

## 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
- Compact version

Type 8708 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 8708 is an instrument for liquid flow control 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 measurement are:

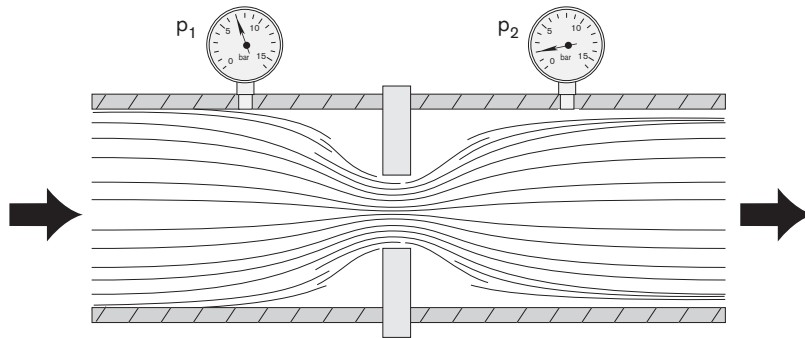
- Heat treatment,
- Machine tools,
- Fuel cell technology,
- Packaging technology,
- Material coating,
- Bio reactors.

The device offers a particularly compact solution.

Technical data			
<b>Full scale range (<math>Q_{nom}</math>)</b>	0.6 to 36 l/h (10 to 600 ml/min) re. water	<b>Power consumption</b>	Max. 2.5 W (5 W with fieldbus version)
<b>Operating medium</b>	Clean and low viscous liquids	<b>Output signal</b> (actual value)	0-5 V, 0-10 V, 0-20 mA or 4-20 mA
<b>Viscosity</b>	0.4 to 4 cSt	<b>Max. current</b> (voltage output)	10 mA
<b>Max. operating pressure</b> (at inlet)	Up to max. 10 barg; typical max. 2 barg	<b>Max. burden</b> (current output)	600 $\Omega$
<b>Calibration medium</b>	Water (conversion to operating medium with correcting function)	<b>Alternative output signal</b>	Digital with fieldbus: ▪ PROFIBUS DP V1 ▪ DeviceNet ▪ CANopen
<b>Medium temperature</b>	10 to + 40 °C	<b>Type of protection</b>	IP40
<b>Ambient temperature</b>	0 to + 55 °C	<b>Dimensions [mm]</b> (without compression fittings)	Standard version: 107 x 115.5 x 28 (BxHxT) Sub-base version: 107 x 115.5 x 43 (BxHxT)
<b>Accuracy</b>	$\pm 1.5$ % o.R. $\pm 0.5$ % F.S.	<b>Total weight</b>	Approx. 900 g
<b>Repeatability</b>	$\pm 0.5$ % F.S.	<b>Installation</b>	Horizontal or vertical
<b>Turn-down ratio</b>	1:10	<b>Light emitting diodes</b> (Default functions, other functions programmable)	Indication for: 1. Power 2. Communication (only in fieldbus version) Limit (only in analogue version) 3. Error
<b>Response time (<math>t_{99\%}</math>)</b>	< 500 ms	<b>Binary inputs</b> (Default functions, other functions programmable)	Two: 1. not assigned 2. not assigned
<b>Body material</b>	Stainless steel	<b>Binary output</b> (Default functions, other functions programmable)	One relay output for: Limit ( $Q_{nom}$ almost reached) Capacity: max. 25 V, 1 A, 25 VA
<b>Housing</b>	PC (Polycarbonate)		
<b>Sealing material</b>	FKM, EPDM, FFKM		
<b>Port connection</b>	G 1/8, NPT 1/8, G 1/4, NPT 1/4, sub-base		
<b>Control valve</b>	Proportional valve; normally close; depending on flow range and pressure		
<b>Valve orifices</b>			
<b>Electrical Connection</b>	Sub-D 15-pin plug M12 (PROFIBUS) 5-pin socket M12 (DeviceNet, CANopen) 5-pin plug		
<b>Operating voltage</b>	24 V DC $\pm 10$ %		
<b>Residual ripple</b>	< 2 %		

## 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 out of which the electronics calculates 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.

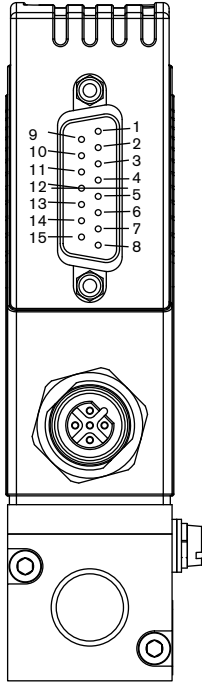
The specification of the inlet pressure,  $p_{1,max}$ , which can be expected is necessary for the selection of the suitable differential pressure sensor.

- ▶ 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)

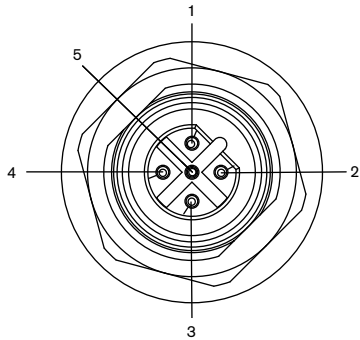
Article	Item no.
<b>15-pin Electrical Connection</b>	
Sub-D 15-pin socket (solder connection)	918 274
Sub-D cover for Sub-D socket, with screw locking device	918 408
Sub-D 15-pin socket with prefabricated 5m cable on one side	787 737
Sub-D 15-pin socket with prefabricated 10m cable on one side	787 738
<b>PROFIBUS DP</b>	
M12 plug	918 198
M12 socket (coupling)	918 447
PROFIBUS Y-Connector	902 098
<b>Adapter</b>	
RS232-Adapter with extension cable to connect to PC (Item no. 917039)	654 748
RS485-Adapter	654 538
PC 2m extension cable for RS232, with 9-pin socket/plug	917 039
USB-Adapter	670 639
Communications software MassFlowCommunicator	Download at <a href="http://www.burkert.com">www.burkert.com</a>

## Pin Assignment



## Sub-D 15-pin plug

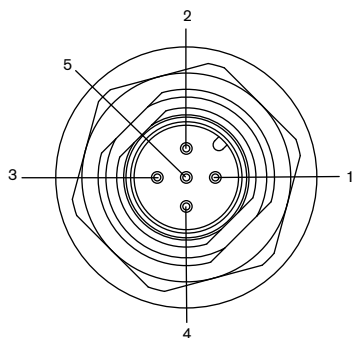
Pin	Connection
1	Relay - NC contact
2	Relay - NO contact
3	Relay - middle contact
4	GND for 24V supply and binary inputs
5	24V Supply +
6	8V Output (only for internal company use)
7	not configured
8	not configured
9	Actual value output GND
10	Actual value output +
11	DGND (for RS232)
12	Binary input 1
13	Binary input 2
14	RS232 RxD (without driver)
15	RS232 RxD (without driver)



## 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

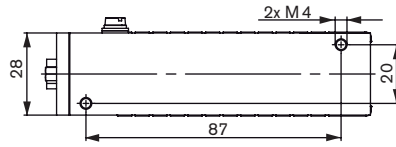


## CANopen resp., DeviceNet - M12 Plug

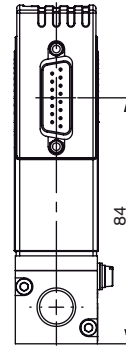
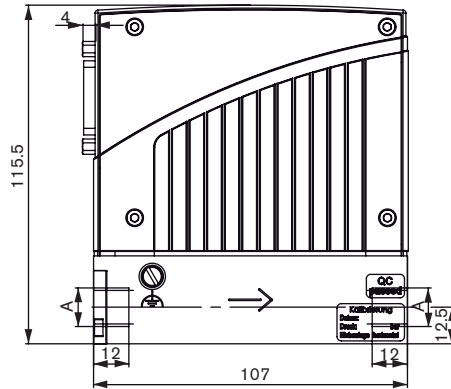
Pin	Connection
1	Shield
2	not configured
3	DGND
4	CAN_H
5	CAN_L

Dimensions [mm]

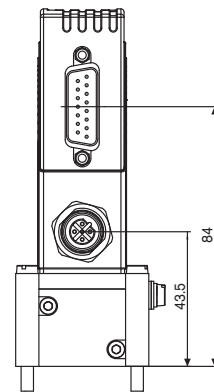
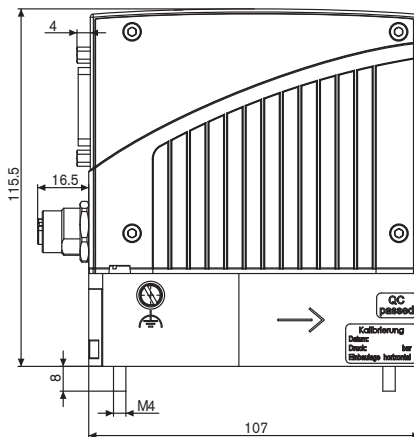
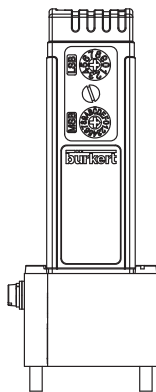
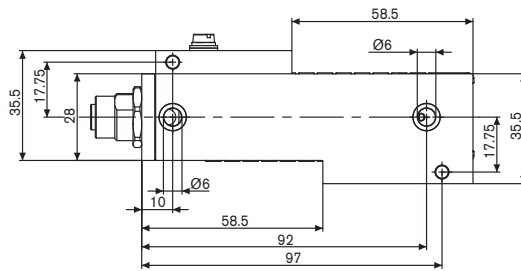
Standard Version



Size A	
G 1/8	G 1/4
NPT 1/8	NPT 1/4



Sub-base Version



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/m<sup>3</sup>] 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  $Q_{nom}$   $p_1 =$   barg ■

Outlet pressure at  $Q_{nom}$   $p_2 =$   barg ■

Max. inlet pressure  $p_{1max}$   barg ■

Pipeline (external-Ø)  mm  inch

LFC/LFM Port connection  
 without screw-in fitting  
 1/8 G-thread  1/4 G-thread (DIN ISO 228/1)  
 1/8 NPT-thread  1/4 NPT-thread (ANSI B1.2)  
 with screw-in fitting  
 Sub-base

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]