

DB51

Compact Thermal Mass Flowmeter and Counter for Compressed Air and Non-Aggressive Gases

- integrated inlet and outlet pipes for high level of accuracy
- removable sensor system for easy maintenance and cleaning
- available for 1/4" to 2" pipe sizes
- measuring ranges 0,8...90 NI/min to 2...1195 Nm³/h
- local LCD-display for flow rate and total
- output signals: 4...20 mA for flow rate, pulses for totalization
- for compressed air and non-aggressive gases
- zero balance possible at instrument



Description:

Model DB51 thermal mass flow meters and counters report and measure mass flow rates and totals of non-aggressive gases, regardless of gas pressure and temperature. Process gas flows around a heated temperature sensor that is encapsulated in glass. As a result, the sensor dissipates heat which an electronics module returns to the sensor to maintain it at a constant temperature. The dissipated heat energy is proportional to the mass flow rate of the gas and is output as a 4 to 20 mA signal by the electronic utilizing calibration curves and process parameters stored in the instrument.

The 4 to 20 mA signal is routed to secondary evaluation devices and provides the flow rate information. An additional pulse output with a pre-defined pulse value is used for totalizing purposes. Mass flow rate and total are also displayed on an integrated back-lit display. High levels of accuracy are obtained by means of upstream and downstream pipe runs integrated in the instrument which ensure that the flow stream is laminar.

Typical applications:

Series DB51 thermal mass flow meters and counters provide flow measurement of non-aggressive gases in 1/4" to 1 1/2" pipe systems. Their rugged, heavy-duty design and easy handling and operation make them the right choice for measuring and monitoring compressed air consumption. They also provide measurements of other suitable gases such as: nitrogen oxygen, argon, helium and carbon dioxide.

Service friendly through removable sensor system:

For cleaning, maintenance, or recalibration the sensor head may be removed from the pipe run without taking the flow conditioner pipe itself out of the system.

This eliminates the need for a bypass pipe and ensures that the gas supply system may continue to operate even with the meter taken out.

Measuring ranges air:

Process-connection (G or NPT)	DIN flange-connection	pipe-ID [mm]	pipe-OD [mm]	Measuring range [Nm³/h]*
R 1/4"	--	8,9	13,7	0,05...5,4 (0,8...90 NI/min)
R 1/2"	DN 15	16,1	21,3	0,2...90
R 3/4"	DN 20	21,7	26,9	0,3...170
R 1"	DN 25	27,3	33,7	0,5...290
R 1 1/4"	DN 32	36,8	42,4	0,7...530**
R 1 1/2"	DN 40	41,8	48,3	1...730**
R 2"	DN 50	53,1	60,3	2...1195**

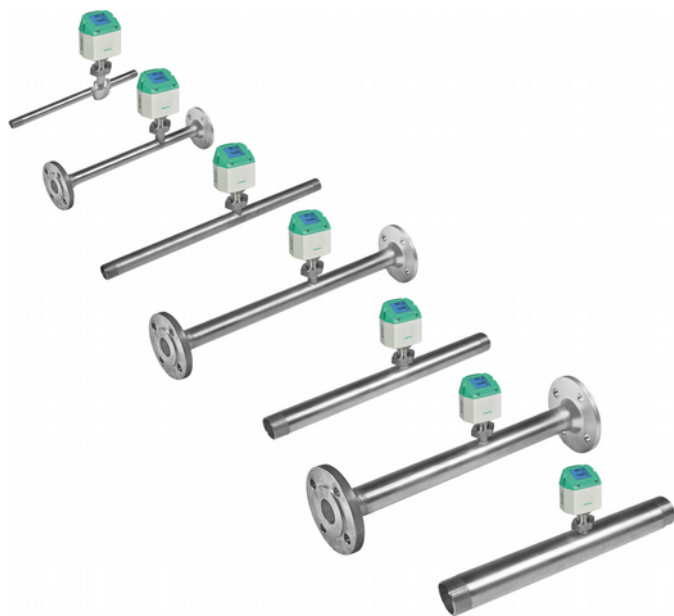
* based on 20 °C and 1000 mbar

**For optimal operation are longer inlet runs necessary.
See table in the instruction manual.

Measuring ranges gases:

Process-connection	Measuring range end values of different gases [m³/h]					
	Argon	CO ₂	N ₂	O ₂	N ₂ O	Natural gas
R 1/4"	8,4	5,1	4,8	5,1	5,1	3
R 1/2"	140	90	80	85	85	50
R 3/4"	275	175	155	165	170	105
R 1"	460	290	260	280	285	170
R 1 1/4"	830	525	485	505	520	310
R 1 1/2"	1140	720	650	695	715	430
R 2"	1870	1185	1060	1140	1170	705

* based on 0 °C and 1013 mbar
further gases on request



Technical Data:

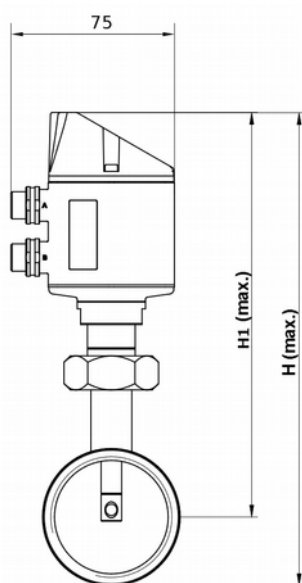
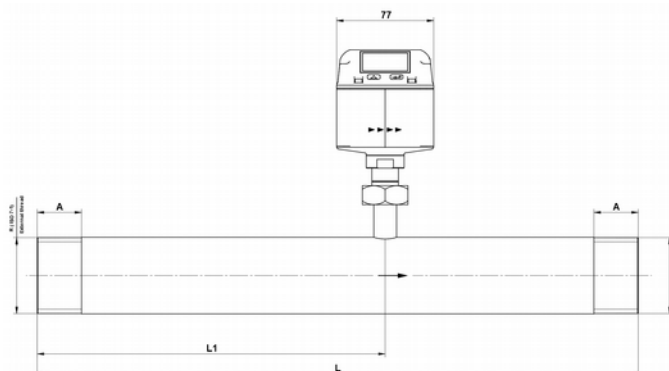
Parameters:	Nm³/h, NI/min
Reference conditions :	0 °C, 1013 mbar, other adjustable via key or factory-made
Adjustable units:	m³/h (standard) m³/min, l/min, l/s, ft/min, cfm, m/s, kg/h, kg/min, kg/s
Measuring medium:	Air, nitrogen, argon, nitrous oxide, CO ₂ , oxygen, natural gas
Sensor:	Pt45, Pt1000
T90:	< 2 seconds
Operating temperature:	-30 ... 80 °C
Operating pressure:	PN 16, optional PN 40
Power supply:	18...36 VDC
Power consumption:	Max. 5 W
Burden:	< 500 Ohm
Digital output:	RS 485 (Modbus RTU)
Analogue output:	4...20 mA for m³/h bzw. l/min other scaling on request
Pulse output:	1 pulse per m³ resp. per litre, galvanically separated scaling adjustable via keys
Accuracy:	± 1,5 % of m.v., ± 0,3 % of f.s. ± 1 % of m.v., ± 0,3 % of f.s. (optional)
Display:	TFT 1,8"
Mounting position:	any
Material:	housing: Polycarbonate
thread version:	St st 1.4301, optional 1.4571
flange version:	1.4571
Electrical protection:	IP 65

Display:

Display:	TFT 1,8"
Resolution:	220 x 176
Indication:	2 values simultaneous: actual flow and total flow (counter rate)
Menu navigation:	multilingual
Adjustable via key at the display:	counter reset Unit selection 4...20 mA scaling reference conditions (°C, mbar) pulse value Zero point balance leak flow volume suppression
Indication:	Rotatable at 180°

Dimensions:

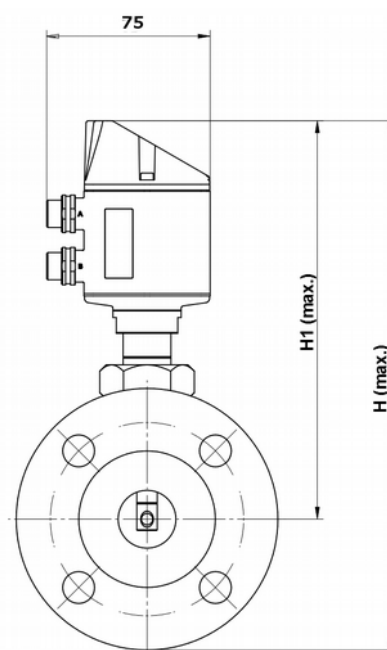
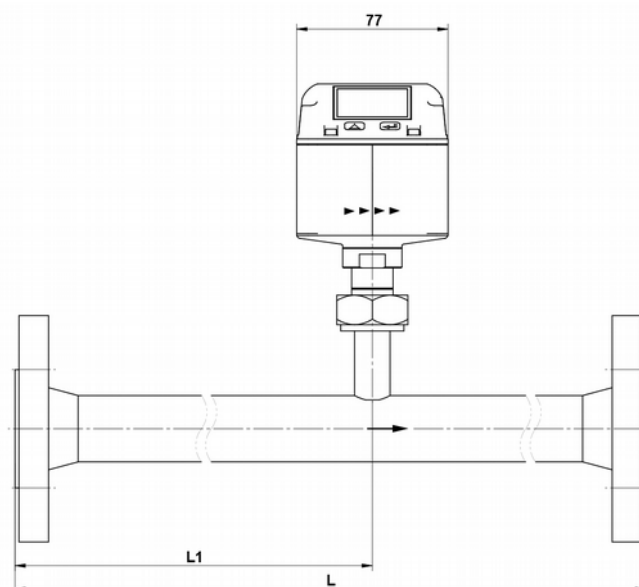
Thread version:



Process-thread	L [mm]	L1 [mm]	H [mm]	H1 [mm]	A [mm]
R 1/4"	194	137	174,7	165,7	15
R 1/2"	300	210	176,4	165,7	20
R 3/4"	475	275	179,2	165,7	20
R 1"	475	275	182,6	165,7	25
R 1 1/4"	475	275	186,9	165,7	25
R 1 1/2"	475*	275	186,9	165,7	25
R 2"	475*	275	195,9	165,7	30

*Attention: Shortened inlet section! Please observe the recommended minimum inlet section (length = 10 m inner diameter) on site!

Flange version:

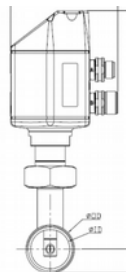
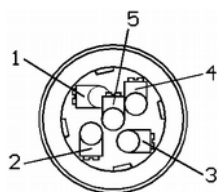


Measuring section	L [mm]	L1 [mm]	H [mm]	H1 [mm]
DN 15	300	210	213,2	165,7
DN 20	475	275	218,2	165,7
DN 25	475	275	223,2	165,7
DN 32	475	275	235,7	165,7
DN 40	475*	275	240,7	165,7
DN 50	475*	275	248,2	165,7

*Attention: Shortened inlet section! Please observe the recommended minimum inlet section (length = 10 m inner diameter) on site!

Electrical connection:

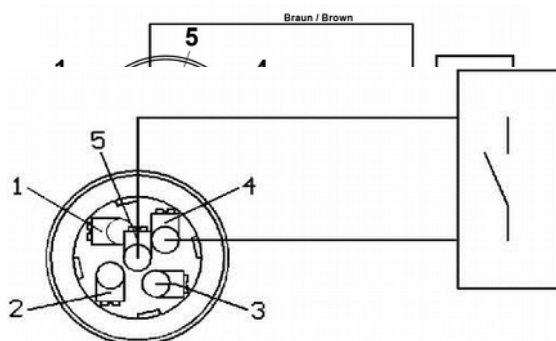
M12 plug:



Plug A

Plug B

Plug A:



Plug B:

Accessories:

Order number:
SM12.

M12-plug with PVC cable

Number of poles:
5= 5-pole

Cable length:

- 0 = without cable for self assembly
- 2 = 2 m PVC cable (standard)
- 5 = 5 m PVC cable
- 10 = 10 m PVC cable

Construction:

- G = straight
- W = angled

Option:

- 0 = none
- 9 = Please specify in writing

Order Code:

Order number:

DB51.

G.

15.

L.

A.

0.

**Thermal Mass Flowmeter and Counter
for gases, with integral inlet- and outlet
pipe runs**

Version:

- G = G Male thread, PN 16
- N = male thread NPT, PN 16
- FD = DIN-Flange PN 16
- 9 = special connection

Measuring range and pipe size:

08 = 0,05...5,4 Nm³/h = 0,8...90 NI/min, 1/4"
(not with flange version)

15 = 0,2...90 Nm³/h, 1/2"

20 = 0,3...170 Nm³/h, 3/4"

25 = 0,5 ...290 Nm³/h, 1"

32 = 0,7...530 Nm³/h, 1 1/4"

40 = 1...730 Nm³/h, 1 1/2"

50 = 2...1195 Nm³/h, 2"

Medium:

- L = Air
- N = Nitrogen
- A = Argon
- H = Helium
- C = Carbon dioxide
- S = Oxygen
- B = Biogas
- E = natural gas

Accuracy:

A = +/- 1,5 % m.v. +/- 0,3 % f.s.

B = +/- 1 % m.v. +/- 0,3 % f.s.

Options:

- 0 = none
- HP = high pressure up to PN 40
- V4A = Inlet- and outlet pipe made of st. steel 1.4571
(standard for flange versions)
- I = analogue output adjusted according to customer
requirements
- 9 = Please specify in writing

2 plugs M12 and 1 blind plug are included in delivery.

DB51-Z.N1: Wall mounted power supply, 100-240 VAC,
10 VA on 24 VDC, 0,35 A

DB51-Z.N2: plug-in power supply unit, 100-240 VAC on
24 VDC, 0,35 A, with 2 m cable

DB51-Z.V1: Cover lid for flow conditioner pipe, aluminium

DB51-Z.V2: Cover lid for flow conditioner pipe, st.st. 1.4404

DB50-Z.K5: Factory calibration, 5 points