

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

Electrocmagnetic 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 fo 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

| | |
|----------------------------|-------------------|
| Measuring Principle | Faraday's Law |
| Application range | Application range |
| Measured Value | |
| Primary measured value | Flow velocity |
| Secondary measured value | Volume flow |

Design

| | |
|-----------------------------|--|
| Features | 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 |
| Modular Construction | The measurement system consists of a flow sensor and a signal converter. It is available as compact and as remote version. |
| Compact Version | With 511B converter: 110–240V AC Power |
| | With 521B converter: 18–36V DC Power |
| | With W800L/W800W: Battery Power |
| Remote Version | In wall mount version with 211B converter (110–240V AC) or 221B converter (18–36V DC) |
| | With W800F converter: Battery Power |
| Measurement Range | 0.3...+10 m/s |

Measuring Conditions

| | |
|-----------------------------|--|
| Reference Conditions | Flow conditions similar to EN 29104 |
| | Medium: Water |
| | Electrical conductivity: ≥20 µS/cm |
| | Temperature: +10...+50°C (+50°F... +120°F) |
| | Inlet section: ≥ 5DN |
| | Operating pressure: Min 1 bar(14.5 psig) |
| Flow Meter Accuracy | Standard: ±0.5% of rate @1.6 ft/sec to 33 ft/sec |
| | Optional: ±0.2% of rate@1.6 ft/sec to 33 ft/sec |

Operating Conditions

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

| Fluid | |
|------------------------------------|--------------------|
| Physical condition | Conductive liquids |
| Electrical conductivity | 220µs/cm |
| Permissible gas content (volume) | ≤5% |
| Permissible solid content (volume) | ≤ 30% |

Installation Conditions

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

Materials

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

Process Connections

| Flange | |
|---------------|--|
| EN 1092-1 | DN40 to DN300 IN PN6...40 |
| | Other sizes or pressure ratings on request |

Materials

| Model | Diameter | | Flow Rate (m³/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-8-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

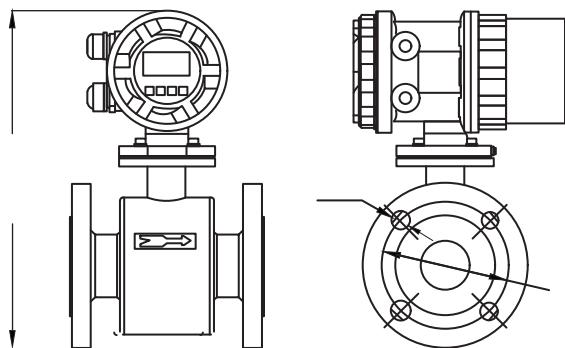


Table 1. Dimensions (DIN PN16, Unit: mm)

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*Ø14 |
| 15 | 200 | 95 | 65 | 310 | 225 | 4*Ø14 |
| 20 | 200 | 105 | 75 | 315 | 230 | 4*Ø14 |
| 25 | 200 | 115 | 85 | 325 | 240 | 4*Ø14 |
| 32 | 200 | 140 | 100 | 340 | 255 | 4*Ø18 |
| 40 | 200 | 150 | 110 | 345 | 260 | 4*Ø18 |
| 50 | 200 | 165 | 125 | 365 | 275 | 4*Ø18 |
| 65 | 200 | 185 | 145 | 375 | 290 | 8*Ø18 |
| 80 | 200 | 200 | 160 | 390 | 305 | 8*Ø18 |
| 100 | 250 | 220 | 180 | 410 | 325 | 8*Ø18 |
| 125 | 250 | 250 | 210 | 440 | 355 | 8*Ø18 |
| 150 | 300 | 285 | 240 | 465 | 380 | 8*Ø22 |
| 200 | 350 | 340 | 295 | 525 | 440 | 12 *Ø22 |
| 250 | 450 | 405 | 355 | 590 | 505 | 12 *Ø26 |
| 300 | 500 | 460 | 410 | 635 | 550 | 12 *Ø26 |
| 350 | 550 | 520 | 470 | 690 | 605 | 16 *Ø26 |
| 400 | 600 | 580 | 525 | 750 | 670 | 16 *Ø30 |
| 450 | 600 | 640 | 585 | 800 | 715 | 20*Ø30 |
| 500 | 600 | 715 | 650 | 865 | 780 | 20*Ø33 |
| 600 | 600 | 840 | 770 | 980 | 895 | 20*Ø36 |
| 700 | 700 | 910 | 840 | 1065 | 980 | 24*Ø36 |
| 800 | 800 | 1025 | 950 | 1175 | 1090 | 24*Ø39 |
| 900 | 900 | 1125 | 1050 | 1275 | 1190 | 28*Ø39 |
| 1000 | 1000 | 1255 | 1170 | 1390 | 1305 | 28*Ø42 |



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