

DB50

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

- **insertion model**
- **available for pipe sizes DN 15 to DN 1000**
- **flow velocities: 0...50 m/s, 0...92,7 m/s, 0...185 m/s or 0...224 m/s**
- **local LCD-display for flow rate, total or temperature (optional)**
- **output signals: 4...20 mA for flow rate or temperature, pulses for total**
- **for compressed air and non-aggressive gases**
- **zero balance possible at instrument**

Description:

Model DB50 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 may also be displayed on an integrated back-lit display if required. The instruments are supplied with a 1/2" thread compression fitting and can be installed and disassembled under pressurized conditions.



Typical applications:

Model DB50 thermal mass flow meters and counters provide flow measurement of non-aggressive gases in DN 15 to DN 1000 pipe systems. Their rugged, heavy-duty design and easy handling and operation make them the right choice for measuring and monitoring compressed air consumption levels. They also provide measurements of other suitable gases such as: nitrogen oxygen, argon, helium and carbon dioxide.

Models:

DB50.S... standard-model, mass flow rate
0...92,7 m/s, G 1/2 male thread

DB50.L... mass flow rate 0...50 m/s,
G 1/2 male thread

DB50.H1... mass flow rate 0...185 m/s,
G 1/2 male thread

DB50.H2... mass flow rate 0...224 m/s,
G 1/2 male thread

Measuring ranges:

The quoted measuring ranges are a rough guide only. The exact measuring ranges are calculated taking the actual inside diameter of the given pipe into account and are used during production to calibrate the instruments.

Air:

Nom-inal pipe size	Pipe inner diameter [mm]	Measuring range end values (20 mA) [m³/h] -air*			Probe length [mm]
		DB50.S 0...92,7 m/s	DB50.H1 0...185 m/s	DB50.H2 0...224 m/s	
DN 25	27,3	148	295	357	120
DN 32	36,0	266	531	644	
DN 40	41,9	366	728	882	160
DN 50	53,1	600	1198	1450	
DN 65	71,1	1095	2187	2648	
DN 80	84,9	1569	3133	3794	
DN 100	110,0	2644	5279	6391	220
DN 125	133,7	3921	7808	9453	
DN 150	159,3	5579	11.097	13.436	
DN 200	200,0	8816	17.533	21.230	
DN 250	250,0	13.742	27.429	33.211	300
DN 300	300,0	19.836	39.545	47.881	
DN 500	500,0	55.101	109.846	133.002	400
DN 600	600,0	79345	158.178	191.524	

* based on 20 °C and 1000 mbar

Gases:

DB50.S: 0...92,7 m/s (standard)

Nom-inal pipe size**	Measuring range end values* (20 mA) [Nm³/h]					
	Ar	CO ₂	N ₂	O ₂	N ₂ O	Natural gas
DN 25	231	146	131	141	145	87
DN 32	416	263	237	254	261	157
DN 40	571	361	324	348	358	216
DN 50	938	594	533	572	588	355
DN 65	1713	1084	974	1045	1075	648
DN 80	2454	1553	1396	1497	1540	928
DN 100	4134	2617	2351	2522	2594	1564
DN 125	6115	3870	3478	3731	3836	2313
DN 150	8692	5501	4943	5303	5453	3287
DN 200	13.733	8691	7810	8378	8615	5194
DN 250	21.483	13.596	12.217	13.107	13.477	8125
DN 300	30.973	19.601	17.613	18.896	19.430	11.713
DN 500	86.036	54.448	48.926	52.489	53.973	32.538
DN 600	123.892	78.405	70.453	75.583	77.721	46.855

* based on 1013 mbar and 0 °C, ** pipe inner diameter as in the table „Air“, further gases on request

DB50.H1 = 0...185 m/s

Nom-inal pipe size**	Measuring range end values* (20 mA) [Nm³/h]					
	Ar	CO ₂	N ₂	O ₂	N ₂ O	Natural gas
DN 25	461	292	262	281	289	174
DN 32	831	526	473	507	521	314
DN 40	1139	721	648	695	714	431
DN 50	1872	1185	1065	1142	1174	708
DN 65	3419	2164	1945	2085	2144	1293
DN 80	4898	3101	2986	2988	3072	1853
DN 100	8252	5224	4694	5033	5176	3122
DN 125	12.205	7727	6942	7445	7656	4617
DN 150	17.347	10.983	9867	10.581	10.881	6562
DN 200	27.409	17.353	15.591	16.718	17.192	10.368
DN 250	42.878	27.147	24.389	26.154	26.895	16.220
DN 300	61.818	39.138	35.163	37.706	38.775	23.385
DN 500	171.716	108.718	97.674	104.739	107.708	64.958
DN 600	247.271	156.553	140.650	150.825	155.100	93.539

* based on 1013 mbar and 0 °C

** pipe inner diameter as in the table „Air“

further gases on request

DB50.H2 = 0...224 m/s

Nom-inal pipe size**	Measuring range end values* (20 mA) [Nm³/h]					
	Ar	CO ₂	N ₂	O ₂	N ₂ O	Erdgas
DN 25	558	353	317	340	350	211
DN 32	1006	637	572	614	631	381
DN 40	1379	873	784	841	865	522
DN 50	2267	1435	1290	1383	1422	858
DN 65	4140	2619	2355	2525	2597	1566
DN 80	5931	3753	3374	3618	3721	2244
DN 100	9992	6323	5684	6095	6269	3781
DN 125	14.779	9352	8407	9015	9272	5592
DN 150	21.006	13.292	11.949	12.812	13.178	7948
DN 200	33.190	21.002	18.879	20.244	20.822	12.558
DN 250	51.922	32.855	29.534	31.669	32.574	19.645
DN 300	74.857	47.368	42.580	45.658	46.962	28.322
DN 500	207.935	131.577	118.277	126.827	130.449	78.673
DN 600	299.427	189.472	170.319	182.631	187.847	113.290

* based on 1013 mbar and 0 °C

** pipe inner diameter as in the table „Air“

further gases on request



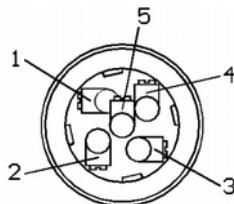
Display: (optional)

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:	inner diameter of pipe counter reset unit selection 4...20 mA scaling reference conditions (°C, mbar) pulse value zero point balance leak flow volume depression
Indication:	rotatable at 180°

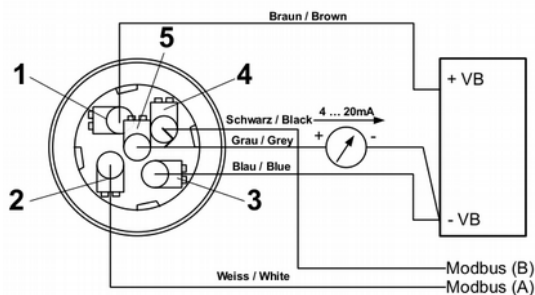
Electrical connection:

	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
Connection plug A	+VB	RS 485 (A)	-VB	RS 485 (B)	I+ (4...20 mA)
Connection plug B (pulse output)	NC	GND	DIR	pulse (galv. isolated)	pulse (galv. isolated)
Connection plug B (option MBus)	NC	NC	NC	MBus	MBus
Farben	brown	white	blue	black	grey

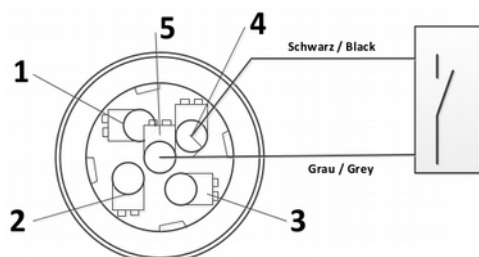
Connection plug 5-pole:



Connection plug A:



Connection plug B (pulse output / MBus):



Technical Data:

Parameters:

at compressed air:	m³/h, l/min (1000 mbar, 20 °C)
at gases:	Nm³/h, NI/min (1013 mbar, 0 °C)
	Other reference conditions can be set via the keyboard or at the factory

Adjustable units:

m³/h (standard), m³/min, l/min, l/s, ft/min, cfm, m/s, kg/h, kg/min, g/s, lb/min, lb/h

Gas types:

air, nitrogen, argon, nitrous oxide, CO₂, oxygen, vacuum

Sensor:

thermal mass flow sensor

T90:

< 2 seconds

Operating temperature:

-30...110 °C (probe tube)
-30 ... 70 °C (housing)

Operating pressure:

up to 50 bar

Power supply:

18 bis 36 VDC

Power consumption:

max. 5 W

Burden:

< 500 Ohm

Digital output:

RS 485 (Modbus RTU)

Analogue output:

4...20 mA for m³/h resp. l/min or temperature

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 (optional):

TFT 1,8"

Process connection:

G 1/2"

Mounting position:

any

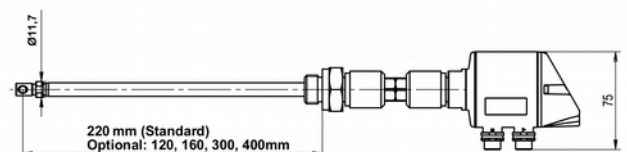
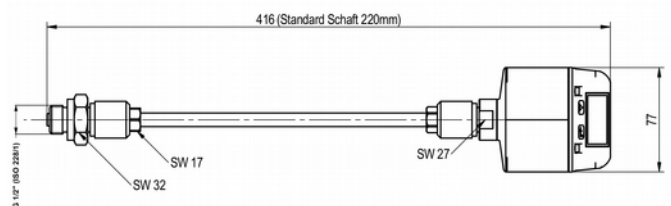
Material:

housing: Polycarbonate
st. st. 1.4301,

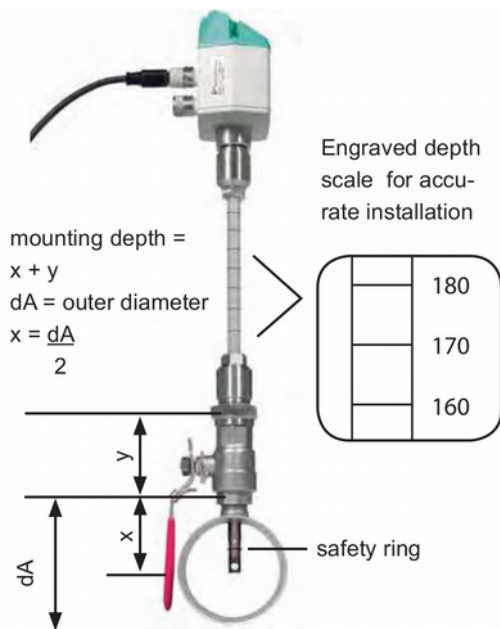
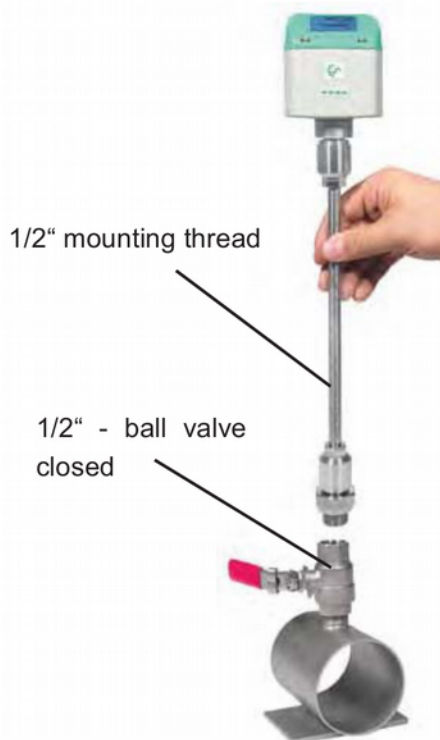
Electrical protection:

IP65

Dimensions:



Mounting information:



Order Code:

Order number: **DB50.** S. 12. L. A. 0

Thermal Mass Flowmeters and Counters for gases- insertion model

Measuring ranges (see table):

L = 0...50 m/s
 S = 0...92,7 m/s (Standard)
 H1 = 0...185 m/s
 H2 = 0...224 m/s

Probe length:

12 = 120 mm 40 = 400 mm
 16 = 160 mm 50 = 500 mm
 22 = 220 mm (Standard) 60 = 600 mm
 30 = 300 mm

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
 D = with LCD-display
 B = bi-directional measurement (flow direction is shown in the display)
 I = analogue output set according to customer requirements
 9 = please specify in writing

Other information: inside pipe diameter in mm (please specify when placing your order, is needed to calculate the exact measuring range.)

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

Accessories:

DB50-Z.M: installation kit, containing a weld-on fitting and 1/2" ball valve made of stainless steel

DB50-Z.N1: wall mounted power supply, 100-240 VAC, 10 VA on 24 VDC, 0,35 A

DB50-Z.N2: plug-in power supply unit, 100-240 VAC on 24 VDC, 0,35 A, with 2 m cable

DB50-Z.K5: factory calibration, 5 points

Order number: **SM12.** 5. 2. G. 0

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