MID1, LABO-MID1-S, I, U, F, C, FLEX-MID1, OMNI-MID1

Магнито-индуктивные датчики потока

GHM MESSTECHNIK

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Flow Transmitter MID1

- **For all electrically conductive fluids**
- **Fixed frequency output range as signal**
- **No moving parts in the area of flow**
- **High medium overload safety**
- **Low pressure loss**
- **Compact design**

Characteristics

The MID1 system consists of a number of sensors which measure the flow speed of a flowing fluid according to the principle of Faraday's law of induction. For this, the fluid must have a minimum electrical conductivity of 50 µS/cm.
Three nominal widths are available. The sensors are available with different evaluation electronics, which vary in type and number of outputs, and in operating convenience.
This transmitter has a non-programmable frequency output (400 Hz at full scale value).

Technical data

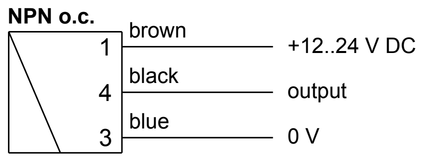
Sensor	magnetic-inductive	
Nominal width	DN 8..25	
Process connection	male thread R $^{1}/_{4}$ ", R $^{1}/_{2}$", R 1 "	
Metering ranges	0.05..60 l/min	for details, see table "Ranges"
Measurement accuracy	0.05..1.5 l/min	
Repeatability	1 %	
Minimum electrical conductivity (medium)	50 µS/cm	
Pressure resistance	PN 10 bar	
Pressure loss	max. 0.3 bar at max. flow	
Medium temperature	0..60 °C (avoid frost and dew)	
Ambient temperature	0..60 °C	
Storage temperature	-20..+80 °C	
Materials medium-contact	stainless steel 1.4404, PPS, FKM	
Supply voltage	12..24 V DC	

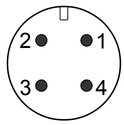
Current consumption	approx. 100 mA	
Signal output	NPN o.C., 400 Hz at full scale value	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 64	
Weight	R $^{1}/_{4}$ "	approx. 0.2 kg
	R $^{1}/_{2}$ "	approx. 0.2 kg
	R 1 "	approx. 0.3 kg
Conformity	CE	

Ranges

R	Nominal width	Metering range l/min H2O	Measurement accuracy
R $^{1}/_{4}$ "	DN 8	0.05.. 1	2.5 % of the measured value, at least 0.005 l/min
R $^{1}/_{2}$ "	DN 15	0.50..10	2.5 % of the measured value, at least 0.05 l/min
R 1 "	DN 25	3.00..60	2.5 % of the measured value, at least 0.3 l/min

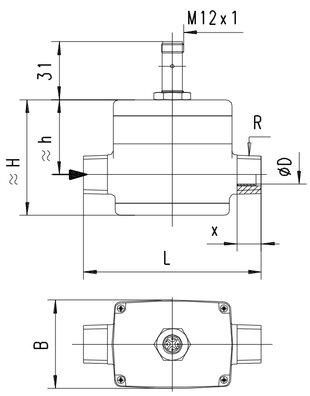
Wiring





Before the electrical installation, it must be ensured that the supply voltage corresponds with the data sheet.
It is recommended to use shielded wiring.

Dimensions



R	Types	L mm	H mm	h mm	x mm	B mm	D mm
R $^{1}/_{4}$ "	MID1-008	85	59	39	9	47	5
R $^{1}/_{2}$ "	MID1-015	95	63	42	13	47	10
R 1 "	MID1-025	110	72	45	16	49	20

Handling and Operation

Installation

The device is screwed into the pipework by means of two male threads or into suitable connection pieces. Here, attention must be paid to the direction (arrow marked on the housing in the direction of flow). Seal using Teflon tape or a fluid seal.

Use the following torques:

R $^1/_4$ ":	3 ±0.5 Nm
R $^1/_2$ "	5 ±0.5 Nm
R 1	12 ±1.0 Nm

The sensor can be operated in any location. However, air bubbles should be avoided. Direction of flow from bottom to top is recommended.
The electronics head is supplied mounted on the sensor body.

Avoid angular loading of the sensor. Pipework in which sensors are installed should be permanently flooded. 10 x D should be used in the inlet and outlet.

Programming

The setting of this transmitter has been fixed in the factory. Changes of parameters must be requested from HONSBERG.

Ordering code

	1.	2.	3.	4.	5.	6.	7.
MID1-		A	P		M	S	

❍=Option

1.	**Nominal width**					
	008	DN 8 - R $^1/_4$ "				
	015	DN 15 - R $^1/_2$ "				
	025	DN 25 - R 1 "				
2.	**Process connection**					
	A	male thread				
3.	**Housing material**					
	P	PPS				
4.	**Metering range**					
	001	0.05.. 1 l/min				●
	010	0.50..10 l/min			●	
	060	3.00..60 l/min		●		
5.	**Signal output**					
	M	frequency output NPN o.c.				
6.	**Electrical connection**					
	S	for round plug connector M12x1, 4-pole				
7.	**Filter time**	Filter	Accuracy			
	01 ❍	0.1 s	± 4.2 %	of the full scale value		
	03 ❍	0.3 s	± 3.6 %			
	06 ❍	0.6 s	± 3.1 %			
	10 ❍	1.0 s	± 2.7 %			
	20	2.0 s	± 2.0 %			
	40 ❍	4.0 s	± 0.5 %			

Options

- Housing material PEEK

Accessories

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

Flow Transmitter LABO-MID1-S

- **For all electrically conductive fluids**
- **No moving parts in the area of flow**
- **High overload protection**
- **Low pressure loss**
- **Compact design**
- **Various nominal widths**

Characteristics

The MID1 system consists of a number of sensors which measure the flow speed of a flowing fluid according to the principle of Faraday's law of induction. For this, the fluid must have a minimum electrical conductivity of 50 µS/cm. The speed is converted to a flow quantity in proportion to the cross-section of the measurement pipe. Three nominal widths are available.
The sensors are available with different converter / counter, which vary in type and number of outputs, and in operating convenience.

The LABO electronics fitted to the device make available an electronic switching output (push-pull) with adjustable characteristics (minimum/maximum) and hysteresis, which responds when an adjustable limit is fallen short of or exceeded.
If desired, the switching value can be set to the currently existing flow using "teaching".
Models with analog or pulse output are also available (see separate data sheets).

Technical data

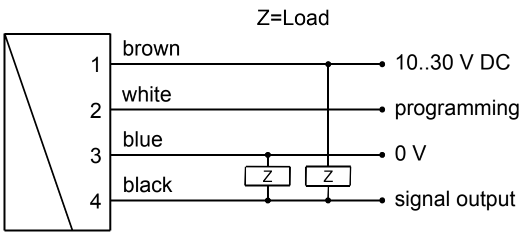
Sensor	magnetic-inductive	
Nominal width	DN 8..25	
Process connection	Male thread R $^{1}/_{4}$ ", R $^{1}/_{2}$ ", R 1 "	
Switching ranges	0.05.. 60 l/min	For details, see table "Ranges"
Measurement accuracy	0.05..1.5 l/min	
Electrical Minimum conductivity (medium)	50 µS/cm	
Pressure resistance	PN 10 bar	
Pressure loss	max. 0.3 bar at max. flow	
Medium temperature	0..60 °C (avoid frost and dew)	
Operating temperature	0..70 °C (Electronics)	
Storage temperature	-20..+80 °C	

Materials medium-contact	stainless steel 1.4404, PPS, FKM	
Materials, non-medium-contact	Sensor tube: Adhesive:	CW614N nickelled Epoxy resin
Supply voltage	10..30 V DC	
Power consumption	< 1 W (for no-load output)	
Switching output	transistor output "push-pull" (resistant to short circuits and polarity reversal) I_{out} = 100 mA max.	
Display	yellow LED (On = Normal / Off = Alarm / rapid flashing = Programming)	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 64	
Weight	R $^{1}/_{4}$ " R $^{1}/_{2}$ " R 1 "	approx. 0.2 kg approx. 0.2 kg approx. 0.3 kg
Conformity	CE	

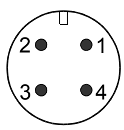
Ranges

R	Nominal width	Metering range l/min H2O	Measurement accuracy
R $^{1}/_{4}$ "	DN 8	0.05.. 1	2.5 % of the measured value, at least 0.005 l/min
R $^{1}/_{2}$ "	DN 15	0.50..10	2.5 % of the measured value, at least 0.05 l/min
R 1 "	DN 25	3.00..60	2.5 % of the measured value, at least 0.3 l/min

Wiring

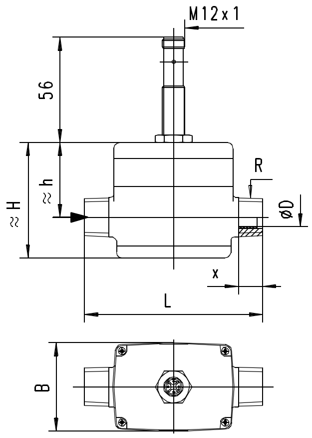


Connection example: PNP NPN



Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.
It is recommended to use shielded wiring.
The push-pull output) can as desired be switched as a PNP or an NPN output.

Dimensions



R	Types	L mm	H mm	h mm	x mm	B mm	D mm
R 1/4"	MID1-008	85	59	39	9	47	5
R 1/2"	MID1-015	95	63	42	13	47	10
R 1 "	MID1-025	110	72	45	16	49	20

Handling and operation

Installation

The device is screwed into the pipework by means of two male threads or into suitable connection pieces. Here, attention must be paid to the direction (arrow marked on the housing in the direction of flow). Seal using Teflon tape or a fluid seal.

Use the following torques:

R 1/4 ": 3 ±0.5 Nm
R 1/2 " 5 ±0.5 Nm
R 1 12 ±1.0 Nm

The sensor can be operated in any location. However, air bubbles should be avoided. Direction of flow from bottom to top is recommended.
Avoid angular loading of the sensor. Pipework in which sensors are installed should be permanently flooded. 10 x D should be used in the inlet and outlet.

Note

The switching value can be programmed by the user via "teaching". If desired, programmability can be blocked by the manufacturer.
The ECI-1 device configurator with associated software is available as a convenient option for programming all parameters by PC, and for adjustment.

Operation and programming

The switching value is set as follows:

- Apply the flow rate to be set to the device.
- Apply an impulse of at least 0.5 seconds and max. 2 seconds duration to pin 2 (e.g. via a bridge to the supply voltage or a pulse from the PLC), in order to accept the measured value.
- When the teaching is complete, pin 2 should be connected to 0 V, so as to prevent unintended programming.

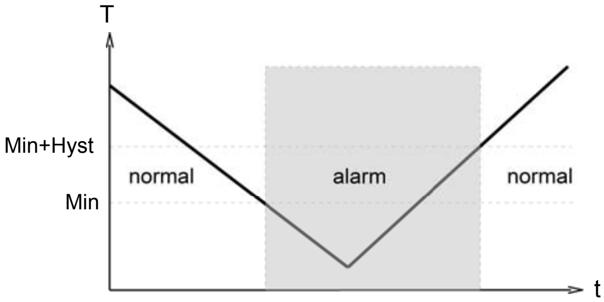
The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output.

In order to avoid the need to transit to an undesired operating status during the teach-in, the device can be provided ex-works with a teach-offset. The teach-offset point is added to the currently measured value before saving. The offset point can be positive or negative.

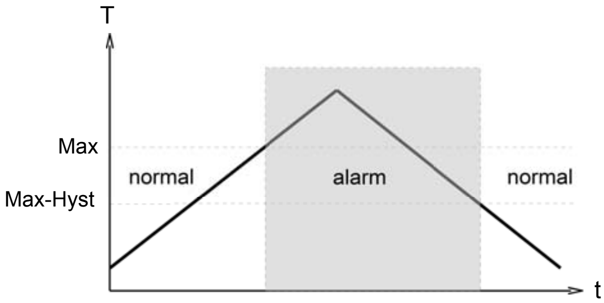
Example: The switching value should be set to 80 %. However, it is possible only to reach 60 % without problems. In this case, the device would be ordered with a "teach-offset" of +20°%. At a flow rate of 60 % in the process, teaching would then store a value of 80 %.

The limit switch can be used to monitor minima or maxima.

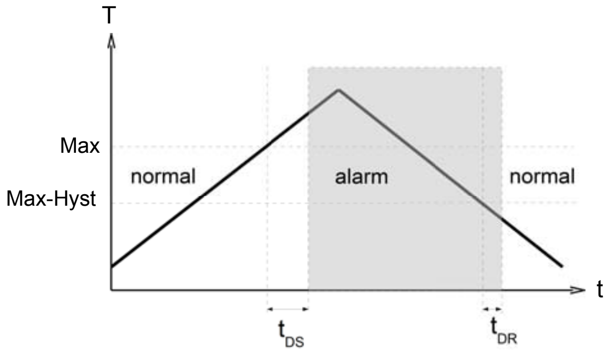
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



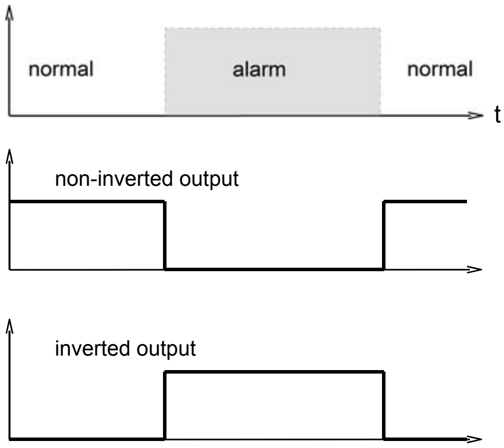
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



A switchover delay time (t_{DS}) can be applied to the switchover to the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no supply voltage.
In the non-inverted (standard) model, while in the normal state the switching output is at the level of the supply voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



A Power-On-Delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

Ordering code

The basic device is ordered e.g. MID1-xxx with electronics e.g. LABO-MID-xxx

	1.	2.	3.	4.	5.
MID1-		A	P		E

	6.	7.	8.	9.	10.	11.
LABO- MID1-		S				S

❍=Option

1.	**Nominal width**				
	008	DN 8 - R $^1/_4$"			
	015	DN 15 - R $^1/_2$"			
	025	DN 25 - R 1 "			
2.	**Process connection**				
	A	male thread			
3.	**Housing material**				
	P	PPS			
4.	**Switching range**				
	001	0.05.. 1 l/min			●
	010	0.50..10 l/min		●	
	060	3.00..60 l/min	●		
5.	**Connection for**				
	E	electronics			
6.	**For nominal width**				
	008	DN 8 - R $^1/_4$"			●
	015	DN 15 - R $^1/_2$"		●	
	025	DN 25 - R 1 "	●		
7.	**Switching output (Limit switch)**				
	S	push-pull (compatible with PNP and NPN)			
8.	**Programming**				
	P	programmable (teaching possible)			
	N ❍	cannot be programmed (no teaching)			
9.	**Switching function**				
	L	minimum-switch			
	H	maximum-switch			
10.	**Switching signal**				
	O	standard			
	I ❍	inverted			
11.	**Electrical connection**				
	S	for round plug connector M12x1, 4-pole			

Options for LABO

Switching delay period (0.0..99.9 s) (from Normal to Alarm) [ ][ ][.][ ] s

Switch-back delay period (0.0..99.9 s) (from Alarm to Normal) [ ][ ][.][ ] s

Power-On delay period (0..99 s) (after connecting the supply, time during which the switching output is not activated) [ ][ ] s

Switching output fixed at [ ][ ][ ] l/min

Switching hysteresis Standard = 2 % of the metering range [ ][ ] %

Teach-offset (in percent of the metering range) Standard = 0 % [ ][ ][ ][ ] %

Further options available on request.

Options

- Housing material PEEK

Accessories

- Cable/round plug connector (KB...) see additional information “Accessories”
- Device configurator ECI-1

Flow Transmitter LABO-MID1-I / U / F / C

- **For all electrically conductive fluids**
- **Electrical outputs configurable (4..20 mA, 0..10 V, frequency, pulse / xl / min)**
- **No moving parts in the area of flow**
- **High overload protection**
- **Low pressure loss**
- **Compact design**
- **0..10 V , 4..20 mA , frequency/pulse output, completely configurable.**

Characteristics

The MID1 system consists of a number of sensors which measure the flow speed of a flowing fluid according to the principle of Faraday's law of induction. For this, the fluid must have a minimum electrical conductivity of 50 µS/cm. The speed is converted to a flow quantity in proportion to the cross-section of the measurement pipe. Three nominal widths are available.
The sensors are available with different evaluation electronics, which vary in type and number of outputs, and in operating convenience.
The LABO electronics make various output signals available:

- Analog signal 0/4..20 mA (LABO-I)
- Analog signal 0/2..10 V (LABO-U)
- Frequency signal (LABO-F) or
- A value signal Pulse / x Litres (LABO-C)

A model with switching output is also available.

If desired, the range end value can be set to the currently existing flow using "teaching".

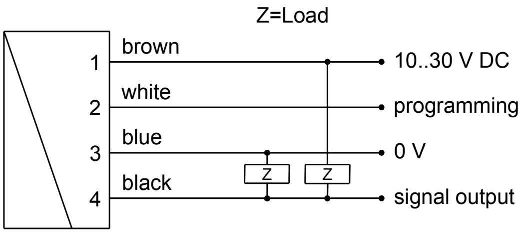
Technical data

Sensor	magnetic-inductive	
Nominal width	DN 8..25	
Process connection	male thread R $^{1}/_{4}$ ", R $^{1}/_{2}$", R 1 "	
Metering ranges	0.05..60 l/min	for details, see table "Ranges"
Measurement accuracy	0.05..1.5 l/min	
Electrical Minimum conductivity (medium)	50 µS/cm	
Pressure resistance	PN 10 bar	
Pressure loss	max. 0.3 bar at max. flow	
Medium temperature	0..60 °C (avoid frost and dew)	
Operating temperature	0..70 °C (Electronics)	
Storage temperature	-20..+80 °C	
Materials medium-contact	stainless steel 1.4404, PPS, FKM	
Materials, non-medium-contact	Sensor tube: CW614N nickelled Adhesive: Epoxy resin	
Supply voltage	10..30 V DC at voltage output 10 V: 15..30 V DC	
Power consumption	< 1 W (for no-load outputs)	
Output data:	all outputs are resistant to short circuits and reversal polarity protected	
Current output:	4..20 mA (0..20 mA available on request)	
Voltage output:	0..10 V (2..10 V available on request) output current max. 20 mA	
Frequency output:	Transistor output "push-pull" I_{out} = 100 mA max.	
Pulse output:	transistor output "push-pull" I_{out} = 100 mA max. pulse width 50 ms pulse per volume is to be stated	
Display	yellow LCD shows operating voltage (LABO-XF-I / U) or output status (LABO-XF-F / C) or (rapid flashing = Programming)	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 64	
Weight	R $^{1}/_{4}$" approx. 0.2 kg R $^{1}/_{2}$" approx. 0.2 kg R 1 " approx. 0.3 kg	
Conformity	CE	

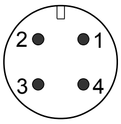
Ranges

R	**Nominal width**	**Metering range** l/min H2O	**Measurement accuracy**
R $^{1}/_{4}$"	DN 8	0.05.. 1	2.5 % of the measured value, at least 0.005 l/min
R $^{1}/_{2}$"	DN 15	0.50..10	2.5 % of the measured value, at least 0.05 l/min
R 1 "	DN 25	3.00..60	2.5 % of the measured value, at least 0.3 l/min

Wiring



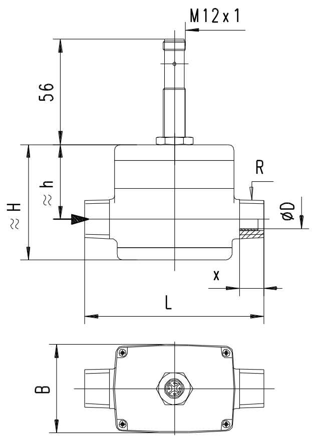
Connection example: PNP NPN



Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.
It is recommended to use shielded wiring.

The push-pull output) of the frequency output version can as desired be switched as a PNP or an NPN output.

Dimensions



R	Types	L mm	H mm	h mm	x mm	B mm	D mm
R $^1/_4$"	MID1-008	85	59	39	9	47	5
R $^1/_2$"	MID1-015	95	63	42	13	47	10
R 1 "	MID1-025	110	72	45	16	49	20

Handling and operation

Installation

The device is screwed into the pipework by means of two male threads or into suitable connection pieces. Here, attention must be paid to the direction (arrow marked on the housing in the direction of flow). Seal using Teflon tape or a fluid seal.

Use the following torques:

R $^1/_4$ ": 3 ±0.5 Nm
R $^1/_2$ " 5 ±0.5 Nm
R 1 12 ±1,0 Nm

The sensor can be operated in any location. However, air bubbles should be avoided. Direction of flow from bottom to top is recommended.
Avoid angular loading of the sensor. Pipework in which sensors are installed should be permanently flooded. 10 x D should be used in the inlet and outlet.

Note

The metering range end value can be programmed by the user via "teaching". Requirement for programmability must be stated when ordering, otherwise the device cannot be programmed.
The ECI-1 device configurator with associated software is available as a convenient option for programming all parameters by PC, and for adjustment.
The teaching option is not available for the pulse output version.

Operation and programming

The teaching process can be carried out by the user as follows:

- The measured value which is to be set is applied to the device.
- Apply an impulse of at least 0.5 seconds and max. 2 seconds duration to pin 2 (e.g. via a bridge to the supply voltage or a pulse from the PLC), in order to accept the measured value.
- When the teaching is complete, pin 2 should be connected to 0 V, so as to prevent unintended programming.

The devices have a yellow LED which flashes during the programming pulse. During operation, the LED serves as an indicator of operating voltage (for analog output) or of switching status (for frequency or pulse output).

In order to avoid the need to transit to an undesired operating status during the teach-in, the device can be provided ex-works with a teach-offset. The teach-offset point is added to the currently measured value before saving. The offset point can be positive or negative.

Example: The end of the metering range should be set to 80 %. However, only 60 % can be achieved without problem. In this case, the device would be ordered with a "teach-offset" of +20°%. At a flow rate of 60 % in the process, teaching would then store a value of 80 %.

There are many more parameters which can be programmed by the ECI-1 device configurator if necessary.

HONSBERG INSTRUMENTS

Product Information

LABO-MID1-I / U / F / C

Ordering code

The basic device is ordered e.g. MID1-xxx
with electronics e.g. LABO-MID-xxx

	1.	2.	3.	4.	5.
MID1-		**A**	**P**		**E**

	6.	7.	8.	9.
LABO- MID1-				

❍=Option

1.	**Nominal width**				
	008	DN 8 - R $^1/_4$"			
	015	DN 15 - R $^1/_2$"			
	025	DN 25 - R 1 "			
2.	**Process connection**				
	A	male thread			
3.	**Housing material**				
	P	PPS			
4.	**Metering range**				
	001	0.05.. 1 l/min			●
	010	0.50..10 l/min		●	
	060	3.00..60 l/min	●		
5.	**Connection for**				
	E	electronics			
6.	**For nominal width**				
	008	DN 8 - R $^1/_4$"			●
	015	DN 15 - R $^1/_2$"		●	
	025	DN 25 - R 1 "	●		
7.	**Signal output**				
	I	current output 4..20 mA			
	U	voltage output 0..10 V			
	F	frequency output			
	C	pulse output			
8.	**Programming**				
	P ❍	programmable (teaching possible)			
	N	cannot be programmed (no teaching)			
9.	**Electrical connection**				
	S	for round plug connector M12x1, 4-pole			

Required ordering information

For LABO-MID1-F:
Output frequency at full scale [ ][ ][ ][ ] Hz
Maximum value: 2,000 Hz

For LABO-MID1-C:
For the pulse output version, the volume (with numerical value and unit) which will correspond to one pulse must be stated.

Volume per pulse (numerical value) [ ][ ][ ][ ]

Volume per pulse (unit) [ ]

Options for LABO

Special range for analog output: [ ][ ][ ] l/min
<= Metering range (Standard=Metering range)

Special range for frequency output: [ ][ ][ ] l/min
<= Metering range (Standard=Metering range)

Power-On delay period (0..99 s) [ ][ ] s
(time after applying power during which the outputs are not activated or set to defined values)

Further options available on request.

Options

- Housing material PEEK

Accessories

- Cable/round plug connector (KB...)
  see additional information “Accessories”
- Evaluation electronics OMNI-TA
- Device configurator ECI-1

Flow Transmitter FLEX-MID1

- **For all electrically conductive fluids**
- **No moving parts in the area of flow**
- **Analog output (4..20 mA or 0..10 V)**
- **1 x switching output (push-pull) or widely programmable frequency output**
- **High overload protection**
- **Low pressure loss**
- **Compact design**

Characteristics

The MID1 system consists of a number of sensors which measure the flow speed of a flowing fluid according to the principle of Faraday's law of induction. For this, the fluid must have a minimum electrical conductivity of 50 µS/cm. Three nominal widths are available. The sensors are available with different evaluation electronics, which vary in type and number of outputs, and in operating convenience.

The FLEX transducer on the sensor has an analog output (4..20 mA or 0..10 V) and one switching output, which can be configured as a limit switch for monitoring minima or maxima, or as a frequency output.

The switching output is designed as a push-pull driver, and can therefore be used both as a PNP or an NPN output. The state of the switching output is signalled with a yellow LED in the switching outlet; the LED has all-round visibility.
The sensor is configured in the factory, or alternatively this can be done with the aid of the optionally available ECI-1 device configurator (USB interface for PC). A selectable parameter can be modified on the device, with the aid of the magnet clip provided. In this case, the current measured value is saved as the parameter value. Examples of these parameters are the switching value or the metering range end value.
The stainless steel electronics housing is rotatable, so it is possible to orient the cable outlet after installation.

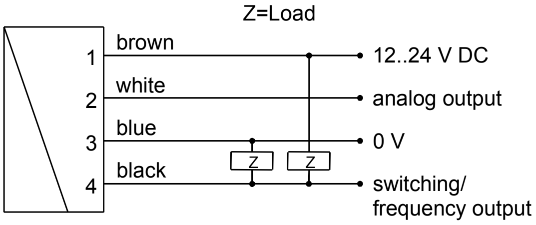
Technical data

Sensor	magnetic-inductive	
Nominal width	DN 8..25	
Process connection	male thread R $^1/_4$ ", R $^1/_2$", R 1 "	
Metering ranges	0.05..60 l/min	for details, see table "Ranges"
Measurement accuracy	0.05..1.5 l/min	
Repeatability	1 %	
Electrical Minimum conductivity (medium)	50 µS/cm	
Pressure resistance	PN 10 bar	
Pressure loss	max. 0.3 bar at max. flow	
Medium temperature	0..60 °C (avoid frost and dew)	
Ambient temperature	0..60 °C	
Storage temperature	-20..+80 °C	
Materials medium-contact	stainless steel 1.4404, PPS, FKM	
Materials, non-medium-contact	Electronic housing: Stainless steel 1.4305 Connection pla-te: CW614N nickelled	
Supply voltage	12..24 V DC	
Current consumption	approx. 120 mA	
Analog output	4..20 mA or 0..10 V DC	
Switching output	transistor output "push-pull" (resistant to short circuits and polarity reversal) I_{out} = 100 mA max.	
Switching hysteresis	adjustable (please state when ordering)	
Display	yellow LED (On = Normal / Off = Alarm)	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 64	
Weight	R $^1/_4$" approx. 0.32 kg R $^1/_2$" approx. 0.32 kg R 1 " approx. 0.42 kg	
Conformity	CE	

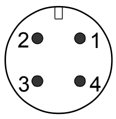
Ranges

R	Nominal width	Metering range l/min H2O	Measurement accuracy
R $^1/_4$"	DN 8	0.05.. 1	2.5 % of the measured value, at least 0.005 l/min
R $^1/_2$"	DN 15	0.50..10	2.5 % of the measured value, at least 0.05 l/min
R 1 "	DN 25	3.00..60	2.5 % of the measured value, at least 0.3 l/min

Wiring



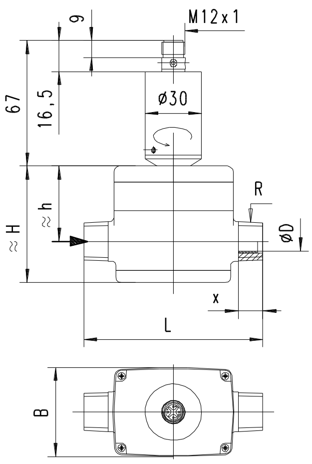
Connection example: PNP NPN



Before the electrical installation, it must be ensured that the supply voltage corresponds with the data sheet.

It is recommended to use shielded wiring.
The push-pull output can as desired be switched as a PNP or an NPN output.

Dimensions



R	Types	L mm	H mm	h mm	x mm	B mm	D mm
R $^{1}/_{4}$"	MID1-008	85	59	39	9	47	5
R $^{1}/_{2}$"	MID1-015	95	63	42	13	47	10
R 1 "	MID1-025	110	72	45	16	49	20

Handling and operation

Installation

The device is screwed into the pipework by means of two male threads or into suitable connection pieces. Here, attention must be paid to the direction (arrow marked on the housing in the direction of flow). Seal using Teflon tape or a fluid seal.

Use the following torques:

R $^{1}/_{4}$ ":	3 ±0.5 Nm
R $^{1}/_{2}$ "	5 ±0.5 Nm
R 1	12 ±1.0 Nm

The sensor can be operated in any location. However, air bubbles should be avoided. Direction of flow from bottom to top is recommended.
The electronics head is supplied mounted on the sensor body.

Avoid angular loading of the sensor. Pipework in which sensors are installed should be permanently flooded. 10 x D should be used in the inlet and outlet.

Programming

The electronics contain a magnetic contact, with the aid of which different parameters can be programmed. Programming takes place when a magnet clip is applied for a period between 0.5 and 2 seconds to the marking located on the label. If the contact time is longer or shorter than this, no programming takes place (protection against external magnetic fields).

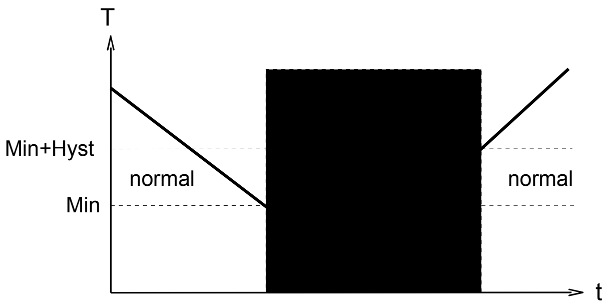
After the programming ("teaching"), the clip can either be left on the device, or removed to protect data.
The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output.
In order to avoid the need to transit to an undesired operating status during "teaching", the device can be provided ex-works with a "teach-offset". The "teach-offset" value is added to the currently measured value before saving (or is subtracted if a negative value is entered).

Example: The switching value is to be set to 70 % of the metering range, because at this flow rate a critical process status is to be notified. However, only 50% can be achieved without danger. In this case, the device would be ordered with a "teach-offset" of +20 %. At 50 % in the process, a switching value of 70 % would then be stored during "teaching".

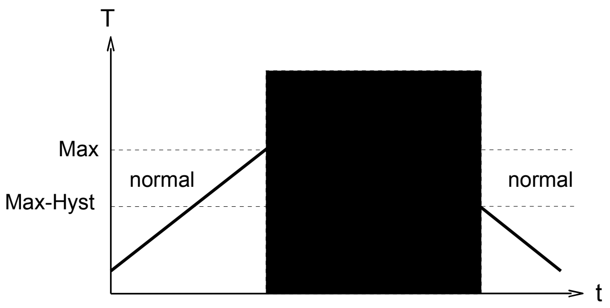
Normally, programming is used to set the limit switch. However, if desired, other parameters such as the end value of the analog or frequency output may also be set.

The limit switch can be used to monitor minima or maxima.

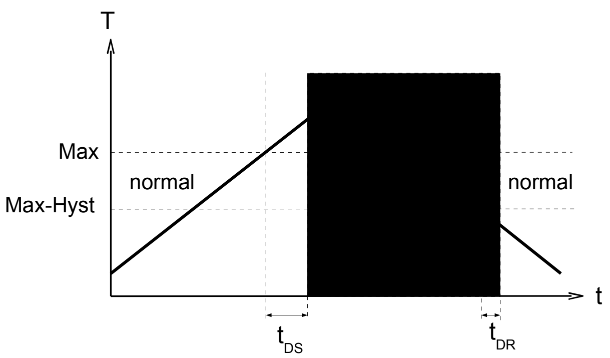
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is again exceeded.



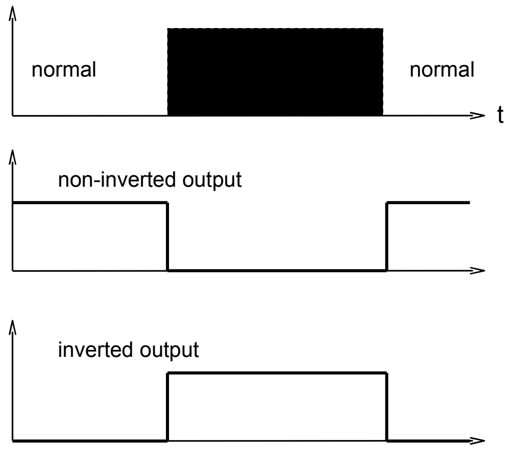
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



A switchover delay time (t_{DS}) can be applied to the switchover to the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no supply voltage.
In the non-inverted (standard) model, while in the normal state the switching output is at the level of the supply voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



A Power-On delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

Ordering code

The basic device is ordered e.g. MID1-xxx
with electronics e.g. FLEX-MID1-xxx

	1.	2.	3.	4.	5.
MID1-		**A**	**P**		**E**

	6.	7.	8.	9.
FLEX-MID1-				

❍=Option

1.	**Nominal width**				
	008	DN 8 - R $^1/_4$"			
	015	DN 15 - R $^1/_2$"			
	025	DN 25 - R 1 "			
2.	**Process connection**				
	A	male thread			
3.	**Housing material**				
	P	PPS			
4.	**Metering range**				
	001	0.05.. 1 l/min			●
	010	0.50.. 10 l/min		●	
	060	3.00.. 60 l/min	●		
5.	**Connection for**				
	E	electronics			
6.	**For nominal width**				
	008	DN 8 - R $^1/_4$"			●
	015	DN 15 - R $^1/_2$"		●	
	025	DN 25 - R 1 "	●		
7.	**Analog output**				
	I	current output 4..20 mA			
	U	voltage output 0..10 V			
8.	**Functioning of the switching output**				
	L	minimum switch			
	H	maximum switch			
	R	frequency output			
9.	**Switching signal**				
	O	standard output			
	I	inverted output			

Options for FLEX

Special range for analog output: (not greater than the sensor's working range) — ☐☐☐ l/min

Special range for frequency output: (not greater than the sensor's working range) — ☐☐☐ l/min

End frequency (max. 2000 Hz) — ☐☐☐☐ Hz

Switching delay (from Normal to Alarm) — ☐☐.☐ s

Switchback delay (from Alarm to Normal) — ☐☐.☐ s

Power-On delay (0..99) (time after power on, during which the outputs are not actuated) — ☐☐ s

Switching output fixed — ☐☐☐ l/min

Special hysteresis (standard = 2% EW) — ☐☐ %

Options

- Housing material PEEK

Accessories

- Cable/round plug connector (KB...)
  see additional information “Accessories”
- Device configurator ECI-1

Flow Transmitter / Switch OMNI-MID1

- **For all electrically conductive fluids**
- **No moving parts in the area of flow**
- **High overload protection**
- **Low pressure loss**
- **Analog output, two switching outputs**
- **Clear, easily legible, illuminated graphic LCD display**
- **Modifiable units in the display**
- **Small, compact construction**

Characteristics

The MID1 system consists of a number of sensors which measure the flow speed of a flowing fluid according to the principle of Faraday's law of induction. For this, the fluid must have a minimum electrical conductivity of 50 µS/cm. Three nominal widths are available.
The sensors are available with different evaluation electronics, which vary in type and number of outputs, and in operating convenience.

The OMNI transducer located on the sensor has a backlit graphics LCD display which is very easy to read, both in the dark and in bright sunlight. The graphics display allows the presentation of measured values and parameters in a clearly understandable form. The measured values are displayed to 4 places, together with their physical unit, which may also be modified by the user. The electronics have an analog output (4..20 mA or 0..10 V) and two switching outputs, which can be used as limit switches for monitoring minima or maxima, or as two-point controllers.

The switching outputs are designed as push-pull drivers, and can therefore be used both as PNP and NPN outputs. Exceeding limit values is signalled by a red LED which is visible over a long distance, and by a cleartext in the display. The stainless steel case has a hardened non-scratch mineral glass pane. It is operated by a programming ring fitted with a magnet, so there is no need to open the operating controls housing, and its leakproofness is permanently ensured.

By turning the ring to right or left, it is simple to modify the parameters (e.g. switching point, hysteresis...). To protect from unintended programming, it can be removed, turned through 180 ° and replaced, or completely removed, thus acting as a key.

Technical data

Sensor	magnetic-inductive	
Nominal width	DN 8..25	
Process connection	male thread R $^1/_4$ ", R $^1/_2$ ", R 1 "	
Metering ranges	0.05..60 l/min	for details, see table "Ranges"
Measurement accuracy	0.05..1.5 l/min	
Repeatability	1 %	
Minimum electrical conductivity (medium)	50 µS/cm	
Pressure resistance	PN 10 bar	
Pressure loss	max. 0.3 bar at max. flow	
Medium temperature	0..60 °C (avoid frost and dew)	
Ambient temperature	0..60 °C	
Storage temperature	-20..+80 °C	
Materials medium-contact	stainless steel 1.4404, PPS, FKM	
Materials, non-medium-contact	Housing Glass Magnet Ring	stainless steel 1.4305 mineral glass, hardened samarium-Cobalt POM
Supply voltage	18..24 V DC	
Power consumption	< 1 W	
Analog output	4..20 mA / max. load 500 Ω or 0..10 V / min. load 1 kΩ	
Switching outputs	transistor output "push-pull" (resistant to short circuits and polarity reversal) I_{out} = 100 mA max.	
Hysteresis	adjustable, position of the hysteresis depends on minimum or maximum	
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.	
Electrical connection	for round plug connector M 12x1, 5-pole	
Ingress protection	IP 64	
Weight	R $^1/_4$ " R $^1/_2$ " R 1 "	approx. 0.35 kg approx. 0.35 kg approx. 0.45 kg

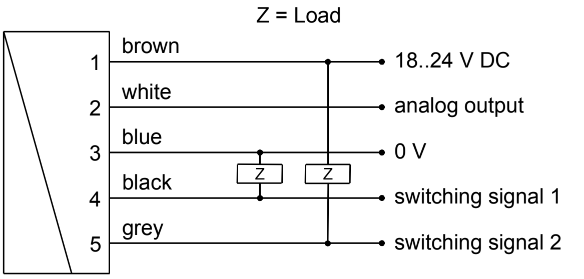
Product Information

OMNI-MID1

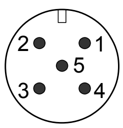
Ranges

R	Nominal width	Metering range l/min H2O	Measurement accuracy
R $^1/_4$"	DN 8	0.05.. 1	2.5 % of the measured value, at least 0.005 l/min
R $^1/_2$"	DN 15	0.50..10	2.5 % of the measured value, at least 0.05 l/min
R 1 "	DN 25	3.00..60	2.5 % of the measured value, at least 0.3 l/min

Wiring

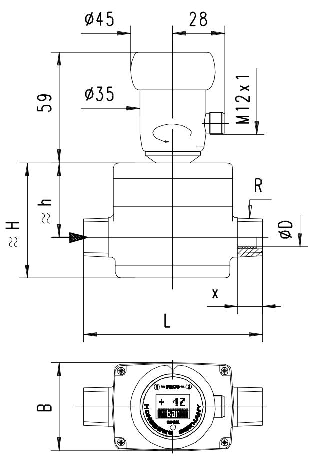


Connection example: PNP NPN



Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.
The use of shielded cabling is recommended.

Dimensions



	L mm	H mm	h mm	R	x mm	B mm	D mm
OMNI-MID1-008	85	59	39	$^1/_4$ "	9	47	5
OMNI-MID1-015	95	63	42	$^1/_2$ "	13	47	10
OMNI-MID1-025	110	72	45	1 "	16	49	20

Handling and operation

Installation

The device is screwed into the pipework by means of two male threads or into suitable connection pieces. Here, attention must be paid to the direction (arrow marked on the housing in the direction of flow). Seal using Teflon tape or a fluid seal.

Use the following torques:

R $^1/_4$ ": 3 ±0.5 Nm
R $^1/_2$ " 5 ±0.5 Nm
R 1 12 ±1.0 Nm

The sensor can be operated in any location. However, air bubbles should be avoided. Direction of flow from bottom to top is recommended.
The electronics head is supplied mounted on the sensor body.

Avoid angular loading of the sensor. Pipework in which sensors are installed should be permanently flooded. 10 x D should be used in the inlet and outlet.

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 (PROG)

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 (present value and 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
  MIN = Monitoring of minimum value
  MAX = Monitoring of maximum 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)
- Physical unit (Units)
- Output: 0..20 mA or 4..20 mA
- 0/4 mA (measured value corresponding to 0/4 mA)
- 20 mA (measured value corresponding to 20 mA)

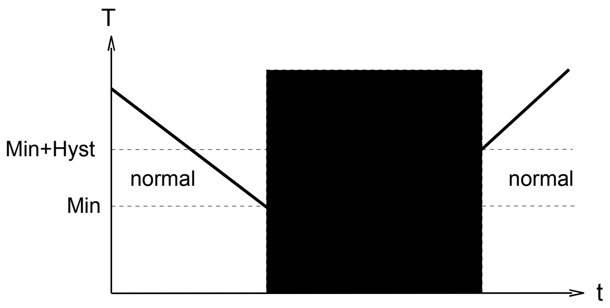
For models with a voltage output, replace 20 mA accordingly with 10 V.

Edit, using position 2

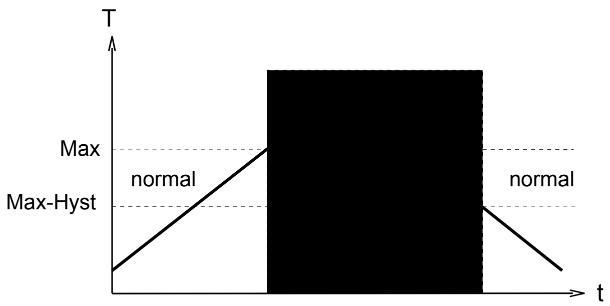
If the currently visible parameter is to be modified:

- 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 cursor moves to the next digit.
- 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 minima or minima or maxima.



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 display
Overload of a switching output is detected and indicated on the display ("Check S 1 / S 2"), and the switching output is switched off.

Simulation mode
To simplify commissioning, the sensor provides a simulation mode for the analog output. It is possible to create a programmable value in the range 0..26.0 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 mode is accessed by means of **Code 311**.

Factory settings
After modifying the configuration parameters, it is possible to reset them to the factory settings at any time using **Code 989**.

Ordering code

The basic device is ordered e.g. MID1-xxx with electronics e.g. OMNI-MID1-xxx

	1.	2.	3.	4.	5.
MID1-		**A**	**P**		**E**

	6.	7.	8.
OMNI-MID1-			**S**

❍=Option

1.	**Nominal width**				
	008	DN 8 - R $^1/_4$"			
	015	DN 15 - R $^1/_2$"			
	025	DN 25 - R 1 "			
2.	**Process connection**				
	A	male thread			
3.	**Housing material**				
	P	PPS			
4.	**Metering range**				
	001	0.05.. 1 l/min			●
	010	0.50..10 l/min		●	
	060	3.00..60 l/min	●		
5.	**Connection for**				
	E	electronics			
6.	**For nominal width**				
	008	DN 8 - R $^1/_4$"			●
	015	DN 15 - R $^1/_2$"		●	
	025	DN 25 - R 1 "	●		
7.	**Analog output**				
	I	current output 0/4..20 mA			
	U ❍	voltage output 0/2..10 V			
8.	**Electrical connection**				
	S	for round plug connector M12x1, 5-pole			

Options

- Housing material PEEK

Accessories

- Cable/round plug connector (KB...) see additional information “Accessories”
- Device configurator ECI-1

GHMGROUP

Specialists by C mpetence.

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