senseca

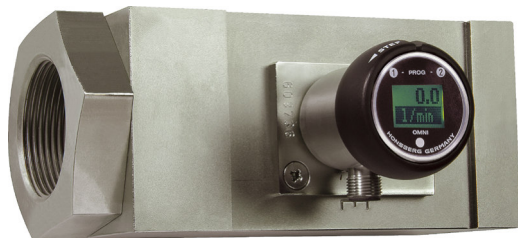## Product Information

Flow Meter / Switch / Indicator OMNI-HR1MV

- Viscosity stabilised from 30 to 200 mm²/s
- 0/4..20 mA or 0/2..10 V output signal
- 2 x programmable switches (push-pull)
- Backlit graphical LCD-Display (transreflective), can be read in sunlight and in the dark
- Programmable parameters via rotatable, removable ring (programming protection)
- All metal housing with scratch and chemical resistant glass
- Unit is displayed (selectable)
- Rotatable electronic head for best reading position
- Parameter interface

Characteristics

The electronics can be used on the spot to set switching values where process values are exceeded or fallen short of. This setting can be carried out via the display even without a process. The present values or error messages from the measuring point are visible at any time, and all major parameters can be accessed on the spot. The analog current signal can be evaluated from large distances, and the present values can be made available there. If desired, the sensor can be configured at the factory with your parameters. It is therefore ready for immediate use, without programming. If you wish to change parameters, you can set the device directly at the sensor, by means of the programming ring.

The entire family of OMNI sensors is made up in a modular way, by means of a building-block system (hardware and software). A 16-bit microcontroller with a 14-bit A/D converter and a 12-bit D/A converter ensure the necessary processing speed and accuracy. The signal is displayed with the unit of measure by a backlit LCD graphical display, and is converted into a 0/4..20 mA signal. Two switching values with a choice of PNP or NPN output can be programmed across the whole range. The hystereses of the switching values can be set separately in value and direction (min., max. switching value).

Exceeding or falling short of switching values, and error messages, are indicated by a flashing red LED visible from a long distance, together with a message in the display.

Further parameters can be modified by means of a code:

Signal filter, selectable unit (l/min, m³/h ...) incl. automatic conversion of the values, selectable output 0..20 mA, 4.0.20mA, 0..10 V or 2..10 V, value assignment of 0/4..20 mA or 0/2..10 V (setting of zero point and range).

For commissioning, the sensor supports a simulation mode for the analog output. It is possible to create a programmable mA value at the output (without modifying the process variable). The range is 0..20 mA. This enables the commissioner to test the run between the sensor and the downstream electronics.

The complete housing can be rotated around the mechanical connection, and so after sealing, the correct position for reading can be set. Operation is through dialog with the display messages. It is possible to reset to the factory settings at any time.

Technical data

Sensor	analog hall sensor
Nominal width	DN 32..50
Process connection	female thread G 1¼..G 2 (further process connections available on request)
Metering range	2..220 l/min — for details see table "Ranges"
Q_{max.}	to 250 l/min — for details see table "Ranges"
Tolerance	±3 % of the full scale value plus viscosity variation
Pressure resistance	PN 200 bar
Media temperature	-20..+85 °C optionally -20..+150 °C
Ambient temperature	-20..+70 °C
Media	water, oils (gases and aggressive media available on request)
Wiring	see section "Wiring"
Supply voltage	18..30 V DC
Power consumption	< 1 W
Analog output	0/4..20 mA, 0/2..10 V via a 500 OhmΩ resistance after 0 V.
Switching values S1+S2	PNP or NPN, selectable, 300 mA max. load in total, programmable as min. max. value or max. value, resistant to short circuits, reversal polarity protected.
Display	backlit graphical LCD-Display (transreflective), extended temperature range -20..+70 °C, 32 x 16 pixels, background illumination, displays value and unit, flashing LED signal lamp with simultaneous message on the display.
Ingress protection	IP 67
Electrical connection	for round plug connector M12x1, 5-pole
Materials medium-contact	*Brass construction*: CW614N nickelled, CW614N, 1.4310, hard ferrite *DN 32..40*: NBR	*Stainless steel construction*: 1.4571, 1.4404, 1.4310, hard ferrite PTFE-coated, *DN 32..40*: FKM
Materials, non-medium-contact	CW614N, PPS, glass
Weight	see table "Dimensions and weights"
Installation location	Standard: horizontal inwards flow; other installation positions are possible; the installation position affects the display, metering and switching range.

senseca

Product Information   OMNI-HR1MV
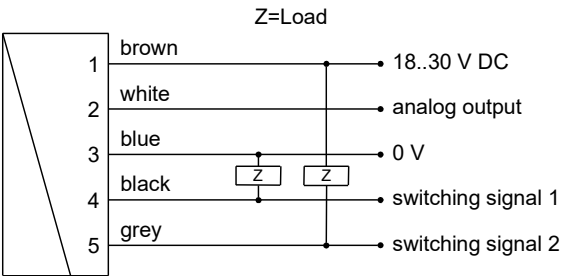
Ranges

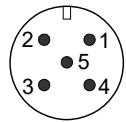Details in the table correspond to horizontal inwards flow with increasing flow rate.

Switching range l/min H$_2$O or oil 30..200mm^2/s	Display range l/min H$_2$O or oil 30..200mm^2/s	Q$_{max.}$ recommended
2 - 12	2 - 15	50
5 - 20	5 - 25	60
10 - 40	10 - 45	100
20 - 60	20 - 65	150
30 - 100	30 - 110	200
50 - 150	50 - 160	230
100 - 200	100 - 220	250

Special ranges are available.

Wiring

Z=Load

1	brown	18..30 V DC
2	white	analog output
3	blue	0 V
4	black	switching signal 1
5	grey	switching signal 2

Connection example: PNP   NPN

connector M12x1

Dimensions and weights

G	DN	Types	L	SW	X	Weight kg
G 1$\frac{1}{4}$	32	HR1MV-0032G.E	165	70	29	5.8
G 1$\frac{1}{2}$	40	HR1MV-0040G.E	165			5.5
G 2	50	HR1MV-0050G.E	150	-	26	5.0
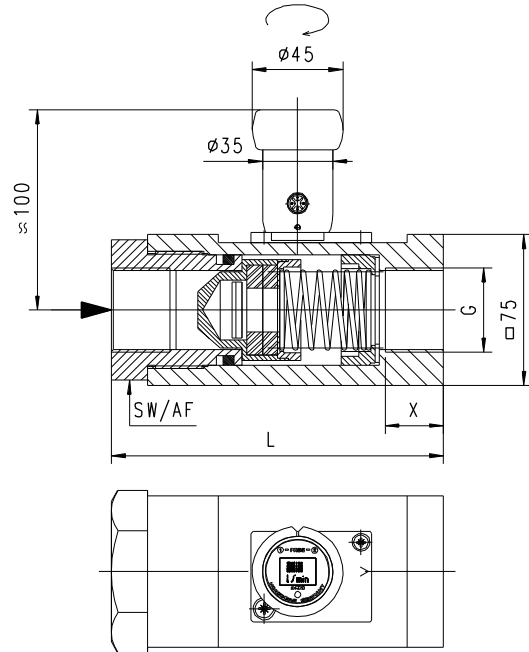
Handling and operation

Note

● Include straight calming section of 5 x DN in inlet and outlet.
● If the media are dirty, install a filter (use magnetic filter for ferritic components)

Programming

The annular gap of the programming ring can be turned to positions 1 and 2. The following actions are possible:

Set to 1 = continue (STEP)
Set to 2 = modify (EDIT)

Neutral position between 1 and 2

The ring can be removed to act as a key, or turned through 180 ° and replaced to create a programming protector.
Operation is by dialog with the display messages, which makes its use very simple.
Starting from the normal display (currently measured value with unit), if 1 (STEP) is repeatedly selected, then the display shows the following information in this order:

Display of the parameters, using position 1

● Switching value S1 (switching point 1 in the selected unit)
● Switching characteristic of S1

Product Information | OMNI-HR1MV

- (MIN = monitoring of minimum value, hysteresis greater than switching value,
- MAX = monitoring of maximum value, hysteresis less than switching value)
- Hysteresis 1 (hysteresis value of S1 in the set unit)
- Switching value S2
- Switching characteristic of S2
- Hysteresis 2
- Code:
  After entering the code 111, further parameters can be defined:
- Filter (settling time of the display and output)
- Units: e.g. l/min or m³/h
- Output: 0..20 mA or 4..20 mA
- 0/4 mA (flow rate corresponding to 0/4 mA)
- 20 mA (flow rate corresponding to 20 mA)

Edit, using position 2

If the currently visible parameter is to be modified:

- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified.
- By repeatedly turning to position 2, values are increased; by turning to position 1, the next digit is reached.
- Leave the parameter by turning to position 1 (until the cursor leaves the row); this accepts the modification.
- If there is no action within 30 seconds, the device returns to the normal display range without accepting the modification.

The limit switches S1 and S2 can be used to monitor minimal or maximal.

With a minimum-switch, falling below the limit value causes a switchover to the alarm state.
Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.
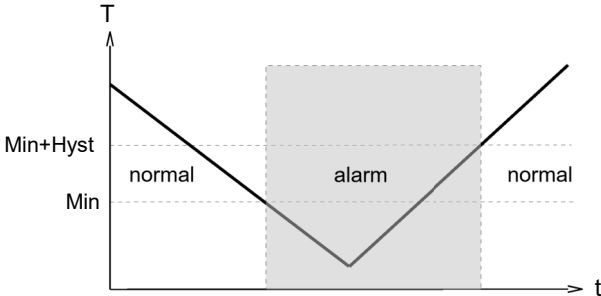
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.
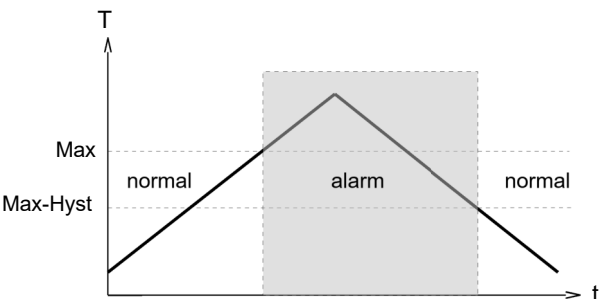
The change to the alarm state is indicated by the integrated red LED and a cleartext in the display.
While in the normal state the switching outputs are at the level of the supply voltage; in the alarm state they are at 0 V, so that a wire break would also display as an alarm state at the signal receiver.
Overload of the switching output is detected, indicated on the display ("Check S1 / S2"), and the switching output is switched off.

Simulation mode

To simplify commissioning, the sensor supports a simulation mode for the analog output. It is possible to create a programmable value in the range 0..26 mA at the output (without modifying the process variable). This allows the wiring run between the sensor and the downstream electronics to be tested during commissioning. This is mode is accessed by means of code 311.

Overload display

Overload of the switching output is detected, indicated on the display, and the switching output is set to high impedance.

Default setting

After setting the configuration parameters, they can be reset to factory values at any time, by means of code 989.

Starting from the normal display (currently measured value with unit), if 1 (STEP) is selected repeatedly, then the display shows the following information:

Display of the parameters, using position 1

- Switching values S1 and S2: Switching values in the selected unit.
- Hysteresis direction of S1 and S2:
  Max = Hysteresis less than S1 or S2
- Max = Hysteresis greater than S1 or S2
- Hystereses Hyst1 and Hyst2:
- Hysteresis values of the switching values in the set unit
- After entering code 111, further parameters can be defined (this should take place only if necessary)
- Filter: Selectable filter constant in seconds (affects display and output)
- Unit: e.g. bar or psi ...
- Output: 0..20 mA or 4..20 mA
- 0/4 mA: Displayed value for 0/4 mA
- 20 mA: Displayed value for 20 mA

Edit, using position 2

- If the visible parameter is to be modified:
- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified. By repeatedly turning to position 2, values are increased; by turning to position 1, the next digit is reached. In this way, every digit can be modified. If there is no action within 5 seconds, the device returns to the normal display range without accepting the modification.

Saving the changes using position 1

- After leaving the last value, turn once to position 1; this accepts the modification.

Ordering code

The basic device is ordered e.g. HR1MV-032GM040E with electronics e.g. OMNI-HR1MVS

Product Information

OMNI-HR1MV

```
            1.    2.    3.    4.    5.
HR1MV - [    ][ G ][    ][    ][ E ]

            6.    7.
OMNI-HR1MV [ S ][    ]
```

1.	Nominal width	
032	DN 32 - G $1\frac{1}{4}$	
040	DN 40 - G $1\frac{1}{2}$	
050	DN 50 - G 2	
2.	**Process connection**	
G	female thread	
3.	**Connection material**	
M	brass	
K	stainless steel	
4.	**Metering range H$_2$O or oil 30..200 mm^2/s for horizontal inwards flow**	
012	2 - 12 l/min	
025	5 - 25 l/min	
040	10 - 40 l/min	
060	20 - 60 l/min	
100	30 - 100 l/min	
150	50 - 150 l/min	
200	100 - 200 l/min	
5.	**Connection for**	
E	electronics	

6.	Electrical connection	
S	for round plug connector M12x1, 5-pole	
7.	**Option 1**	
H	❍	model with gooseneck
O	❍	tropical model - oil-filled version for heavy duty or external use
D		High temperature to 150 ° C

Combinations with OMNI

OMNI-converter / counter can be combined with very different types of pickup systems for flow rate, level, temperature, and pressure. This has created a family of sensors with which different types of applications can be supported.

Options

- Tropical model (completely oil-filled for severe external applications or for rapidly changing temperatures. Reliably prevents condensation).
- Measured values for oil or gas
- Special quantities
- Temperature display 0..120 °C
- Reinforced piston

Accessories

- Cable/round plug connector (KB...)
  see additional information "Accessories"

Ordering information

- Specify direction of flow, medium, and metering range.
- For viscous media, state viscosity, temperature and medium (e.g. ISO VG 68) (enquire about metering range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (request metering range)