# Vortex Flow Meter
# Model: MDVF1

## Applications

- Universal measuring principle for liquids and gases
- Measurement of (non-)conductive liquids, gases, saturated and superheated steam Gross/net heat metering of steam and hot water
- Measurement of consumption of industrial gases (natural gas, nitrogen etc.)
  Measurement of consumption in compressed air systems
  Chemical and other process industries
  Food and beverage industry
  Cooling circuits, Compressed air, Inert gases, Oxygen
  Natural gas, Steam
  Hydrocarbons, thermal oils etc. Solvents, Desalinated water, Gases, welding gases, steam, Petrochemical products (benzene, ethylene, etc.)


## Special features

- Flow measurement up to 11000 $m^3/h$ gas, 2000 $m^3/h$ liquid
- Process pressures up to 350 bar
- Fluid temperature up to 350°C
- Communication HART, PROFIBUS DP/PA, FOUNDATION Fieldbus, MODBUS RS485
- Sensor materials, 316 L, Hastelloy C hastelloy B, Titanium, Tantalum

## Description

| | |
|---|---|
| **Accuracy class** | 1.5% or 1% of rate |
| **Flow unite** | liter, $m^3$, metric Ton or USG per second, minute or hour (the user must specify the required flow unit while ordering); also percent of the measurement range could be displayed |
| **Ambient Temperature** | Sensor: -20 ~ 80°C, Converter: -15 ~ 50°C |
| **Electrode materials** | 316L, Hastelloy C, Hastelloy B, Ti, Ta, Pt/Iridium alloy, Stainless steel, painting tungsten carbide |
| **Nominal diameter** | DN 15 mm to DN 300 mm |
| **Communication** | Rs485 (Modbus protocol), HART, PROFIBUS DP/PA, FOUNDATION Fieldbus, MODBUS Rs485 |
| **Output signal** | 4 - 20 mA, Pulse or alarm (option) |
| **Frequency output** | 1...5000 Hz, 36 VDC max. & 250 mA max. |
| **Pulse Output Eq. Wt.** | 0.001~1.000 $m^3/p$, 0.001~1.000 l/p, 0.001~1.000 US gal/p, 0.001~1.000 Ton/p |
| **Pulse Output** | 100 p/s max., 36 VDC & 250 mA max. |
| **Pulse Output Width** | Can be set by the user |
| **Alarm Outputs** | High & Low limits, Transistor output, maximum 250 mA @ 36 VDC<br>When high and low limits are reached a bell-like icon will be displayed on the display |
| **Load resistance** | 4 - 20 mA, 0 - 500Ω |

## MDVF1 Series

Designed from DN 15 mm to 300 mm in size with a flow range of 5 $m^3/h$ to 11000 $m^3/h$ gas and 1.2 $m^3/h$ to 2000 $m^3/h$ liquid these meters are factory-configured and calibrated to international standards to provide the user with assurance of both quality and performance of the meter. A calibration certificate is included with each flowmeter shipped to the users.

## Pressure Class Selection

| Code | Pressure Class | Code | Pressure Class | Code | Pressure Class |
|---|---|---|---|---|---|
| P2 | 2 MPa | P8 | 16 MPa | P14 | 30 MPa |
| P4 | 4 MPa | P10 | 20 MPa | P16 | 35 MPa |
| P6 | 6 MPa | P12 | 25 MPa | Cu | Customer |

## Diameter selection

| Model | Connection (mm) | (inch) | Rated Pressure (Bar) | Minimum / Maximum (Flow) Liquid ($m^3/h$) | Gas ($m^3/h$) |
|---|---|---|---|---|---|
| M1 | 15 | 1/2 | 1 | 1.2...6.2 | 5...25 |
| M2 | 20 | 3/4 | 1 | 1.5...10 | 8...50 |
| M3 | 25 | 1 | 1 | 1.6...16 | 10...70 |
| M4 | 40 | 1 1/2 | 1 | 2.5...26 | 22...220 |
| M5 | 50 | 2 | 1 | 3.5...38 | 36...320 |
| M6 | 65 | 2 1/2 | 1 | 6.2...65 | 50...480 |
| M7 | 80 | 3 | 1 | 10...100 | 70...640 |
| M8 | 100 | 4 | 1 | 15...150 | 130...1100 |
| M9 | 125 | 5 | 1 | 25...250 | 200...1700 |
| M10 | 150 | 6 | 1 | 36...380 | 280...2200 |
| M11 | 200 | 8 | 1 | 62...650 | 580...5000 |
| M12 | 250 | 10 | 1 | 140...1400 | 970...8000 |
| M13 | 300 | 12 | 1 | 200...2000 | 1380...11000 |
| C | Customer range consult the factory if you have special requirement | | | | |

## MDVF 1 Vortex Flow meter

| ORDERING CODE | Example: MDVF 1 | M6 | S | F | 150 | L | B2 | A | B | N | M | D | I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal Diameter please see the diameter selection table | | | | | | | | | | | | | |
| Please specify | | M6 | | | | | | | | | | | |
| Flow Range | | | | | | | | | | | | | |
| S - Standard | | | S | | | | | | | | | | |
| E - Extended | | | | | | | | | | | | | |
| C - Customer | | | | | | | | | | | | | |
| Process Connection | | | | | | | | | | | | | |
| F - Flange | | | | F | | | | | | | | | |
| S - Sanitary | | | | | | | | | | | | | |
| T - Thread | | | | | | | | | | | | | |
| W - Wafer | | | | | | | | | | | | | |
| O - Other | | | | | | | | | | | | | |
| Flang Type | | | | | | | | | | | | | |
| D - DIN Please specify PN | | | | | | | | | | | | | |
| A - ASME Please specify class | | | | | 150 | | | | | | | | |
| C - Customer | | | | | | | | | | | | | |
| Converter - Indicator | | | | | | | | | | | | | |
| L - Local indication | | | | | | L | | | | | | | |
| W - Wall - Mounting box converter - Indicator | | | | | | | | | | | | | |
| Body Material | | | | | | | | | | | | | |
| B1 - Carbon steel | | | | | | | | | | | | | |
| B2 - 304 Stainless steel | | | | | | | B2 | | | | | | |
| B3 - 316 Stainless steel | | | | | | | | | | | | | |
| Wet Part Material | | | | | | | | | | | | | |
| L - 316L Stainless steel | | | | | | | | | | | | | |
| H - Hastelloy C | | | | | | | | L | | | | | |
| B - Hastelloy B | | | | | | | | | | | | | |
| T - Titanium | | | | | | | | | | | | | |
| L - Tantalum | | | | | | | | | | | | | |
| M - Monel | | | | | | | | | | | | | |
| P - Pt / Iridium alloy | | | | | | | | | | | | | |
| O - Other | | | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | | |
| A - 1% for liquid | | | | | | | | | | | | | |
| B - 1.5% for liquid | | | | | | | | | B | | | | |
| C - 1.5% for gas and steam | | | | | | | | | | | | | |
| Out Put | | | | | | | | | | | | | |
| N - Not required only totalizer | | | | | | | | | | N | | | |
| U - 4 ~ 20 mA. Frequency / pulse | | | | | | | | | | | | | |
| I - 4 ~ 20 mA, pulse, EXibIICT4 | | | | | | | | | | | | | |
| M - Modbus RS485 | | | | | | | | | | | | | |
| P - Pulse with EX case | | | | | | | | | | | | | |
| C - Customer | | | | | | | | | | | | | |
| Digital Communication | | | | | | | | | | | | | |
| N - No Communication | | | | | | | | | | | | | |
| M - Modbus RS485 | | | | | | | | | | | M | | |
| H - Hart | | | | | | | | | | | | | |
| F - Foundation fieldbus | | | | | | | | | | | | | |
| P - Profidbus DP/PA | | | | | | | | | | | | | |
| G - GPRS | | | | | | | | | | | | | |
| Power Supply | | | | | | | | | | | | | |
| A - 85 ~ 250 VAC | | | | | | | | | | | | | |
| D - 20 ~ 36 VDC | | | | | | | | | | | | D | |
| B - Battery power | | | | | | | | | | | | | |
| Z - Dual power ( battery and 24 VDC ) | | | | | | | | | | | | | |
| Protection Grade | | | | | | | | | | | | | |
| I - IP 65 | | | | | | | | | | | | | I |
| P - IP 68 | | | | | | | | | | | | | |
| E - IP 68 Explosion - proof | | | | | | | | | | | | | |

| ORDERING CODE | Example: MDVF1 | T1 | N | L |
|---|---|---|---|---|
| Temperature Rating | | | | |
| T1 - (-20...100˚C) | | T1 | | |
| T2 - (-20...250˚C) | | | | |
| T3 - (-20...350˚C) | | | | |
| Temperature & Pressure Compensation | | | | |
| N - Non | | | N | |
| W - with | | | | |
| Fluid | | | | |
| L - Liquid | | | | L |
| G - Gas | | | | |
| S - Steam | | | | |

## ■ PLEASE SUPPLY THE FOLLOWING INFORMATION WHEN YOU INQUIRE.

(Fill in the form below to the extent possible. Further details will be finalized in later consultation.)

• Fill in the blanks. Tick the boxes ☐ that apply.

| | | |
|---|---|---|
| **1. Sensor unit** | | |
| **2. Process fluid (※1)** | Name:_____ SP. gr :_____ Viscosity :_____ Concentration :_____% | |
| **3. Flow range** | Maximum_____ Normal_____ Full scale_____ ☐kg/h ☐Others _____ | |
| **4. Fluid temperature** | Maximum_____℃ Normal_____℃ Min._____℃ | |
| **5. Operating pressure** | Maximum_____MPa Normal_____MPa Min._____MPa | |
| **6. Ambient temperature** | Maximum_____℃ Min._____℃ | |
| **7. Fluid flow direction** | ☐Left→Right ☐Right→Left ☐Bottom→Top (☐ Top →Bottom)<br>Orientation: See sketch on page 23. | |
| **8. Nominal size** | _____mm or _____inch | |
| **9. Required accuracy** | ± _____% of reading ± _____% of full scale | |
| **10. Process connection** | ☐Flanged connection (Flange rating) ☐Ferrule connection ☐Screw connection | |
| **11. Explosionproof** | ☐Not required ☐TIIS ☐ATEX ☐IECEx ☐KCs ☐CSA ☐EAC ☐NEPSI ☐ITRI | |
| **12. Power supply** | V ☐AC ☐DC | |
| **13. Output specifications** | Pulse output | ☐Volt. pulse: [0]: 1.5V [1]: 13VDC min. Out. impedance: 2.2kΩ |
| | | ☐Open drain output (equivalent to open collector output )<br>[Min.10V to Maximum 30V, 50mADC, ON resiatance 0.6Ω or less] |
| | | ☐Output frequency: Any point from 0.1 to 10000Hz at full scale |
| | | Two outputs from flow rate (mass or volume). |
| | Analog output | 4 to 20mADC Maximum load: 500Ω |
| | | 2 outputs from instant. flow rate (mass, volume), temp. or density (option) |
| | Additional damping | 0 to 200s. (variable) |
| | Alarm output | Slug flow High _____g/mL Low _____g/mL |
| **14. Communication protocol** | ☐HART ☐FOUNDATION fieldbus ☐PROFIBUS ☐Modbus<br>(Address: ) | |
| **15. Transmission length** | Sensor unit (→) m Transmitter (→) m Receiving instrument | |
| **16. Receiver** | ☐Totalizer ☐Indicator ☐Recorder ☐Flow controller ☐Batch controller<br>☐Density computer ☐Computer ☐Others | |
| **17. Dedicated cable length** | In case of Remote-mount type _____m | |
| **18. In case of separate type transmitter** | ☐Stanchion type w/bracket and 2″ U bolt | |
| **19. No. of units required** | | |
| **20. Application** | | |
| **21. Other considerations** | | |
| **22. Cable gland** | ☐Standard ☐ATEX directive compliant ☐ATEX directive compliant for earthed cable | |
| **23. Maritime certification** | | |


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