

## Coriolis Mass Flowmeter VARD-80

Coriolis Mass Flowmeter VARD- 80 used to measure direct mass flow in CNG applications. Usually it is incorporated into CNG dispensers which in turn are used to fill vehicles with CNG(methane).

### Highlights

- Excellent accuracy
- Excellent zero stability
- Bidirectional flow measurement.
- Tolerance to vibration from external sources
- Absence of moving parts
- Best price-performance ratio
- Few requirements for installation
- Stainless steel construction

### Features

The flowmeter directly measures mass of media flowing through its tubes. Embedded electronics (onboard controller) receives signals from pick-up sensors, processes them and transforms to mass flow rate with further accumulation in a “total\_mass” register, that holds values in a floating point format. The set of parameters, including total\_mass can be transmitted to any external host device upon request from the host. Communication with host device established via RS-485 bus utilizing MODBUS (other protocols can be implemented upon request) protocol. At the end of measurement cycle host device issues “Reset” command to reset total\_mass to zero.

Except of total\_mass the flowmeter provides the following read-only parameters upon request from host device: signal magnitudes from both pick-up sensors, tubes resonant frequency , zero offset and mass flow rate. Normally, these parameters not used during dispenser's operation. Rather, they can be read out for meter health testing purposes.

There are several parameters , that can be set by the host device. They are:

- Meter calibration coefficient
- Zero offset reset
- Start counting threshold
- Stop counting threshold
- Flow direction

Meter calibration coefficient used to compensate mass measurement error during calibration process. Zero offset reset normally used once during factory calibration but encouraged to be applied during on site installation as well. Start/stop counting thresholds affect meter sensitivity. Though, they have their factory default settings but can be changed to increase (not recommended) or decrease sensitivity (should be used in a noisy environment, such as compressor vibration, etc.). The meter has one input port (flowing media input) and one output port. Normally, the media (for example gas) should flow into the input port, then through the meter and come out from the output port. If this flow preserved, the flow direction parameter should be set to one. Sometimes , during flowmeter installation this flow is not preserved. That is the media flows into output port and comes out from input port. In such cases not necessarily to reverse ports, but just set direction\_flow = 0 (reverse flow). In addition, the flowmeter capable counting bidirectional flow when flow direction parameter set to 2. Once media flows forward the total\_mass is increased. When media flows in opposite direction the total\_mass decreasing.

Upon power up the flowmeter performs number of initialization routines including search of resonant frequency. Once this process is not complete (several seconds) any command from host device is ignored.

## Technical specifications

- Relative accuracy for gases -  $\pm 0.5\% \pm (\text{Zero stability}/(\text{flow rate}) * 100\%)$
- Relative accuracy for fluids -  $\pm 0.1\% \pm (\text{Zero stability}/(\text{flow rate}) * 100\%)$
- Flow range - 1 to 50 Kg/min
- Zero stability - 10 grams/min
- Maximal pressure - 350 bar
- Process fluid temperature -30 +80 °C
- Ambient temperature -40 +80 °C
- Communication protocol – MODBUS or any (upon request)
- Supply voltage - 12 VDC
- Current consumption – 65 mA max

## Implementation

Flowmeter comprises mechanical part (sensor) and electronics.

Tube materials are 316L stainless steel. Other parts 304 stainless steel.

Electronics based on Cortex-M4 microcontroller which has host and debug ports. MODBUS used for communication with host device.



With cover case



Without cover case

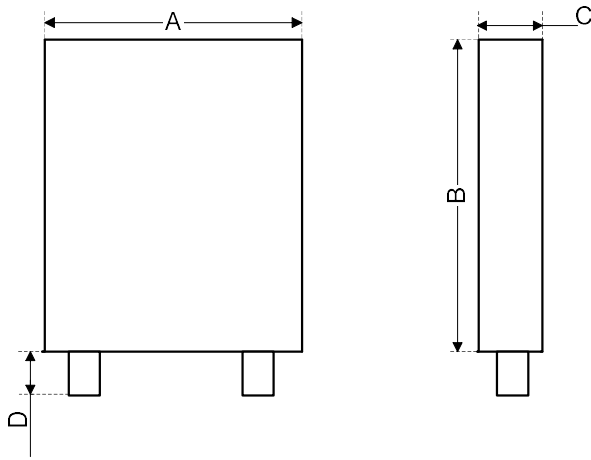


Side view



Bottom view with input/output ports.

## Mechanical sizes



Model	A	B	C	D
VARD 80	230 mm	265 mm	50 mm	35 mm

Weight - 4.3 кг

Input/output port connection – 20x1.5 mm