

Flow meter M335-M350

FACTS | FIGURES | DATA



Flow meter M335-M350

Flow meter M335 · M350

Measuring ranges 50-60.000 l/h



M23 PVDF



M335/M350 PSU



M335/M350 PA



M335/M350 PVC

FUNCTION

The M335/M350 flow meter operates on the float principle and is used for flow rate measurements in closed pipelines. The medium flows through the vertically installed flow meter from bottom to top. This raises the float and shows the current flow rate on the scale on the measuring device. The read-off edge corresponds to the largest diameter of the float.

The M335/M350 flow meters come as standard with a water scale and a % scale, and two setpoint indicators.

SPECIAL FEATURES

- Fracture-proof and corrosion-resistant
- Radially removable
- Special adhesive scales for liquid and gaseous media
- Holder for accessories (limit value contacts)
- Measuring tube carries the DN label, and also the measuring range and material
- PVDF floats and stops as standard
- Measuring ranges 50-60.000 l/h
- Operating pressure PN 10 bar at 20 °C

MATERIALS

Measuring tube	Float	Top and bottom inserts	O-ring
PA	PVDF (standard)	PVDF	EPDM (standard), FPM (optional)
PVC	PVDF (standard)	PVDF	EPDM (standard), FPM (optional)
PSU	PVDF (standard)	PVDF	EPDM (standard), FPM (optional)

CONNECTION POSSIBILITIES

Socket	Spigot	Plastic female thread	Metal female thread
PVC adhesive socket (standard)	PP fusion spigot	PVC	Stainless steel V4A
PP fusion socket	PVDF fusion spigot	PP	Malleable cast iron
PVDF fusion socket	PE fusion spigot	PVDF	

PRESSURE LOSS

Measuring range l/h	50-500	100-1,000	150-1,500	250-2,500	200-2,000	300-3,000
Pressure loss mbar	22.84	22.84	22.84	22.84	24.99	24.99
Measuring range l/h	600-6,000	1,000-10,000	1,500-15,000	2,000-20,000	3,000-30,000	8,000-60,000
Pressure loss mbar	24.99	24.99	28.23	45.67	45.67	47.24

MEASURING ACCURACY

Accuracy Class 4 as defined by VDE/DIN 3513 page 2

Flow in %	10	20	30	40	50	60	70	80	90	100
Total measured value error in %	13.00	8.00	6.33	5.50	5.00	4.67	4.43	4.25	4.11	4.00
Total limit value error in %	1.3	1.6	1.9	2.2	2.5	2.9	3.1	3.4	3.7	4.0

FLOAT TYPE FLOW METER

d	DN	Measuring range H ₂ O l/h	M335 / M350	M23
32	25	50-500	▲■●	◆
32	25	100-1,000	▲■●	◆
40	32	150-1,500	▲■●	
40	32	250-2,500	▲■●	
50	40	200-2,000	▲■●	◆
50	40	300-3,000	▲■●	◆
50	40	600-6,000	▲■●	
63	50	600-6,000	▲■●	◆
63	50	1,000-10,000	▲■●	◆ (1,200-12,000 l/h)
63	50	1,500-15,000	▲■●	
75	65	2,000-20,000	▲■●	◆
75	65	3,000-30,000	▲■●	◆
75	65	8,000-60,000	▲■●	

TEMPERATURE RANGE

Measuring tube	Screw connection	Max. temp. at 1 bar
PVC-U	PVC-U	0-60 °C
PA	PVC-U	0-60 °C
PSU	PVC-U	0-60 °C
PSU	PVDF	0-90 °C
PVDF	PVDF	0-100 °C

Key to symbols:

▲ PA (polyamide Trogamid), ■ PSU (polysulphone), ● PVC, ◆ PVDF

Flow meter M335-M350

CHEMICAL RESISTANCE OF (FLOAT-TYPE) FLOW METERS

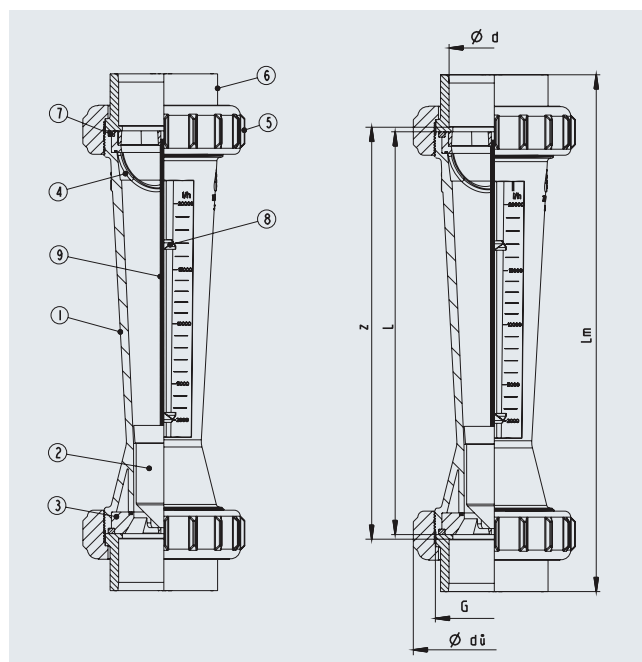
	Chemical	Formula	Concentration	Measuring tube material				Guide rod
				PVC-U	PA	PSU	PVDF	PVDF/Va
Acid	Phosphoric acid	H ₃ PO ₄	75 %	x	O	x	x	x
	Sulphuric acid	H ₂ SO ₄	< 90 %	x	-	-	x	x
	Nitric acid	HNO ₃	< 55 %	x	-	-	x	x
	Nitric acid	HNO ₃	67 %	-	-	-	x	x
	Hydrofluoric acid	HF	< 70 %	x	-	-	x	x
	Hydrochloric acid	HCl	36 %	x	-	x	x	x
Alkali	Ammonia	NH ₄ OH	25 %	x	x	x	-	-
	Potash	KOH	< 50 %	x	O	x	-	-
	Caustic soda	NaOH	< 40 %	x	O	x	-	-
Inorganic	Ferric chloride	FeCl ₃		x	x	x	x	x
	Chlorine bleaching	NaOCl	15 %	x	x	x	-	-
	Sodium bisulphite	NaHSO ₃	< 40 %	x	x	x	x	x
	Hydrogen peroxide	H ₂ O ₂	35 %	x	-	x	O	O
	Aqueous inorganic saline solutions (non-oxidising)	to saturation		x	x	x	x	x
Organic	Formic acid	HCOOH	85 %	O	-	O	O	O
	Acetic acid	CH ₃ COOH	85 %	O	-	O	O	O
	Formaldehyde	H ₂ CO	< 40 %	x	-	x	O	O
	Glycol		< 50 %	O	-	x	x	x
	Acetone	pure			O	-	O	O
	Ethanol, methanol	pure		O	-	x	x	x
	Aliphatic hydrocarbons	pure		O	x	x	x	x

Other concentrations and media available on request X=recommended, O=conditionally recommended, - = not recommended

INDIVIDUAL PARTS

Pos.	Designation	Qty.	Materials
1	Measuring tube	1	PA, PVC, PSU, (PVDF, only M23)
2	Float	1	PVDF
3	Insert, bottom	1	PVDF
4	Insert, top	1	PVDF
5	Union nut	2	PVC, PP, PVDF
6	Insertion part (socket, spigot)	2	PVC, PP, PVDF
7	O-ring	2	EPDM, FPM
8	Setpoint indicator	2	PS
9	Guide rod*	1	PVDF/Va

*from DN 50 1,500-15,000 l/h

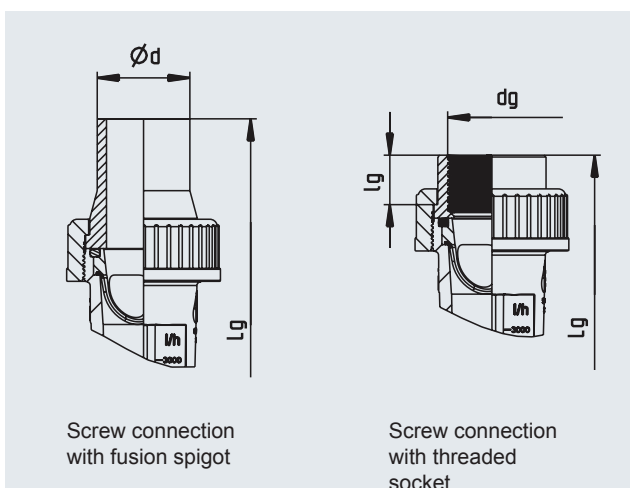


M 350 DIMENSIONS

Dimensions in mm																				
Measuring range I/h ₂ O	Adhesive socket					Fusion socket			Spigot PP			Spigot PVDF			Threaded socket					
	d	DN	G	d _u	L	d _m	z	L _m	d _m	z	L _m	d	L _g	S SDR 11	d	L _g	S SDR 33	d _g	L _g	l _g
50-500	32	25	1 1/2"	60	335	32	341	385	32	345	381	32	455	2.9	32	443	2.4	1"	385	17
100-1,000																				
150-1,500	40	32	2"	72	335	40	341	393	40	345	385	40	461	3.7	40	461	2.4	1 1/4"	393	19
250-2,500																				
200-2,000	50	40	2 1/4"	83	335	50	341	403	50	345	391	50	467	4.6	50	459	3	1 1/2"	403	23
300-3,000																				
600-6,000																				
600-6,000	63	50	2 3/4"	103	335	63	341	417	63	345	399	63	473	5.8	63	461	3	2"	417	23
1,000-10,000																				
1,500-15,000																				
2,000-20,000	75	65	3 1/2"	122	335	75	341	429	75	345	407	75	587	6.9	75	453	3.6	2 1/2"	-	-
3,000-30,000																				
8,000-60,000																				

M 350 DIMENSIONS

Dimensions in mm																				
Measuring range I/h ₂ O	Adhesive socket					Fusion socket			Spigot PP			Spigot PVDF			Threaded socket					
	d	DN	G	d _u	L	d _m	z	L _m	d _m	z	L _m	d	L _g	S SDR 11	d	L _g	S SDR 33	d _g	L _g	l _g
50-500	32	25	1 1/2"	60	350	32	356	400	32	360	396	32	460	2.9	32	458	2.4	1"	400	17
100-1,000																				
150-1,500	40	32	2"	72	350	40	356	408	40	360	400	40	476	3.7	40	476	2.4	1 1/4"	408	19
250-2,500																				
200-2,000	50	40	2 1/4"	83	350	50	356	418	50	360	406	50	482	4.6	50	474	3	1 1/2"	418	23
300-3,000																				
600-6,000																				
600-6,000	63	50	2 3/4"	103	350	63	356	432	63	360	414	63	488	5.8	63	476	3	2"	432	23
1,000-10,000																				
1,500-15,000																				
2,000-20,000	75	65	3 1/2"	122	350	75	356	444	75	360	422	75	602	6.9	75	468	3.6	2 1/2"	444	-
3,000-30,000																				
8,000-60,000																				



Flow meter M335-M350

ARTICLE NUMBERS

			Type M335		Type M350	
d	DN	Measuring tube	PA		PA	
		Measuring range l/h	Float PVDF Art.-No.	Float PVDF/Magnet Art.-No.	Float PVDF Art.-No.	Float PVDF/Magnet Art.-No.
32	25	50 - 500	17.100.214	17.100.256	17.100.298	17.100.340
32	25	100 - 1,000	17.100.215	17.100.257	17.100.299	17.100.341
40	32	150 - 1,500	17.100.216	17.100.258	17.100.300	17.100.342
40	32	250 - 2,500	17.100.217	17.100.259	17.100.301	17.100.343
50	40	200 - 2,000	17.100.218	17.100.260	17.100.302	17.100.344
50	40	300 - 3,000	17.100.219	17.100.261	17.100.303	17.100.345
50	40	600 - 6,000	17.100.220	17.100.262	17.100.304	17.100.346
63	50	600 - 6,000	17.100.221	17.100.263	17.100.305	17.100.347
63	50	1,000 - 10,000	17.100.222	17.100.264	17.100.306	17.100.348
63	50	1,500 - 15,000	17.100.224	17.100.266	17.100.308	17.100.350
75	65	2,000 - 20,000	17.100.225	17.100.267	17.100.309	17.100.351
75	65	3,000 - 30,000	17.100.226	17.100.268	17.100.310	17.100.352
75	65	8,000 - 60,000	17.100.227	17.100.269	17.100.311	17.100.353
d	DN	Measuring tube	PSU		PSU	
32	25	50 - 500	17.100.228	17.100.270	17.100.312	17.100.354
32	25	100 - 1,000	17.100.229	17.100.271	17.100.313	17.100.355
40	32	150 - 1,500	17.100.230	17.100.272	17.100.314	17.100.356
40	32	250 - 2,500	17.100.231	17.100.273	17.100.315	17.100.357
50	40	200 - 2,000	17.100.232	17.100.274	17.100.316	17.100.358
50	40	300 - 3,000	17.100.233	17.100.275	17.100.317	17.100.359
50	40	600 - 6,000	17.100.234	17.100.276	17.100.318	17.100.360
63	50	600 - 6,000	17.100.235	17.100.277	17.100.319	17.100.361
63	50	1,000 - 10,000	17.100.236	17.100.278	17.100.320	17.100.362
63	50	1,500 - 15,000	17.100.238	17.100.280	17.100.322	17.100.364
75	65	2,000 - 20,000	17.100.239	17.100.281	17.100.323	17.100.365
75	65	3,000 - 30,000	17.100.240	17.100.282	17.100.324	17.100.366
75	65	8,000 - 60,000	17.100.241	17.100.283	17.100.325	17.100.367
d	DN	Measuring tube	PVC		PVC	
32	25	50 - 500	17.100.200	17.100.242	17.100.284	17.100.326
32	25	100 - 1,000	17.100.201	17.100.243	17.100.285	17.100.327
40	32	150 - 1,500	17.100.202	17.100.244	17.100.286	17.100.328
40	32	250 - 2,500	17.100.203	17.100.245	17.100.287	17.100.329
50	40	200 - 2,000	17.100.204	17.100.246	17.100.288	17.100.330
50	40	300 - 3,000	17.100.205	17.100.247	17.100.289	17.100.331
50	40	600 - 6,000	17.100.206	17.100.248	17.100.290	17.100.332
63	50	600 - 6,000	17.100.207	17.100.249	17.100.291	17.100.333
63	50	1,000 - 10,000	17.100.208	17.100.250	17.100.292	17.100.334
63	50	1,500 - 15,000	17.100.210	17.100.252	17.100.294	17.100.336
75	65	2,000 - 20,000	17.100.211	17.100.253	17.100.295	17.100.337
75	65	3,000 - 30,000	17.100.212	17.100.254	17.100.296	17.100.338
75	65	8,000 - 60,000	17.100.213	17.100.255	17.100.297	17.100.339

Article numbers for flow meter M23 PVDF on request.


SPECIAL SCALES

Measuring range	Air 0 bar		Air 1 bar		Air 2 bar		Air 3 bar	
H ₂ O l/h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h
50-500	00.005.526	1.5-14	00.005.602	3-20	00.005.615	3-24	00.005.628	3-28
100-1,000	00.005.527	2.5-29	00.005.603	4-41	00.005.616	5-50	00.005.629	5-58
150-1,500	00.005.528	4-45	00.005.604	6-63	00.005.617	7-77	00.005.630	8-90
250-2,500	00.005.529	7-79	00.005.605	10-111	00.005.618	12-136	00.005.631	14-158
200-2,000	00.005.530	6-58	00.005.606	9-82	00.005.619	11-100	00.005.632	12-116
300-3,000	00.005.531	9-108	00.005.607	13-152	00.005.620	16-186	00.005.633	18-216
600-6,000	00.005.532	17-174	00.005.608	24-246	00.005.621	30-301	00.005.634	34-348
600-6,000	00.005.533	17-175	00.005.609	24-247	00.005.622	30-302	00.005.635	34-350
1,000-10,000	00.005.534	29-301	00.005.610	41-425	00.005.623	51-520	00.005.636	58-602
1,500-15,000	00.005.535	53-405	00.005.611	75-572	00.005.624	92-700	00.005.637	106-810
2,000-20,000	00.005.536	55-545	00.005.612	78-770	00.005.625	96-942	00.005.638	110-1,090
3,000-30,000	00.005.537	80-758	00.005.613	113-1,072	00.005.626	139-1,311	00.005.639	160-1,516
8,000-60,000	00.005.538	140-840	00.005.614	200-1,150	00.005.627	250-1,450	00.005.640	300-1,650
Measuring range	Air 4 bar		Air 5 bar		Air 6 bar		Air 7 bar	
H ₂ O l/h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h
50-500	00.005.641	4-31	00.005.654	4-34	00.005.667	5-37	00.005.680	5-39
100-1,000	00.005.642	6-65	00.005.655	7-71	00.005.668	7-76	00.005.681	8-82
150-1,500	00.005.643	9-100	00.005.656	10-110	00.005.669	11-119	00.005.682	12-127
250-2,500	00.005.644	16-177	00.005.657	18-193	00.005.670	19-209	00.005.683	20-223
200-2,000	00.005.645	14-130	00.005.658	15-142	00.005.671	16-153	00.005.684	17-164
300-3,000	00.005.646	21-241	00.005.659	23-264	00.005.672	24-286	00.005.685	26-305
600-6,000	00.005.647	39-389	00.005.660	42-426	00.005.673	45-461	00.005.686	49-492
600-6,000	00.005.648	39-392	00.005.661	42-428	00.005.674	45-463	00.005.687	49-495
1,000-10,000	00.005.649	65-674	00.005.662	72-737	00.005.675	77-797	00.005.688	83-851
1,500-15,000	00.005.650	119-907	00.005.663	130-992	00.005.676	141-1,073	00.005.689	150-1,146
2,000-20,000	00.005.651	124-1,220	00.005.664	135-1,335	00.005.677	146-1,444	00.005.690	156-1,542
3,000-30,000	00.005.652	180-1,697	00.005.665	197-1,857	00.005.678	212-2,008	00.005.691	227-2,145
8,000-60,000	00.005.653	300-1,850	00.005.666	350-2,000	00.005.679	350-2,200	00.005.692	400-2,300
Measuring range	Air 8 bar		HCl 30-33 %		NaOH 30 %		NaOH 50 %	
H ₂ O l/h	Art.-No.	N m ³ /h	Art.-No.	l/h	Art.-No.	l/h	Art.-No.	l/h
50-500	00.005.693	4.5-42	00.005.539	20-405	00.005.552	4-226	00.005.565	1-55
100-1,000	00.005.694	7.5-87	00.005.540	55-866	00.005.553	15-600	00.005.566	3-192
150-1,500	00.005.695	12-135	00.005.541	90-1,340	00.005.554	30-970	00.005.567	6-365
250-2,500	00.005.696	21-237	00.005.542	165-2,310	00.005.555	70-1,800	00.005.568	15-770
200-2,000	00.005.697	18-174	00.005.543	115-1,660	00.005.556	35-1,240	00.005.569	8-520
300-3,000	00.005.698	27-324	00.005.544	190-3,050	00.005.557	75-2,370	00.005.570	15-1,170
600-6,000	00.005.699	51-522	00.005.545	420-4,900	00.005.558	230-4,000	00.005.571	50-2,270
600-6,000	00.005.700	51-525	00.005.546	430-5,090	00.005.559	240-4,700	00.005.572	55-2,300
1,000-10,000	00.005.701	87-903	00.005.547	750-9,460	00.005.560	475-7,340	00.005.573	140-4,340
1,500-15,000	00.005.702	159-1,215	00.005.548	1,415-11,570	00.005.561	1,030-10,330	00.005.574	420-5,820
2,000-20,000	00.005.703	165-1,635	00.005.549	1,500-17,300	00.005.562	915-11,720	00.005.575	245-7,590
3,000-30,000	00.005.704	240-2,274	00.005.550	2,175-24,120	00.005.563	1,195-16,040	00.005.576	400-11,120
8,000-60,000	00.005.705	400-2,500	00.005.551	5,000-58,000	00.005.564	300-34,000	00.005.577	1,700-13,000

Special scales as requested by the customer

Details required: Medium, spec. weight in g/cm³, viscosity in cP or mPas, operating temperature in °C, desired measuring range in l/h.

Application instructions for special scales

When applying special scales later, ensure that the marking  on the scale corresponds with the one on the measuring tube.

Flow meter M335-M350

ACCESSORIES

Limit value contact 240 min.
Limit value contact 242 max.
For further information, refer to the separate data sheets.

INSTALLATION AND ASSEMBLY INSTRUCTIONS

- Install the flow meter into the pipeline system vertically and without tension.
- Provide an inlet and outlet section, Inlet approx. 10 x DN, outlet approx. 5 x DN.

NOTES ON OPERATION

- Avoid pressure surges, as these can damage the unit.
- Exercise caution when installing: the measuring tube must not come into contact with solvent !
- Before start-up, make sure that the connected parts are sufficiently tightened.
- The union nuts must not be mixed up on a measuring tube made from the material PVDF. The overall length also does not correspond to the dimensions table.

We reserve the right to make technical changes in the interest of improvement.

SPECIAL SCALES H₂O WITH OTHER UNITS OF MEASUREMENT

Measuring range series M335/M350

d	DN	l/h	Art.-No.	l/min	Art.-No.	m ³ /h	Art.-No.	US GPM
32	25	50 - 500	00.005.487	0.8 - 8	00.005.740	0.05 - 0.5	00.005.513	0.22 - 2.2
32	25	100 - 1,000	00.005.488	1.7 - 17	00.005.741	0.1 - 1	00.005.514	0.44 - 4.4
40	32	150 - 1,500	00.005.489	2.5 - 25	00.005.742	0.15 - 1.5	00.005.515	0.66 - 6.6
40	32	250 - 2,500	00.005.490	4 - 41	00.005.743	0.25 - 2.5	00.005.516	1.1 - 11
50	40	200 - 2,000	00.005.491	3.3 - 33	00.005.744	0.2 - 2	00.005.517	0.88 - 8.8
50	40	300 - 3,000	00.005.492	5 - 50	00.005.745	0.3 - 3	00.005.518	1.32 - 13.2
50	40	600 - 6,000	00.005.493	10 - 100	00.005.746	0.6 - 6	00.005.519	2.64 - 26.4
63	50	600 - 6,000	00.005.494	10 - 100	00.005.747	0.6 - 6	00.005.520	2.64 - 26.4
63	50	1,000 - 10,000	00.005.495	16 - 166	00.005.748	1 - 10	00.005.521	4.4 - 44.02
63	50	1,500 - 15,000	00.005.496	25 - 250	00.005.749	1.5 - 15	00.005.522	6.6 - 66.04
75	65	2,000 - 20,000	00.005.497	33 - 330	00.005.750	2 - 20	00.005.523	8.8 - 88
75	65	3,000 - 30,000	00.005.498	50 - 500	00.005.751	3 - 30	00.005.524	13.2 - 132
75	65	8,000 - 60,000	00.005.499	133 - 1,000	00.005.752	8 - 60	00.005.525	35.2 - 264

PRESSURE CORE TABLE FOR GASES: CALIBRATION PRESSURE 0 BAR

Operating pressure in bar	Factor x display value	Operating pressure in bar	Factor x display value
0.0	1.000	3.0	2.000
0.2	1.095	4.0	2.240
0.4	1.184	5.0	2.450
0.6	1.265	6.0	2.650
0.8	1.340	7.0	2.830
1.0	1.414	8.0	3.000
1.5	1.580	9.0	3.165
2.0	1.730	10.0	3.320

This table is used to correct values displayed for gases by the flow meter if the operating pressure deviates from the pressure used as a basis for the calibration. The values displayed on the flow meter are simply multiplied by the factor corresponding to the operating pressure.

We supply special scales for operating pressures of between 1 and 8 bar (see page 7).

Limit value contact

Z 40 min./Z 42 max.

For float-type
flow meters

M335/M350/M123/M23 PVDF



USE

The limit value contacts Z40 and Z42 are used for external monitoring of limited flow values on our (float-type) flow meters. They are pushed onto the guide rod located on the flow meter and can be adjusted to any desired value on the corresponding scale.

FUNCTION

A solenoid installed in the float closes or opens a reed contact permanently cast in the limit value contact. The switching function is bistable. This means that the switching state is maintained even if the solenoid float moves away from the contact.

SWITCHING STATES

	Float above	Float below
Z40 min	open	closed
Z42 max	closed	open

Attention

When retrofitting the flow meter with limit value contacts, ensure that the standard float is replaced with a solenoid float. The solenoid float is clearly identified by an "M" on the top.

ORDER NUMBERS

Z40 min.	17.100.686
Z42 max.	17.100.687

TECHNICAL DATA

Switching voltage*	max. 230 V~
Switching rating*	max. 10 W/12 VA
Switching current*	max. 0.5 A
Contact resistance	< 200 mOhm
Leakage resistance	> 1011 Ohm
Permissible ambient temperature	0 to +55°C
Protection type in acc.	with DIN 40050-IP 65
Switching hysteresis	1-2 mm float travel

We reserve the right to make technical changes in the interest of improvement.

* Even a brief overshoot is not permitted. This is uncontrollable with inductive or capacitive peaks, e.g. with contactors or solenoid valves. It is therefore recommended to use a limit value switch or a contact protection relay.

Flow meter M335-M350

Measurement sensor Z60
4-20 mA output signal

For float-type flow meters
M335/M350/M23 PVDF



DESCRIPTION

The Z60 measurement sensor is a further development of the Z50 measurement sensor. In contrast to the predecessor model, the Z60 no longer uses reed contacts, but instead a new, specially developed electronics system with a microprocessor and sensors. The measurement sensor delivers an output signal of 4-20 mA depending on the vertical position of the solenoid float in the flow meter. This signal can be processed further, e.g. via an SPS in order to control processes, or to indicate the flow rate precisely on an external display.

Please note :

As the resolution of the different scales varies, we always program the respective measurement range individually. For this reason, please notify us of the desired measurement range when ordering.

TECHNICAL DATA

- Supply voltage: 12-24 VDC (+ -10%)
- Power consumption: < 50 mA
- Load resistance: Min. 0 max. 500 Ohm
- Current output: 4-20 mA (3 conductors)
- Protection type: IP 65
- Ambient temperature: 0 °C to +50 °C
- Connector: DIN 43650 connector
- Measurement accuracy: < 1 %

Electrical connection

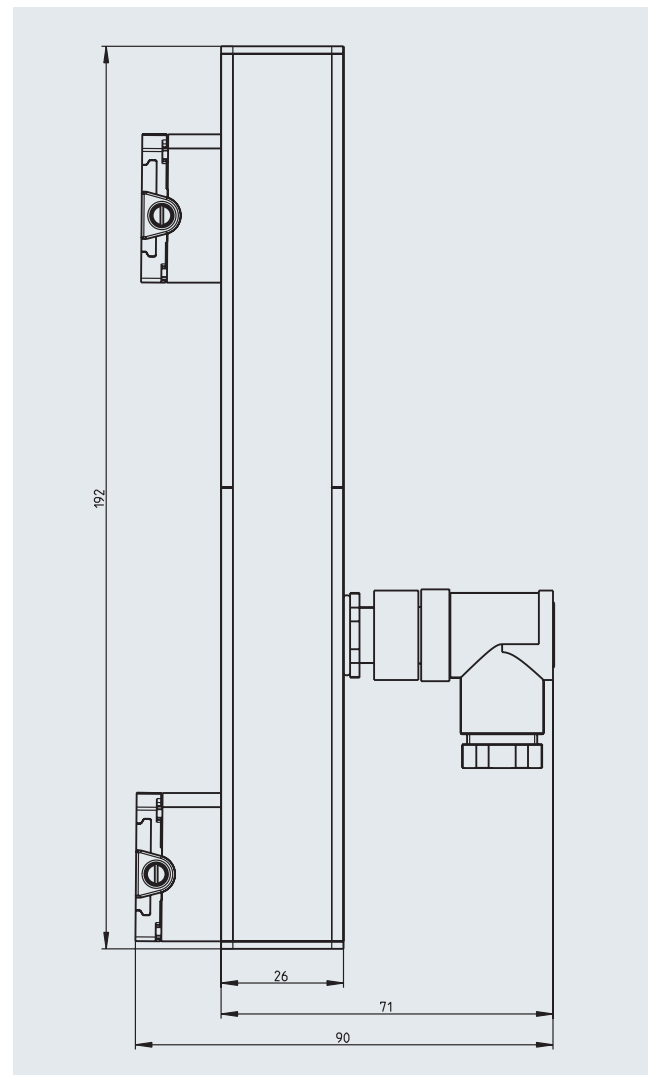
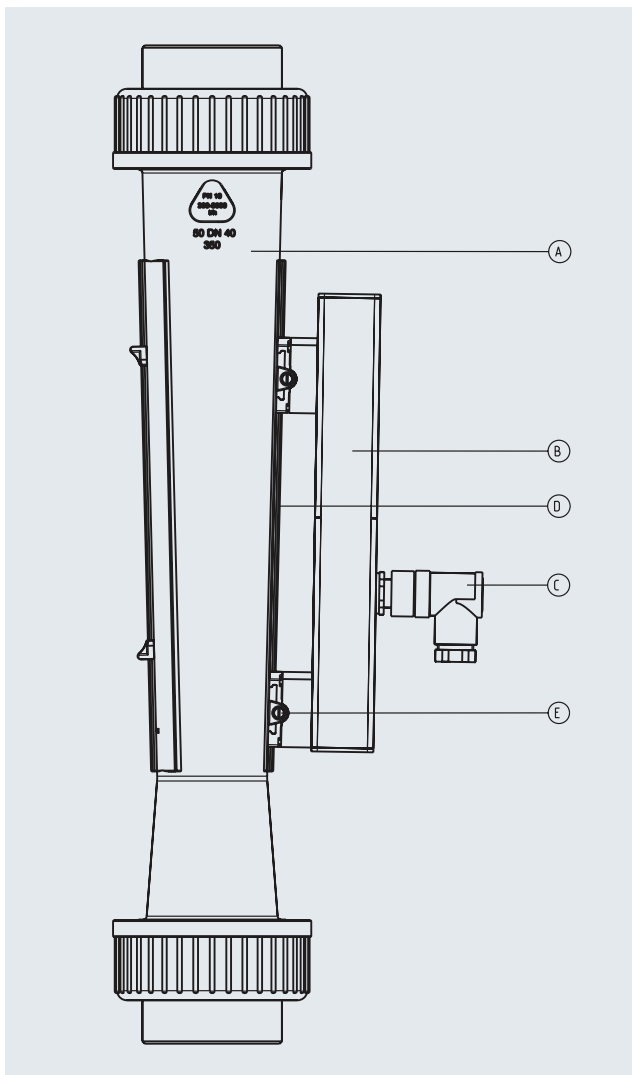
- Pin 1: Operating voltage
12-24 V 1 O ← +24 V
- Pin 2: Output signal
4-20 mA 2 O → 4-20 mA -----R
- Pin 3: 0 V 3 O →

Functional elements

- A M335/M350 flow meters with solenoid float
- B Z60 measurement sensor
- C Plug connector
- D Guide rod
- E Clamping screw for attaching and adjusting the sensor

Assembly instructions

1. Slide the sensor onto the guiding rod on the flow meter
2. Align the marking on the sensor with the 50% marking on the flow meter scale
3. Tighten clamping screws
4. Remove connector and wire it according to specifications (see “Electrical connection”)



ARTICLE NUMBERS

Measuring range l/h	Article No.	Measuring range l/h	Article No.
50 - 500	17.100.926	600 - 6,000 (DN50)	17.100.933
100 - 1,000	17.100.927	1,000 - 10,000	17.100.934
150 - 1,500	17.100.928	1,500 - 15,000	17.100.935
250 - 2,500	17.100.929	2,000 - 20,000	17.100.936
200 - 2,000	17.100.930	3,000 - 30,000	17.100.937
300 - 3,000	17.100.931	8,000 - 60,000	17.100.938
600 - 6,000 (DN40)	17.100.932		



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Flow meter M123

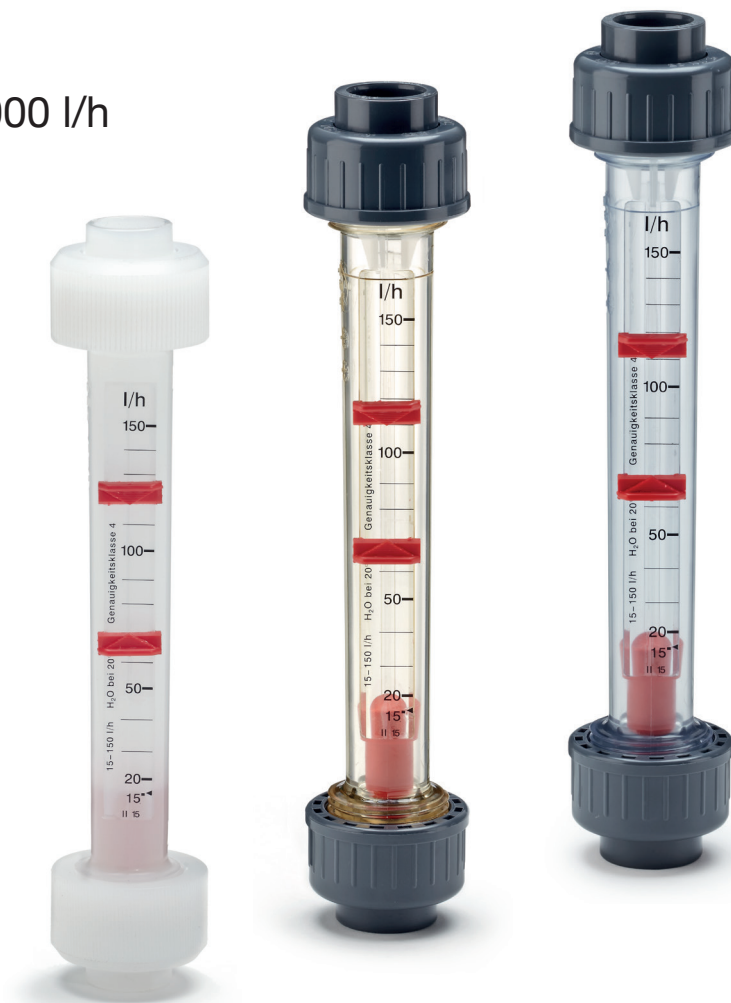
FACTS | FIGURES | DATA



Flow meter M123

Flow meter M123

Measuring ranges 1.5-1,000 l/h



M 123 PVDF

M 123 PSU

M 123 PVC

FUNCTION

The M123 flow meter works on the float principle and is used to measure the flow rate in closed pipelines. The medium flows through the vertically installed flow meter from bottom to top. This raises the float and shows the current flow rate on the scale on the measuring device. The read-off edge corresponds to the largest diameter of the float.

The M123 flow meters have a water scale and 2 setpoint indicators as standard.

SPECIAL FEATURES

- Fracture-proof and corrosion-resistant
- Radially removable
- Adhesive special scales, for liquid and gaseous media
- Holder for accessories (limit value contacts)
- Measuring tube carries the DN label, and also the measuring range and material
- PVDF floats and stops as standard
- Measuring ranges 1.5-1,000 l/h
- Less space required thanks to short overall length
- Operating pressure PN 10 at 20 °C

MATERIALS

Measuring tube	Float	Insert, top and bottom	O-ring
PVC	PVDF	PVDF	EPDM (standard), FPM (optional)
PSU	PVDF	PVDF	EPDM (standard), FPM (optional)
PVDF	PVDF	PVDF	FPM (standard)

CONNECTION POSSIBILITIES

Socket	Spigot	Plastic female thread	Metal female thread
PVC adhesive socket (standard)	PP fusion socket	PVC	Stainless steel V4A
PP fusion spigot	PVDF fusion spigot	PP	Malleable cast iron
PVDF fusion socket	PE fusion spigot	PVDF	

PRESSURE LOSS

Measuring range l/h	1.5-15	2.5-25	5-50	10-100	8-80	15-150	20-200	15-150	30-300	50-500	100-1,000
Pressure loss mm WS	46.0	46.0	46.0	46.0	44.7	44.7	44.7	82.8	82.8	82.8	82.8
Measuring range l/h	1.5-15	2.5-25	5-50	10-100	8-80	15-150	20-200	15-150	30-300	50-500	100-1,000
Pressure loss mbar	4.6	4.6	4.6	4.6	4.47	4.47	4.47	8.28	8.28	8.28	8.28

Operating pressure: max. PN 10 at 20 °C

MEASURING ACCURACY

Accuracy Class 4 as defined by VDE/DIN 3513 page 2

Flow in %	10	20	30	40	50	60	70	80	90	100
Total measured value error in %	13.00	8.00	6.33	5.50	5.00	4.67	4.43	4.25	4.11	4.00
Total limit value error in %	1.3	1.6	1.9	2.2	2.5	2.9	3.1	3.4	3.7	4.0

FLOAT-TYPE FLOW METER

d	DN	Measuring range H ₂ O	M 123
16	10	1.5-15	■ ●
16	10	2.5-25	■ ● ▲
16	10	5-50	■ ● ▲
16	10	10-100	■ ● ▲
20	15	8-80	■ ● ▲
20	15	15-150	■ ● ▲
20	15	20-200	■ ● ▲
32	25	15-150	■ ● ▲
32	25	30-300	■ ● ▲
32	25	50-500	■ ● ▲
32	25	100-1,000	■ ● ▲

Key to symbols: ■ PSU (Polysulphone), ● PVC, ▲ PVDF

TEMPERATURE RANGE

Measuring tube	Screw connection	Max. temp. at 1 bar
PVC-U	PVC-U	0-60 °C
PA	PVC-U	0-60 °C
PSU	PVC-U	0-60 °C
PSU	PVDF	0-90 °C
PVDF	PVDF	0-100 °C

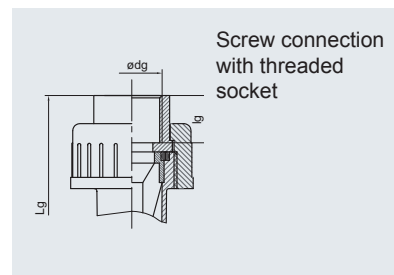
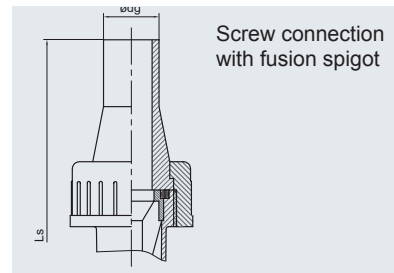
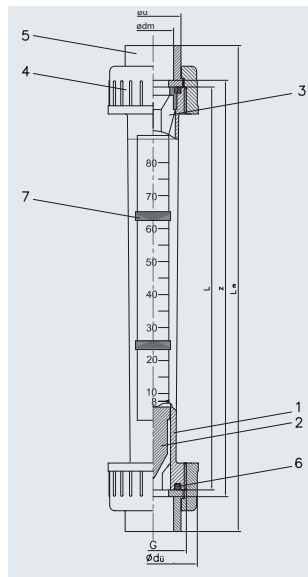
Flow meter M123

ARTICLE NUMBERS

d	DN	Measuring tube range l/h	PVC		PSU		PVDF	
			Float PVDF Art.-No.	Float PVDF/Magnet Art.-No.	Float PVDF Art.-No.	Float PVDF/Magnet Art.-No.	Float PVDF Art.-No.	Float PVDF/Magnet Art.-No.
16	10	1.5 - 15	17.003.700	17.003.711	17.000.862	17.001.459		
16	10	2.5 - 25	17.003.701	17.003.712	17.000.864	17.001.461	17.003.611	17.003.622
16	10	5 - 50	17.003.702	17.003.713	17.000.866	17.001.463	17.003.612	17.003.623
16	10	10 - 100	17.003.703	17.003.714	17.000.868	17.001.465	17.003.613	17.003.624
20	15	8 - 80	17.003.704	17.003.715	17.000.895	17.001.467	17.003.614	17.003.625
20	15	15 - 150	17.003.705	17.003.716	17.000.897	17.001.469	17.003.615	17.003.626
20	15	20 - 200	17.003.706	17.003.717	17.000.899	17.001.471	17.003.616	17.003.627
32	25	15 - 150	17.003.707	17.003.718	17.000.901	17.001.473	17.003.617	17.003.628
32	25	30 - 300	17.003.708	17.003.719	17.000.903	17.001.475	17.003.618	17.003.629
32	25	50 - 500	17.003.709	17.003.720	17.000.905	17.001.477	17.003.619	17.003.630
32	25	100 - 1,000	17.003.710	17.003.721	17.000.907	17.001.479	17.003.620	17.003.631

INDIVIDUAL PARTS

Pos.	Designation	Material
1	Measuring tube	PSU, PVC, PVDF
2	Float	PVDF
3	Insert, top	PVDF
4	Union cut	PVC, PP, PVDF
5	Insertion part	PVC, PP, PVDF
6	O-ring	EPDM, FPM
7	Setpoint indicator	PS



DIMENSIONS (in mm)

Measuring range l/hH ₂ O	Adhesive socket						Fusion socket			Spigot PP			Threaded socket				
	d	DN	G	d _u	L	d _m	z	L _m	d _m	z	L _m	d	L _g	S	d	L _g	l _g
1.5-15	16	10	3/4"	35	165	16	171	199	15.5	175	201				3/8"	199	11
2.5-25																	
5-50																	
10-100																	
8-80	20	15	1"	20	191	20	191	223	19.5	195	223	20	293	1.9	1/2"	223	13
15-150																	
20-200																	
15-150	32	25	1 1/2"	60	200	36	206	250	31.5	210	246	32	320	3.0	1"	250	17
30-300																	
50-500																	
100-1,000																	

SPECIAL SCALES

Measuring range	Air 0 bar		Air 1 bar		Air 2 bar		Air 3 bar	
H ₂ O l/h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h
1.5 - 15	00.000.998	0.10 - 0.55	00.001.050	0.15 - 0.80	00.001.051	0.17 - 0.9	00.001.052	0.20 - 1.1
2.5 - 25	00.001.059	0.2 - 0.95	00.001.060	0.25 - 1.3	00.001.061	0.3 - 1.6	00.001.062	0.4 - 1.9
5 - 50	00.001.070	0.5 - 1.9	00.001.071	0.7 - 2.7	00.001.072	0.8 - 3.4	00.001.073	1.0 - 3.8
10 - 100	00.001.081	0.8 - 3.0	00.001.082	1.0 - 4.2	00.001.083	1.2 - 5.4	00.001.084	1.4 - 6.4
8 - 80	00.001.092	0.6 - 2.8	00.001.093	0.8 - 4	00.001.094	1.0 - 5.0	00.001.095	1.2 - 5.6
15 - 150	00.001.103	1.4 - 5.6	00.001.104	2 - 8	00.001.105	2 - 10	00.001.106	3 - 12
20 - 200	00.001.114	1.5 - 7.0	00.001.115	2 - 10	00.001.116	3 - 13	00.001.117	3 - 15
15 - 150	00.001.125	1.0 - 6.5	00.001.126	1 - 90	00.001.127	1.5 - 11	00.001.128	2 - 13
30 - 300	00.001.136	1.5 - 11	00.001.137	2 - 15	00.001.138	2.5 - 18	00.001.139	3 - 22
50 - 500	00.001.147	3 - 18	00.001.148	4 - 25	00.001.149	5 - 30	00.001.150	5 - 35
100 - 1,000	00.001.158	6 - 30	00.001.159	8 - 44	00.001.160	10 - 54	00.001.161	12 - 62

Measuring range	Air 4 bar		Air 5 bar		Air 6 bar		Air 7 bar	
H ₂ O l/h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h
1.5 - 15	00.001.053	0.25 - 1.20	00.001.054	0.25 - 1.3	00.000.999	0.26 - 1.45	00.001.055	0.30 - 1.5
2.5 - 25	00.001.063	0.4 - 2.1	00.001.064	0.5 - 2.4	00.001.065	0.5 - 2.5	00.001.066	0.5 - 2.7
5 - 50	00.001.074	1.2 - 4.2	00.001.075	1.2 - 4.6	00.001.076	1.2 - 5.0	00.001.077	1.4 - 5.4
10 - 100	00.001.085	1.6 - 7.0	00.001.086	1.6 - 7.4	00.001.087	2.0 - 8.0	00.001.088	2 - 8.8
8 - 80	00.001.096	1.4 - 6.4	00.001.097	1.4 - 7.0	00.001.098	1.5 - 7.5	00.001.099	1.5 - 8.0
15 - 150	00.001.107	3 - 13	00.001.108	3 - 14	00.001.109	3.5 - 15	00.001.110	3.5 - 16.5
20 - 200	00.001.118	4 - 17	00.001.119	4 - 18	00.001.120	4 - 20	00.001.121	5 - 21
15 - 150	00.001.129	2 - 14.5	00.001.130	2 - 16	00.001.131	2 - 17	00.001.132	2.5 - 18
30 - 300	00.001.140	3 - 24	00.001.141	4 - 26	00.001.142	4 - 28	00.001.143	4 - 30
50 - 500	00.001.151	6 - 40	00.001.152	6 - 44	00.001.153	8 - 48	00.001.154	8 - 50
100 - 1,000	00.001.162	12 - 70	00.001.163	15 - 75	00.001.164	15 - 80	00.001.165	15 - 85

Measuring range	Air 8 bar		Air 9 bar		Air 10 bar	
H ₂ O l/h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h	Art.-No.	N m ³ /h
1.5 - 15	00.001.056	0.3 - 1.6	00.001.057	0.3 - 1.7	00.001.058	0.35 - 1.8
2.5 - 25	00.001.067	0.6 - 2.9	00.001.068	0.6 - 3.0	00.001.069	0.6 - 3.2
5 - 50	00.001.078	1.4 - 5.8	00.001.079	1.6 - 6.0	00.001.080	1.6 - 6.4
10 - 100	00.001.089	2.0 - 9.0	00.001.090	2 - 10	00.001.091	2 - 10
8 - 80	00.001.100	1.5 - 8.5	00.001.101	2.0 - 9.0	00.001.102	2.0 - 9.5
15 - 150	00.001.111	4 - 17	00.001.112	4 - 18	00.001.113	4 - 19
20 - 200	00.001.122	5 - 23	00.001.123	5 - 23	00.001.124	5 - 25
15 - 150	00.001.133	2.5 - 19.5	00.001.134	3 - 20	00.001.135	3 - 21
30 - 300	00.001.144	4 - 33	00.001.145	5 - 34	00.001.146	5 - 35
50 - 500	00.001.155	8 - 54	00.001.156	8 - 56	00.001.157	10 - 60
100 - 1,000	00.001.166	20 - 90	00.001.167	20 - 95	00.001.168	20 - 100

Flow meter M123

SPECIAL SCALES

Measuring range	HCl 30-33 % (PSU)		NaOH 30 %		NaOH 50 %	
	Art.-No.	l/h	Art.-No.	l/h	Art.-No.	l/h
1.5 - 15	00.005.117	1 - 10	00.005.144	0.1 - 2.0	–	–
2.5 - 25	00.005.118	2.5 - 20	00.005.145	0.2 - 5	–	–
5 - 50	00.005.119	5 - 40	00.005.128	1 - 14	–	–
10 - 100	00.005.120	10 - 85	00.005.129	3 - 35	–	–
8 - 80	00.005.121	8 - 70	00.005.130	2 - 23	00.005.137	0.2 - 3.5
15 - 150	00.005.122	15 - 125	00.005.131	3 - 55	00.005.138	0.5 - 10
20 - 200	00.005.123	20 - 170	00.005.132	5 - 80	00.005.139	0.5 - 16
15 - 150	00.005.124	5 - 125	00.005.133	3 - 55	00.005.140	0.5 - 11
30 - 300	00.005.125	30 - 260	00.005.134	6 - 130	00.005.141	1 - 33
50 - 500	00.005.126	50 - 425	00.005.135	10 - 250	00.005.142	2 - 80
100 - 1,000	00.005.127	100 - 850	00.005.136	40 - 600	00.005.143	10 - 220

Special scales as requested by the customer

Details required: Medium, spec. weight in g/cm³, viscosity in cP or mPas, operating temperature in °C, desired measuring range in l/h.

Application instructions for special scales

When applying special scales later, ensure that the marking ◀ on the scale corresponds with the one on the measuring tube.

ACCESSORIES

Limit value contact Z 40 min.
Limit value contact Z 42 max.

INSTALLATION AND ASSEMBLY INSTRUCTIONS

- Install the flow meter into the pipeline system vertically and without tension.
- Provide an inlet and outlet section Inlet approx. 10 x DN, outlet approx. 5 x DN.

NOTES ON OPERATION

- Avoid pressure surges, as these can damage the unit.
- Exercise caution when installing. The measuring tube must not come into contact with solvent.
- Before start-up, make sure that the connected parts are sufficiently tightened.
- The union nuts must not be mixed up on a measuring tube made from the material PVDF. The overall length also does not correspond to the dimensions table.

We reserve the right to make technical changes in the interest of improvement.

SPECIAL SCALES H₂O WITH OTHER UNITS OF MEASUREMENT

Measuring range Series M 123

d	DN	l/h	Art.-No.	USGPM
16	10	1.5 - 15	00.000.959	0.006 - 0.066
16	10	2.5 - 25	00.000.961	0.01 - 0.11
16	10	5 - 50	00.000.962	0.02 - 0.22
16	10	10 - 100	00.000.963	0.04 - 0.44
20	15	8 - 80	00.000.964	0.035 - 0.35
20	15	15 - 150	00.000.965	0.06 - 0.66
20	15	20 - 200	00.000.966	0.08 - 0.8
32	25	15 - 150	00.000.967	0.06 - 0.66
32	25	30 - 300	00.000.968	0.13 - 1.3
32	25	50 - 500	00.000.969	0.22 - 2.2
32	25	100 - 1,000	00.000.970	0.44 - 4.4

PRESSURE CORE TABLE FOR GASES: CALIBRATION PRESSURE 0 BAR

Operating pressure in bar	Factor x display value	Operating pressure in bar	Factor x display value
0.0	1.000	3.0	2.000
0.2	1.095	4.0	2.240
0.4	1.184	5.0	2.450
0.6	1.265	6.0	2.650
0.8	1.340	7.0	2.830
1.0	1.414	8.0	3.000
1.5	1.580	9.0	3.165
2.0	1.730	10.0	3.320

Limit value contact

Z 40 min./Z 42 max.

For float-type
flow meters

M335/M350/M123/ M23 PVDF



USE

The limit value contacts Z40 and Z42 are used for external monitoring of limited flow values on our (float-type) flow meters. They are pushed onto the guide rod located on the flow meter and can be adjusted to any desired value on the corresponding scale.

FUNCTION

A solenoid installed in the float closes or opens a reed contact permanently cast in the limit value contact. The switching function is bistable. This means that the switching state is maintained even if the solenoid float moves away from the contact.

SWITCHING STATES

	Float above	Float below
Z 40 min	open	closed
Z 42 max	closed	open

Attention

When retrofitting the flow meter with limit value contacts, ensure that the standard float is replaced with a solenoid float. The solenoid float is clearly identified by an “M” on the top.

ORDER NUMBERS

Z40 min.	17.100.686
Z42 max.	17.100.687

TECHNICAL DATA

Switching voltage*	max. 230 V~
Switching rating*	max. 10 W/12 VA
Switching current*	max. 0.5 A
Contact resistance	< 200 mOhm
Leakage resistance	> 1011 Ohm
Permissible ambient temperature	0 to +55°C
Protection type in acc.	with DIN 40050-IP 65
Switching hysteresis	1-2 mm float travel

We reserve the right to make technical changes in the interest of improvement.

* Even a brief overshoot is not permitted. This is uncontrollable with inductive or capacitive peaks, e.g. with contactors or solenoid valves. It is therefore recommended to use a limit value switch or a contact protection relay.



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