Technical Information

Honeywell

VersaFlow Mag 100 Electromagnetic Flow Sensor Specifications

34-VF-03-08 September 2009

The Economical Solution

The VersaFlow Mag 100 flow sensor is an economical solution for a wide range of applications. VersaFlow Mag 100 can be used in applications (including various aqueous solutions), where other measurement techniques e.g. turbines, venturi, etc. were previously used.

VersaFlow is suitable for even the most demanding applications and is recognized as an industry standard.

Highlights

- Basic and fully functional wafer design flow sensor
- Quick and easy to install and operate
- Available in sizes 3/8” - 6"
- Excellent price-performance ratio
- Excellent chemical resistance
- Maintenance free

Industries

- Water
- Wastewater
- Heating, Ventilation & Air Conditioning (HVAC)
- Agriculture
- Machinery

Applications

- Water circulation, distribution and treatment e.g. in swimming pools and recreation facilities
- Sprinkler irrigation systems
- Fertilizer distribution
- Water circuits of buildings and offices

Figure 1 – VersaFlow Electromagnetic Flow Sensor

VersaFlow Electromagnetic Flow Converters

VersaFlow converters are compatible with all sensors
TWM 9000

Wall Mount

Integral Mount

Field Mount

All meters consist of a sensor and converter, which may be mounted integral to the sensor, or remotely mounted with a field mount kit, wall mount housing or 19” rack mount module.
See Specification 34-VF-03-02 or 34-VF-03-24 for converter details

TWM 1000

Technical Data

ASME [inch]	3/8"	1/2"	1"	1 1/2"	2"	3"	4"	6"
DN [mm]	10	15	25	40	50	80	100	150

Process Flange Standard

EN 1092-1 -PN40	■	■	■	■	■	■		
EN 1092-1 -PN 16							■	■
ASME B16.5- 150 lbs RF	■	■	■	■	■	■	■	■
ASME B16.5-300 lbs RF	▒	▒	▒	▒	▒	▒	▒	▒
JIS20 K	■	■	■	■	■	■	■	
JIS10 K								■
	Pressure limits in separate table.							
	Note: DN 10 (3/8") requires DN 15 (1/2") process flanges.							

Liner

PFA	■	■	■	■	■	■	■	■

Electrodes

Hastelloy C4	■	■	■	■	■	■	■	■

Grounding Rings

Integrated st. st. 1.4571 (AISI 316 Ti)	■	■						
Separate st st. 1.4571 (AISI 316 Ti)			▒	▒	▒	▒	▒	▒

Stud Bolts and Nuts

Rubber centering sleeves				■	■	■	■	■
Steel	▒	▒	▒	▒	▒	▒	▒	▒
Stainless steel	▒	▒	▒	▒	▒	▒	▒	▒
	Gaskets not included							

Materials Used

Measuring tube, austenitic stainless steel	■	■	■	■	■	■	■	■
Housing GTW-S 38 (polyurethane coated)	■	■	■	■				
Housing sheet steel (polyurethane coated]					■	■	■	■
Connection box, die-cast aluminum (polyurethane coated]	■	■	■	■	■	■	■	■
	Other materials on request.							

Protection Category

IP 66/67 eq. NEMA 4/4X / 6	■	■	■	■	■	■	■	■
IP 68 eq. NEMA 6	▒	▒	▒	▒	▒	▒	▒	▒

Approvals

Non-Ex	■	■	■	■	■	■	■	■
	Approval for flow sensor only							

Versions

Compact + TWM 1000 C or TWM 9000C	■	■	■	■	■	■	■	■
Separate +TWM 1000W or TWM9000F, R, W	■	■	■	■	■	■	■	■

■ standard ▒ optional □ on request

ASME [inch]	3/8"	1/2"	1"	1 1/2"	2"	3"	4"	6"
DN [mm]	10	15	25	40	50	80	100	150

Vacuum Load

Vacuum load	**0 mbar/0 psi absolute**

Electrical Conductivity

Non-water	**min. 5 µS/cm**
Water	**min. 20 µS/cm**

■ standard ■ optional □ on request

Process flange standard	Operating pressure	
	min. - max. [bar]	min. - max. [psig]
ASME B16.5 - 150 lbs RF	0-16	0-232
ASME B16.5 - 300 lbs RF	0-16	0-232
EN 1092-1 – PN 16	0-16	0-232
EN 1092-1 – PN 40	0-16	0-232
JIS 10 K	0-10	0-145
JIS20K	0-16	0-232

Temperature	Process		Ambient	
	min. [°C]	max. [°C]	min. [°C]	max. [°C]
Remote Converter TWM 1000 or TWM 9000	-25	120	-25	60
Compact with TWM 1000 or TWM 9000	-25	120	-25	50

Temperature	Process		Ambient	
	min. [°F]	max. [°F]	min. [°F]	max. [°F]
Remote Converter TWM 1000 or TWM 9000	-13	248	-13	140
Compact with TWM 1000 or TWM 9000	-13	248	-13	122

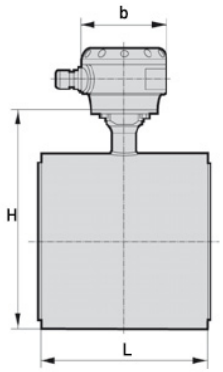
Dimensions

Nominal size	Dimensions [mm]						Approx. weight
DN	L	H	W	T_{box}	T_{010}	T_{300}	[kg]*
10	68	137	47	214	242	292	1,7
15	68	137	47	214	242	292	1,7
25	54	147	66	224	252	302	1,7
40	78	162	82	239	267	317	2,6
50	100	151	101	228	256	306	4,2
80	150	180	130	257	285	335	5,7
100	200	207	156	284	312	362	10,5
150	200	271	219	348	376	426	15

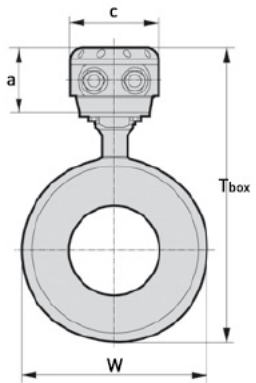
Nominal size	Dimensions [inches]						Approx. weight
ASME	L	H	W	T_{box}	T_{010}	T_{300}	[lbs]*
3/8”	2,68	5,39	1,85	8,43	9,53	11,5	3,7
1/2"	2,68	5,39	1,85	8,43	9,53	11,5	3,7
1"	2,13	5,79	2,6	8,82	9,92	11,89	3,7
1 1/2"	3,07	6,38	3,23	9,41	10,51	12,48	5,7
2"	3,94	5,94	3,98	8,98	10,08	12,05	9,3
3"	5,91	7,08	5,12	10,12	11,22	13,19	12,6
4"	7,87	8,15	6,14	11,18	12,28	14,25	23,1
6"	7,87	10,67	8,62	13,7	14,8	16,77	33,1

* Approx. weight of meter body

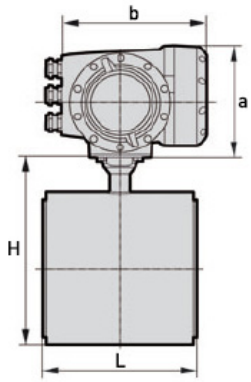
Frontview Remote Electronics



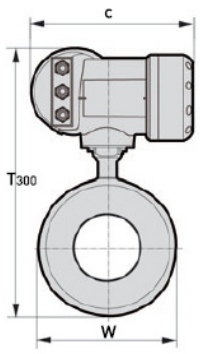
Sideview Remote Electronics



Frontview Integral Electronics



Sideview Integral Electronics



Note: For Sensor with TWM1000 Converter refer to Specification 36-VF-03-24

Specifications are subject to change without notice

For More Information

Learn more about how Honeywell's VersaFlow Mag 100 Electromagnetic Flow Sensor can be an economical solution for a wide range of applications, visit our website www.honeywell.com/ps/hfs or contact your Honeywell account manager.

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Technical Information

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VersaFlow Mag 1000 Electromagnetic Flow Sensor Specifications

34-VF-03-16 September 2009

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.

Figure 1 – VersaFlow Electromagnetic Flow Sensor

Highlights

- Drinking water approvals including KTW, WRc, KIWA, ACS
- Time proven design
- Maintenance free
- In situ verification with HONEYWELL MagCheck
- Compliance with OIML R-49 and ISO 4064
- Permanently submersible, buried underground (option)

Industries

- Water
- Wastewater
- Pulp & paper
- Minerals & Mining
- Iron, Steel & Metals
- Power Plant

Electromagnetic Product Range

VersaFlow converters: TWM 9000

Applications

- Water distribution networks
- Irrigation
- Municipal watering
- Water purification
- Cooling stations
- District heating

TWM1000

Technical Data

Nominal diameter	MM10									MM11								MM12								
ASME [inch]	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	64"	72"	80"
DN [mm]	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	1400	1600	1800	2000

Nominal Flange Pressure

EN 1092-1 - PN40	
EN 1092-1 - PN25	
EN 1092-1 - PN16	
EN 1092-1 - PN10	
EN 1092-1 - PN6	
ISO insertion length	
ASME B16.5 - 150lbs RF	
ASME B16.5 - 300lbs RF	
ASME B16.5 - 600 lbs RF	
ASME B16.5 - 900lbs RF	
ASME B16.5 - 1500 lbs RF	
AWWA - class B or D FF	
JIS10K	
JIS20K	
	For vacuum load see separate table
	Larger than DN 2000 / ASME 80" on request
	AWWA flanges, DN 700 - 1000 / ASME 28" - 40" ≤ 10 bar
	AWWA flanges, DN 1200 - 2000 / ASME 48" - 80" ≤ 6 bar

Liner

Polypropylene	
Hard Rubber	
	See pressure and temperature limits for various liners

Electrodes

Hastelloy C4	
Stainless steel 1,4571 (AISI 316 Ti)	
Hastelloy C22	
Titanium	

Grounding Rings

Hastelloy C4	
Stainless steel 1,4571 (AISI 316 Ti)	
Titanium	

Flanges

Steel 1.0460 (C 22,8)	
Steel 1.0038 (RSt37-2)	
Stainless steel 1.4404 (AISI 316 L)	
Stainless steel 1.4571 (AISI 316 Ti)	

Nominal diameter	MM10									MM11								MM12								
ASME [inch]	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	64"	72"	80"
DN [mm]	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	1400	1600	1800	2000

Materials

Measuring tube – austenitic stainless steel	
Housing (polyurethane coated) sheet steel	
Housing stainless steel	
Die-cast aluminum connection box (polyurethane coated)	
Stainless steel connection box	
	Other materials on request

Protection Category

IP 66/67 eq. NEMA 4/4X / 6	
IP 68 field eq. NEMA 6P	
IP 68 factory eq. NEMA6P	

Approvals

Non-Ex	
EEx zone 1	
FM - class I div. 2	
CSA – class I div.2	
NEPSI zone 1	
SAA - Aus Ex zone 2	
TIIS - zone 2	
	Please note the approvals are for flow sensors only.

Versions

TWM 1000 Compact/Separate	
TWM 9000 Compact/Separate	

Conductivity

Min. conductivity	min. 20 µS/cm

■ standard ▒ optional □ on request

Temperature range

Temperature range	Process [°C]		Ambient [°C]	
	min.	max.	min.	max.
Hardrubber				
Remote Converter (TWM 1000 or TWM 9000)	-5	80	-40	65
Compact with TWM 1000 or TWM 9000	-5	80	-40	65
Polypropylene				
Remote Converter (TWM 1000 or TWM 9000)	-5	90	-40	65
Compact with TWM 1000 or TWM 9000	-5	90	-40	65
	* Polypropylene available for DN 25 - 150			

Temperature range	Process [°F]		Ambient [°F]	
	min.	max.	min.	max.
Hardrubber				
Remote Converter (TWM 1000 or TWM 9000)	23	176	-40	149
Compact with TWM 1000 or TWM 9000	23	176	-40	149
Polypropylene				
Remote Converter (TWM 1000 or TWM 9000)	23	194	-40	149
Compact with TWM 1000 or TWM 9000	23	194	-40	149
	* Polypropylene available for ASME 1” - 6”			

Vacuum Load

Liner	Diameter	Minimum operating pressure absolute in mbar (abs) at process temperature			
	[mm]	20°C	40°C	60°C	80°C
Polypropylene	DN 25 - 150	250	250	400	400
Hard rubber	DN 200 - 300	250	250	400	400
	DN 350 - 1000	500	500	600	600
	DN 1200 - 3000	600	600	750	750

Liner	Diameter	Minimum operating pressure absolute in psia at process temperature			
	[inch]	68°F	104°F	140°F	176°F
Polypropylene	1" - 6"	3,6	3,6	5,8	5,8
Hard rubber	8" - 12"	3,6	3,6	5,8	5,8
	14" - 40"	7,3	7,3	8,7	8,7
	48" -120"	8,7	8,7	10,9	10,9

Dimensions and Weights

Nominal size		Dimensions [mm]							Approx. weight
DN	PN	L		H	W	T			[kg]
[mm]	[bar]	DIN	ISO			box	010	300	
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

Nominal size		Dimensions 150 lbs [inch]						Approx. weight
DN	PN	L	H	W	T			[lbs]
[mm]	[bar]				box	010	300	
DN1"...6"								
1"	284	5,91	5,39	4,25	8,46	9,53	11,57	18
1 1/2"	284	5,91	6,1	5	9,17	10,24	12,28	22
2"	284	7,87	7,05	5,98	10,12	11,18	13,23	29
3"	284	7,87	8,03	7,5	11,1	12,17	14,21	37
4"	284	9,84	9,49	9	12,56	13,62	15,67	51
5"	284	9,84	10,55	10	13,62	14,69	16,73	60
6"	284	11,81	11,69	11	14,76	15,83	17,87	75
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")						

Nominal size		Dimensions 150 lbs [mm]						Approx. weight
ASME	PN	L	H	W	T			[kg]
[inch]	[psi]				box	010	300	

DN1"...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

DN8"...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")						

Nominal size		Dimensions 300 lbs [inch]						Approx. weight
ASME	PN	L	H	W	T			[lbs]
[inch]	[psi]				box	010	300	
DN1"...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
DN8"...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")						

Nominal size		Dimensions 300 lbs [mm]						Approx. weight
ASME	PN	L	H	W	T			[kg]
[inch]	[psi]				box	010	300	

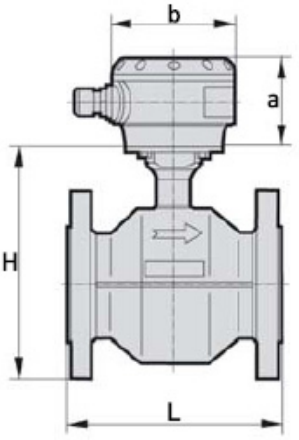
DN1"...6"

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

DN8"...24"

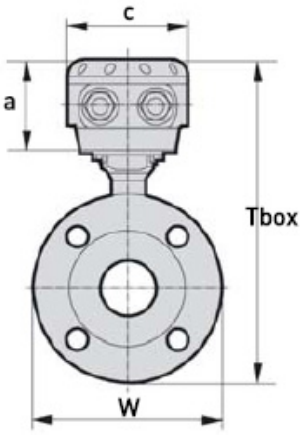
8"	741	400	382	381	460	487	539	71
10"	741	500	433	444,5	511	538	590	112
12"	741	600	508	520,7	586	613	665	170
14"	741	700	550	584,2	628	655	707	215
16"	741	800	609	647,7	687	714	766	290
20"	741	800	723	774,7	801	828	880	425
24"	741	800	848	914,4	926	953	1005	610
		Pressures are applicable at 20 °C (68 °F)						
		For higher temperatures, the pressure and temperature ratings are as per ASME B16.5 (up to 24") or ASME B16.47 (>24")						

Frontview VersaFlow



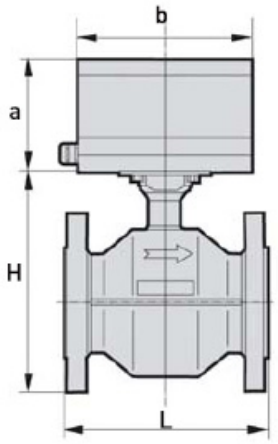
a = 77 mm / 3,1"
b = 111 mm / 4,4"

Sideview VersaFlow



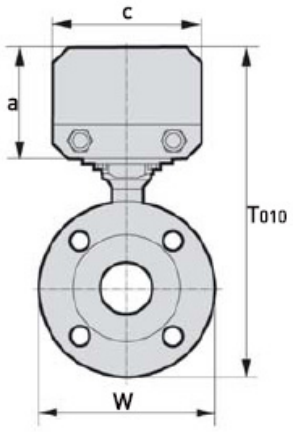
a = 77 mm / 3,1"
c = 106 mm / 4,2"

Frontview VersaFlow



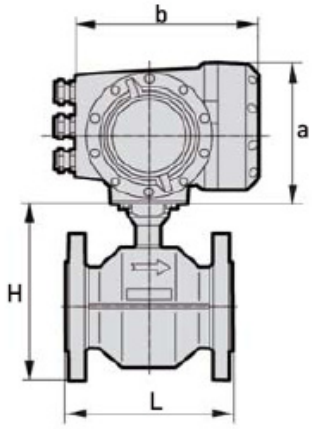
a = 105 mm / 4,2 "
b = 160 mm / 6,3"

Sideview VersaFlow



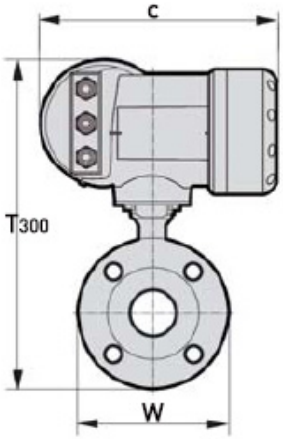
a = 105 mm / 4,2"
c = 140mm / 5,5"

Frontview VersaFlow



a = 155 mm / 6,1"
b = 202 mm / 7,8"

Sideview VersaFlow



c = 260 mm / 10,2"

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

Specifications are subject to change without notice.

For More Information

Learn more about how Honeywell's VersaFlow Mag 1000 Electromagnetic Flow Sensor can be the optimum solution for water and wastewater applications visit our website www.honeywell.com/ps/hfs or contact your Honeywell account manager.

Honeywell Process Solutions

1860 West Rose Garden Lane

Phoenix, Arizona 85027

Tel: 1-800-423-9883 or 1-800-343-0228

www.honeywell.com/ps

34-VF-03-16
September 2009

Technical Information

Honeywell

VersaFlow Mag 2000 FL Electromagnetic Flow Sensor Specifications

34-VF-03-21 September 2009

Solution with High-Tech Ceramics

The VersaFlow Mag 2000 FL Electromagnetic flow sensor is the standard in accuracy. VersaFlow Mag 2000 FL is highly resistant against abrasion.

Highlights

- Excellent long-term stability and accuracy
- For most aggressive and abrasive fluids
- Fully vacuum-resistant
- High-tech ceramics liner
- Insensitive against temperature shocks

Industries

- Chemicals
- Pulp & Paper
- Water
- Wastewater
- Minerals & Mining

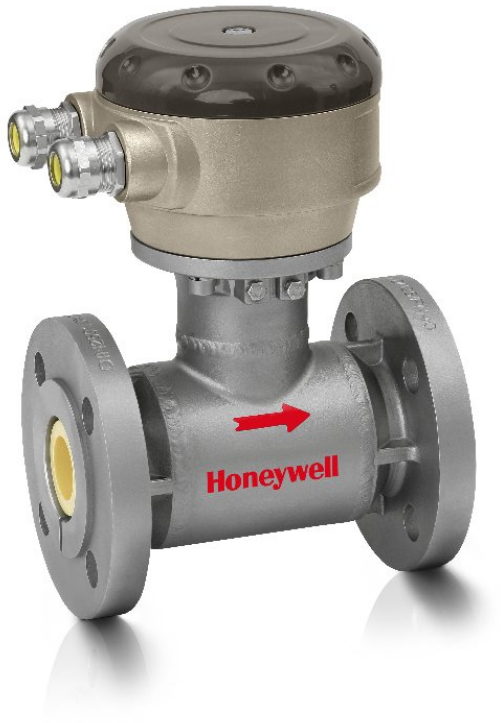


Figure 1 – VersaFlow Electromagnetic Flow Sensor

Applications

- Dosing and batching
- Electrolyte measurement for battery filling
- Dosing control
- Chemical injection
- Wastewater treatment

Electromagnetic Product Range

VersaFlow Converters: All converters fit to all Sensors

		
Integral Mounted	**Field Mounted**	**Wall Mounted**

TWM 9000 High-performance solution

VersaFlow Sensors

				
VersaFlow Mag 100 Economical solution	**VersaFlow Mag 1000 Economical solution**	**VersaFlow Mag 4000 Standard solution for the process industry**	**VersaFlow Mag 2000SW Solution with high-tech ceramics**	**VersaFlow Mag 3000 Sanitary and hygienic solution**

Technical Data

Nominal diameter	MM52						MM53		
ASME [inch]	1/2"	1"	11/2"	2"	3"	4"	6"	8"	10"
DN [mm]	15	25	40	50	80	100	150	200	250

Nominal Flange Pressure

EN 1092-1 - PN40	■	■	■	■	■				
EN 1092-1 - PN16						■	■		
EN 1092-1 - PN10								■	■
ASME B16.5 - 150lbs RF	■	■	■	■	■	■	■	■	■
ASME B16.5 - 300lbs RF	■	■	■	■	■	■			

Measuring Tube

Ceramic	■	■	■	■	■	■	■	■	■

Electrodes

Cermet	■	■	■	■	■	■			
Stainless steel 1,4571 (AISI 316 Ti)							■	■	■
Platinum							■	■	■
HC4							■	■	■
Low noise (basis HC4, Ta, Ti)							■	■	■

Rings / Gaskets

PTFE (integrated) / no gasket required	■	■	■	■	■	■			
Stainless steel 1,4404 (AISI 316L) Viton							■	■	■
Hastelloy C4 / Viton							■	■	■

Flanges

Stainless Steel AISI 316 (1.4408)	■	■	■	■	■	■			
Steel 37 – C22							■	■	■

Nominal diameter	MM52						MM53		
ASME [inch]	1/2"	1"	1 1/2"	2"	3"	4"	6"	8"	10"
DN [mm]	15	25	40	50	80	100	150	200	250

Materials

Flow sensor housing (PU coated)									
- stainless steel ASISI 316 (1.4408)	■	■	■	■	■	■			
- sheet steel							■	■	■
Flow converter housing (compact design)									
- die cast aluminium (PU coated)	■	■	■	■	■	■	■	■	■
- stainless steel AISI 304 (1.4306)									
Connection boxes (separate design)									
- die cast aluminium (PU coated)	■	■	■	■	■	■	■	■	■
- stainless steel AISI 3040 (1.4306)									
	Other materials on request								

Protection Category

IP 66/67 eq. NEMA 4/4X / 6	■	■	■	■	■	■	■	■	■
IP 68 field eq. NEMA 6P									
IP 68 factory eq. NEMA6P									
	IP68 only available with stainless steel connection box								

Nominal diameter	MM52						MM53		
ASME [inch]	1/2"	1"	1 1/2"	2"	3"	4"	6"	8"	10"
DN [mm]	25	25	40	50	80	100	150	200	250

Approvals

Non-Ex	■	■	■	■	■	■	■	■	■
EEx zone 1 / 2	▒	▒	▒	▒	▒	▒			
FM - class I div. 1 / 2	▒	▒	▒	▒	▒	▒			
CSA – GP / class I div. 1/2	▒	▒	▒	▒	▒	▒			
	Please note the approval are for flow sensors only								

Versions

Compact+ TWM 9000 C	■	■	■	■	■	■			
Separate+ TWM 9000 F, R, W	■	■	■	■	■	■	■	■	■

Conductivity

≥ 1 µS/cm (non-water)		■	■	■	■	■	■	■	■
≥ 5 µS/cm (non-water)	■								
≥ 20 µS/cm (demineralised cold water)	■	■	■	■	■	■	■	■	■

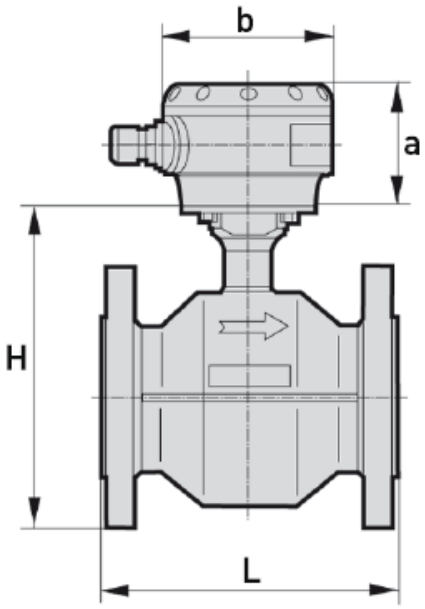
■ standard ▒ optional □ on request

Dimensions and Weights

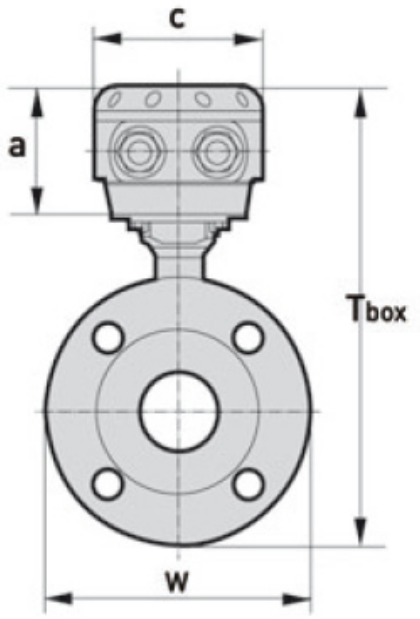
Nominal size		Dimensions [mm]					Approx. weight
DN	PN	L	H	W	T		[kg]
[mm]	[bar]				box	TWM9000	
DN2.5...100							
15	40	150	127	95	205	282	3
25	40	150	143	115	221	298	4
40	40	150	168	150	246	323	6
50	40	200	184	165	262	339	9
80	40	200	217	200	295	372	15
100	16	250	248	235	326	403	21
DN150...250							
150	16	265	355	283	426	-	37
200	10	315	396	342	467	-	53
250	10	365	458	395	529	-	87

Nominal size		Dimensions 150 lbs [inch]					Approx. weight
DN	PN	L	H	W	T		[lbs]
[mm]	[bar]				box	TWM9000	
DN1/2"...4"							
1/2"	580	5.91	5.00	3.74	8.07	11.1	1.36
1"	580	5.91	5.63	4.53	8.7	11.73	1.81
11/2"	580	5.91	6.61	5.91	9.69	12.72	2.72
2"	580	7.87	7.24	6.5	10.31	13.35	4.08
3"	580	7.87	8.54	7.87	11.61	14.65	6.8
4"	232	9.84	9.76	9.25	12.83	15.87	9.52
DN6"...10"							
6"	232	10.43	13.98	11.14	16.77	-	16.78
8"	145	12.4	15.59	13.46	18.39	-	24.03
10"	145	14.37	18.03	15.55	20.83	-	39.45
		DN6"…10": Total fitting length: L + 2x 0.12” + 2x gasket thickness (flowmeter with separate rings)					

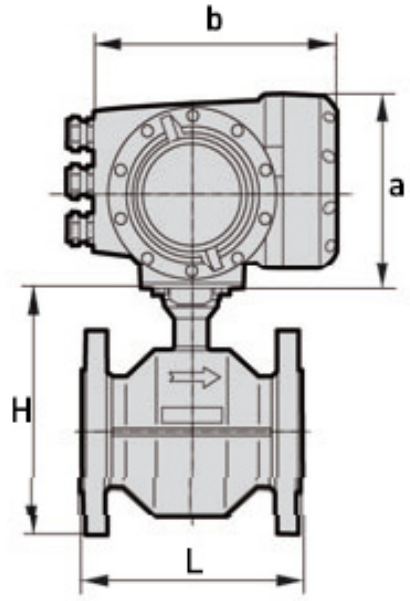
Frontview VersaFlow Mag 2000 F



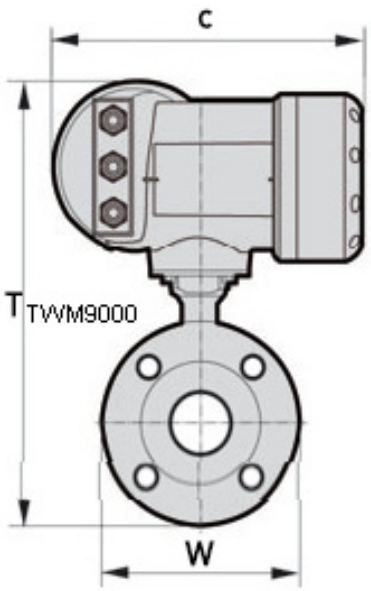
Sideview VersaFlow Mag 2000 F



Frontview VersaFlow Mag 2000 Compact



Sideview VersaFlow Mag 2000 Compact



Dimensions Housing

Type	Dimension a		Dimension b		Dimension c	
	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)
Connection box	77	3.1	111	4.4	106	4.2
Compact converter	155	6.1	202	7.8	260	10.2

Temperature Range

Temperature range	Process (°C)		Ambient (°C)		Process (°F)		Ambient (°F)	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
DN2.5… 100								
Separate flow sensor	-60	180	-40	65	-76	356	-40	149
Compact + TWM 9000	-60	140	-40	65	-76	284	-40	149
DN150… 250								
Separate flow sensor	-60	120	-25	60	-76	248	-13	140

Temperature change	10 minutes (°C)		Sudden change (°C)		10 minutes (°F)		Sudden change (°F)	
	rising	falling	rising	falling	rising	falling	rising	falling
DN15… 100	150	100	120	80	302	212	248	176
DN150… 250	150	80	100	60	302	176	212	140

Specifications are subject to change without notice.

For More Information

Learn more about how Honeywell's VersaFlow Mag 2000 FL Electromagnetic Flow Sensor can provide long-term stability and accuracy, visit our website www.honeywell.com/ps/hfs or contact your Honeywell account manager.

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www.honeywell.com/ps

34-VF-03-21
September 2009

Technical Information

Honeywell

VersaFlow Mag 2000 SW Electromagnetic Flow Sensor Specifications

34-VF-03-22 August 2008

Solution with High-Tech Ceramics

The VersaFlow Mag 2000 SW electromagnetic flow sensor is the standard in accuracy.
VersaFlow Mag 2000 SW is highly resistant against abrasion.

Highlights

- Excellent long-term stability and accuracy
- Transfer standard of international metrological authorities
- For most aggressive and abrasive fluids
- Fully vacuum-resistant
- High-tech ceramics liner
- Insensitive against temperature shocks

Industries

- Chemicals
- Pulp & Paper
- Water
- Wastewater
- Minerals & Mining
- Automotive

Applications

- Transfer standard
- Dosing of additives
- Water meter calibration
- Volumetric dosing
- Chemical dosing
- Automotive (engine test rigs)
- Calibration of diaphragm pumps

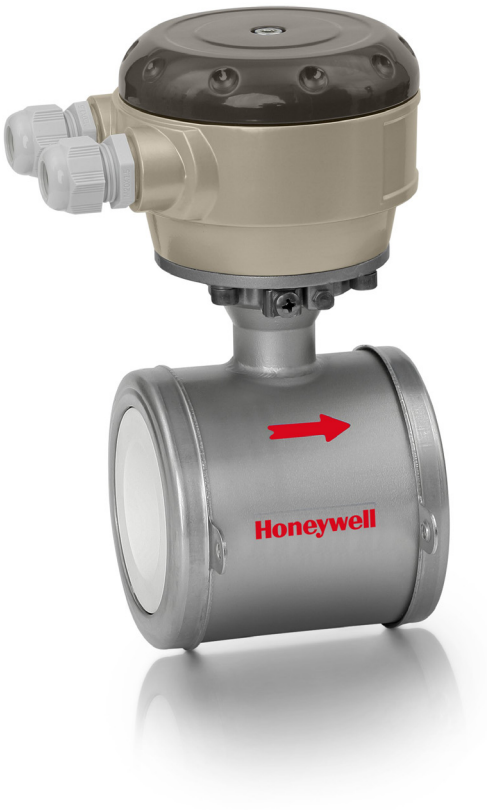


Figure 1 – VersaFlow Electromagnetic Flow Sensor

1. **Sandwich design**
2. **Ceramic liner**
3. **Cermet electrodes**

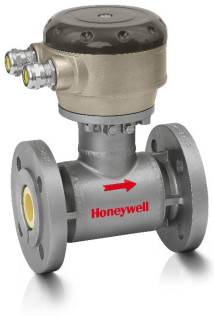
Electromagnetic Product Range

VersaFlow converters: All converters fit to all sensors

TWM 9000 High-performance solution

		
Integral Mounted	**Field Mounted**	**Wall Mounted**

VersaFlow Sensors

				
VersaFlow Mag1000 Economical solution	**VersaFlow Mag1000 Solution for the water and wastewater industry**	**VersaFlow Mag4000 Standard solution for the process industry**	**VersaFlow Mag2000 Solution with high-tech ceramics**	**VersaFlow Mag3000 sanitary and hygienic solution**

Technical Data

Nominal diameter	MM51									
ASME [inch]	1/10"	1/8"	1/4"	3/8"	1/10"	1"	11/2 "	2"	3"	4"
DN [mm]	2.5	4	6	10	15	25	40	50	80	100

Nominal Flange Pressure

EN 1092-1 - PN40	■	■	■	■	■	■	■	■	■	
EN 1092-1 – PN25										■
EN 1092-1 – PN16										■
ASME B16.5 - 150lbs RF	■	■	■	■	■	■	■	■	■	■
ASME B16.5 - 300lbs RF	■	■	■	■	■	■	■	■	■	■

Measuring Tube

Ceramic	■	■	■	■	■	■	■	■	■	■

Electrodes

Cermet	■	■	■	■	■					
Platinum						■	■	■	■	■

Rings / Gaskets

Stainless steel AISI 316Ti (1.4571) FKM/FPM (1)	■	■	■	■	■					
Without / Gylon						■	■	■	■	■
Hastelloy C4 / FKM/FPM (1)	■	■	■	■	■					
Hastelloy C4 / EPDM	■	■	■	■	■					
Hastelloy C4 / Kalrez	■	■	■	■	■					
Stainless steel AISI 316Ti (1.4571) / EPDM	■	■	■	■	■					
Titanium / EPDM	■	■	■	■	■					
Titanium / Kalrez	■	■	■	■	■					
Titanium / PTFE-PF 29	■	■	■	■	■	■	■	■	■	■
Without / Chemotherm						■	■	■	■	■
Hastelloy C4 / Chemotherm						■	■	■	■	■
Hastelloy C4 / Gylon						■	■	■	■	■
PTFE (integrated) / no gasket required						■	■	■	■	■
Stainless steel AISI 316Ti (1.4571) / Chemotherm						■	■	■	■	■
Stainless steel AISI 316Ti (1.4571) / Gylon						■	■	■	■	■

Stud Bolts and Nuts

Steel	■	■	■	■	■	■	■	■	■	■
Stainless Steel, rubber, centering screws	■	■	■	■	■	■	■	■	■	■

(1) acc. DIN ISO 1629 / ASTM D 1418

Nominal diameter	MM51									
ASME [inch]	1/10"	1/8"	¼"	3/8"	1/10"	1"	11/2 "	2"	3"	4"
DN [mm]	25	4	6	10	15	25	40	50	80	100

Materials

Flow sensor housing (PU coated)										
- stainless steel Duplex (1.4462)	■	■	■	■	■					
- stainless steel AISI 304 (1.4306)						■	■	■	■	■
Flow converter housing (compact design)										
- die cast aluminium (PU coated)	■	■	■	■	■	■	■	■	■	■
- stainless steel AISI 304 (1.4306)	▒	▒	▒	▒	▒					
Connection box (separate design)										
- die cast aluminium (PU coated)	■	■	■	■	■	■	■	■	■	■
- stainless steel AISI 304 (1.4306)	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
	Other materials on request									

Protection Category

IP 66 / 67 eq. NEMA 4/4X / 6	■	■	■	■	■	■	■	■	■	■
IP 68 field eq. NEMA 6P	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
IP 68 factory eq. NEMA6P	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
	IP68 only available with stainless steel connection box									

Approvals

Non-Ex	■	■	■	■	■	■	■	■	■	■
EEx zone 1 / 2	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
FM – class I div. 1 / 2	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
CSA – GP / class I div. ½	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
	Please note the approval are for flow sensors only									

Versions

Compact+ TWM 9000 C	■	■	■	■	■	■	■	■	■	■
Separate+ TWM 9000 F, R, W	■	■	■	■	■	■	■	■	■	■

Vacuum Load

0mbar / 0psi absolute	■	■	■	■	■	■	■	■	■	■

Conductivity

≥ 1 µS/cm (non-water)						■	■	■	■	■
≥ 5 µS/cm (non-water)		■	■	■	■					
≥ 10 µS/cm (non-water)	■									
≥ 20 µS/cm (demineralised cold water)	■	■	■	■	■	■	■	■	■	■

■ standard ▒ optional □ on request

Dimensions and Weights

Nominal size		Dimensions [mm]					Approx.** weight
DN	PN	L*	H	W	T		[kg]
[mm]	[bar]				box	TWM9000	

SI – Dimensions

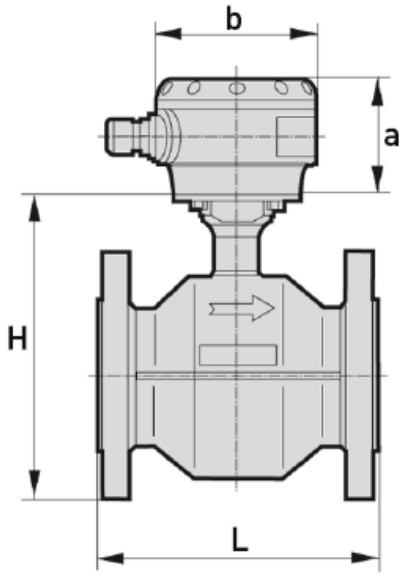
2.5	40	65	123	44	200	278	1.6
4	40	65	123	44	200	278	1.6
6	40	65	123	44	200	278	1.6
10	40	65	123	44	200	278	1.6
15	40	65	123	44	200	278	1.6
25	40	58	116	68	193	271	1.6
40	40	83	131	83	208	286	2.4
50	40	103	149	101	226	304	2.9
80	40	153	181	133	258	336	6.4
100	16	203	206	158	283	361	8.8
		*Total fitting length					
		DN 2.5-15, flowmeter with integrated rings: Dim. L + 2 x gasket thickness					
		DN 25-100, flowmeter without rings: Dim. L only (no gasket required)					
		**Approx weight of meter body					

Nominal size		Dimensions 150 lbs [inch]					Approx.** weight
DN	PN	L	H	W	T		[lbs]
[inch]	[psig]				box	TWM9000	

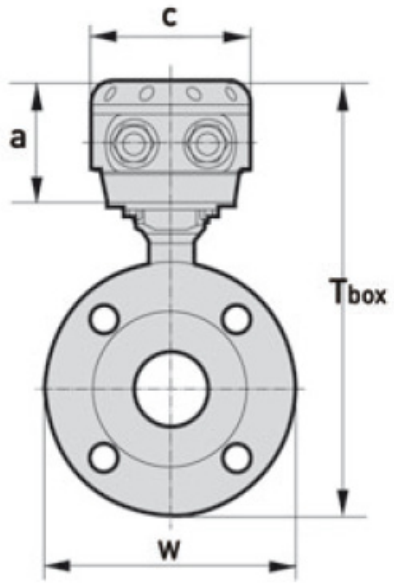
ASME – Dimensions

1/10”	580	2.56	4.84	1.73	7.87	10.94	10.94
1/8”	580	2.56	4.84	1.73	7.87	10.94	10.94
1/4”	580	2.56	4.84	1.73	7.87	10.94	10.94
3/8”	580	2.56	4.84	1.73	7.87	10.94	10.94
1/2"	580	2.56	4.84	1.73	7.87	10.94	10.94
1"	580	2.28	4.57	2.68	7.6	10.67	10.67
11/2"	580	3.27	5.16	3.27	8.19	11.26	11.26
2"	580	4.06	5.87	3.98	8.9	11.97	11.97
3"	580	6.02	7.13	5.24	10.16	13.23	13.23
4"	232	7.99	8.11	6.22	11.14	14.21	14.21
		*Total fitting length					
		ASME 1/10” – 1/2, flowmeter with integrated rings: Dim. L + 2 x gasket thickness					
		ASME 1” – 4”, flowmeter without rings: Dim. L only (no gasket required)					
		**Approx weight of meter body					

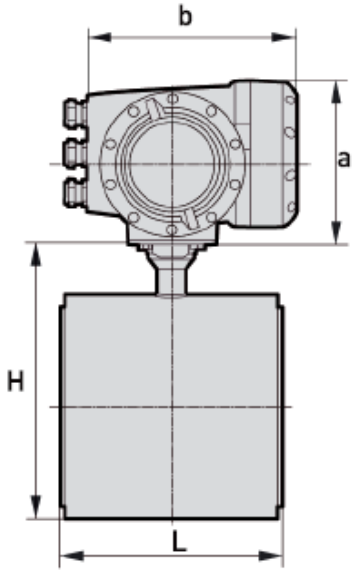
Frontview - Remote Converter



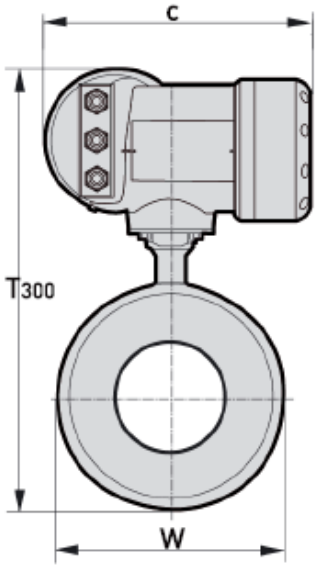
Sideview - Remote Converter



Frontview - Compact



Sideview - Compact



Dimensions Housing

Type	Dimension a		Dimension b		Dimension c	
	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)
Connection box	77	3.1	111	4.4	106	4.2
TWM 9000 Compact converter	155	6.1	202	7.8	260	10.2

Temperature Range

Temperature range	Process (°C)		Ambient (°C)		Process (°F)		Ambient (°F)	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Separate flow sensor	-60	180	-40	65	-76	356	-40	149
Compact+TWM 9000	-60	140	-40	65	-76	284	-40	149

Temperature change	Max. permissible temperature change (°C)				Max. permissible temperature change (°F)			
	10 minutes (°C)		Sudden change (°C)		10 minutes (°F)		Sudden change (°F)	
	rising	falling	rising	falling	rising	falling	rising	falling
DN2.5… 15	150	120	120	90	302	248	248	194
DN25… 100	150	100	120	60	302	212	248	176

Specifications are subject to change without notice.

For More Information

Learn more about how Honeywell's VersaFlow Mag 2000 SW Electromagnetic Flow Sensor can provide excellent long-term stability and accuracy, visit our website www.honeywell.com/ps/hfs or contact your Honeywell account manager.

Honeywell

Honeywell Process Solutions

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Phoenix, Arizona 85027

Tel: 1-800-423-9883 or 1-800-343-0228

www.honeywell.com/ps

34-VF-03-22
August 2008

Technical Information

Honeywell

VersaFlow Mag 3000 Electromagnetic Flow Sensor Specifications

34-VF-03-23 August 2008

Sanitary and Hygienic Solution

The VersaFlow Mag 3000 is the electromagnetic flow sensor for the food and beverage industry. The 3000 sensor is manufactured in conformance to FDA requirements and has all requested (needed) approvals available. As an add on, a EHEDG approval is available and documents the hygienic design and the clean ability of the device.

Together with the converters TWM 9000 or TWM 1000, the meter can be used for mixing and dosing applications. It offers also a special measuring mode for pulsating flow. Even for products with low conductivity e. g. glucose or high concentrated fruit concentrate the VersaFlow Mag 3000 is the first choice.

Due to the fact that the industrial production of beer, water and milk increases rapidly, the produced volume gets larger and larger pipe sizes are needed. The VersaFlow Mag 3000 is the only hygienic electro magnetic flow meter with a pipe size of DN150 / 6” (where the hygienic standards list such a size).

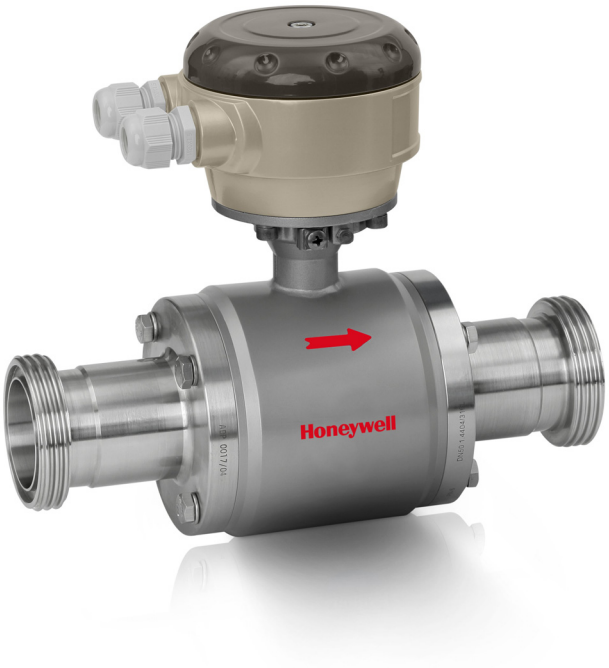


Figure 1 – VersaFlow Electromagnetic Flow Sensor

Highlights

- Developed in cooperation with customers from the food industry
- Stainless steel design for hygienic and aseptic operation
- Unique gasket concept prevents gasket from expanding into measuring tube
- Suitable for all CIP and SIP processes
- All industry-specific connectors and lengths
- High form stability and vacuum resistance

Industries

- Food & Beverages
- Pharmaceuticals
- Cosmetics

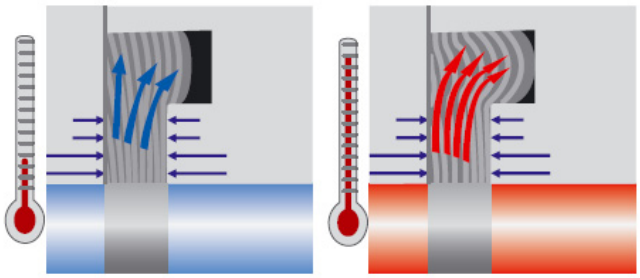
Applications

- For aseptic and hygienic applications
- Mixing, dosing and filling
- For pulsating flow

Features and Benefits

Stainless Steel Mesh

The reinforced PFA liner makes sure that the VersaFlow Mag 3000 keep its form stable. Even at high temperatures and very low pressure or vacuum the liner does not collapse and keeps its size. This is one reason why the meter is extremely accurate.



Unique Gasket Adapter Concept

With support of the TNO, a member of the European EHEDG organization, the sealing concept of the stainless steel adapters has been redesigned. A novel gasket concept prevents the gasket from expanding into the measuring tube. During the CIP/ SIP cleaning procedure, the gasket expands into the special constructed “expansion chamber” and not into the pipe section. This leads to a sharp sealing at the edge of the pipe line and a perfect transition into the measuring section. Additionally the gasket experiences less stress which results in a longer life time and reduced maintenance.

Stainless Steel converter housing

A regular cleaning procedure from outside, where aggressive cleaning agents are used, can attack the standard polyurethane coat of the converter. In these cases the cast stainless steel housing is recommended.

Initially Issued: x/xx/xxxx Authorization No.: 1205

This Is To Certify That

XXXXXX Alexander

P.O. Box 118 3300 AC, Dordrecht, 01965-3800 THE NETHERLANDS

Is hereby authorized to continue to apply the 3-A Symbol to the models of equipment, conforming to 3-A Sanitary Standards for:

Flow Meters, Number: 33-03, set forth below:

Model Designations: All OPTIFLUX 6xxx models as product is labeled and advertised in sizes: 1/10" (DN 2.5), 1/8" (DN 4), 1/4" (DN 6), 3/8" (DN 10), 1/2" (DN 15), 1" (DN 25), 1x1/2" (DN 40), 2" (DN 50), 2x1/2" (DN 65), 3" (DN 80), 4" (DN 100), 5" (DN 125), and 6" (DN 150).

Valid through: xx/xx/xxxx

Timothy S. Bush
Executive Director, 3-A Sanitary Standards, Inc.

*****

The issuance of this authorization for the use of the 3-A Symbol is based upon the voluntary certification, by the applicant for it, that the equipment listed above complies fully with the 3-A Sanitary Standards designated. Legal responsibility for compliance is solely that of the holder of this Certificate of Authorization, and 3-A Sanitary Standards, Inc. does not warrant that the holder of an authorization at all times complies with the provisions of the said 3-A Sanitary Standards. This in no way affects the responsibility of 3-A Sanitary Standards, Inc. to take appropriate action in cases in which evidence of noncompliance has been established.

EHEDG and 3A approved

The VersaFlow Mag3000 is approved from EHEDG and 3A. The hygienic design of the meter and the cleanability of the equipment was tested. Such tests identify weak points in the hygienic design, including places where product residues may rest or where microbes may grow out during production time.

Technical Data

Nominal diameter													
[inch]	**1/10"**	**1/8"**	**1/4"**	**3/8"**	**1/2"**	**1"**	**1 1/2"**	**2"**	**2 1/2"**	**3"**	**4"**	**5"**	**6"**
[mm]	**2.5**	**4**	**6**	**10**	**15**	**25**	**40**	**50**	**65**	**80**	**100**	**125**	**150**

Measuring System

Versions													
Compact +TWM 9000 C	■	■	■	■	■	■	■	■	■	■	■	■	■
Remote + TWM 9000 F, R, W	■	■	■	■	■	■	■	■	■	■	■	■	■
Compact +TWM 1000 C	■	■	■	■	■	■	■	■	■	■	■	■	■
Remote + TWM 1000 W	■	■	■	■	■	■	■	■	■	■	■	■	■
Inlet	Min. 5DN												
Outlet	Min. 2DN												

Operating Conditions

Ambient temperature													
Separate slow sensor	-40… +65 °C / -40… +150 °F												
Compact version	-40… +65 °C / -40… +150 °F												
Process temperature													
Separate slow sensor	-40… +180 °C / -40… +355 °F												
Compact version	TWM 9000: -40… +140 °C / -40… +285 °F TWM 1000: -40… +120 °C / -40… +250 °F												
Vacuum load													
0 mbar / 0 psi absolute	■	■	■	■	■	■	■	■	■	■	■	■	■
Conductivity													
Non-water	≥ 5 µS/cm												
Water	≥ 20 µ S/cm												

Materials

Measuring tube													
Stainless steel 1.4301 (AISI 304)	■	■	■	■	■	■	■	■	■	■	■	■	■
Housing													
Stainless steel 1.4462 (Duplex)	■	■	■	■	■								
Stainless steel 1.4301 (AISI 304)						■	■	■	■	■	■	■	■
Connection box (F-versions only)													
Aluminum, polyurethane coated	■	■	■	■	■	■	■	■	■	■	■	■	■
Stainless steel 1.4408 (AISI)	■	■	■	■	■	■	■	■	■	■	■	■	■
Adapters													
Stainless steel 1.4404 (AISI 316L)	■	■	■	■	■	■	■	■	■	■	■	■	■
	Note: other materials on request												

Nominal diameter													
[inch]	**1/10”**	**1/8”**	**1/4”**	**3/8”**	**1/2”**	**1”**	**1 1/2 "**	**2”**	**2 1/2 "**	**3”**	**4”**	**5”**	**6”**
[mm]	**2.5**	**4**	**6**	**10**	**15**	**25**	**40**	**50**	**65**	**80**	**100**	**125**	**150**

Liner													
PFA (FDA conform)	■	■	■	■	■	■	■	■	■	■	■	■	■
Electrodes													
Hastelloy C4	■	■	■	■	■	■	■	■	■	■	■	■	■
Hastelloy B2	▒	▒	▒	▒	▒								
Platinum	▒	▒	▒	▒	▒								
Stainless steel 1.4404 (AISI 316 L)						▒	▒	▒	▒	▒	▒	▒	▒
Stainless steel 1.4571 (AISI 316 Ti)	▒	▒	▒	▒	▒								
Tantalum	▒	▒	▒	▒	▒								
Titanium	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Gaskets													
EPDM	■	■	■	■	■	■	■	■	■	■	■	■	■
Silicone (non-Ex only)	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
	Note: FDA recommends EPDM gaskets only if product < 8% fat.												

Process Connections

DIN 11850 row 2 / 11866 row A	■	■	■	■	■	■	■	■	■	■	■	■	■
DIN 11851	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
DIN 11864-2a flange with notch							▒	▒	▒	▒	▒	▒	▒
DIN 32676							▒	▒	▒	▒	▒		
ISO 2037	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
ISO 2852	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
ISO 2853	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒			
SMS 1145						▒	▒	▒	▒	▒	▒		
TRI CLOVER					▒	▒	▒	▒	▒	▒	▒		
	Note: DN2.5… 6 (1/10…1/4”) have DN10 (3/8”) connections.												

Dimensions and Weights

Nominal diameter													
[inch]	1/10”	1/8”	1/4”	3/8”	1/2”	1”	11/2 "	2”	2 1/2 "	3”	4”	5”	6”
[mm]	2.5	4	6	10	15	25	40	50	65	80	100	125	150

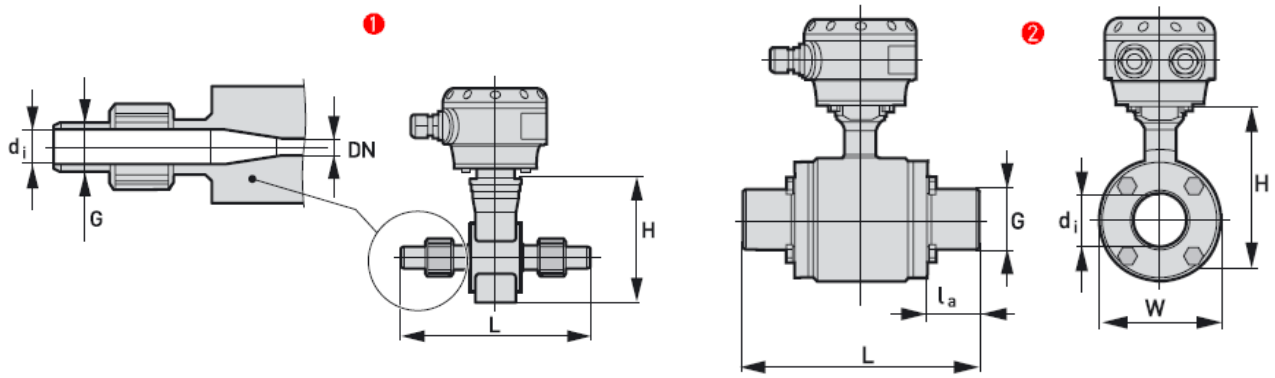
Approvals

3A	■	■	■	■	■	■	■	■	■	■	■	■	■
EHEDG	■	■	■	■	■	■	■	■	■	■	■	■	■
Non-Ex	■	■	■	■	■	■	■	■	■	■	■	■	■
EEx zone 1/2	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	□	□	□
FM – class I div.2	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	□	□	□
CSA – GP / class I div.2	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	□	□	□
SAA – Aus Ex zone 1/2	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	□	□	□
TIIS – zone 1/.2	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	□	□	□
Protection category													
IP66 / 67 eq. NEMA 4/4X / 6	■	■	■	■	■	■	■	■	■	■	■	■	■
IP68 field eq. NEMA 6P	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
IP68 factory eq. NEMA 6P	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒

■ **standard** ▒ **optional** □ **on request**

Dimensions and Weights

DIN 11850 (row 2 or DIN 11866 row A)



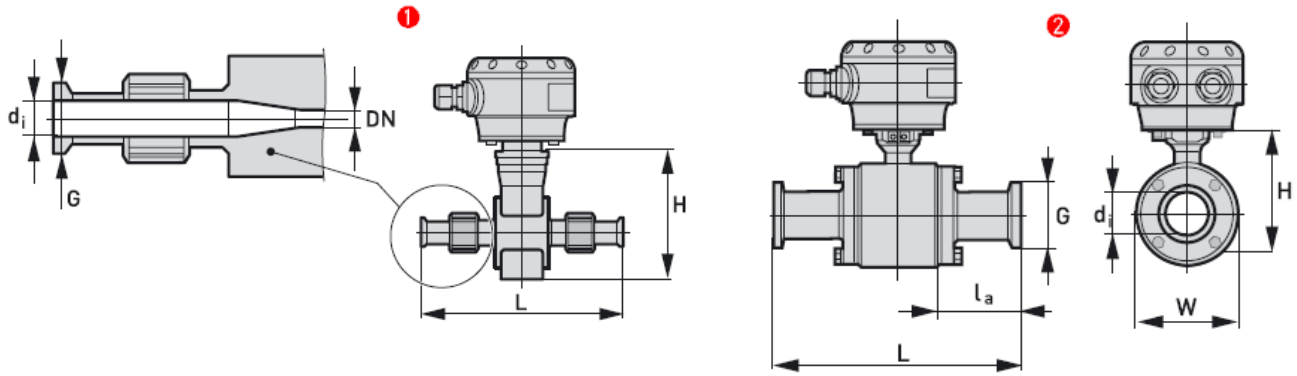
(1) DN2.5...10 screwed adapter with DN10 process connections / DN15 screwed adapter

(2) DN25...150 bolted adapter

Nominal size		Dimensions [mm]						Approx. weight	
		Adapter			Flowmeter				
DN	PN	d_i	G	l_a	L	H	W	[kg]	(lbs)
2.5	40	10	13	32	180	142	44	1.5	3.3
4	40	10	13	32	180	142	44	1.5	3.3
6	40	10	13	32	180	142	44	1.5	3.3
10	40	10	13	32	180	142	44	1.5	3.3
15	40	16	19	32	180	142	44	1.5	3.3
25	40	26	29	20.6	132.6	128	89	3	6.6
40	40	38	41	61.3	220	153	114	5.3	11.7
50	25	50	53	61.3	220	153	114	6.8	15
65	25	66	70	41.8	220	180	414	10.9	24
80	25	81	85	66.8	280	191	152	11.2	24.7
100	16	100	104	59.3	280	242	203	18.4	40.6
125	10	125	129	66.3	319	258	219	29.5	65.0
150	10	150	154	64.3	325	293	254	44.3	97.7

Dimensions and Weights

DIN 11851



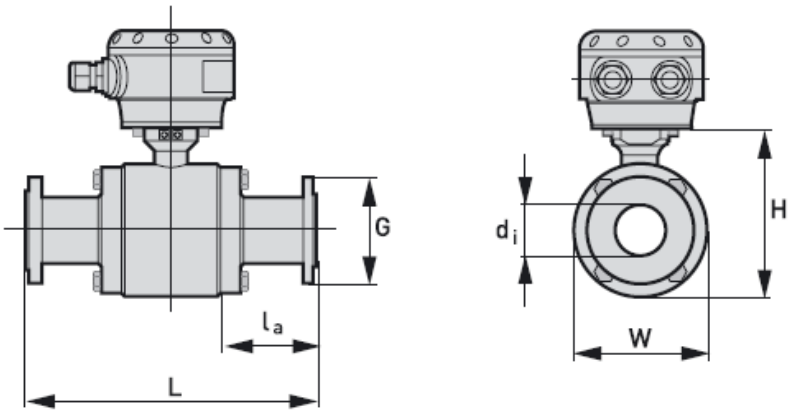
(1) DN2.5...10 screwed adapter with DN10 process connections / DN15 screwed adapter

(2) DN25...150 bolted adapter

Nominal size		Dimensions [mm]						Approx. weight	
		Adapter			Flowmeter				
DN	PN	d_i	G	l_a	L	H	W	[kg]	(lbs)
2.5	40	10	Rd 28 x 1/8”	53.1	214	142	44	1.5	3.3
4	40	10	Rd 28 x 1/8	53.1	214	142	44	1.5	3.3
6	40	10	Rd 28 x 1/8	53.1	214	142	44	1.5	3.3
10	40	10	Rd 28 x 1/8	53.1	214	142	44	1.5	3.3
15	40	16	Rd 34 x 1/8	53.1	214	142	44	1.5	3.3
25	40	26	Rd 52 x 1/6	49.3	190	128	89	3.2	7.1
40	40	38	Rd 65 x 1/6	91.3	280	153	114	5.5	12.1
50	25	50	Rd 78 x 1/6	93.3	284	153	114	5.3	11.7
65	25	66	Rd 95 x 1/6	77.8	292	180	414	10	22.1
80	25	81	Rd 110 x 1/4	107.8	362	191	152	12.5	27.6
100	16	100	Rd 130 x 1/4	109.3	380	242	203	21.8	48.1
125	10	On request							
150	10								

Dimensions and Weights

DIN 11864-2A



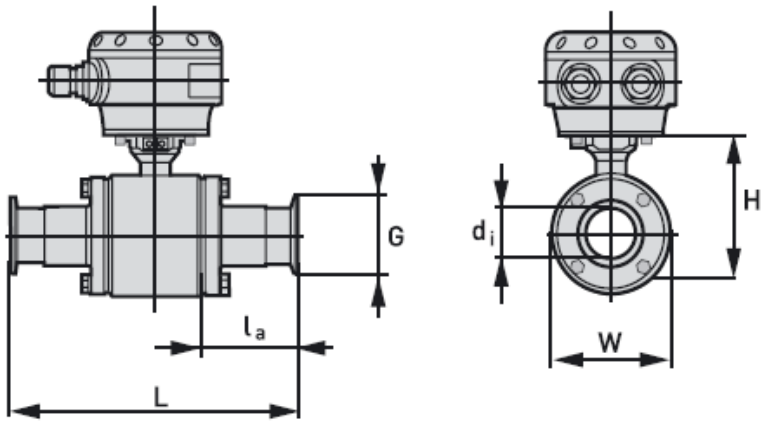
Nominal size		Dimensions [mm]						Approx. weight	
		Adapter			Flowmeter				
DN	PN	d_i	G	l_a	L	H	W	[kg]	(lbs)
25	40	26	70	45.8	183	128	89	4.4	9.7
40	40	38	82	83.3	264	153	114	7.5	16.5
50	25	50	94	83.3	264	153	114	9	19.8
65	25	66	113	63.8	264	180	141	14.5	32
80	25	81	133	122.8	392	191	152	18.6	41
100	16	100	159	115.3	392	242	203	28.2	62.2
125	10	On request							
150	10								

Note:

Meter supplied with flange with notch

Dimensions and Weights

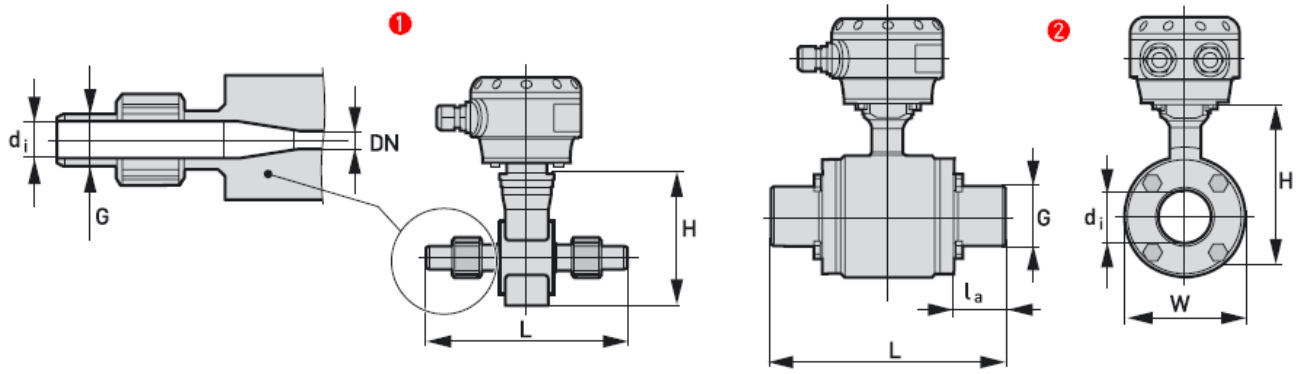
DIN 32676



Nominal size		Dimensions [mm]						Approx. weight	
		Adapter			Flowmeter				
DN	PN	d_i	G	l_a	L	H	W	[kg]	(lbs)
25	16	26	50.5	41.8	190	128	89	3.2	7.1
40	16	38	50.5	80.8	280	153	114	5.5	12.1
50	16	50	64	80.8	284	153	114	5.3	11.7
65	16	66	91	67.8	292	180	141	10	22.1
80	16	81	106	92.8	362	191	152	12.5	27.6
100	16	100	119	85.3	380	242	203	21.8	48.1

Dimensions and Weights

ISO 2037



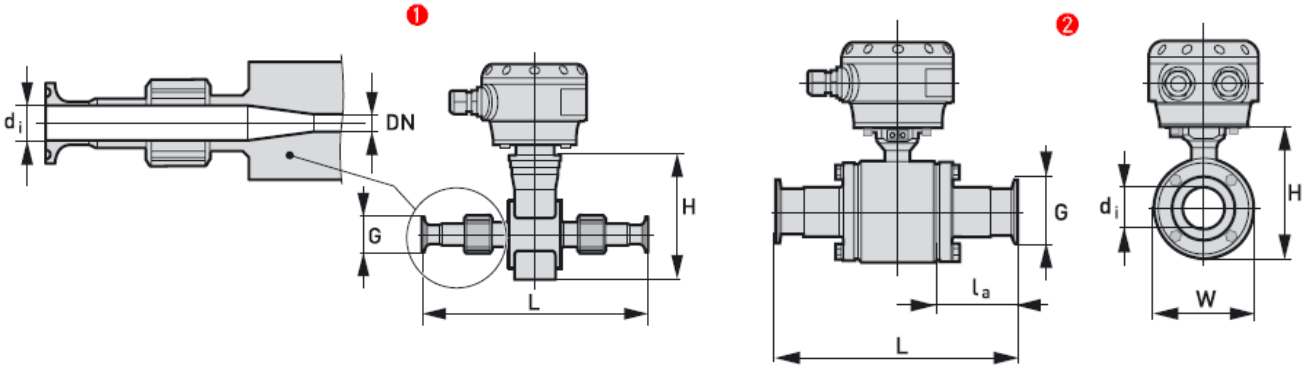
(1) DN2.5...10 screwed adapter with DN10 process connections / DN17.2 screwed adapter

(2) DN25...150 bolted adapter

Nominal size		Dimensions [mm]						Approx. weight	
		Adapter			Flowmeter				
DN	PN	d_i	G	l_a	L	H	W	[kg]	(lbs)
2.5	40	10	12	32	180	142	44	1.5	3.3
4	40	10	12	32	180	142	44	1.5	3.3
6	40	10	12	32	180	142	44	1.5	3.3
12	40	10	12	32	180	142	44	1.5	3.3
17.2	40	16	17.2	32	180	142	44	1.5	3.3
25	40	22.6	25	20.6	132.6	128	89	3	6.6
38	40	38	38	61.3	220	153	114	5.3	11.7
51	25	49	51	61.3	220	153	114	5	11
63.5	25	60.3	63.5	41.8	220	180	414	9	19.8
76.1	25	72.9	76.1	66.8	280	191	152	10.8	23.8
101.6	16	97.6	101.6	59.3	280	242	203	18.4	40.6
114.3	10	110.3	114.3	66.3	319	258	219	29.5	65.0
139.3	10	135.7	139.3	64.3	325	293	254	44.3	97.7

Dimensions and Weights

ISO 2852



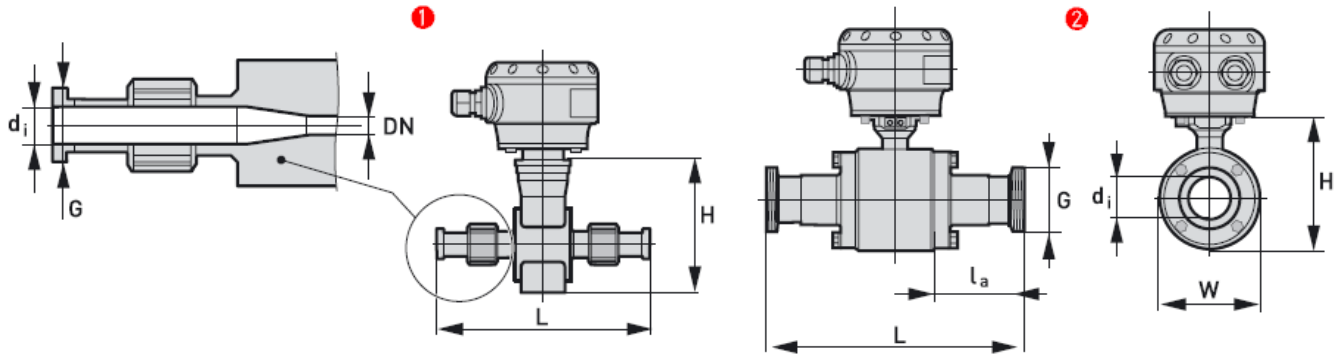
(1) DN2.5...10 screwed adapter with DN10 process connections / DN17.2 screwed adapter

(2) DN25...150 bolted adapter

Nominal size		Dimensions [mm]						Approx. weight	
		Adapter			Flowmeter				
DN	PN	d_i	G	l_a	L	H	W	[kg]	(lbs)
2.5	16	10	34	51.6	219	142	44	1.8	4.0
4	16	10	34	51.6	219	142	44	1.8	4.0
6	16	10	34	51.6	219	142	44	1.8	4.0
12	16	10	34	51.6	219	142	44	1.8	4.0
17.2	16	16	34	51.6	219	142	44	1.8	4.0
25	16	22.6	50.5	41.8	175	128	89	3.3	7.3
38	16	35.6	50.5	87.8	273	153	114	5.4	11.9
50	16	48.6	64	87.8	273	153	114	5.2	11.5
63.5	10	60.3	77.5	68.3	273	180	141	9.5	20.9
71.1	10	72.9	91	93.3	333	191	152	11.2	24.7
101.6	8	97.6	119	85.8	333	242	203	19.1	42.1
125	5	On request							
150	5								

Dimensions and Weights

ISO 2853



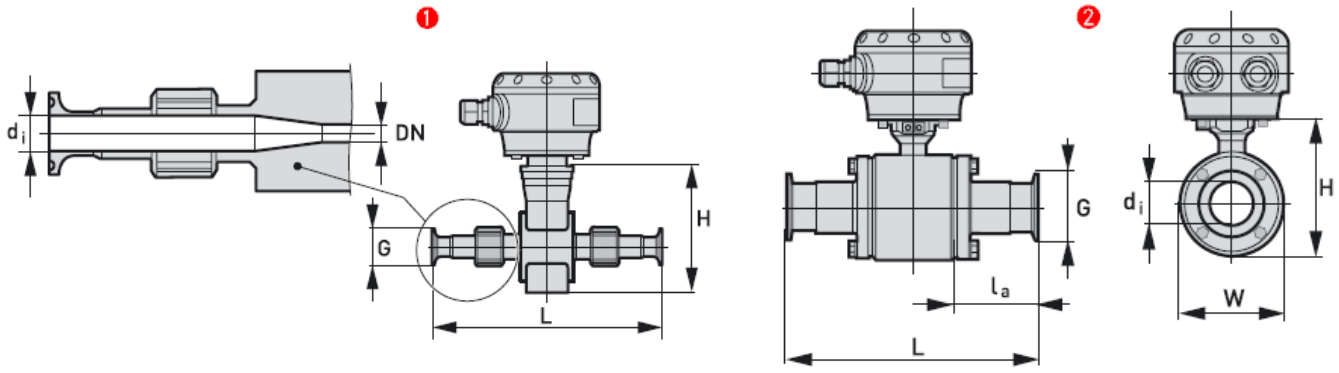
(1) DN2.5...10 screwed adapter with DN10 process connections / DN15 screwed adapter

(2) DN25...150 bolted adapter

Nominal size		Dimensions [mm]						Approx. weight	
		Adapter			Flowmeter				
DN	PN	d_i	G	l_a	L	H	W	[kg]	(lbs)
2.5	40	10	Rd 22.8 x 1/8”	53	226	142	44	3.1	6.8
4	40	10	Rd 22.8 x 1/8”	53	226	142	44	3.1	6.8
6	40	10	Rd 22.8 x 1/8”	53	226	142	44	3.1	6.8
10	40	10	Rd 22.8 x 1/8”	53	226	142	44	3.1	6.8
15	40	16	Rd 22.8 x 1/8”	53	226	142	44	3.1	6.8
25	40	22.6	Rd 37.1 x 1/8	45	226	131	80	4.4	9.7
38	40	35.6	Rd 56.6 x 1/8	49.5	253	149	98	6.1	13.5
51	25	48.6	Rd 64.1 x 1/8	51.5	263	181	130	7.6	16.8
63.5	25	60.3	Rd 77.6 x 1/8	50.5	309	206	156	11.7	25.8
76.1	25	72.9	Rd 91.1 x 1/8	50.5	309	206	156	12	26.5

Dimensions and Weights

Tri-Clover



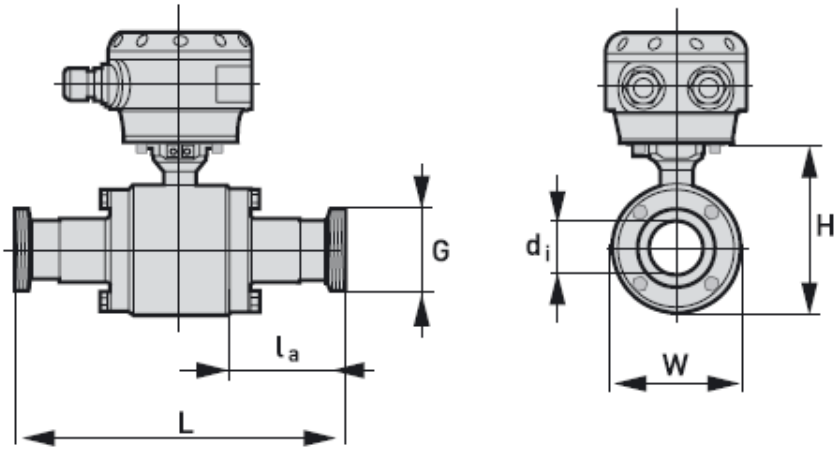
(1) DN½.... ¾ screwed adapter

(2) DN1”...4” bolted adapter

Nominal size		Dimensions [mm]						Approx. weight	
		Adapter			Flowmeter				
DN	PN	d_i	G	l_a	L	H	W	[kg]	(lbs)
½”	290	0.37	0.98	1.97	8.5	5.59	1.73	1.5	3.3
¾”	290	0.62	0.98	1.97	8.5	5.59	1.73	1.5	3.3
1”	290	0.85	1.98	1.02	7.48	5.04	3.5	3.2	7.1
1½”	290	1.35	1.98	3.46	11.02	6.02	4.49	5.5	12.1
2”	290	1.85	2.52	3.46	11.18	6.02	4.49	5.3	11.7
2½”	290	2.35	3.05	2.69	11.5	7.09	5.55	10	22.1
3”	290	2.85	3.54	3.68	14.25	7.52	5.98	12.5	27.6
4”	174	3.83	4.68	3.38	14.96	9.53	7.99	21.8	48.1

Dimensions and Weights

SMS 1145 Adapter

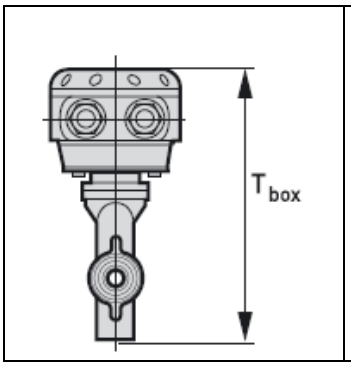


Nominal size		Dimensions [mm]						Approx. weight	
		Adapter			Flowmeter				
DN	PN	d_i	G	l_a	L	H	W	[kg]	(lbs)
25	6	22.6	Rd 40-6	28.1	147.6	128	89	3.2	7.1
38	6	35.5	Rd 60-6	54	262	153	114	5.7	12.6
51	6	48.6	Rd 70-6	84.3	266	153	114	5.4	11.9
63.5	6	60.3	Rd 85-6	69.8	276	180	141	9.9	21.8
76	6	72.9	Rd 98-6	99.8	346	191	152	12.1	26.7
100	6	97.6	Rd 132-6	44	336	242	203	21.9	48.3

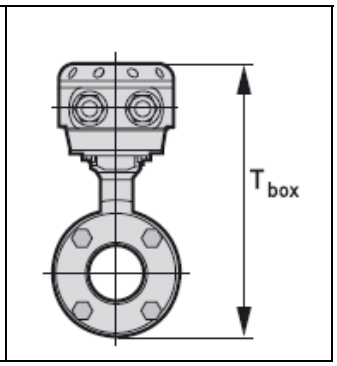
Dimensions for different Housing Variations

Remote version connection box

DN2.5… 15

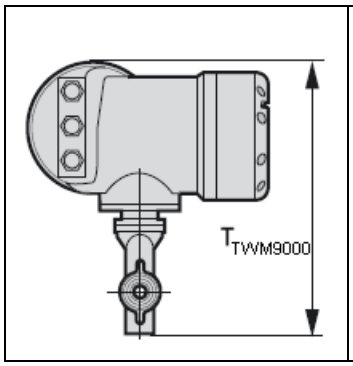


DN25… 150

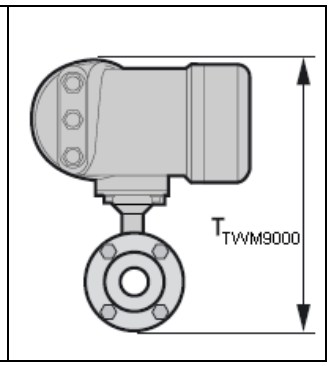


Compact version TWM 9000

DN2.5… 15

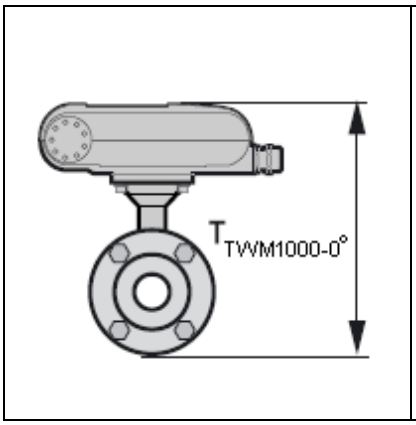


DN25… 150

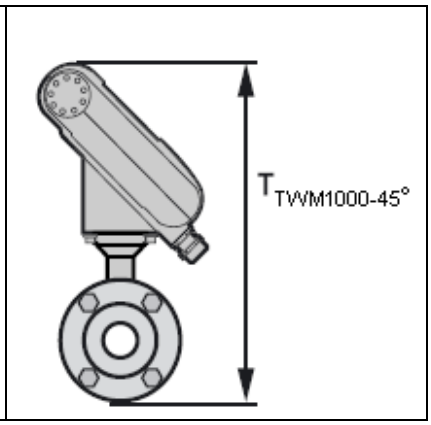


Compact Version TWM 1000

TWM 1000 – 0° version



TWM 1000 - 45° version



Nominal size		Dimensions [mm]				Dimensions [inch]			
DN	PN	T_{box}	$T_{TWM1000-0°}$	$T_{TWM1000-45°}$	$T_{TWM9000}$	T_{box}	$T_{TWM1000-0°}$	$T_{TWM1000-45°}$	$T_{TWM9000}$
2.5	40	200	205	309	302	7.87	8.07	12.17	10.94
4	40	200	205	309	302	7.87	8.07	12.17	10.94
6	40	200	205	309	302	7.87	8.07	12.17	10.94
10	40	200	205	309	302	7.87	8.07	12.17	10.94
15	40	200	205	309	302	7.87	8.07	12.17	10.94
25	40	205	210	314	283	8.08	8.28	12.36	11.14
40	40	230	235	339	308	9.05	9.25	13.35	12.13
50	25	230	235	339	308	9.05	9.25	13.35	12.13
65	25	257	262	366	335	10.11	10.31	14.41	13.19
80	25	268	273	377	346	10.55	10.75	14.84	13.62
100	16	319	324	428	397	12.56	12.76	16.85	15.63
125	10	335	340	444	413	13.19	13.39	17.48	16.26
150	10	370	375	479	448	14.56	14.76	18.86	17.64

Specifications are subject to change without notice.

For More Information

Learn more about how Honeywell's VersaFlow Mag 3000 Electromagnetic Flow Sensor can be best used for food and beverage industry, visit our website www.honeywell.com/ps/hfs or contact your Honeywell account manager.

Honeywell Process Solutions

1860 West Rose Garden Lane

Phoenix, Arizona 85027

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www.honeywell.com/ps

34-VF-03-23
August 2008

Technical Information

Honeywell

VersaFlow Mag 4000 Electromagnetic Flow Sensor Specifications

34-VF-03-01 September 2009

Standard Solution for the Process Industry

The VersaFlow electromagnetic flow sensor is a process industry standard suitable for the most demanding applications.

Highlights

- Proven in the Process industries
- Robust and reliable
- More than 250,000 units operating in the field
- Works reliably under demanding conditions: High temperatures (up to 180°C / 356°F) and low conductivity (non-water from 1 µS/cm, water from 20 µS/cm)
- Quick to install and easy to operate
- Chemically resistant to a wide range of processes.
- Hazardous area versions available

Industries

- Chemicals
- Pulp & Paper
- Water
- Wastewater
- Minerals & Mining
- Iron, Steel & Metals
- Pharmaceuticals

Applications

- Clean liquids
- Slurries and pastes with high solids content
- Abrasive and aggressive products

Figure 1 – VersaFlow Electromagnetic Flow Sensor

Electromagnetic Product Range

VersaFlow converters are compatible with all sensors

TWM9000 Integral Mounted

TWM9000 Remote Mounted

TWM1000

All meters consist of a sensor and a converter, which may be mounted integral to the sensor, or remotely, either with a field mount kit, wall mount housing or a 19” rack mount module. See Specification 34-VF-03-02 (TWM9000) or 34-VF-03-24 (TWM1000) for converter details.

Technical Data

Nominal diameter	MM40						MM41								MM42								MM43								
ASME [inch]	1/10"	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	64"	72"	80"
DN [mm]	2,5	4	6	10	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	1400	1600	1800	2000

Nominal Flange Pressure

EN 1092-1 - PN40	
EN 1092-1 - PN25	
EN 1092-1 - PN16	
EN 1092-1 - PN10	
EN 1092-1 - PN6	
ISO insertion length	
ASME B16.5 - 150lbs RF	
ASME B16.5 - 300lbs RF	
ASME B16.5 - 600 lbs RF	
ASME B16.5 - 900lbs RF	
ASME B16.5 - 1500 lbs RF	
JIS10K	
JIS20K	
	DN > 2000 / 80" on request.
	DN 2.5-6(1/10" -1/4"): DN 10 or 15 (3/8" or 1/2") connection, SS Duplex (1.4462).
	With ASME B16.5 150 lbs RF flanges DN 700 - 1000 (28"- 40") ≤ 10 bar.
	With ASME B16.5 150 lbs RF flanges DN 1200 - 2000 (48"- 80") ≤ 6 bar.
	N.B. for vacuum load see separate table.

Liner

PTFE	
PFA	
ETFE	
PU (Irathane)	
Hardrubber (Ex only)	

Electrodes

Hastelloy C4	
Hastelloy B2	
Hastelloy C22	
Platinum	
Stainless steel 316 Ti (1.4571)	
Titanium	
Tantalum	
Low noise HC4	
LownoiseSS316Ti (1.4571)	
	N.B. Other materials on request.

Nominal diameter	MM40						MM41								MM42								MM43								
ASME [inch]	1/10"	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	64"	72"	80"
DN [mm]	2,5	4	6	10	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	1400	1600	1800	2000

Grounding Rings

Stainless steel 316 Ti (1.4571)*	
Hastelloy C4**	
Hastelloy B2**	
Titanium**	
Tantalum (ring Nr1 and Nr2 only)	
	*DN2.5-6:ringNr1 available; DN 10 - 2000: ring Nr1, 2 and 3 available.
	** Ring Nr.1, 2 and 3 available.

Flanges

Steel 1.0460 (C 22,8)	
Steel 1.0038 (RSt37-2)	
Stainless steel 1.4306(304)	
Stainless steel 1.4404 (316 L)	
Stainless steel 1.4571 (316 Ti)	

Materials

Measuring tube -stainless steel	
Housing (polyurethane coated)	
- Stainless steel Duplex (1.4462)	
- GTW-S 30	
- Sheet steel	
-Stainless steel 304 (1.4306)	
Connection box (F-versions only)	
-Aluminum, polyurethane coated	
-Stainless steel 304 (1.4306)	
	Other materials on request.

Protection Category

IP 66/67 eq. NEMA 4/4X / 6	
IP 68 field eq. NEMA 6P	
IP 68 factory eq. NEMA6P	
	N.B. IP 68 is only available with a stainless steel connection box.

standard optional on request

Nominal diameter	MM40 →					MM41										MM42								MM43								
ASME [inch]	1/10"	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	64"	72"	80"
DN [mm]	2,5	4	6	10	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	1400	1600	1800	2000

Approvals

Non - Ex																															
EEx zone 1/2																															
FM - class I div. 2																															
CSA-GP/classIdiv. 2																															
NEPSI zone 1																															
SAA - Aus Ex zone 1 / 2																															
TIIS - zone1 /2																															
	Please note the approvals are for flow sensors only.																														

Versions

Compact+ TWM 9000 C																															
Separate+ TWM 9000 F, R, W																															
Compact/Separate TWM1000																															

Conductivity

Non-water	>10µS	min. 1 µS/cm (TWM 9000), min. 5 µS/cm (TWM 1000)
Water	min. 20 µS/cm	

■ standard ▒ optional □ on request

Temperature Range

Temperature range	Process [°C]		Ambient [°C]		Process [°F]		Ambient [°F]	
	min.	max.	min.	max.	min.	max.	min.	max.
PTFE								
Remote Converter (TWM 1000 or TWM 9000)	-40	180	-40	65	-40	356	-40	149
Compact with TWM 1000 or TWM 9000	-40	140	-40	65	-40	284	-40	149
PFA								
Remote Converter (TWM 1000 or TWM 9000)	-40	180	-40	65	-40	356	-40	149
Compact with TWM 1000 or TWM 9000	-40	140	-40	65	-40	284	-40	149
ETFE								
Remote Converter (TWM 1000 or TWM 9000)	-40	120	-40	65	-40	248	-40	149
Compact with TWM 1000 or TWM 9000	-40	120	-40	65	-40	248	-40	149
Hardrubber								
Remote Converter (TWM 1000 or TWM 9000)	-5	80	-25	65	23	176	-13	149
Compact with TWM 1000 or TWM 9000	-5	80	-40	65	23	176	-40	149
	N.B. Hardrubber liner is available for Ex-versions only							
Irathane								
Remote Converter (TWM 1000 or TWM 9000)	-5	65	-25	65	23	149	-13	149
Compact with TWM 1000 or TWM 9000	-5	65	-40	65	23	149	-40	149

Dimensions and Weights

Nominal size		Dimensions [mm]						Approx. weight
DN	PN	L		H	W	Total (T)		[kg]
[mm]	[bar]	DIN	ISO			box	TWM9000	
DN2,5...20								
2,5	40	130	-	142	90	220	299	3
4	40	130	-	142	90	220	299	3
6	40	130	-	142	90	220	299	3
10	40	150	-	106	90	184	263	6
15	40	150	200	106	95	184	263	6
20	40	150	200	158	105	236	315	7
DN25...150								
25	40	150	200	140	115	218	297	5
32	40	150	200	157	140	235	314	6
40	40	150	200	166	150	244	323	7
50	40	200	200	186	165	264	343	11
65	16	200	200	200	185	278	357	9
80	40	200	200	209	200	287	366	14
100	16	250	250	237	220	315	394	15
125	16	250	250	266	250	344	423	19
150	16	300	300	300	285	378	457	27
DN200...600								
200	10	350	350	361	340	439	518	34
250	10	400	450	408	395	486	565	48
300	10	500	500	458	445	536	615	58
350	10	500	550	510	505	588	667	78
400	10	600	600	568	565	646	725	101
450	10	600	-	618	615	696	775	111
500	10	600	-	671	670	749	828	130
600	10	600	-	781	780	859	938	165
DN700...2000								
700	10	700	-	898	895	976	1055	248
800	10	800	-	1012	1015	1090	1169	331
900	10	900	-	1114	1115	1192	1271	430
1000	10	1000	-	1225	1230	1303	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

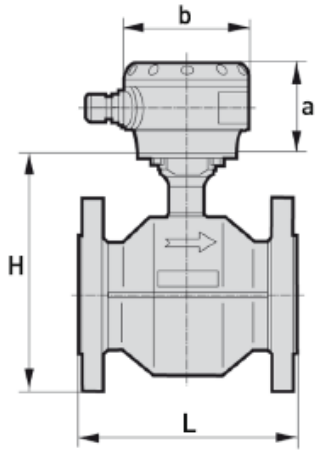
Nominal size		Dimensions 150lbs [mm]					Approx. weight
ASME	PN	Flow Sensor Only			Total (T)		[lb]
[inch]	[psi]	L	H	W	box	TWM9000	
DN0,1"...0,75"							
1/10"	284	5,12	5,59	3,5	8,66	11,69	6
1/8"	284	5,12	5,59	3,5	8,66	11,69	6
1/4"	284	5,12	5,59	3,5	8,66	11,69	6
3/8"	284	5,91	5,08	3,5	8,15	11,26	12
1/2"	284	5,91	5,08	3,5	8,15	11,26	12
3/4"	284	5,91	5,28	3,88	8,35	11,46	18
DN1"...6"							
1"	284	5,91	5,39	4,25	8,46	11,57	18
1 1/2"	284	5,91	6,1	5	9,17	12,28	22
2"	284	7,87	7,05	5,98	10,12	13,23	29
3"	284	7,87	8,03	7,5	11,1	14,21	37
4"	284	9,84	9,49	9	12,56	15,67	51
5"	284	9,84	10,55	10	13,62	16,73	60
6"	284	11,81	11,69	11	14,76	17,87	75
DN8"...24"							
8"	284	13,78	14,25	13,5	17,32	20,43	95
10"	284	15,75	16,3	16	19,37	22,48	143
12"	284	19,69	18,78	19	21,85	24,96	207
14"	284	27,56	20,67	21	23,74	26,85	284
16"	284	31,5	22,95	23,5	26,02	29,13	364
18"	284	31,5	24,72	25	27,8	30,91	410
20"	284	31,5	26,97	27,5	30,04	33,15	492
24"	284	31,5	31,38	32	34,45	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")					

Nominal size		Dimensions 150lbs [mm]					Approx. weight
ASME	PN	Flow Sensor Only			Total (T)		[kg]
[inch]	[psi]	L	H	W	box	TWM9000	
DN0,1"...0,75"							
1/10"	284	130	142	88,9	220	297	3
1/8"	284	130	142	88,9	220	297	3
1/4"	284	130	142	88,9	220	297	3
3/8"	284	150	129	88,9	207	286	6
1/2"	284	150	129	88,9	207	286	6
3/4"	284	150	134	98,6	212	291	8
DN1"...6"							
1"	284	150	137	108	215	294	8
1 1/2"	284	150	155	127	233	312	10
2"	284	200	179	152	257	336	13
3"	284	200	204	190,5	282	361	17
4"	284	250	241	228,6	319	398	23
5"	284	250	268	254	346	425	27
6"	284	300	297	279,4	375	454	34
DN8"...24"							
8"	284	350	362	342,9	440	519	43
10"	284	400	414	406,4	492	571	65
12"	284	500	477	482,6	555	634	94
14"	284	700	525	533,4	603	682	129
16"	284	800	583	596,9	661	740	165
18"	284	800	628	635	706	785	186
20"	284	800	685	698,5	763	842	223
24"	284	800	797	812,8	875	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")					

Nominal size		Dimensions 300lbs [inch]					Approx. weight
ASME	PN	Flow Sensor Only			Total (T)		[lb]
[inch]	[psi]	L	H	W	box	TWM9000	
DN0,1"...0,75"							
1/10"	741	5,12	5,59	3,75	8,66	11,69	6
1/8"	741	5,12	5,59	3,75	8,66	11,69	6
1/4"	741	5,12	5,59	3,75	8,66	11,69	6
3/8"	741	5,91	5,24	3,75	8,31	11,42	15
1/2"	741	5,91	5,24	3,75	8,31	11,42	15
3/4"	741	5,91	5,67	4,62	8,74	11,85	20
DN1"...6"							
1"	741	5,91	5,71	4,87	8,78	11,89	18
1 1/2"	741	7,87	6,65	6,13	9,72	12,83	20
2"	741	9,84	7,32	6,5	10,39	13,5	29
3"	741	9,84	8,43	8,25	11,5	14,61	37
4"	741	11,81	10	10	13,07	16,18	51
6"	741	12,6	12,44	12,5	15,51	18,62	79
DN8"...24"							
8"	741	15,75	15,04	15	18,11	21,22	157
10"	741	19,69	17,05	17,5	20,12	23,23	247
12"	741	23,62	20	20,5	23,07	26,18	375
14"	741	27,56	21,65	23	24,72	27,83	474
16"	741	31,5	23,98	25,5	27,05	30,16	639
20"	741	31,5	28,46	30,5	31,54	34,65	937
24"	741	31,5	33,39	36	36,46	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")					

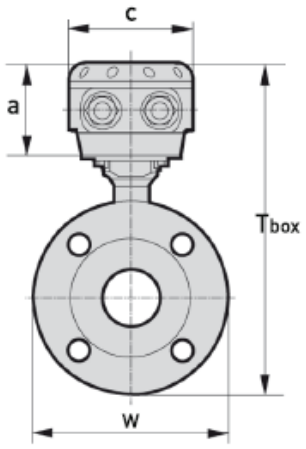
Nominal size		Dimensions 300lbs [mm]					Approx. weight
ASME	PN	Flow Sensor Only			Total (T)		[kg]
[inch]	[psi]	L	H	W	box	TWM9000	
DN0,1"...0,75"							
1/10"	741	130	142	95,2	220	297	3
1/8"	741	130	142	95,2	220	297	3
1/4"	741	130	142	95,2	220	297	3
3/8"	741	150	133	95,2	211	290	7
1/2"	741	150	133	95,2	211	290	7
3/4"	741	150	144	117,3	222	301	9
DN0,1"...6"							
1"	741	150	145	123,8	223	302	8
1 1/2"	741	200	169	155,6	247	326	9
2"	741	250	186	165,1	264	343	13
3"	741	250	214	209,6	292	371	17
4"	741	300	254	254	332	411	23
6"	741	320	316	317,5	394	473	36
DN0,8"...24"							
8"	741	400	382	381	460	539	71
10"	741	500	433	444,5	511	590	112
12"	741	600	508	520,7	586	665	170
14"	741	700	550	584,2	628	707	215
16"	741	800	609	647,7	687	766	290
20"	741	800	723	774,7	801	880	425
24"	741	800	848	914,4	926	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")					

Frontview VersaFlow (w/TWM9000F)



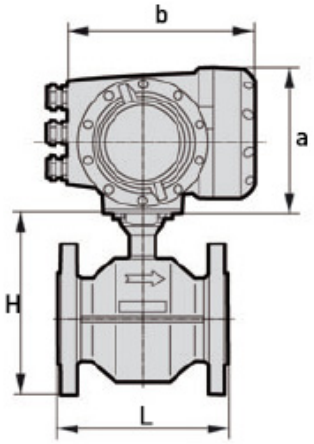
a = 77 mm / 3,1"
b = 106 mm / 4,2"

Sideview VersaFlow (w/TWM9000F)



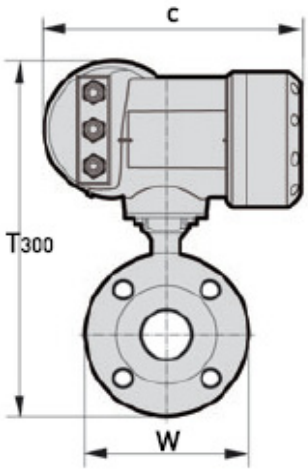
a = 77 mm / 3,1"
c = 106 mm / 4,2"

Frontview VersaFlow (w/TWM9000C)



a = 155 mm / 6,1"
b = 202 mm / 7,8"

Sideview VersaFlow (w/TWM9000C)



c = 260 mm / 10,2"

Note: For Sensor with TWM1000 Converter refer to Specification 36-VF-03-24

Vacuum Load

Liner	Diameter	Max. pressure	Vacuum load in mbar abs. at a process temperature [°C] of …								
	[mm]	[bar]	40	60	70	80	90	100	120	140	180
PFA	DN 2.5 - 150	50	0	0	0	0	0	0	0	0	0
Hardrubber	DN 200 - 300	150	250	400	400	400	-	-	-	-	-
	DN 350 - 3000	150	500	600	600	600	-	-	-	-	-
ETFE	DN 200 - 2000	150	100	100	100	100	100	100	100	-	-
PTFE	DN 10 - 20	50	0	0	0	0	0	0	500	750	1000
	DN 200 - 300	50	500	750	1000	1000	1000	1000	1000	1000	1000
	DN 350 - 600	50	800	1000	1000	1000	1000	1000	1000	1000	1000
PU	DN 200 - 1800	1500	500	600	-	-	-	-	-	-	-

Liner	Diameter	Max. pressure	Vacuum load in psia at a process temperature [°F] of …								
	[inch]	[psi]	104	140	158	176	194	212	248	284	356

Vacuum Load

PFA	1/10" - 6"	725	0	0	0	0	0	0	0	0	0
Hardrubber	8" - 12"	2176	3,6	5,8	5,8	5,8	-	-	-	-	-
	14" - 120"	2176	7,3	8,7	8,7	8,7	-	-	-	-	-
ETFE	8" - 72"	2176	1,5	1,5	1,5	1,5	1,5	1,5	1,5	-	-
PTFE	3/8" - 3/4"	725	0	0	0	0	0	0	7,3	10,9	14,5
	8" - 12"	725	7,3	10,9	14,5	14,5	14,5	14,5	14,5	14,5	14,5
	14" - 24"	725	11,6	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5
PU	8" - 72"	21756	7,3	8,7	-	-	-	-	-	-	-

Specifications are subject to change without notice

For More Information

Learn more about how Honeywell's VersaFlow Mag 4000 Electromagnetic Flow Sensor can be used to monitor a variety of processes, visit our website www.honeywell.com/ps/hfs or contact your Honeywell account manager.

Honeywell Process Solutions

1860 West Rose Garden Lane

Phoenix, Arizona 85027

Tel: 1-800-423-9883 or 1-800-343-0228

www.honeywell.com/ps

34-VF-03-01
September 2009

Technical Information

Honeywell

TWM 1000
Electromagnetic Flow Converter Specifications

34-VF-03-24 August 2008

The More Than Economical Solution

The TWM1000 offers a broad range of performance with an outstanding price/performance ratio.

The TWM1000 has been developed for applications requiring an economical solution for the measuring task at a high technological level.

Highlights

- Quick and easy to install and operate
- Large, illuminated graphic display with intuitive operation
- Multiple user languages as standard
- Maintenance-free
- Outstanding price/performance ratio
- Extremely quick signal conversion

Industries

- Agriculture
- Heating, Ventilation & Air Conditioning
- Machinery
- Power Plants
- Water
- Wastewater

Applications

- Measuring homogeneous media
- Water distribution networks and spray-irrigation systems
- Water treatment
- Environmental technology

Figure 1 – TWM1000 Electromagnetic Flow Converter

1. Large, illuminated graphic display with intuitive operation
2. For AC and DC operation

Options and Variants

Modular converter concept

Despite its somewhat different appearance, the TWM1000 has many of the same functions as its "big brother", the TWM9000.
The diagnostics function, conductivity measurement and simple menu navigation, to mention just a few.
This latest member of the transformer family also has a large number of fully-developed functions:

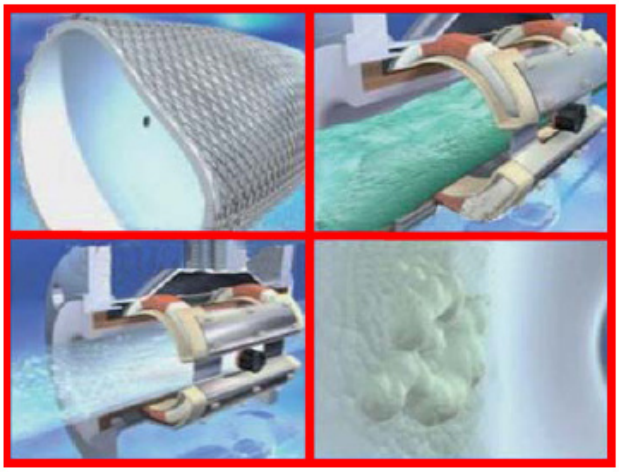
- various auxiliary power supply versions (AC, DC, AC/DC)
- HART as standard
- optional Ex version available

Compact design in various versions

The TWM1000C in the 0° version is ideal for installation in vertical pipes.
The 45° version, on the other hand, allows draining of liquids when it is installed in horizontal pipes. The angled design also improves the readability of the display.
The backlit display provides excellent readability from long distances.
The 4 softkeys enable easy operation, start-up and parametrization.
Both housing versions can be rotated in 90° increments, allowing customer-specific installation positions.

Signal converter in wall version

With the TWM1000W, remote installation is possible in the case of temperature effects, vibration or difficult-to-reach locations.
A signal cable is used to connect the sensor and the converter for the purposes of power supply and signal processing.
The electronics can be used in all housing versions without reparametrization.



Diagnosis

The TWM1000 has been equipped with an extensive diagnostic tool for device function and application tests.

- Conductivity measurement
- Electrode error
- Process or ambient temperature too high

Technical Data

Measuring System

Measurement principle	Faraday's law of induction
Function	Continuous measurement of current volume flow, flow velocity, conductivity, mass flow (at constant density), coil temperature of the measuring sensor
Modular construction	The measurement system consists of a measuring sensor and a signal converter
Signal converter	
Compact version (C)	TWM1000 C (0° & 45° version)
Remote version (W)	TWM1000 W
Measuring sensor	
VersaFlow Mag 100	TWM1000 C & W: DN10...150 / 3/8"…6"
VersaFlow Mag 1000	TWM1000 C & W: DN25...1200 / 1"…48"
VersaFlow Mag 4000	TWM1000 C: DN2.5...1200 / 1/10"…48"; TWM1000 W: DN 10...1200 / 3/8"…48";
VersaFlow Mag 2000	TWM1000 C: DN2.5...250 / 1/10"…12"; TWM1000 W: DN 10...250 / 3/8"…12"
VersaFlow Mag 3000	TWM1000 C: DN2.5...150 / 1/10"…6"; TWM1000 W: DN 10...150 / 3/8"…6"
Communication	
Outputs	Current (incl. HART®), pulse, frequency, status output and/or limit switch
Counter	2 internal counters with a max. of 8 counter places (e.g. for counting volume and/or mass units)
Verification	Integrated verification, diagnosis functions: flowmeter, empty pipe detection, stabilization
Display and user interface	
Graphic display	LC display, backlit white; size: 128x64 pixels, corresponds to 59x31 mm = 2.32"x1.22"
Display functions	2 measured value pages, 1 status page, 1 graphic page (measured values and depictions adjustable as required)
Units	Metric, British and US units selectable as required from lists for volume / mass flow and counting, flow speed, electrical conductivity, temperature
Language of display texts	English, French, German (others on request)
Operating elements	4 keys for operator control of the signal converter without opening the housing

Measuring Accuracy

Maximum measuring error	±0.3% of the measured value ±1 mm/s, depending on the measuring sensor (see accuracy curves)
Repeatability	±0.1 %

Operating Conditions

Temperature	
Process temperature	See also data sheet for the measuring sensor
Ambient temperature	-40…+65°C / -40…+149°F (ambient temperature 55°C / 131°F and higher: protect
	electronics against self-heating, because an increase in the electronics temperature in 10°C / 50°F steps leads to a corresponding reduction of the electronics' service life by a factor of two.)
Storage temperature	-50…+70°C / -58…+158°F
Electrical conductivity	
All media except for water	Min. 5 µS/cm (see also data sheet for the measuring transformer)
	Min. 20 µS/cm

Materials

Die-cast aluminium (polyurethane-coated)	Standard

Electrical Connection

Voltage	Standard: 100…230 VAC (-15% / +10%), 50/60 Hz
	Option 1: 24 VDC (-55% / +30%)
	Option 2: 24VAC/DC (AC: -15% / +10%; DC: -25% / +30%)
Power consumption	Standard: 8 VA
	Option 1: 4 W
	Option 2: AC 8 VA; DC: 4 W
Signal cable	Only for remote versions
A: type DS 300	Max. length: 600 m / 1950 ft (depending on electrical conductivity and measuring sensor version)
Cable entries	Standard: M20 x 1.5
	Option: ½" NPT, PF ½

Outputs

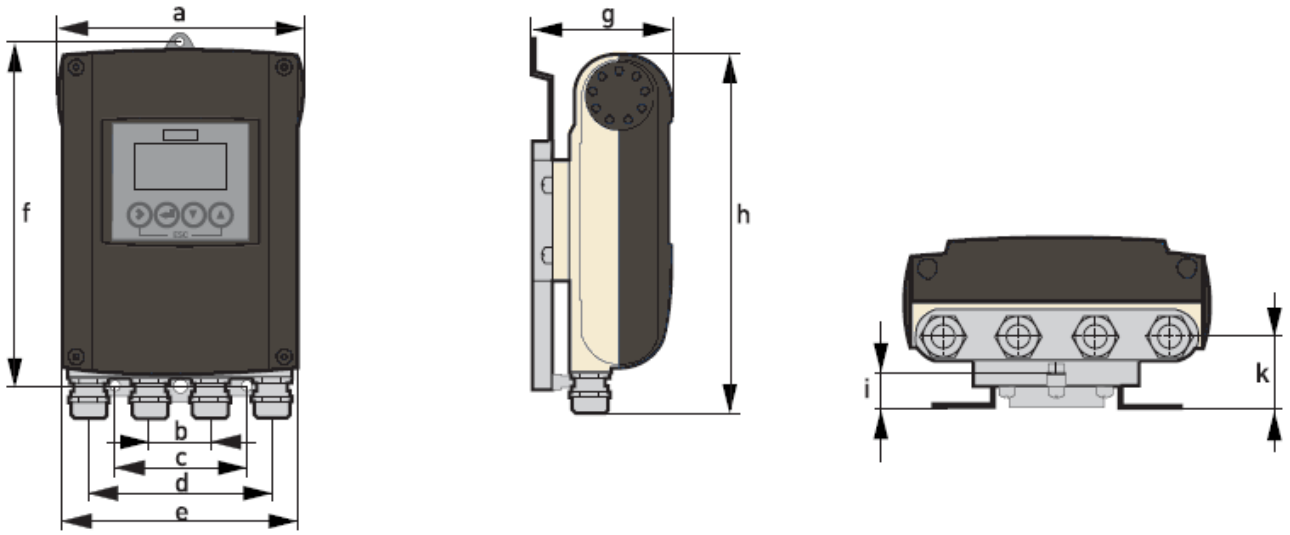
Current output		
Function	Measurement of volume and mass (at constant density), HART® communication	
Settings	Without HART®	With HART®
	Q = 0%: 0…15 mA	Q = 0%: 4…15 mA
	Q = 100%: 10…21.5 mA	Q = 100%: 10…21.5 mA
	Error identification: 0…22 mA	Error identification: 3.5…22 mA
Operating data		
Active	$U_{int,nom}$ = 24 VDC I ≤ 22mA R_L ≤ 750 Ω	
Passive	U_{ext} ≤ 32 VDC I ≤ 22mA U_0 ≤ 2 V at I = 22 mA	
Pulse or frequency output		
Function	Can be set as a pulse output (e.g.- for volume or mass counting) or frequency output	
Settings	For Q = 100%: 0.01...10000 pulses per second or pulses per unit volume	
	Pulse width: setting automatic, symmetric or fixed (0.05...2000 ms)manual	
Operating data		
Passive	U_{ext} ≤ 32 VDC	
	100 Hz < f_{max} ≤ 10 kHz: I ≤ 20mA open: I ≤ 0.1 mA at U_{ext} = 5 V I ≤ 0.5mA at U_{ext} = 24 V I ≤ 0.7mA at U_{ext} = 32 V closed: U_0 ≤ 0.8V at I = 1 mA U_0 ≤ 1.5V at I = 10 mA U_0 ≤ 3.5V at I = 100 mA f ≤ 1 kHz: R_L ≤ 10 Ω f ≤ 10 kHz: R_L ≤ 2 Ω	

Status output / limit switch	
Function and settings	Settable as automatic measuring range change, indicator for direction of flow, overflow, error, operating point or empty pipe detection
	Valve control with activated dosing function
	Status and/or control: ON or OFF
Operating data	
Passive	$U_{ext} \leq 32$ VDC $I \leq 100$mA open: $I \leq 0.05$ mA at $U_{ext} = 32$ VDC closed: $U_0 \leq 0.2$V at I = 10 mA $U_0 \leq 2$V at I = 100 mA
Low-flow cutoff	
On	0...±9.999 m/s; 0...20.0%, settable in 0.1 % steps, separately for each current and pulse output
Off	0...±9.999 m/s; 0...19.0%, settable in 0.1 % steps, separately for each current and pulse output
Time constant	
Function	Can be set together for all flow indicators and outputs, or separately for: current, pulse and frequency output, and for limit switches and the 2 internal counters
Time setting	0…100 seconds, settable in 0.1 second steps

Hazardous areas	
Non-Ex	Standard
EEx - Zone 1/2	In preparation
SAA version Ex Zone 1/2	In preparation
TIIS - Zone 1/2	In preparation
Protection category to IEC 529 / EN 60529	
All versions	IP 66 / 67 (corresponds to NEMA 4X/6)

Dimensions and Weights

Wall-Mounted Version



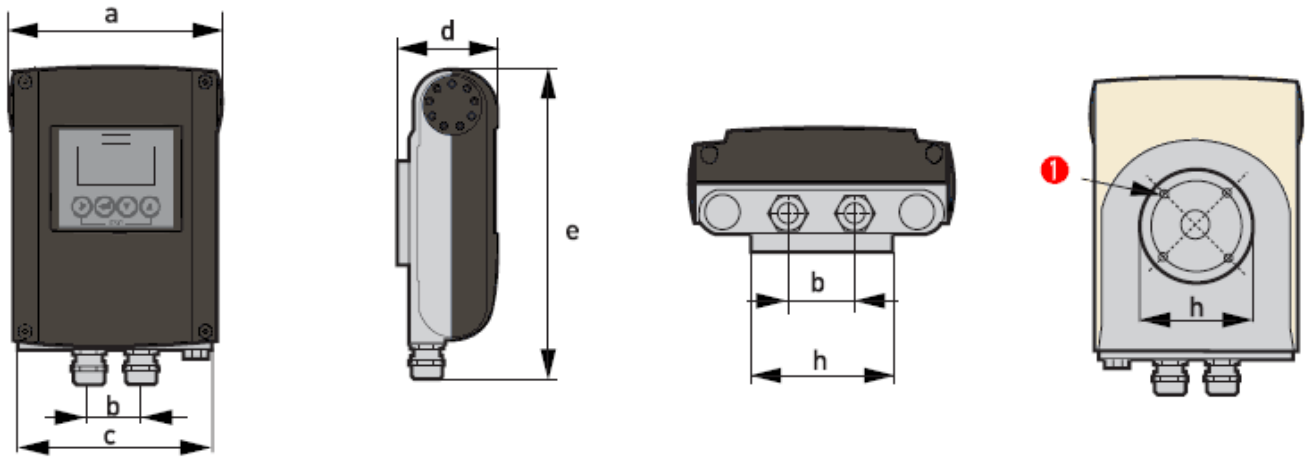
Dimensions and weight in mm and kg

	Dimensions [mm]										Weight [kg]
	a	b	c	d	e	f	g	h	i	k	
Wall-mounted version	161	40	87.2	120	155	241	95.2	257	19.3	39.7	Std: 1.9 Ex: 2.4

Dimensions and weight in inches and lbs

	Dimensions [inches]										Weight [lbs]
	a	b	c	d	e	f	g	h	i	k	
Wall-mounted version	6.34	1.57	3.43	4.72	6.10	9.49	3.75	10.12	0.76	1.56	Std: 4.2 Ex: 5.3

Compact 0° version



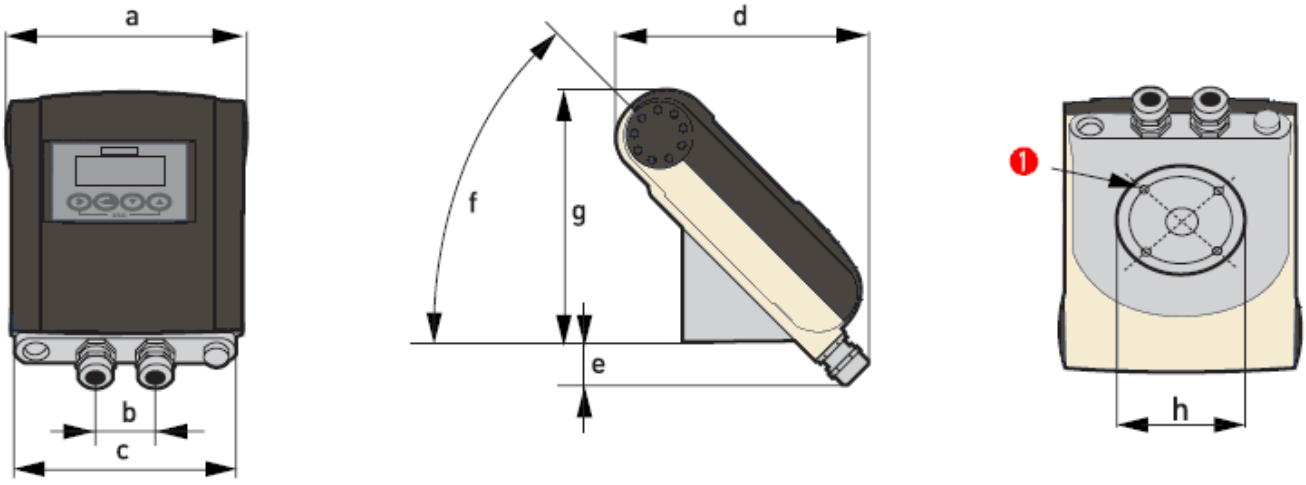
Dimensions and weight in mm and kg

	Dimensions [mm]								Weight [kg]
	a	b	c	d	e	f	g	h	
0° version	161	40	155	81.5	257	-	-	Ø72	Std: 1.9 Ex: 2.4

Dimensions and weight in inches and lbs

	Dimensions [inches]								Weight [lbs]
	a	b	c	d	e	f	g	h	
0° version	6.34	1.57	6.1	3.21	10.12	-	-	Ø2.83	Std: 4.2 Ex: 5.3

Compact 45° version



Dimensions and weight in mm and kg

	Dimensions [mm]								Weight [kg]
	a	b	c	d	e	f	g	h	
45° version	161	40	155	184	27.4	45°	186	Ø72	Std: 2.1 Ex: 2.6

Dimensions and weight in inches and lbs

	Dimensions [inches]								Weight [lbs]
	a	b	c	d	e	f	g	h	
45° version	6.34	1.57	2.17	2.74	1.08	45°	7.32	Ø2.83	Std: 4.2 Ex: 5.3

Flow Tables

Flow rate in m/s and m^3/h

	$Q_{100\%}$ in m^3/h			
v [m/s]	**0.3**	**1**	**3**	**12**
DN [mm]	**Min. flow**	**Nominal flow**		**Max. flow**
2.5	0.01	0.02	0.05	0.21
4	0.01	0.05	0.14	0.54
6	0.03	0.10	0.31	1.22
10	0.08	0.28	0.85	3.39
15	0.19	0.64	1.91	7.63
20	0.34	1.13	3.39	13.57
25	0.53	1.77	5.30	21.21
32	0.87	2.90	8.69	34.74
40	1.36	4.52	13.57	54.29
50	2.12	7.07	21.21	84.82
65	3.58	11.95	35.84	143.35
80	5.43	18.10	54.29	217.15
100	8.48	28.27	84.82	339.29
125	13.25	44.18	132.54	530.15
150	19.09	63.62	190.85	763.40
200	33.93	113.10	339.30	1357.20
250	53.01	176.71	530.13	2120.52
300	76.34	254.47	763.41	3053.64
350	103.91	346.36	1039.08	4156.32
400	135.72	452.39	1357.17	5428.68
450	171.77	572.51	1717.65	6870.60
500	212.06	706.86	2120.58	8482.32
600	305.37	1017.90	3053.70	12214.80
700	415.62	1385.40	4156.20	16624.80
800	542.88	1809.60	5428.80	21715.20
900	687.06	2290.20	6870.60	27482.40
1000	848.22	2827.40	8482.20	33928.80
1200	1221.45	3421.20	12214.50	48858.00

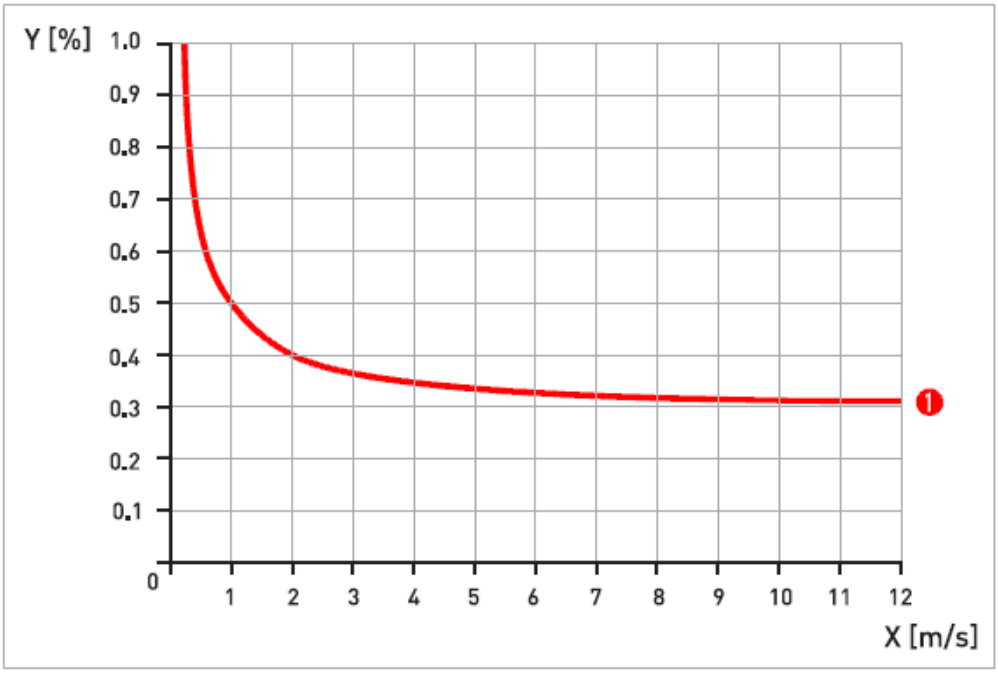
Flow Rate in ft/s and gallons/min

	$Q_{100\%}$ in .US gallons/min			
v [ft/s]	**1**	**3.3**	**10**	**40**
DN [inch]	**Min. flow**	**Nominal flow**		**Max. flow**
1/10	0.02	0.09	0.23	0.93
1/8	0.06	0.22	0.60	2.39
1/4	0.13	0.44	1.34	5.38
3/8	0.37	1.23	3.73	14.94
1/2	0.84	2.82	8.40	33.61
3/4	1.49	4.98	14.94	59.76
1	2.33	7.79	23.34	93.36
1.25	3.82	12.77	38.24	152.97
1.5	5.98	19.90	59.75	239.02
2	9.34	31.13	93.37	373.47
2.5	15.78	52.61	159.79	631.16
3	23.90	79.69	239.02	956.09
4	37.35	124.47	373.46	1493.84
5	58.35	194.48	583.24	2334.17
6	84.03	279.97	840.29	3361.17
8	149.39	497.92	1493.29	5975.57
10	233.41	777.96	2334.09	9336.37
12	336.12	1120.29	3361.19	13444.77
14	457.59	1525.15	4574.93	18299.73
16	597.54	1991.60	5975.44	23901.76
18	756.26	2520.61	7562.58	30250.34
20	933.86	3112.56	9336.63	37346.53
24	1344.50	4481.22	13445.04	53780.15
28	1829.92	6099.12	18299.20	73196.79
32	2390.23	7966.64	23902.29	95609.15
36	3025.03	10082.42	30250.34	121001.37
40	3734.50	12447.09	37346.00	149384.01
48	5377.88	17924.47	53778.83	215115.30

Accuracy

Reference conditions

- Medium: water
- Temperature: 20°C / 68°F
- Pressure: 1 bar / 14.5 psi
- Inlet run: ≥ 5 DN



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

	DN [mm]	DN [inch]	Accuracy	Curve
VersaFlow Mag 1000 / 4000 / 2000 / 3000	10…1200	3/8…48	0.3% of mV +1 mm/s	1
VersaFlow Mag 100	10…150	3/8…6	0.4% of mV +1 mm/s	as 1 + 0.1%
VersaFlow Mag 2000 / 3000 / 4000	2.5…6	1/10…1/4		

Specifications are subject to change without notice.

For More Information

Learn more about how Honeywell's TWM 1000 Electromagnetic Flow Converter can offer a broad range of performance with an outstanding price/performance ratio, visit our website www.honeywell.com/ps/hfs or contact your Honeywell account manager.

Honeywell

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34-VF-03-24
August 2008

Technical Information

Honeywell

VersaFlow TWM 9000 Electromagnetic Flow Converter Specifications

34-VF-03-02 September 2009

The High-Performance Solution

The TWM 9000 is the only electromagnetic flow converter with diagnostics for the instrument and application. TWM 9000 is compatible with all electromagnetic flow sensors and is suitable for all applications.

Highlights

- Complete Diagnostics of the application and instrument
- Quick to install and easy to operate
- Excellent long-term stability
- Optimal zero point stability independent from process properties
- One converter for all applications; helps facilitate procurement, engineering and inventory management.
- Exceeds requirements VDI / VDE/ WIB 2650 and NAMUR NE 107
- Integrated temperature and conductivity measurement
- Suitable for Custody Transfer

Industries

- Chemicals
- Food & Beverage
- Minerals & Mining
- Oil & Gas
- Pharmaceuticals
- Power Plants
- Pulp & Paper
- Water
- Wastewater
- Machinery

Figure 1 – VersaFlow Electromagnetic Flow Converter

Electromagnetic Product Range

VersaFlow converters are compatible with all sensors

All meters consist of a sensor and a converter. The converter may be mounted integral to the sensor, or remotely, either with a field mounting kit or a wall-mounted housing. See sensor specification for details.

Applications

- Products with low conductivity, high solid contents or entrained air
- Inhomogeneous, abrasive and corrosive products
- Quick media changes
- Abrupt changes of pH value
- Pulsating or turbulent flows

Model

C (compact) (Integrally Mounted)	TWM 9000 C
F (field), W (wall), R (19" rack) (Remote Mounted)	TWM 9000 F, TWM 9000 W, TWM 9000 R

Performance

Maximum measuring error	See Accuracy Curves
Repeatability	±0.06% to OIML R117
Full-scale range (see flow table)	v = 0.3...12 m/s / 1...40 ft/s

Conductivity

Min. process liquid conductivity (non-water)	As low as 1 µS/cm (see flow sensor)
Min. process liquid conductivity (water)	20 µS/cm

Content of solids

Maximum percentage (by volume)	30%

Display

With local display (2 meas. pages: 1 status page, 1 graphical page)	Standard

Languages

English, French, German, Dutch, Polish, Portuguese, Danish , Spanish, Swedish, Slovenian, Italian	Standard

Combinations

VersaFlow Mag 100 Specification 34-VF-03-08	DN10...150 (3/8” to 6”)
VersaFlow Mag 1000 Specification 34-VF-03-16	DN25...3000 (1” to 120”)
VersaFlow Mag 4000 Specification 34-VF-03-01	DN2.5...3000 (1/10” to 120”)
VersaFlow Mag 2000 Specification 34-VF-03-21(F), 34-VF-03-22(SW)	DN2.5...250 (1/10” to 10”)
VersaFlow Mag 3000 Specification 34-VF-03-23	DN2.5...150 (1/10” to 6”)

Communication

Current, pulse & status output, frequency output, limit switch	Standard
HART communication, control input, 3 counters	Standard
Ex-i	Option
Foundation Fieldbus	Option
Profibus PA	Option
Profibus DP	Option
Modbus	Option

Verification

Integrated verification, diagnostics:	Standard
- instrument / process / measurement	Standard
- empty pipe indication / stabilization	Standard

Custody Transfer

Without	Standard
Cold potable water (OIML R-49, KIWA K618)	Option[1]
Other than water (OIML R-117)	Option[1]

Power Supply

Voltage	Power Consumption	Standard/Option
100…230 VAC (-15% / +10%), 50/60 Hz	22 VA	Standard
24 VDC (-55% / +30%)	12 W	Option
24 VAC/DC (AC: -15% / +10%; DC: -25% / +30%)	AC 22 VA; DC: 12 W	Option

Approval

Non Ex	Standard
EEx - zone 1	Option [2]
FM - Class I DIV 2	Option [2]
CSA - Class I DIV 2	Option [2]
NEPSI zone 1	Option [2]
SAA – Aus Ex zone 1 / 2 (pending)	Option [2]

Protection category (according to IEC 529 / EN 60 529)

C (compact)	IP 66 / 67 (eq. to NEMA 6)
F (remote)	IP 66 / 67 (eq. to NEMA 6)
W (wall)	IP 65 (eq. to NEMA 4/4X)
R (19" rack)	IP 20 (eq. to NEMA 1)

Temperature

Process temperature	See flow sensor
Ambient temperature	-40…+65°C / -40…+149°F
Storage temperature	-50…+70°C / -58…+158°F

Signal Cable

Separate - DS (dep. on measuring sensor and conductivity)	5...600 m / 15...1950 ft
Separate - BTS (dep. on measuring sensor and conductivity)	5...600 m / 15...1950 ft
Separate - LIYCY (Class 1 Div. 2 only) (dep. on measuring sensor and conductivity)	5...100 m / 15...330 ft

[1] pending
[2] only for C and F version

Cable Connection

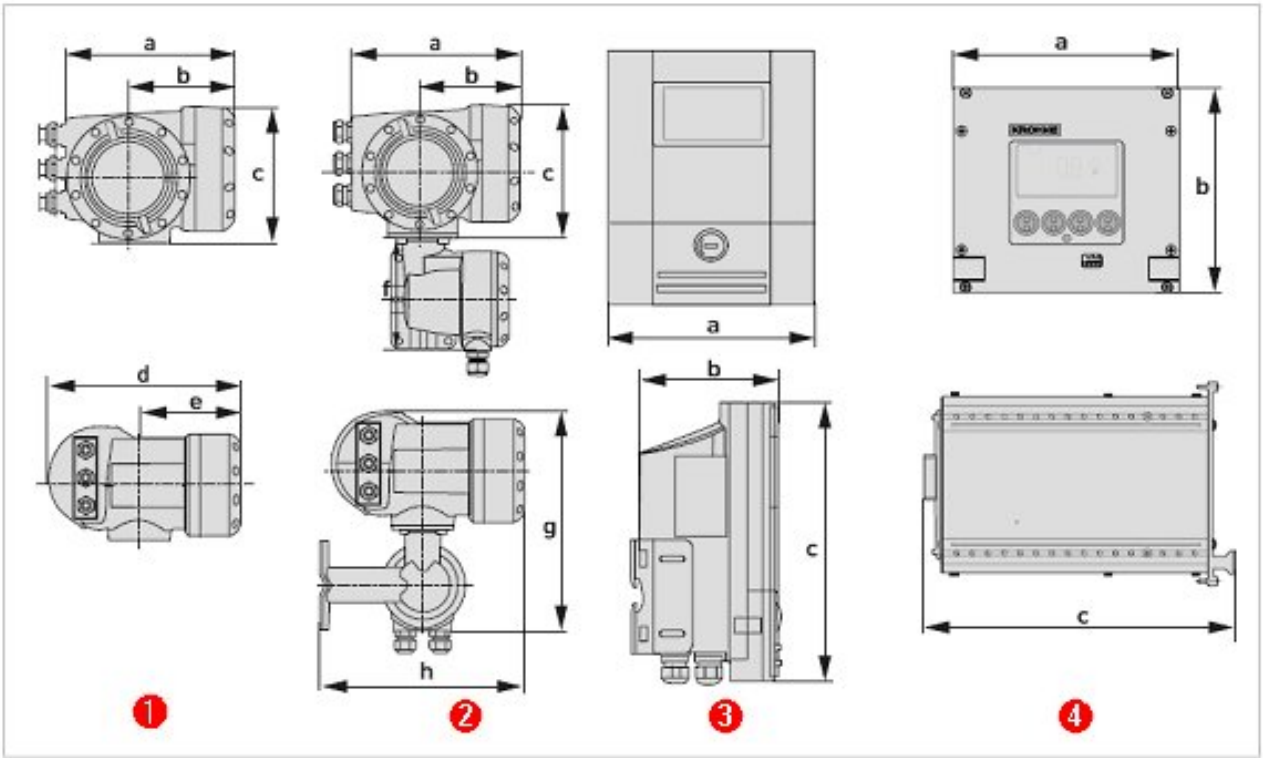
M20 x 1.5	Standard
½" NPT	Option
PF ½	Option

Materials Used

Die-cast aluminum (polyurethane coated); C and F version only	Standard
Polyamide - polycarbonate; W version only	Standard
Stainless steel 316 L (1.4404); C and F version only	Option
Custody transfer lead & sealing; C and F version only	Option [1]

[1] pending

Dimensions and Weights



1 Compact version (TWM 9000 C)
2 Field housing (TWM 9000 F) - remote version
3 Wall-mounted housing (TWM 9000 W) - remote version
4 19" rack (TWM 9000 R) - remote version

Dimensions and Weights in mm and kg

Version	Dimensions mm [inches]								Weights kg [lbs]
	a	b	c	d	e	f	g	h	
TWM 9000 C	202 (7.95)	120 (4.75)	155 (6.10)	260 (10.20)	137 (5.40)	-	-	-	4.2 (9.30)
TWM 9000 F	202 (7.95)	120 (4.75)	155 (6.10)	-	-	140.5 (5.50)	295.8 (11.60)	277 (10.90)	5.7 (12.60)
TWM 9000 W	198 (7.80)	138 (5.40)	299 (11.80)	-	-	-	-	-	2.4 (5.30)
TWM 9000 R	142 (5.60)	129 (5.08)	195 (7.68)	-	-	140.5 (5.53)	295.8 (11.65)	277 (10.90)	1.2 (2.65)

I/O Specifications

Overall Functionality

Function	Continuous measurement of actual volume flow rate, flow velocity, conductivity, massflow (at const. density), coil temperature. Integrated batch controller
	Bidirectional flow measurement and totalisation
	Flow direction identified via status or current output
	Diagnostics: Accuracy, linearity, electrode contamination, noise, flow profile, field current, coil resistance and temperature, empty or non-full pipe + derived functions

Current Output

Function	Measurement of volume and mass (at constant density), HART® communication		
Settings	**With HART®**		Without HART
	Q = 0%: 4…15 mA		Q = 0%: 0…15 mA
	Q = 100%: 10…21.5 mA		Q = 100%: 10…21.5 mA
	Error identification: 3.5…22 mA		Error identification: 0…22 mA
Operating data	**Basic I/Os**	**Modular I/Os**	**EEx-i**
Active	Uint,nom = 24 VDC I ≤ 22 mA RL ≤ 1 kΩ		Uint,nom = 20 VDC I ≤ 22 mA R_L ≤ 450 Ω
			U_0 = 21 V I_0 = 90mA P_0 = 0.5W C_0 = 90 nF / L_0 = 2 mH C_0 = 110 nF / L_0 = 0.5mH
Passive	Uext ≤ 32 VDC I ≤ 22 mA U0 ≤ 1.8 V at I = 22 mA		Uext = 32 VDC I ≤ 22 mA U_0 ≤ 4 V at I = 22 mA
			U_i = 30 V I_i = 100 mA P_i= 1W C_i = 10 nF L_i ~ 0 mH

Pulse or Frequency Output

Function	Can be set as a pulse output (e.g.- for volume or mass counting) or frequency output		
Settings	For Q = 100%: 0.01...10000 pulses per second or pulses per unit volume		
	Pulse width: setting automatic, symmetric or fixed (0.05...2000 ms)		
Operating data	**Basic I/Os**	**Modular I/Os**	**EEx-i**
Active	-	U_{nom} = 24 VDC	-
		f_{max} ≤ 100 Hz: I ≤ 20 mA open: I ≤ 0.05 mA closed: $U_{0,nom}$ = 24 V at I = 20 mA	
		100 Hz < f_{max} ≤ 10 kHz: I ≤ 20 mA open: I ≤ 0.05 mA closed: $U_{0,nom}$ = 22.5 V at I = 1 mA $U_{0,nom}$ = 21.5 V at I = 10mA $U_{0,nom}$ = 19 V at I = 20 mA	
Passive	U_{ext} ≤ 32 VDC		-
	f_{max} δ 100 Hz: I ≤ 100 mA open: I ≤ 0.05 mA at U_{ext} = 32 VDC closed: U_0 ≤ 0.2 V at I = 10 mA U_0 ≤ 2 V at I = 100mA		
	100 Hz < f_{max} δ 10 kHz: I ≤ 20 mA open: I ≤ 0.05 mA at U_{ext} = 32 VDC closed: U_0 ≤ 1.5 V at I = 1 mA U_0 ≤ 2.5 V at I = 10 mA U_0 ≤ 5.0 V at I = 20 mA		
NAMUR	-	Passive to EN 60947-5-6 open: I_{nom} = 0.6mA closed: I_{nom} = 3.8mA	Passive to EN 60947-5-6 open: I_{nom} = 0.43 mA closed: I_{nom} = 4.5mA
			U_i = 30 V I_i = 100 mA P_i = 1 W C_i =10 nF L_i ~ 0 mH

Status Output/Limit Switch

Function and settings	Settable as automatic measuring range change, indicator for direction of flow, overflow, error, operating point or empty pipe detection		
	Valve control with activated dosing function		
	Status and/or control: ON or OFF		
Operating data	**Basic I/Os**	**Modular I/Os**	**EEx-i**
Active	-	U_{int} = 24 VDC I ≤ 20 mA open: I ≤ 0.05 mA closed: $U_{0,nom}$ = 24 V at I = 20 mA	-
Passive	Uext ≤ 32 VDC I ≤ 100 mA open: I ≤ 0.05 mA at Uext = 32 VDC closed: U0 ≤ 0.2 V at I = 10 mA U0 ≤ 2 V at I = 100mA	U_{ext} = 32 VDC I ≤ 100 mA R_L ≤ 47 k∧ open: I ≤ 0.05 mA at U_{ext} = 32 VDC closed: U_0 ≤ 0.2 V at I = 10 mA U_0 ≤ 2 V at I = 100 mA	-
NAMUR	-	Passive to EN 60947-5-6 open: I_{nom} = 0.6 mA closed: I_{nom} = 3.8mA	Passive to EN 60947-5-6 open: I_{nom} = 0.43 mA closed: I_{nom} = 4.5mA
			U_i = 30 V I_i = 100 mA P_i = 1 W C_i =10 nF L_i = 0 mH

Control Input

Function	Hold value of the outputs (e.g. for cleaning counter and error reset, range change).		
	Start of dosing when dosing function is activated.		
Operating data	**Basic I/Os**	**Modular I/Os**	**EEx-i**
Active	-	U_{int} = 24 VDC Terminals open: $U_{0,nom}$ = 22 V Terminals bridged: I_{nom} = 4 mA On: $U_0 \geq$ 12 V with I_{nom} = 1.9mA Off: $U_0 \leq$ 10 V with I_{nom} = 1.9mA	-
Passive	$U_{ext} \leq$ 32 VDC I_{nom} = 6.5 mA at U_{ext} = 24 VDC I_{nom} = 8.2 mA at U_{ext} = 32 VDC On: $U_0 \geq$ 8 V with I_{nom} = 2.8mA Off: $U_0 \leq$ 2.5 V with I_{nom} = 0.4mA	$U_{ext} \leq$ 32 VDC I ≤ 9.5 mA at U_{ext} = 24 V I ≤ 9.5 mA at U_{ext} = 32 V On: $U_0 \geq$ 3 V with I_{nom} = 1.9mA Off: $U_0 \leq$ 2.5 V with I_{nom} = 1.9mA	U_{ext} δ 32 VDC I ≤ 6 mA at U_{ext} = 24 V I ≤ 6.6 mA at U_{ext} = 32 V On: $U_0 \geq$ 5.5 V or I ≥ 4 mA Off: $U_0 \leq$ 3.5 V or I ≤ 0.5 mA U_i = 30 V I_i = 100 mA P_i = 1 W C_i = 10 nF L_i = 0 mH
NAMUR	-	Active to EN 60947-5-6 Terminals open: $U_{0,nom}$ = 8.7 V Terminals bridged: I_{nom} = 7.8 mA On/off: $U_{0, nom}$ = 6.3 V with I_{nom} = 1.9 mA Identification for open terminals: $U_0 \geq$ 8.1 V with I ≤ 0.1 mA Identification for bridged terminals: $U_0 \leq$ 1.2 V with I ≥ 6.7 mA	-

Low Flow Cut-Off

On	0...±9.999 m/s; 0...20.0%, settable in 0.1% steps, separately for each current and pulse output
Off	0...±9.999 m/s; 0...19.0%, settable in 0.1% steps, separately for each current and pulse output

Time Constant

Function	Can be set together for all flow indicators and outputs, or separately for: current, pulse and frequency output, and for limit switches and the 3 internal counters
Time setting	0…100 seconds, settable in 0.1 second steps

I/O-Module Combination Possibilities

Communication	Basic I/O	Ex-i I/O	Modular I/O
Current Output			
Active / passive	■	■	■
HART	■	■	■
Pulse and Status Output			
Active			▒
Passive	■	■	▒
Namur (acc. to EN 60947-5-6)			▒
Control Input			
Active			▒
Passive	■	▒	▒
Namur (acc. to EN 60947-5-6)			▒
Foundation Fieldbus			
Foundation Fieldbus (pending)		▒	▒
Profibus/Modbus			
Profibus PA		▒	▒
Profibus DP			▒
Modbus			▒
Protection			
Ex-d / e	▒	▒	▒

■ standard ▒ optional □ on request

Note:

Ex-i I/O: up to 1 additional in-/output module possible (see I/O-module combinations)

Modular I/O: up to 2 additional in-/output module possible (see I/O-module combinations)

I/O Modules

	I/O			1st module			2nd module	
1	Basic		0	no module possible		0	no module possible	
2	Ex-i (Ia + Pp)		1	Ex-i (Ia + Pp/Cp)				
3	Ex-i (Ip + Pp)		2	Ex-i (Ip + Pp/Cp)				
4	Modular (Ia + Pa)		8	no module		8	no module	
6	Modular (Ia + Pp)		A	Ia		A	Ia	Ia = current output - active
7	Modular (Ia + Pn)		B	Ip		B	Ip	Ip = current output - passive
8	Modular (Ip + Pa)		C	Pa/Sa		C	Pa/Sa	Pa/Sa = pulse/status output - active, high current
B	Modular (Ip + Pp)		E	Pp/Sp		E	Pp/Sp	Pp/Sp = pulse/status output - passive, high current
C	Modular (Ip + Pn)		F	Pn/Sn		F	Pn/Sn	Pn/Sn = pulse/status output - passive, Namur
D	Profibus PA		G	Ca		G	Ca	Ca = control input - active, high current
E	Foundation Fieldbus		H	Cn		H	Cn	Cn = control input - active, Namur
F	Profibus DP		K	Cp		K	Cp	Cp = control input - passive, high current
G	RS485 Modbus							
H	RS485 Modbus with interactive termination							

The TWM 9000 with standard basic I/O covers almost all applications, having 4 I/Os:

- active/passive current output (+HART)
- passive pulse/status output
- passive status output
- passive status output / control input

The I/O-module combination is thus 1-0-0 (see above).

The TWM 9000 with modular I/O can be tailor-made to any application:

- Suppose you require a converter with passive pulse output and 3 passive current outputs. The I/O-module combination then becomes B-B-B.
- Suppose you require a converter with 2 active pulse/status outputs. The I/O-module combination then becomes either 4-C-8 or 8-C-8 (depending on whether active or passive current output is required). The latter ’8’ indicates that 1 additional module can be added in the future.
- Suppose you require a converter with Profibus PA communication, 1 active current output and 1 passive control input. The I/O-module combination then becomes D-A-K.

For I/O-module combinations, not described in the overview on the right, please consult HONEYWELL.

Example for Combination of I/O's

Basic I/O		
	2	3
1	0	0

Ex- I/O		
1	2	3
2	0	0
	1	
	2	
3	0	0
	1	
	2	
D	0	0
	1	
	2	
E	0	0
	1	
	2	

Modular I/O			Modular I/O			Modular I/O			Modular I/O		
Comm	1st	2nd	Comm	1st	2nd	Comm	1st	2nd	Comm	1st	2nd
4	8	8	6	8	8	7	8	8	8	8	8
	A	8		A	8		A	8		B	8
		A			A			A			B
		C			E			F			C
		G			K			H			G
	C	8		E	8		F	8		C	8
		C			E			F			C
		G			K			H			G
	G	8		K	8		H	8		G	8
		G			K			H			G
D	8	8	E	8	8	G	8	8	H	8	8
	A	8		A	8		A	8		A	8
		A			A			A			A
		C			C			C			C
		K			K			K			K
	C	8		C	8		C	8		C	8
		C			C			C			C
		K			K			K			K
	K	8		K	8		K	8		K	8
		K			K			K			K
B	8	8	C	8	8	F	8	0			
	B	8		B	8		A	0			
		B			B		B	0			
		E			F		C	0			
		K			H		E	0			
	E	8		F	8		F	0			
		E			F		G	0			
		K			H		H	0			
	K	8		H	8		K	0			
		K			H						

Full-Scale Flowrates

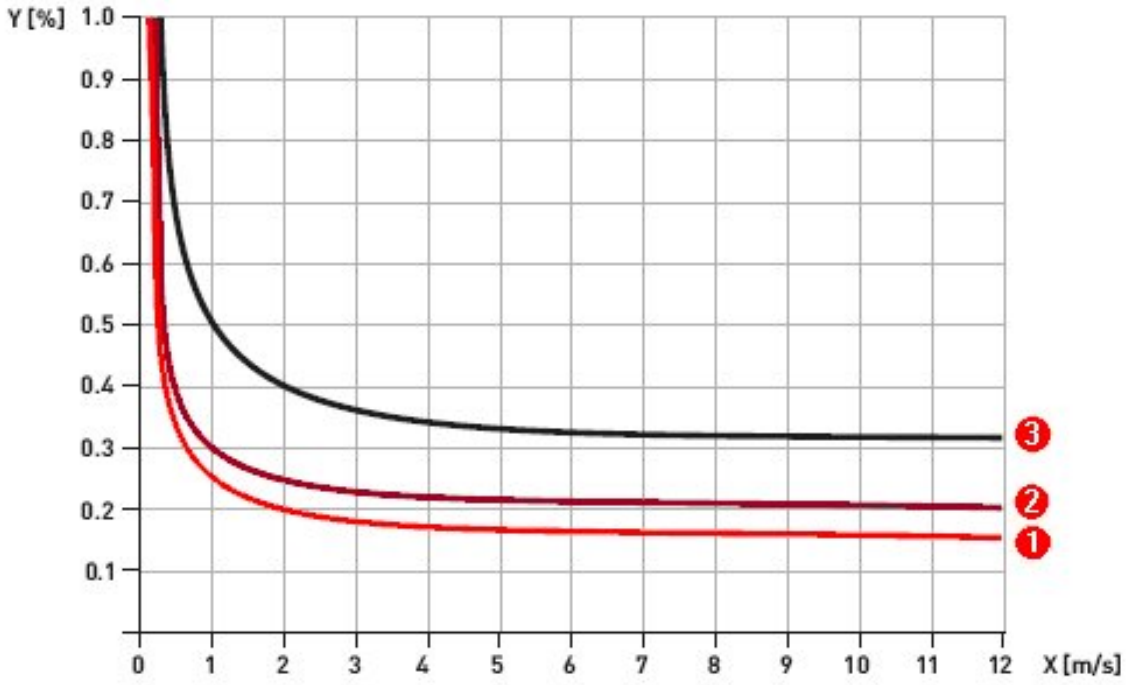
Flowrates in m/s and m^3/h

	$Q_{100\%}$ in m^3/h		
v [m/s]	0.3	3	12
DN [mm]	minimum	nominal	maximum
2.5	0.01	0.05	0.21
4	0.01	0.14	0.54
6	0.03	0.31	1.22
10	0.08	0.85	3.39
15	0.19	1.91	7.63
20	0.34	3.39	13.57
25	0.53	5.30	21.21
32	0.87	8.69	34.74
40	1.36	13.57	54.29
50	2.12	21.21	84.82
65	3.58	35.84	143.35
80	5.43	54.29	217.15
100	8.48	84.82	339.29
125	13.25	132.54	530.15
150	19.09	190.85	763.40
200	33.93	339.30	1357.20
250	53.01	530.13	2120.52
300	76.34	763.41	3053.64
350	103.91	1039.08	4156.32
400	135.72	1357.17	5428.68
450	171.77	1717.65	6870.60
500	212.06	2120.58	8482.32
600	305.37	3053.70	12214.80
700	415.62	4156.20	16624.80
800	542.88	5428.80	21715.20
900	687.06	6870.60	27482.40
1000	848.22	8482.20	33928.80
1200	1221.45	12214.50	48858.00
1400	1433.52	14335.20	57340.80
1600	2171.46	21714.60	86858.40
1800	2748.27	27482.70	109930.80
2000	3393.00	33930.00	135720.00
2200	4105.50	41055.00	164220.00
2400	4885.80	48858.00	195432.00
2600	5733.90	57339.00	229356.00
2800	6650.10	66501.00	266004.00
3000	7634.10	76341.00	305364.00

Flowrates in ft/s and gallons/min

	$Q_{100\%}$ in US gallons/min		
v [ft/s]	1	10	40
DN [inch]	minimum	nominal	maximum
1/10	0.02	0.23	0.93
1/8	0.06	0.60	2.39
1/4	0.13	1.34	5.38
3/8	0.37	3.73	14.94
1/2	0.84	8.40	33.61
3/4	1.49	14.94	59.76
1	2.33	23.34	93.36
1.25	3.82	38.24	152.97
1.5	5.98	59.75	239.02
2	9.34	93.37	373.47
2.5	15.78	159.79	631.16
3	23.90	239.02	956.09
4	37.35	373.46	1493.84
5	58.35	583.24	2334.17
6	84.03	840.29	3361.17
8	149.39	1493.29	5975.57
10	233.41	2334.09	9336.37
12	336.12	3361.19	13444.77
14	457.59	4574.93	18299.73
16	597.54	5975.44	23901.76
18	756.26	7562.58	30250.34
20	933.86	9336.63	37346.53
24	1344.50	13445.04	53780.15
28	1829.92	18299.20	73196.79
32	2390.23	23902.29	95609.15
36	3025.03	30250.34	121001.37
40	3734.50	37346.00	149384.01
48	5377.88	53778.83	215115.30
56	6311.60	63115.99	252463.94
64	9560.65	95606.51	382426.03
72	12100.27	121002.69	484010.75
80	14938.92	149389.29	597557.18
88	18075.97	180759.73	723038.90
96	21511.53	215115.30	860461.20
104	25245.60	252456.02	1009824.08
112	29279.51	292795.09	1171180.37
120	33611.93	336119.31	1344477.23

Accuracy



Y [%]: Deviation of actual measurement value
X [m/s]: Flow velocity

Reference conditions
Medium: Water
Temperature: 20°C / 68°F
Pressure: 1 bar / 14.5 psi
Inlet: ≥ 5DN

VersaFlow version	DN [mm]	DN [inches]	Accuracy	Curve
Mag 2000	10….100	3/8…10	0.15% of MV + 1 mm/s	1
Mag 1000, 3000, 4000	10….1600	3/8…80	0.2% of MV + 1 mm/s	2
Mag 100	10…150	3/8…6	0.3% of MV + 2 mm/s	3
Mag 1000, 4000	>1600	>64	0.3% of MV + 2 mm/s	3
Mag 2000, 3000, 4000	<10	<3/8	0.3% of MV + 2 mm/s	3

Specifications are subject to change without notice.

For More Information

Learn more about how Honeywell's VersaFlow TWM 9000 Electromagnetic Flow Converter can help facilitate procurement, engineering and inventory management, visit our website www.honeywell.com/ps/hfs or contact your Honeywell account manager.

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