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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

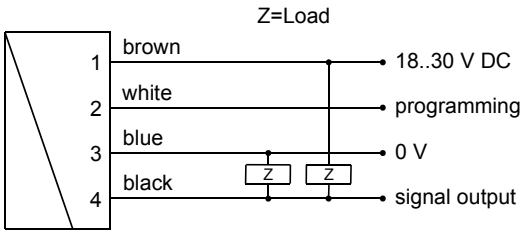
Sensor	magnetic-inductive	
Nominal width	DN 8..25	
Process connection	Male thread R ¼ ", R ½ ", R 1 "	
Switching ranges	0.05.. 60 l/min	For details, see table "Ranges"
Measurement accuracy	0.05..1.5 l/min	
Electrical Minimum conductivity (medium)	50 µS/cm	
Pressure resistance	PN 10 bar	
Pressure loss	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:	CW614N nickelled
	Adhesive:	Epoxy resin
Supply voltage	18..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 ¼ "	approx. 0.2 kg
	R ½ "	approx. 0.2 kg
	R 1 "	approx. 0.3 kg
Conformity	CE	

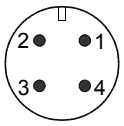
Ranges

R	Nominal width	Metering range l/min H2O	Measurement accuracy
R ¼ "	DN 8	0.05.. 1	2.5 % of the measured value, at least 0.005 l/min
R ½ "	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.

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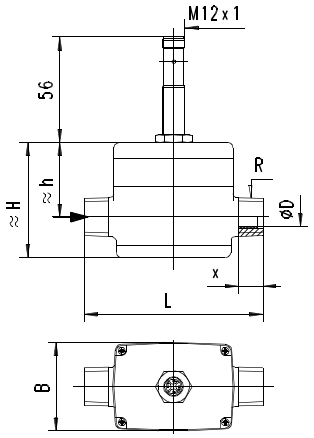
Product Information

LABO-MID1-S

Dimensions



R	Types	L	H	h	x	B	D
		mm	mm	mm	mm	mm	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.

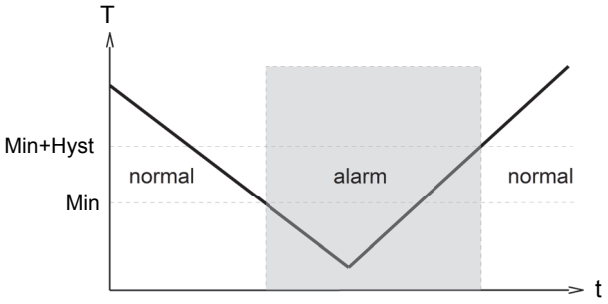
The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output.

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.

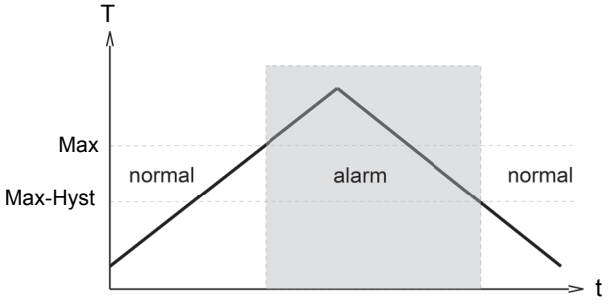
Example: The switching value should be set to 80 %. However, it is possible only to reach 60 % without problems. In this case, the device would be ordered with a "teach-offset" of +20°%. At a flow rate of 60 % in the process, teaching would then store a value of 80 %.

The limit switch can be used to monitor minimal or maximal.

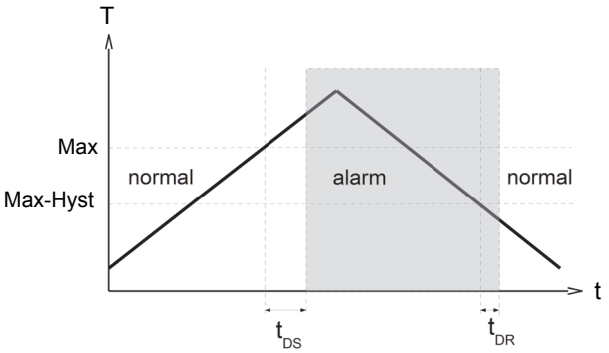
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



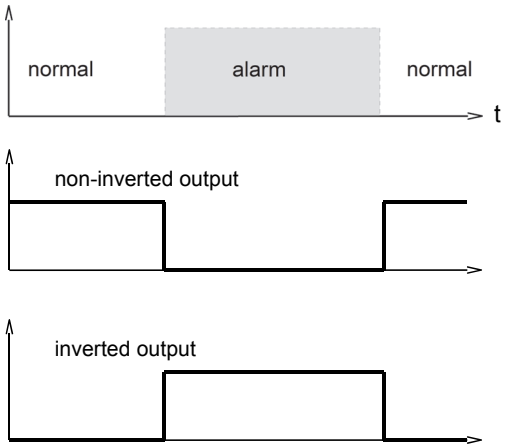
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



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) ☐☐.☐ s
(from Normal to Alarm)

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

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

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