

LFM Liquid Flow Meter



- High dynamic flow measurement
- Applicable for liquid flow measurement up to 600 ml/min (36 l/h)
- No moving parts in medium
- Fieldbus optional

Type 8709 can be combined with...



Type 1150

Multi-channel
program controller



Type 6606

2/2-way
Solenoid Valve



Type 6011

2/2-way
Solenoid Valve



MassFlowCommunicator

Communications
Software

Type 8709 is an instrument for liquid flow measurement in process technology.

The actual value supplied by the sensor is transmitted through the digital electronics and over a standard signal output or a field bus interface.

In the device two calibration curves can be stored, which the user is able to switch between.

Typical application areas of liquid measurements are:

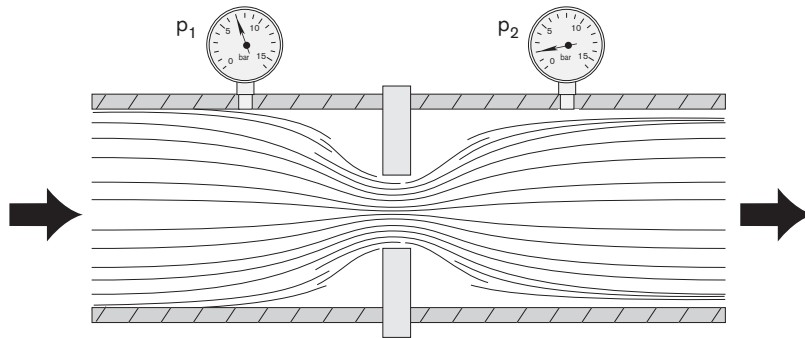
- Heat treatment,
- Machine tools,
- Fuel cell technology,
- Packaging technology,
- Material coating,
- Bio reactors.

In particular, the Type 8709 meets the requirement of IP65.

Technical data			
Full scale range (Q_{nom})	0.6 to 36 l/h (10 to 600 ml/min) re. water	Output signal (actual value)	0-5 V, 0-10 V, 0-20 mA or 4-20 mA
Operating medium	Clean and low viscous liquids	Max. current (voltage output)	10 mA
Viscosity	0.4 to 4 cSt	Max. burden (current output)	600 Ω
Max. operating pressure (at inlet)	Up to max. 10 barg; typical max. 2 barg	Alternative output signal	Digital with fieldbus: ▪ PROFIBUS DP V1 ▪ DeviceNet ▪ CANopen
Calibration medium	Water (conversion to operating medium with correcting function)	Type of protection	IP65
Medium temperature	10 to + 40 °C	Dimensions [mm] (without compression fittings)	115 x 137.5 x 37 (BxHxT)
Ambient temperature	0 to + 55 °C	Total weight	ca. 1100 g
Accuracy	± 1.5 % o.R. ± 0.5 % F.S.	Installation	Horizontal or vertical
Repeatability	± 0.5 % F.S.	Light emitting diodes (Default function, other functions programmable)	Indication for: 1. Power 2. Communication 3. Limit 4. Error
Turn-down ratio	1:10	Binary inputs (Default function, other functions programmable)	Three: 1. not assigned 2. not assigned 3. not assigned
Response time ($t_{95\%}$)	< 500 ms	Binary outputs (Default function, other functions programmable)	Two relay outputs for: 1. Limit (Q_{nom} almost reached) 2. Error (e.g. sensor failure) Capacity: max. 60 V, 1 A, 60 VA
Body material	Stainless steel		
Housing	PBT		
Sealing material	FKM, EPDM, FFKM		
Port connection	G1/8, NPT 1/8, G1/4, NPT 1/4		
Electrical Connection	Round socket, 8-pin, Sub-HD socket, 15-pin, M12 plug or socket, 5-pin (with fieldbus)		
Operating voltage	24 V DC ± 10 %		
Residual ripple	< 2 %		
Power consumption	Max. 2.5 W (5 W with fieldbus version)		

Measurement principle

The sensor measures the flow by means of differential pressure. An orifice in the main channel causes pressure loss at liquid flow which is measured by the differential pressure sensor. The sensor feedbacks a precise and temperature compensated signal from which the electronics calculate the corresponding flow.



To avoid a blockage of the aperture by contaminated mediums an upstream filter is recommended.

Notes regarding the selection of the unit

The decisive factors for the perfect functioning of an LFM within the application are the fluid compatibility, the pressure range and the correct choice of the flow meter range. The pressure loss over the LFM averages in typical applications approx. 500 mbar, with up to 2 barg inlet pressure.

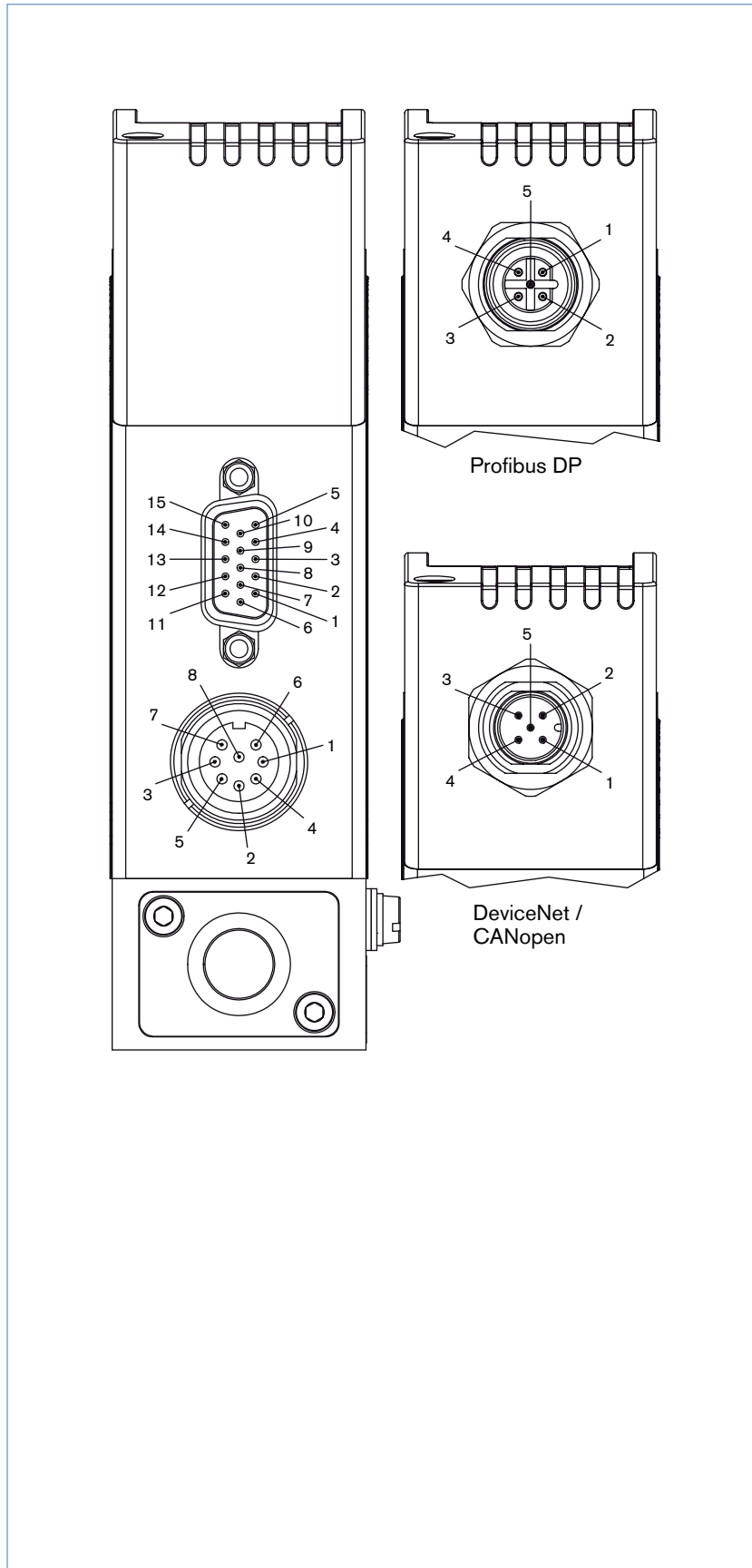
The specification of the inlet pressure, $p_{1,max}$, which can be expected is necessary for the selection of the suitable differential pressure sensor.

- ▶ The request form on page 5 contains the relevant fluid specification. Please use the experience of Bürkert engineers already in the design phase and provide us with a copy of your request containing the necessary data together with your inquiry or order.

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

Article	Item no.
Electrical connection	
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-D 15-pin plug with prefabricated 5m cable on one side	787 735
Sub-D 15-pin plug with prefabricated 10m cable on one side	787 736
PROFIBUS DP	
M12 plug	918 198
M12 socket (coupling)	918 447
PROFIBUS Y-Connector	902 098
Adapter	
RS232-Adapter with extension cable to connect to PC (Item no. 917039)	654 757
RS485-Adapter	658 499
PC 2m extension cable for RS232, with 9-pin socket/plug	917 039
USB-Adapter	670 696
Communications software MassFlowCommunicator	Download at www.burkert.com

Pin Assignment



Fieldbus version

**PROFIBUS DP - M12 socket , B-coded
(DPV1 max. 12 Mbaud)**

Pin	Connection
1	VDD
2	RxD/ TxD – N (A-circuit)
3	DGND
4	RxD/ TxD – P (B-circuit)
5	not configured

CANopen resp., DeviceNet - M12 Plug

Pin	Connection
1	Shield
2	not configured
3	DGND
4	CAN_H
5	CAN_L

Sub-HD socket, 15-pin

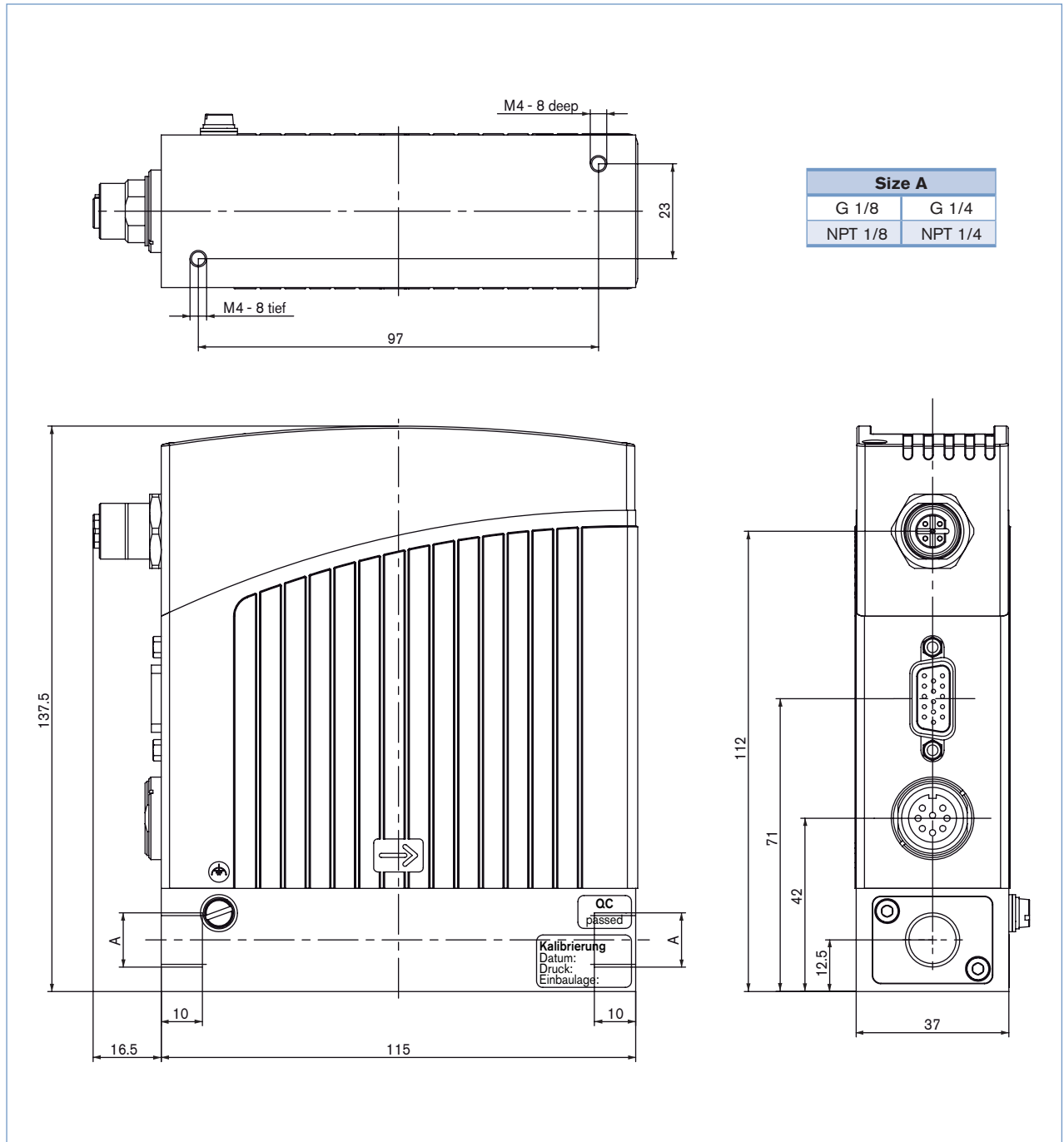
Pin	Connection
1	not configured
2	not configured
3	Actual value output + ¹⁾
4	Binary input 2
5	12V-Output (only for internal company use)
6	RS232 TxD (direct connection to PC)
7	Binary input 1
8	DGND (for binary input)
9	only for internal company use (do not connect)
10	12V-Output (only for internal company use)
11	12V-Output (only for internal company use)
12	Binary input 3
13	Actual value output GND ¹⁾
14	RS232 RxD (direct connection to PC)
15	DGND (for RS232-interface)

¹⁾ not applicable for fieldbus version

Round socket, 8-pin,

Pin	Connection
1	24V Supply +
2	Relay 1 - middle contact
3	Relay 2 - middle contact
4	Relay 1 - NC contact
5	Relay 1 - NO contact
6	24V-Supply GND
7	Relay 2 - NO contact
8	Relay 2 - NC contact

Dimensions [mm]



In devices without fieldbus communication there is no electrical M12 connector in the upper housing part.

Note

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

LFC/LFM 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		
Street	Tel./Fax		
Postcode/Town	E-Mail		

LFC applications
 LFM applications
 Quantity
 Required delivery date

Medium data

Fluids

Density [kg/m³] at 20°C at 40°C

Viscosity [cSt] at 5°C at 20°C at 40°C

Medium temperature [°C or °F] °C °F

Abrasive components/solid particles no yes, as follows:

Fluidic data

Maximum flow Q_{nom} l/h l/min
 kg/h kg/min
 ml/h ml/min

Minimum flow Q_{min} l/h l/min
 kg/h kg/min
 ml/h ml/min

Inlet pressure at Q_{nom} p₁ = barg ■

Outlet pressure at Q_{nom} p₂ = barg ■

Max. inlet pressure p_{1max} barg ■

Pipeline (external-Ø) mm inch

LFC/LFM Port connection without screw-in fitting
 1/4 G-thread 1/4 G-thread (DIN ISO 228/1)
 1/4 NPT-thread 1/4 NPT-thread (ANSI B1.2)
 with screw-in fitting

Installation of LFC/LFM horizontal, valve upright (standard) horizontal, valve to the side
 vertical, flow upwards vertical, flow downwards

Ambient temperature °C

Material data

Body material Stainless steel

Seal material FKM EPDM Other:

Electrical data

Output Signal

with standard signal	with fieldbus
<input type="checkbox"/> 0-5 V	<input type="checkbox"/> PROFIBUS DP
<input type="checkbox"/> 0-10 V	<input type="checkbox"/> DeviceNet
<input type="checkbox"/> 0-20 mA	<input type="checkbox"/> CANopen
<input type="checkbox"/> 4-20 mA	

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