

Technical Information

VersaFlow Mag 1000 Electromagnetic Flow Sensor Specifications, 34-VF-03-16, June 2022



Solution for the Water and Wastewater Industry

The VersaFlow electromagnetic flow sensor is the optimum solution for water and wastewater applications. Its long-term reliability and durability make it the standard flow sensor for the water market.

Highlights

- Extensive diagnostic capabilities.
- Quick to install and easy to operate.
- Time proven design.
- Maintenance free.
- In site verification with HONEYWELL Mag Check.
- Compliance with ISO 4064, EN14154.
- Permanently submersible, buried underground (option).



Figure 1 – VersaFlow Magnetic Flow sensor

Industries

- Water & Wastewater
- Pulp & paper
- Minerals & Mining
- Iron, Steel & Metals
- Power Plant
- Chemicals & Petrochemicals
- Oil & Gas
- Pharmaceuticals

Applications

- Water distribution networks
- Irrigation
- Municipal watering
- Water purification
- Cooling stations
- District heating
- Sewage and sludge
- Leakage detection
- Revenue metering or Billing

Electromagnetic Product range

VersaFlow Converters are compatible with all sensors



TWM9000 Integral Mounted



TWM9000 Remote Mounted



TWM9000 Wall Mounted



TWM1000

Technical Data**Table 2**

Measuring System		
Measuring principle	Faraday's Law	
Application range	Electrically conductive fluids	
Conductivity		
Non-water	>5 μS	min. 1 $\mu\text{S}/\text{cm}$ (TWM 9000), min. 5 $\mu\text{S}/\text{cm}$ (TWM 1000)
Water	min. 20 $\mu\text{S}/\text{cm}$	
Measured value		
Primary value	Flow velocity	
Secondary value	Volume flow	
Design		
Features	Fully welded maintenance free sensor	
	Standard as well as customized designs e.g higher pressure ratings	
	Industry standard insertion lengths	
Construction	The measurement system consists of a flow sensor and a signal converter. Signal converter is available as compact or separate version.	
Compact version	With signal converter TWM1000 & TWM9000	
Housing Remote version	Wall mount (W) with TWM1000	
	Field (F), wall (W) or rack (R) mount with TWM9000	
Performance specifications		
Measuring accuracy		
Sensor diameter	Signal converter type	Accuracy
DN 25...2000 / 1...80"	TWM9000	$\pm 0.2\%$ of mv + 1 mm/s
DN 25...1200 / 1...48"	TWM1000	$\pm 0.3\%$ of mv + 1 mm/s
Repeatability	$\pm 0.1\%$ of measured value, minimum 1 mm/s	
Stability	$\pm 0.1\%$ of measured value	
Calibration	Standard: 2-point calibration by direct volume comparison	
Measuring range	-12...+12 m/s / -40...+40 ft/s	
Pressure loss	Negligible	
Permissible gas and solid content		
Gas content(volume)	TWM9000: $\leq 5\%$	
Solid content(volume)	TWM1000: $\leq 10\%$	
Solid content(volume)	TWM9000: $\leq 70\%$	
Versions		
Configuration	Compact	Separate
VersaFlow MAG 1000	TWM 9000C TWM 1000C	TWM9000F, R, W TWM1000W

Measuring Accuracy

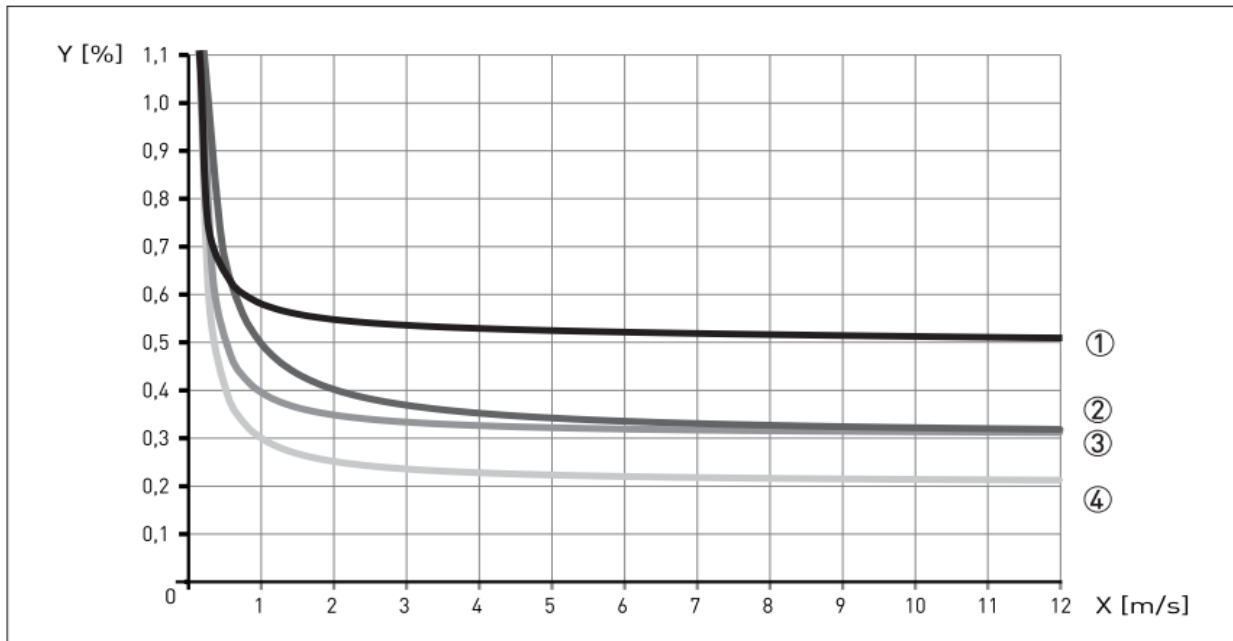


Figure 2 – Flow velocity vs. accuracy

X [m/s] : flow velocity
 Y [%] : deviation from the actual measured value (mv)

Accuracy

Table 3

Flow Sensor diameter	Signal Converter type	Accuracy	Curve
DN25...1600 / 1...64"	TWM 9000	± 0.2% of mv + 1 mm/s	(4)
DN25...1200 / 1...48"	TWM 1000	± 0.3% of mv + 1 mm/s	(3)
DN1800...3000 / > 64"	TWM 9000	± 0.3% of mv + 2 mm/s	(2)

Measuring error

The measuring error is obtained from the combined effects of accuracy and zero stability.

Reference conditions

- Product: Water
- Temperature: +5...35°C / +41...95°F
- Operating pressure: 0.1...5 barg / 1.5...72.5 psig
- Inlet section: > 5 DN
- Outlet section: > 2 DN

Temperature range**Table 4**

Temperature range	Process [°C]		Ambient [°C]		Process [°F]		Ambient [°F]	
	min.	max.	min.	max.	min.	max.	min.	max.
Hard rubber								
Remote Converter (TWM 1000 or TWM 9000)	-5	80	-40	65	23	176	-40	149
Compact with TWM 1000 or TWM 9000	-5	80	-40	65	23	176	-40	149
Polypropylene								
Remote Converter (TWM 1000 or TWM 9000)	-5	90	-40	65	23	194	-40	149
Compact with TWM 1000 or TWM 9000	-5	90	-40	65	23	194	-40	149
*Polypropylene available for DN 25 – 150, ASME 1" – 6"								

Vacuum Load**Table 5**

Liner	Diameter	Minimum operating pressure absolute in mbar (abs) at process temperature			
		[mm]	20°C	40°C	60°C
Polypropylene	DN 25 - 150	250	250	400	400
	DN 200 - 300	250	250	400	400
Hard rubber	DN 350 - 1000	500	500	600	600
	DN 1200 - 3000	600	600	750	750

Table 6

Liner	Diameter	Minimum operating pressure absolute in psia at process temperature			
		[inch]	68°F	104°F	140°F
Polypropylene	1" – 6"	3,6	3,6	5,8	5,8
	8" – 12"	3,6	3,6	5,8	5,8
Hard rubber	14" – 40"	7,3	7,3	8,7	8,7
	48" -120"	8,7	8,7	10,9	10,9

Dimensions and Weights

Table 7

Nominal size		Dimensions [mm]							Approx. weight
DN	PN	L		H	W	Total (T)			[kg]
[mm]	[bar]	DIN	ISO			box	TWM 1000	TWM 9000	
DN25...150									
25	40	150	200	140	115	218	245	297	5
32	40	150	200	157	140	235	262	314	6
40	40	150	200	166	150	244	271	323	7
50	40	200	200	186	165	264	291	343	11
65	16	200	200	200	185	278	305	357	9
80	40	200	200	209	200	287	314	366	14
100	16	250	250	237	220	315	342	394	15
125	16	250	250	266	250	344	371	423	19
150	16	300	300	300	285	378	405	457	27
DN200...600									
200	10	350	350	361	340	439	466	518	34
250	10	400	450	408	395	486	513	565	48
300	10	500	500	458	445	536	563	615	58
350	10	500	550	510	505	588	615	667	78
400	10	600	600	568	565	646	673	725	101
450	10	600	-	618	615	696	723	775	111
500	10	600	-	671	670	749	776	828	130
600	10	600	-	781	780	859	886	938	165
DN700...2000									
700	10	700	-	898	895	976	1003	1055	248
800	10	800	-	1012	1015	1090	1117	1169	331
900	10	900	-	1114	1115	1192	1219	1271	430
1000	10	1000	-	1225	1230	1303	1330	1382	507
1200	6	1200	-	1417	1405	1495	-	1574	555
1400	6	1400	-	1619	1630	1697	-	1776	765
1600	6	1600	-	1819	1830	1897	-	1976	1035
1800	6	1800	-	2027	2045	2105	-	2184	1470
2000	6	2000	-	2259	2265	2337	-	2416	1860

Table 8

Nominal size		Dimensions 150 lbs [inch]						Approx. weight
ASME	PN	L	H	W	Total (T)			[lb]
[inch]	[psi]				box	TWM 1000	TWM9000	
DN 1"…6"								
1"	284	5,91	5,39	4,25	8,46	9,53	11,57	9
1 1/2"	284	5,91	6,1	5	9,17	10,24	12,28	15
2"	284	7,87	7,05	5,98	10,12	11,18	13,23	18
3"	284	7,87	8,03	7,5	11,1	12,17	14,21	26
4"	284	9,84	9,49	9	12,56	13,62	15,67	44
5"	284	9,84	10,55	10	13,62	14,69	16,73	49
6"	284	11,81	11,69	11	14,76	15,83	17,87	64
DN8"…24"								
8"	284	13,78	14,25	13,5	17,32	18,39	20,43	95
10"	284	15,75	16,3	16	19,37	20,43	22,48	143
12"	284	19,69	18,78	19	21,85	22,91	24,96	207
14"	284	27,56	20,67	21	23,74	24,8	26,85	284
16"	284	31,5	22,95	23,5	26,02	27,09	29,13	364
18"	284	31,5	24,72	25	27,8	28,86	30,91	410
20"	284	31,5	26,97	27,5	30,04	31,1	33,15	492
24"	284	31,5	31,38	32	34,45	35,51	37,56	675
Pressures are applicable at 20°C (68°F)								
For higher temperatures, the pressure and temperature ratings are as per ASME B16.5 (up to 24") or ASME B16.47 (>24")								

Table 9

Nominal size		Dimensions 150 lbs [mm]						Approx. weight
ASME	PN	L	H	W	T			[kg]
[inch]	[psi]				box	TWM1000	TWM9000	
DN 1"…6"								
1"	284	150	137	108	215	242	294	8
1 1/2"	284	150	155	127	233	260	312	10
2"	284	200	179	152	257	284	336	13
3"	284	200	204	190,5	282	309	361	17
4"	284	250	241	228,6	319	346	398	23
5"	284	250	268	254	346	373	425	27
6"	284	300	297	279,4	375	402	454	34
DN 8"…24"								
8"	284	350	362	342,9	440	467	519	43
10"	284	400	414	406,4	492	519	571	65
12"	284	500	477	482,6	555	582	634	94
14"	284	700	525	533,4	603	630	682	129
16"	284	800	583	596,9	661	688	740	165
18"	284	800	628	635	706	733	785	186
20"	284	800	685	698,5	763	790	842	223
24"	284	800	797	812,8	875	902	954	306
Pressures are applicable at 20 °C (68 °F)								
For higher temperatures, the pressure and temperature ratings are as per ASME B16.5 (up to 24") or ASME B16.47 (>24")								

Table 10

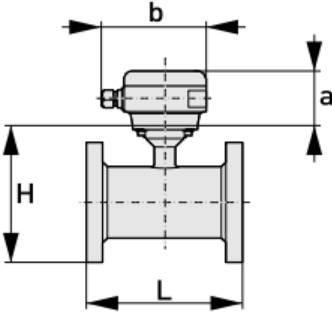
Nominal size		Dimensions 300 lbs [inch]						Approx. weight
ASME	PN	L	H	W	T			[lbs]
[inch]	[psi]				box	TWM 1000	TWM9000	
DN 1"…6"								
1"	741	5,91	5,71	4,87	8,78	9,84	11,89	18
1 1/2"	741	7,87	6,65	6,13	9,72	10,79	12,83	20
2"	741	9,84	7,32	6,5	10,39	11,46	13,5	29
3"	741	9,84	8,43	8,25	11,5	12,56	14,61	37
4"	741	11,81	10	10	13,07	14,13	16,18	51
6"	741	12,6	12,44	12,5	15,51	16,57	18,62	79
DN 8"…24"								
8"	741	15,75	15,04	15	18,11	19,17	21,22	157
10"	741	19,69	17,05	17,5	20,12	21,18	23,23	247
12"	741	23,62	20	20,5	23,07	24,13	26,18	375
14"	741	27,56	21,65	23	24,72	25,79	27,83	474
16"	741	31,5	23,98	25,5	27,05	28,11	30,16	639
20"	741	31,5	28,46	30,5	31,54	32,6	34,65	937
24"	741	31,5	33,39	36	36,46	37,52	39,57	1345
Pressures are applicable at 20 °C (68 °F)								
For higher temperatures, the pressure and temperature ratings are as per ASME B16.5 (up to 24") or ASME B16.47 (>24")								

Table 11

Nominal size		Dimensions 300 lbs [mm]						Approx. weight
ASME	PN	L	H	W	T			[kg]
[inch]	[psi]				box	TWM1000	TWM9000	
DN 1"…6"								
1"	741	150	145	123,8	223	250	302	8
1 1/2"	741	200	169	155,6	247	274	326	9
2"	741	250	186	165,1	264	291	343	13
3"	741	250	214	209,6	292	319	371	17
4"	741	300	254	254	332	359	411	23
6"	741	320	316	317,5	394	421	473	36
DN 8"…24"								
8"	741	400	382	381	460	487	539	71
10"	741	500	433	444,5	511	538	590	112
12"	741	600	508	520,7	586	613	665	170
14"	741	700	550	584,2	628	655	707	215
16"	741	800	609	647,7	687	714	766	290
20"	741	800	723	774,7	801	828	880	425
24"	741	800	848	914,4	926	953	1005	610
Pressures are applicable at 20 °C (68 °F)								
For higher temperatures, the pressure and temperature ratings are as per ASME B16.5 (up to 24") or ASME B16.47 (>24")								

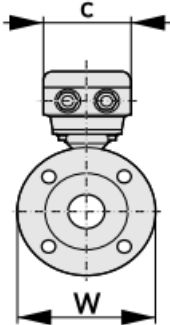
Dimensions and Weights

Front view VersaFlow (w/TWM9000F)



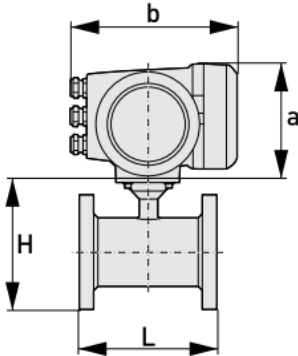
a= 88 mm / 3.5"
b= 139 mm/ 5.5"

Side view VersaFlow (w/TWM9000F)



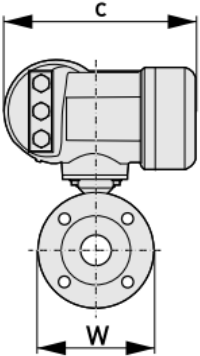
c= 106 mm / 4.2"

Front view VersaFlow (w/TWM9000C)



a= 155 mm / 6.1"
b= 230 mm/ 9.1"

Side view VersaFlow (w/TWM9000C)



c= 260 mm / 10.2"

Figure 3 – Dimensions and weights

Note: For Sensor with TWM 1000 Converter refer to Specification 36-VF-03-24

Sales and Service

For application assistance, current specifications, ordering, pricing, and name of the nearest Authorized Distributor, contact one of the offices below.

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Specifications are subject to change without notice.

For more information

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