

# Electromagnetic Flow Meter

## VIR DATA SHEET



## 1. GENERAL INFORMATION

This manual will assist you in installing, using and maintaining Electromagnetic Flow meter. It is your responsibility to make sure that all operators have access to adequate instructions about safe operating and maintenance procedure.



### **Warning**

**For your safety, review the major warnings and cautions below before operating your equipment.**

1. Use only fluids that are compatible with the housing material and wetted components of your Electromagnetic Flow Meter.
2. When handling hazardous liquids, always exercise appropriate safety precautions.
3. When measuring flammable liquids, observe precautions against fire or explosion.
4. When working in hazardous environments, always exercise appropriate safety precautions.
5. Handle the sensor carefully. Even small scratches or nicks can affect the accuracy.
6. For best results, calibrate the meter at least once a year.
7. Do not purge the flow meter with compressed air.
8. During removal of Electromagnetic flow meter liquid may spill over. Please follow manufacturer's safety precautions for clean up

### 1.1 Product Description

Electromagnetic flow meters are intended for fluid measurement in most industries including water, wastewater, food and beverage, pharmaceutical and chemical.

There are two basic components of Virtec electromagnetic flow meter: 1) The Detector, which includes the flow tube, isolating liner and measuring electrodes. 2) The Converter, which is the electronic device responsible for signal processing, flow calculation, display and output signals

The materials of construction of the wetted parts (liner and electrodes) should be appropriate for the specifications on the intended type of service. Review of the compatibilities consistent with the specifications is recommended.

Cur's electromagnetic flow meters are factory tested and calibrated. A calibration certificate is included in the shipment of each meter.

## 2. TECHNICAL DATA

### Measuring System

<b>Measuring Principle</b>	<b>Faraday's Law</b>
Application range	Application range
<b>Measured Value</b>	
Primary measured value	Flow velocity
Secondary measured value	Volume flow

### Design

<b>Features</b>	Fully welded maintenance-free sensor
	Flange version with full bore flow tube
	Standard as well as higher pressure ratings
	Large diameter range from DN25 to DN 3000 with rugged liners approved for drinking water
	Industry specific insertion lengths
<b>Modular Construction</b>	The measurement system consists of a flow sensor and a signal converter. It is available as compact and as remote version.
<b>Compact Version</b>	With 511B converter: 110-240V AC Power
	With 521B converter: 18-36V DC Power
	With W800L/W800W: Battery Power
<b>Remote Version</b>	In wall mount version with 211B converter (110-240V AC) or 221B converter (18-36V DC)
	With W800F converter: Battery Power
<b>Measurement Range</b>	0.3...+10 m/s

## Measuring Conditions

<b>Reference Conditions</b>	Flow conditions similar to EN 29104
	Medium: Water
	Electrical conductivity: $\geq 20 \mu\text{s}/\text{cm}$
	Temperature: $+10\dots+50^\circ\text{C}$ ( $+50^\circ\text{F}\dots +120^\circ\text{F}$ )
	Inlet section: $\geq 5\text{DN}$
	Operating pressure: Min 1 bar(14.5 psig)
<b>Flow Meter Accuracy</b>	Standard: $\pm 0.5\%$ of rate @1.6 ft/sec to 33 ft/sec
	Optional: $\pm 0.2\%$ of rate@1.6 ft/sec to 33 ft/sec

## Operating Conditions

<b>Temperature</b>	
<b>Process Temperature</b>	Hard rubber liner: $-5^\circ\text{C}\dots+60^\circ\text{C}$ or $90^\circ\text{C}$
	Polypropylene liner: $-5^\circ\text{C}\dots+90^\circ\text{C}$
	PTFE liner: $-5^\circ\text{C}\dots+120^\circ\text{C}$ ; PFA: $180^\circ\text{C}$
<b>Ambient Temperature (all versions)</b>	Standard (with aluminum converter housing)
	$-20^\circ\text{C}\dots+60^\circ\text{C}$ (Protect electronics against self-heating with ambient temperatures above 55)
<b>Storage Temperature</b>	$-20^\circ\text{C}\dots+70^\circ\text{C}$
<b>Pressure</b>	
<b>EN 1092-1</b>	DN2200...DN3000: PN2.5
	DN1200...DN2000: PN 6
	DN200...DN1000: PN10
	DN65...DN150: PN 16
	DN10...DN50: PN 40
	Other pressures on request
<b>Pressure Drop</b>	Negligible

Fluid	
Physical condition	Conductive liquids
Electrical conductivity	220 $\mu$ s/cm
Permissible gas content (volume)	$\leq$ 5%
Permissible solid content (volume)	$\leq$ 30%

### Installation Conditions

<b>Installation</b>	Take care that flow sensor is always fully filled
	For detailed information see chapter "Cautions for Installation"
<b>Flow Direction</b>	Forward and reverse
	Arrow on flow sensor indicates positive flow direction
<b>Inlet Run</b>	5 DN
<b>Outlet Run</b>	2 DN

## Materials

<b>Sensor Housing</b>	Sheet steel, Polyurethane coated
	Other materials on request
<b>Measuring Tube</b>	Austenitic stainless steel
<b>Flanges</b>	Carbon steel; Polyurethane coated
	Other materials on request
<b>Liner</b>	Standard
	DN10 to DN40: PTFE
	DN50 to DN300: PTFE or Hard Rubber
	DN300 to DN2200 Hard Rubber or PTFE Option
<b>Connection Box (only remote versions)</b>	Standard: Polyurethane coated die-cast aluminum
<b>Measuring Electrodes</b>	Standard: Stainless steel 316L
	Option: Hastelloy C, Titanium, Tantalum
	Other materials on request
<b>Grounding Rings</b>	Standard: Stainless steel
<b>Grounding Electrodes (option)</b>	Same material as measuring electrodes

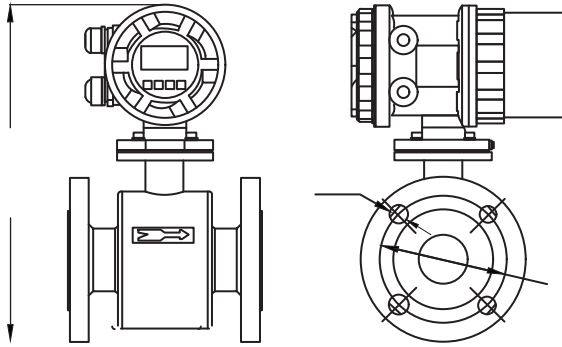
## Process Connections

<b>Flange</b>	
EN 1092-1	DN40 to DN300 IN PN6...40
	Other sizes or pressure ratings on request

**Materials**

Model	Diameter		Flow Rate (m <sup>3</sup> /h)		
			V=0.3m/s	V=6m/s	V=10m/s
"Type No."	(mm)	(Inch)	(Min)	(Calibrated)	(Max)
65-EM-1-VIR-800	6	1/4"	0.0306	0.611	1.018
65-EM-2-VIR-800	10	3/8"	0.0849	1.696	2.827
65-EM-3-VIR-800	15	1/2"	0.1909	3.817	6.362
65-EM-4-VIR-800	20	3/4"	0.3393	6.786	11.31
65-EM-5-VIR-800	25	1"	0.5301	10.60	17.67
65-EM-6-VIR-800	32	1-1/4"	0.8686	17.37	28.95
65-EM-7-VIR-800	40	1-1/2"	1.357	27.14	45.24
65-EM-8-VIR-800	50	2"	2.121	42.14	70.69
65-EM-9-VIR-800	65	2-1/2"	3.584	71.68	119.5
65-EM-10-VIR-800	80	3"	5.429	108.6	181.0
65-EM-11-VIR-800	100	4"	8.482	169.6	282.7
65-EM-VIR-800	125	5"	13.25	265.1	441.8
65-EM-A-VIR-800	150	6"	19.09	381.7	636.2
65-EM-B-VIR-800	200	8"	33.93	678.6	1131
65-EM-C-VIR-800	250	10"	53.01	1060	1767
65-EM-D-VIR-800	300	12"	76.34	1527	2545
65-EM-E-VIR-800	350	14"	103.9	2078	3465
65-EM-F-VIR-800	400	16"	135.7	2714	4524
65-EM-G-VIR-800	450	18"	171.8	3435	5726
65-EM-H-VIR-800	500	20"	212.1	4241	7069
65-EM-I-VIR-800	600	24"	305.4	6107	10179
65-EM-J-VIR-800	700	28"	415.6	8310	13850
65-EM-K-VIR-800	800	32"	542.9	10860	18100
65-EM-L-VIR-800	900	36"	662.8	13740	22900
65-EM-M-VIR-800	1000	40"	848.2	16962	28270

## 4.5 Dimensions Details



**Table 1. Dimensions (DIN PN16, Unit: mm)**

2.1 Flange: DIN PN16

DIA (mm)	L (mm)	D (mm)	K (mm)	H (mm)	H* (mm)	n*d (mm)
10	200	90	60	300	215	4*Φ14
15	200	95	65	310	225	4*Φ14
20	200	105	75	315	230	4*Φ14
25	200	115	85	325	240	4*Φ14
32	200	140	100	340	255	4*Φ18
40	200	150	110	345	260	4*Φ18
50	200	165	125	365	275	4*Φ18
65	200	185	145	375	290	8*Φ18
80	200	200	160	390	305	8*Φ18
100	250	220	180	410	325	8*Φ18
125	250	250	210	440	355	8*Φ18
150	300	285	240	465	380	8*Φ22
200	350	340	295	525	440	12 *Φ22
250	450	405	355	590	505	12 *Φ26
300	500	460	410	635	550	12 *Φ26
350	550	520	470	690	605	16 *Φ26
400	600	580	525	750	670	16 *Φ30
450	600	640	585	800	715	20*Φ30
500	600	715	650	865	780	20*Φ33
600	600	840	770	980	895	20*Φ36
700	700	910	840	1065	980	24*Φ36
800	800	1025	950	1175	1090	24*Φ39
900	900	1125	1050	1275	1190	28*Φ39
1000	1000	1255	1170	1390	1305	28*Φ42





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