contact person
Customer No	Department
Address	Tel./Fax
Postcode/Town	E-mail

☐ **MFC-application** ☐ **MFM-application** ☐ **Quantity** ☐ **Required delivery date**

Medium data

Type of gas (or gas proportion in mixtures)

Density [kg/m³] 1)

Medium temperature [°C or °F] °C °F

Moisture content [g/m³]

Abrasive components / solid particles ☐ no ☐ yes as follows

Fluidic data

Maximum flow Q_{nom} l_N/min 1) | cm_N^3/min 1)
m_N^3/h 1) | cm_S^3/min (sccm) 2)
kg/h | l_S/min (slpm) 2)

Minimum flow Q_{min} l_N/min 1) | cm_N^3/min 1)
m_N^3/h 1) | cm_S^3/min (sccm) 2)
kg/h | l_S/min (slpm) 2)

Inlet pressure at Q_{nom} barg or psig ▪

Outlet pressure at Q_{nom} barg or psig ▪

Max. inlet pressure p_{1max} barg or psig ▪

Pipe run (external-Ø) metric, mm | imperial, inch

MFC/MFM-port connection
☐ without screw-in fitting
☐ 1/4" thread G-thread (DIN ISO 228/1)
☐ 1/4" thread NPT-thread (ANSI >B1.2)
☐ with screw-in fitting

Installation ☐ horizontal ☐ vertical

Ambient temperature °C

Material data

Body material ☐ Stainless steel

Sealing material ☐ FKM ☐ EPDM ☐ Other: _____

Electrical data

Output/Input signal

Standard signal
☐ 0-5 V
☐ 0-10 V
☐ 0-20 mA
☐ 4-20 mA

with Fieldbus
☐ Profibus-DP
☐ DeviceNet
☐ CANopen

■ Please quote all pressure values as overpressures with respect to atmospheric pressure [barg]

1) at: 1.013 bar (a) and 0°C 2) at: 1.013 bar (a) and 20°C

To find your nearest Bürkert facility, click on the orange box → **www.burkert.com**

In case of special application conditions, please consult for advice.

Subject to alterations
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