LABO-RRI- … S, LABO-RRI- … I, LABO-RRI- … U, LABO-RRI- … F, LABO-RRI- … C, LABO-RRH- … S, LABO-RRH- … I, LABO-RRH- … U, LABO-RRH- … F, LABO-RRH- … C, LABO-RR-032-S, LABO-RR-032-I, LABO-RR-032-U, LABO-RR-032-F

Роторные индикаторы и датчики потока GHM MESSTECHNIK

Технические характеристики

Flow Transmitter LABO-RR.032-I / U / F / C

- **Simple and economical flow meter for piping diameters from 32 mm to 150 mm**
- **Made from plastic (optionally stainless steel)**
- **With tapping sleeve fixing for very rapid installation Retro-fitting also easily possible**
- **0..10 V , 4..20 mA , frequency/pulse output, completely configurable**

Characteristics

The flow meter consists of a spinner which is rotated by the flow speed. The rotational speed is proportional to the flow rate. The rotational speed can be recorded using various sensor systems, depending on the different materials for the housing. With plastic housings, there are no magnets in the flow space.

The LABO electronics make various output signals available:

- Analog signal 0/4...20 mA (LABO-RR.-032-I)
- Analog signal 0/2..10 V (LABO-RR.-032-U)
- Frequency signal (LABO-RR.-032-F) or
- A value signal Pulse / x Litres (LABO-RR.-032-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

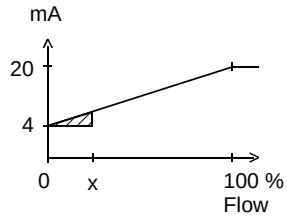
Sensor	LABO-RRI	inductive sensor
	LABO-RRH	hall sensor
Nominal widths	DN 32..150	
Mechanical Connection	welded-on nozzle, DN 50..150 tapping sleeve, DN 32..150 glue socket, screw-in probe	
Metering range	15..1000 l/min for details, see table "Ranges"	
Measurement accuracy	±5 % of full scale value	
Repeatability	±1 % measured value	
Medium temperature	0..60 °C, type RRH as screw-in probe or with welded-on nozzle 0..95 °C	
Pressure resistance	PN 10 bar	
Pressure loss	typically < 0.1 bar	

Materials medium-contact		
Housing	PVC	1.4305
Tapping sleeve	PP	PP
Rotor	PVDF / 1.4310 or Titanium	PVDF / Magnets
Bearing	Iglidur X	Iglidur X
Axis	Ceramic Zr02-TZP	Ceramic Zr02-TZP
Seal	FKM	FKM
Materials, non-medium-contact	Sensor tube:	CW614N nickelled
	Adhesive:	epoxy resin
	Flange bolts:	stainless steel
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 67	
Conformity	CE	

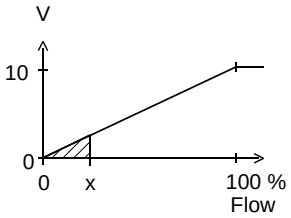
Signal output curves

Value x = Begin of the specified range
= not specified range

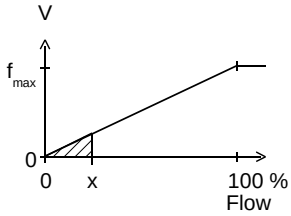
Current output



Voltage output



Frequency output



f_{max} selectable in the range of up to 2000 Hz

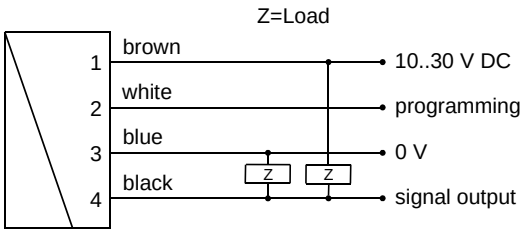
Other characters on request.

Ranges

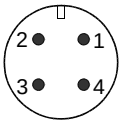
Nominal width	Metering range l/min H_2O	Q_{max} l/min
DN 32	15.. 200	220
DN 40	15.. 300	360
DN 50	25.. 400	480
DN 65	40.. 500	600
DN 80	50.. 700	840
DN 100	85..1000	1200

The measured values were determined using a standing sensor in a flow of water from left to right at 25 °C and with 10 x D run-in and run-out sections.

Wiring



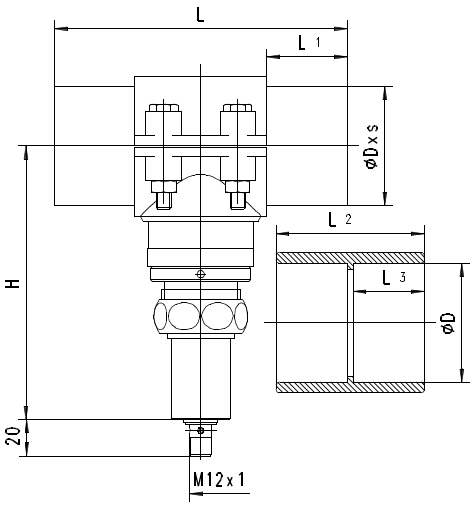
Connection example: PNP NPN



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

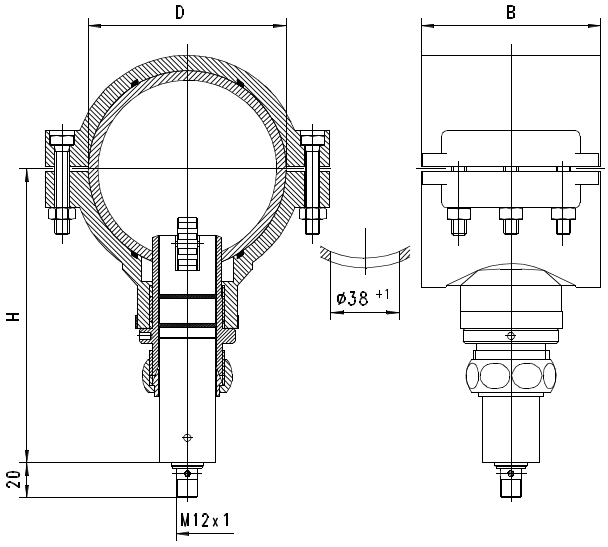
Dimensions

Connection: tapping sleeve with piping section and glue socket(s) RR.-032MH...



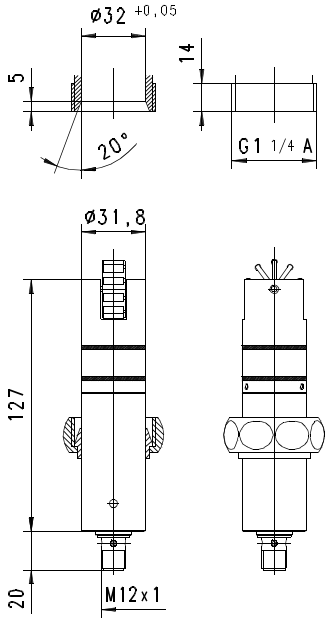
Nominal width	Type	ØD	s	H	L	L1	L2	L3
DN 32	RR.-032MH032.	40	1.9	145.0	132	31	55	26
DN 40	RR.-032MH040.	50	2.4		142	36	65	31
DN 50	RR.-032MH050.	63	3.0		156	43	79	38
DN 65	RR.-032MH065.	75	3.6	153.5	178	49	92	44
DN 80	RR.-032MH080.	90	4.3	156.0	202	56	107	51
DN 100	RR.-032MH100.	110	5.3	166.0	232	66	128	61
DN 125	RR.-032MH125.	140	6.7	172.0	287	81	159	76
DN 150	RR.-032MH150.	160	7.7	180.0	312	91	180	86

Connection: tapping sleeve RR.-032BB... (optionally)

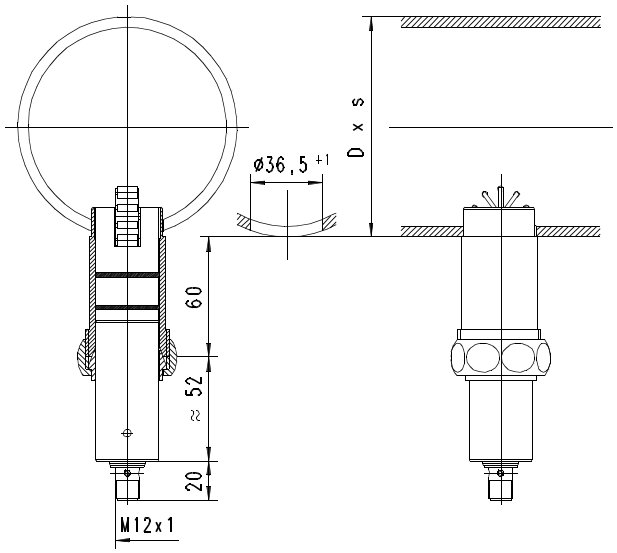


Nominal width	Type	D	B	H
DN 50	RR.-032BB050.	63	70	145.0
DN 65	RR.-032BB065.	75	80	153.5
DN 80	RR.-032BB080.	90	90	156.0
DN 100	RR.-032BB100.	110	100	166.0
DN 125	RR.-032BB125.	140	125	172.0
DN 150	RR.-032BB150.	160	130	180.0

Connection: screw-in probe RR.-032RM000.
Provided by customer



Connection: welded-on nozzle RR.-032VK000. (optionally)

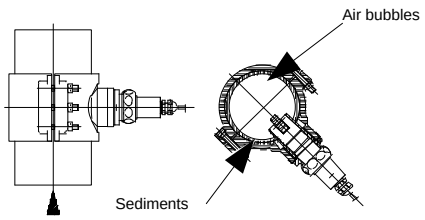


Handling and operation

Installation

The flow meters are inserted in probe form in a tapping sleeve, and are marked with the correct insertion depth. The installation direction of the probe is lengthways to the spinner, and is indicated with arrows on the front of the flow meter. An angular deviation of ±3 ° has no effect on the measurement.

The sensor must be installed with run-in and run-out sections of 10 x D of the pipe diameter, in order to prevent vortices and turbulence.



The best installation position (low contamination, good venting) is with the direction of flow from bottom to top, or in horizontal piping with the sensor at an angle of 45 ° downwards. The union nut must be tightened to a torque of 30 Nm.

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 flow rate 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).

To avoid the need to transit to an undesired operating status for the purpose of teaching, 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 %.

If necessary, a far greater number of parameters can also be programmed using the ECI-1 configuration interface.

Ordering code

The basic device is ordered e.g. RRI-032...
with electronics e.g. LABO-RRI-032...

	1.		2.	3.	4.	5.	6.	7.	8.
RR		-	032						E

	9.		10.	11.	12.	13.
LABO-RR		-		S		

❍=Option

1.	**Sensor**								
	I	with inductive sensor							
	H	with Hall sensor							
2.	**Union nut**								
	032	G $1^1/_4$							
3.	**Mechanical connection**								
	MH	tapping sleeve with piping section and PVC glue sockets							
	BB ❍	PP tapping sleeve							
	RM	screw-in probe G $1^1/_4$ with clamping ring and union nut							
	VK ❍	welded-on nozzle 1.4305							
4.	**Material for probe**								
	H	PVC							●
	K	stainless steel 1.4305						●	
5.	**Nominal width**								
	000	screw-in probe / Welded-on nozzle		●	●				
	032	DN 32					●		
	040	DN 40					●		
	050	DN 50				●	●		
	065	DN 65				●	●		
	080	DN 80				●	●		
	100	DN 100				●	●		
	125	DN 125				●	●		
	150	DN 150				●	●		
6.	**Sealing material**								
	V	FKM							
	E ❍	EPDM							
	N ❍	NBR							
7.	**Rotor**								
	10K	with 10 stainless steel clamps (RRI)							●
	10T ❍	with 10 titanium clamps (RRI)							●
	05M	with 5 magnets (RRH)						●	
8.	**Connection for**								
	E	electronics							
9.	**Sensor**								
	I	with inductive sensor							●
	H	with Hall sensor						●	
10.	**Signal output**								
	I	4..20 mA							
	U	0..10 V							
	F	frequency output							
	C	pulse output							
11.	**Programming**								
	N	cannot be programmed (no teaching)							
	P ❍	programmable (teaching possible)							
12.	**Electrical connection**								
	S	for round plug connector M12x1, 4-pole							
13.	**Optional**								
	H ❍	100 °C version (with 300 mm cable)							

Accessories

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

Flow Switch LABO-RR.032-S

- **Simple and economical flow meter for piping diameters from 32 mm to 150 mm**
- **Made from plastic (optionally stainless steel)**
- **With tapping sleeve fixing for very rapid installation Retro-fitting also easily possible**
- **0..10 V , 4..20 mA , frequency/pulse output, completely configurable**

Characteristics

The flow meter consists of a spinner which is rotated by the flow speed. The rotational speed is proportional to the flow rate. The rotational speed can be recorded using various sensor systems, depending on the different materials for the housing. With plastic housings, there are no magnets in the flow space.

The LABO electronics 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.

Technical data

Sensor	LABO-RRI LABO-RRH	inductive sensor hall sensor
Nominal widths	DN 32..150	
Mechanical Connection	welded-on nozzle, DN 50..150 tapping sleeve, DN 32..150 glue socket, screw-in probe	
Switching range	15..1000 l/min For details, see table "Ranges"	
Measurement accuracy	±5 % of full scale value	
Repeatability	±1 % measured value	
Medium temperature	0..60 °C, type RRH as screw-in probe or with welded-on nozzle 0..95 °C	
Pressure resistance	PN 10 bar	
Pressure loss	typically < 0.1 bar	

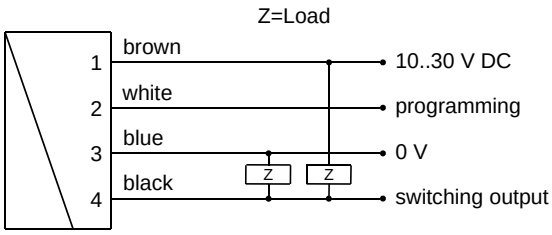
Materials medium-contact	LABO-RRI	LABO-RRH
Housing	PVC	1.4305
Tapping sleeve	PP	PP
Rotor	PVDF / 1.4310 or titanium	PVDF / Magnets
Bearing	Iglidur X	Iglidur X
Axis	Ceramic Zr02-TZP	Ceramic Zr02-TZP
Seal	FKM	FKM
Materials, non-medium-contact	Sensor tube:	CW614N nickelled
	Adhesive:	epoxy resin
	Flange bolts:	stainless steel
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 67	
Conformity	CE	

Ranges

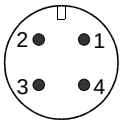
Nominal width	Switching range l/min H_2O	Q_{max} l/min
DN 32	15.. 200	220
DN 40	15.. 300	360
DN 50	25.. 400	480
DN 65	40.. 500	600
DN 80	50.. 700	840
DN 100	85..1000	1200

The measured values were determined using a standing sensor in a flow of water from left to right at 25 °C and with 10 x D run-in and run-out sections.

Wiring



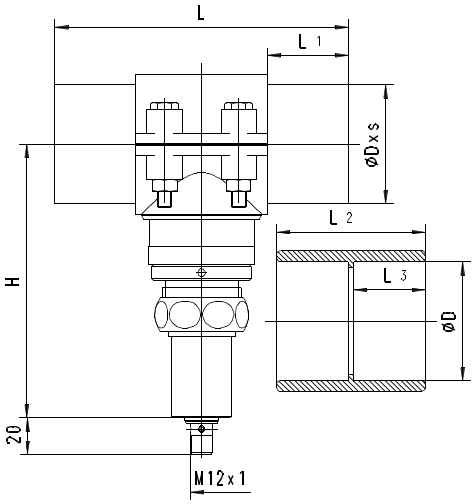
Connection example: PNP NPN



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

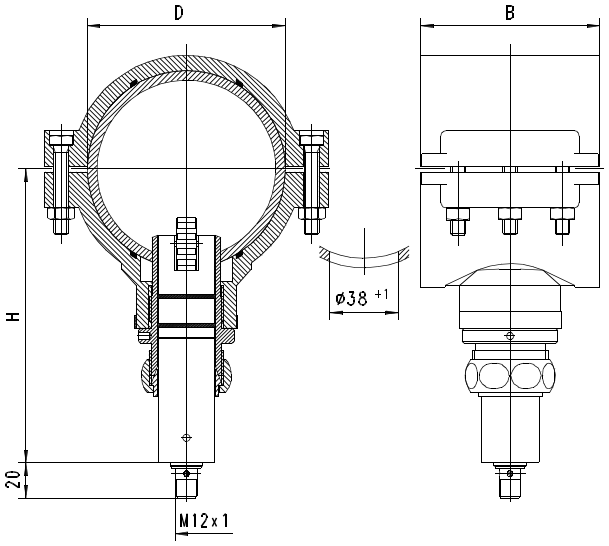
Dimensions

Connection: tapping sleeve with piping section and glue socket(s) RR.-032MH...



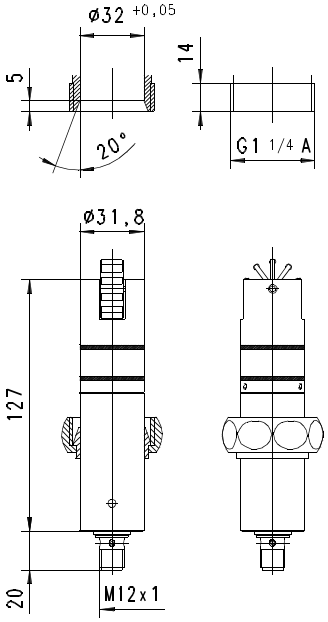
Nominal width	Type	ØD	s	H	L	L1	L2	L3
DN 32	RR.-032MH032.	40	1.9	145.0	132	31	55	26
DN 40	RR.-032MH040.	50	2.4		142	36	65	31
DN 50	RR.-032MH050.	63	3.0		156	43	79	38
DN 65	RR.-032MH065.	75	3.6	153.5	178	49	92	44
DN 80	RR.-032MH080.	90	4.3	156.0	202	56	107	51
DN 100	RR.-032MH100.	110	5.3	166.0	232	66	128	61
DN 125	RR.-032MH125.	140	6.7	172.0	287	81	159	76
DN 150	RR.-032MH150.	160	7.7	180.0	312	91	180	86

Connection: tapping sleeve RR.-032BB... (optionally)

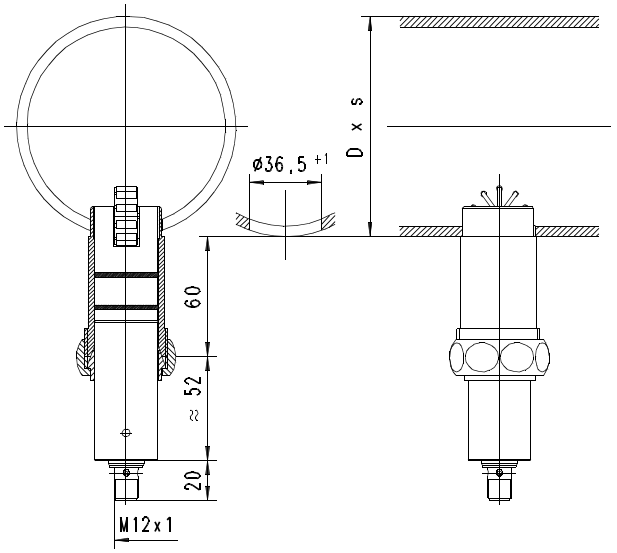


Nominal width	Type	D	B	H
DN 50	RR.-032BB050.	63	70	145.0
DN 65	RR.-032BB065.	75	80	153.5
DN 80	RR.-032BB080.	90	90	156.0
DN 100	RR.-032BB100.	110	100	166.0
DN 125	RR.-032BB125.	140	125	172.0
DN 150	RR.-032BB150.	160	130	180.0

Connection: screw-in probe RR.-032RM000.
Provided by customer



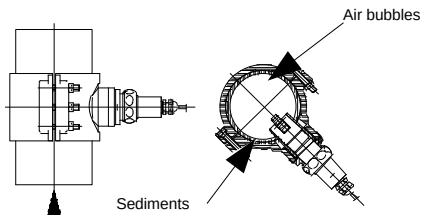
Connection: welded-on nozzle RR.-032VK000. (optionally)



Handling and operation

Installation

The flow meters are inserted in probe form in a tapping sleeve, and are marked with the correct insertion depth. The installation direction of the probe is lengthways to the spinner, and is indicated with arrows on the front of the flow meter. An angular deviation of ±3° has no effect on the measurement.
The sensor must be installed with run-in and run-out sections of 10 x D of the pipe diameter, in order to prevent vortices and turbulence.



The best installation position (low contamination, good venting) is with the direction of flow from bottom to top, or in horizontal piping with the sensor at an angle of 45 ° downwards. The union nut must be tightened to a torque of 30 Nm.

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:

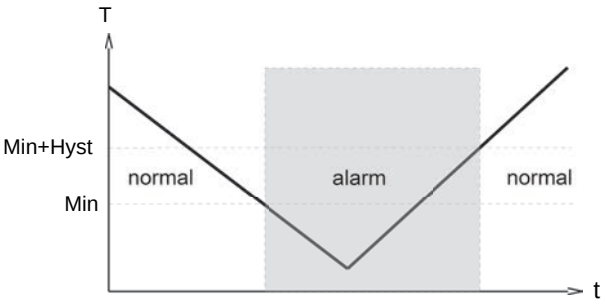
- Apply the flow rate to be set to the device.
- Apply an impulse of at least 0.5 seconds and max. 2 seconds duration to pin 2 (e.g. via a bridge to the supply voltage or a pulse from the PLC), in order to accept the measured value.
- When the teaching is complete, pin 2 should be connected to 0 V, so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

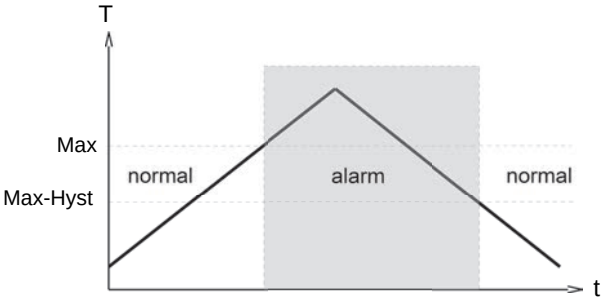
To avoid the need to transit to an undesired operating status for the purpose of teaching, the device can be provided ex-works with a teach-offset. The teach-offset point is added to the currently measured value before saving. The offset point can be positive or negative.

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 %.

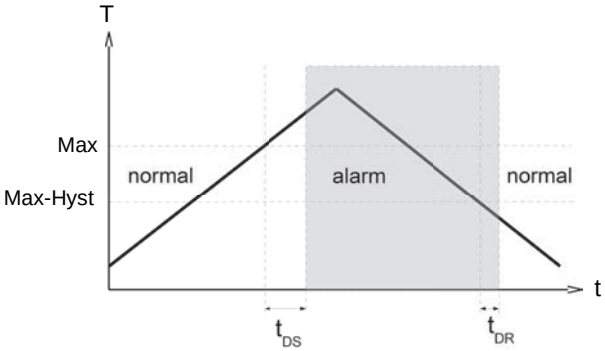
The limit switch can be used for monitoring minima or maxima. With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



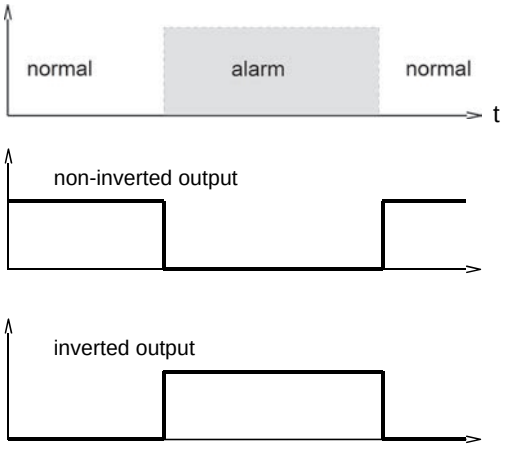
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



A changeover delay time (t_{DS}) can be applied to switching 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. RRI-032...
with electronics e.g. LABO-RRI-032...

	1.		2.	3.	4.	5.	6.	7.	8.
RR		-	**032**						**E**

	9.		10.	11.	12.	13.	14.	15.
LABO-RR		-		**S**			**S**	

❍=Option

1.	**Sensor**									
	I	with inductive sensor								
	H	with Hall sensor								
2.	**Union nut**									
	032	G $1^1/_4$								
3.	**Mechanical connection**									
	MH	tapping sleeve with piping section and PVC glue sockets								
	BB ❍	PP tapping sleeve								
	RM	screw-in probe G $1^1/_4$ with clamping ring and union nut								
	VK ❍	welded-on nozzle 1.4305								
4.	**Material for probe**									
	H	PVC								●
	K	stainless steel 1.4305							●	
5.	**Nominal width**									
	000	screw-in probe / Welded-on nozzle			●	●				
	032	DN 32					●			
	040	DN 40					●			
	050	DN 50				●	●			
	065	DN 65				●	●			
	080	DN 80				●	●			
	100	DN 100				●	●			
	125	DN 125				●	●			
	150	DN 150				●	●			
6.	**Seal material**									
	V	FKM								
	E ❍	EPDM								
	N ❍	NBR								
7.	**Rotor**									
	10K	with 10 stainless steel clamps (RRI)								●
	10T ❍	with 10 titanium clamps (RRI)								●
	05M	with 5 magnets (RRH)							●	
8.	**Connection for**									
	E	electronics								
9.	**Sensor**									
	I	with inductive sensor								●
	H	with Hall sensor							●	
10.	**Switching output (Limit switch)**									
	S	push-pull (compatible with PNP and NPN)								
11.	**Programming**									
	N	cannot be programmed (no teaching)								
	P ❍	programmable (teaching possible)								

12.	**Switching function**	
	L	minimum switch
	H	maximum switch
13.	**Switching signal**	
	O	Standard
	I ❍	Inverted
14.	**Electrical connection**	
	S	For round plug connector M12x1, 4-pole
15.	**Optional**	
	H ❍	100 °C version (with 300 mm cable)

Accessories

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

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

- **Uncomplicated measurement of flow rates**
- **Metal housing with Hall sensor**
- **Working pressure up to 100 bar**
- **Long working life thanks to high quality ceramic axis and special plastic bearing**
- **Run-in and run-out sections are not necessary.**
- **Modular construction with various connection systems**
- **Plug-in and rotatable connections**
- **0..10 V, 4..20 mA , frequency/pulse output, completely configurable**
- **Optionally, non-return valve, filter, constant flow rate device in the connections**

Characteristics

The flow meter consists of a spinner which is rotated by the flowing medium. The rotor's rotational speed is proportional to the flow volume per unit time. The rotor is fitted with magnets. A Hall sensor records the rotational speed, which is proportional to the flow rate.

The LABO-RRH electronics make various output signals available:

- Analog signal 0/4..20 mA (LABO-RRH-I)
- Analog signal 0/2..10 V (LABO-RRH-U)
- Frequency signal (LABO-RRH-F) or
- Value signal Pulse / x Litres (LABO-RRH-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".

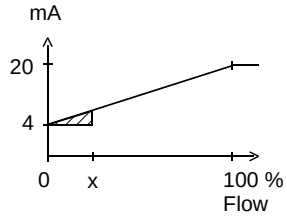
Technical data

Sensor	hall element	
Nominal width	DN 10 (LABO-RRH-010) DN 25 (LABO-RRH-025)	
Mechanical connection	female thread G $^3/_8$, G 1 male thread G $^3/_8$ A, G 1 A hose nozzle Ø11, Ø30 (other threaded, crimped, and plug-in connections, connections with constant flow rate device or limiters available on request)	
Metering ranges	0.1..100 l/min for details, see table "Ranges"	
Measurement accuracy	±3 % of the measured value	
Repeatability	±1 % of full scale value	
Pressure loss	max. 0.5 bar	
Pressure resistance	PN 100 bar	
Medium temperature	0..60 °C, optionally 0..100 °C	
Storage temperature	-20..+80 °C	
Materials medium-contact	Housing	CW614N nickelled or 1.4305
	Rotor	PVDF with magnets, glued with epoxy resin
	Bearing	Iglidur X
	Axis	Ceramic $Zr0_2$-TZP
	Seal	FKM
Materials, non-medium-contact	Clamps	1.4301
	Electronic housing	CW614N nickelled
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. output frequency dependent on metering range, standard 500 Imp/l (corresponds to 666.7 Hz at 80 l/min) range for small values: 5000 Imp/l (corresponds to 500 Hz at 6 l/min) (other frequencies available on request)	
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-RRH-I / U) or output status (LABO-RRH-F / C) (rapid flashing = programming)	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 67	
Weight	LABO-RRH-010	approx. 0.6 kg
	LABO-RRH-025	approx. 1.9 kg
Conformity	CE	

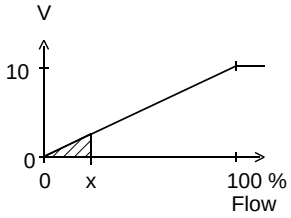
Signal output curves

Value x = Begin of the specified range
= not specified range

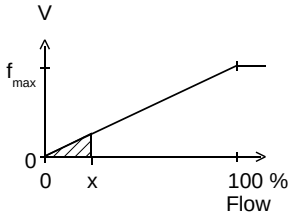
Current output



Voltage output



Frequency output



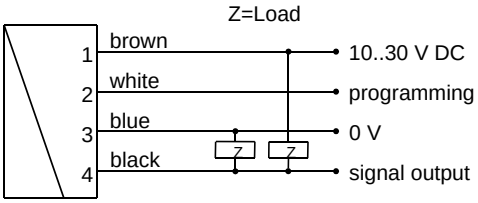
f_{max} selectable in the range of up to 2000 Hz

Other characters on request.

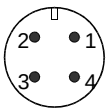
Metering ranges

Metering range l/min (H_2O)	Types	Q_{max} l/min (H_2O)
0.1.. 1.5	LABO-RRH-010...020	1.8
0.2.. 10.0	LABO-RRH-010...050	12.0
0.4.. 12.0	LABO-RRH-010...070	14.4
2.0.. 30.0	LABO-RRH-025...080	36.0
3.0.. 60.0	LABO-RRH-025...120	72.0
4.0.. 100.0	LABO-RRH-025...160	120.0

Wiring



Connection example: PNP NPN

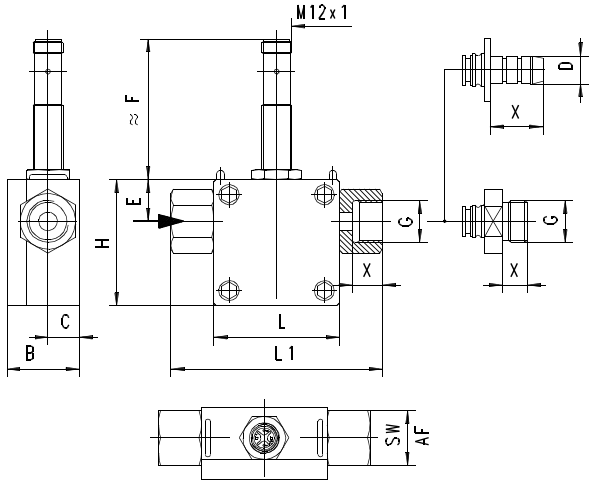


Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.

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



Threaded connection

G	DN	Types	H/L	L1	B	C	E	F	X	SW
G 3/8	10	RRH-010G	50	84	29	12.5	16.5	56	12	22
G 3/8 A		RRH-010A							14	
G 1	25	RRH-025G	70	110	53	23.0	27.5	51	18	38
G 1 A		RRH-025A		122						

Hose nozzle connection

D	DN	Types	H/L	L1	B	C	E	F	X
Ø11	10	RRH-010T	50	96	29	12.5	16.5	56	21
Ø30	25	RRH-025T	70	176	53	23.0	27.5	51	45

Handling and operation

Installation

The Rototron device is installed in the pipework with the aid of the rotatable adapter pieces. If necessary, the adapters can be removed from the body of the housing after the stainless steel clips have been removed from the housing. Before reinstalling, it should be ensured that both the adapter with the O-ring and the sealing surface in the body are clean and undamaged. The adapters should be fitted carefully in the housing (it is best to turn them), so that the O-ring is not damaged.

With this flow sensor, there is no need for run-in and run-out sections. However, it should be ensured that the flow sensor is at all times filled with medium. Any preferred installation position is possible, but the best possible venting position should be chosen (rotor axis horizontal, flow horizontal or from bottom to top).

Air bubbles affect the measurement results. For filling processes, the valve should be installed behind the sensor. A running up time of approx. 0.5 seconds and a running down time of approx. 3 seconds should be noted.

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 flow rate 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 %.

If necessary, a far greater number of parameters can also be programmed using the ECI-1 device configurator.

Ordering code

The basic device is ordered e.g. RRH-010xxx
with electronics e.g. LABO-RRH-010xxx

	1.	2.	3.	4.	5.	6.	7.	8.	9.
RRH-								**V**	**E**

	10.	11.	12.	13.	14.
LABO-RRH-				**S**	

❍=Option

1.	**Nominal width**			
	010	DN 10		
	025	DN 25		
2.	**Mechanical connection**			
	G	female thread		
	A	male thread		
	T	hose nozzle		
3.	**Connection material**			
	M	CW614N nickelled		
	K	1.4305		
4.	**Housing material**			
	M	CW614N		
	K	1.4305		
5.	**Inwards flow drilling**			
	020	Ø 2.0		●
	050	Ø 5.0		●
	070	Ø 7.0		●
	080	Ø 8.0	●	
	120	Ø12.0	●	
	160	Ø16.0	●	
6.	**Seal material**			
	V	FKM		
	E ❍	EPDM		
	N ❍	NBR		
	K ❍	Kemraz		
7.	**Rotor**			
	05	with 5 magnets		
	02 ❍	with 2 magnets		
8.	**Rotor material**			
	V	PVDF		
9.	**Connection for**			
	E	electronics		

10.	**For nominal width**			
	010	DN 10		●
	025	DN 25	●	
11.	**Signal output**			
	I	current output 4..20 mA		
	U	voltage output 0..10 V		
	F	frequency output (see "Ordering information")		
	C	pulse output (see "Ordering information")		
12.	**Programming**			
	N	cannot be programmed (no teaching)		
	P ❍	programmable (teaching possible)		
13.	**Electrical connection**			
	S	for round plug connector M12x1, 4-pole		
14.	**Optional**			
	H ❍	100 °C version (with 300 mm cable)		

Required ordering information

For LABO-RRH-F:
Output frequency at full scale ☐☐☐☐ Hz
Maximum value: 2.000 Hz

For LABO-RRH-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

- Transparent cover DN 10
- Air or gas model

Accessories

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

Flow Switch LABO-RRH-S

- **Uncomplicated monitoring of flow rates**
- **Metal housing with Hall sensor**
- **Working pressure up to 100 bar**
- **Long working life thanks to high quality ceramic axis and special plastic bearing**
- **Run-in and run-out sections are not necessary.**
- **Modular construction with various connection systems**
- **Plug-in and rotatable connections**
- **Optionally, non-return valve, filter, constant flow rate device in the connections**

Characteristics

The flow meter consists of a spinner which is rotated by the flowing medium. The rotor's rotational speed is proportional to the flow volume per unit time. The rotor is fitted with magnets. A Hall sensor records the rotational speed, which is proportional to the flow rate.

The LABO-RRH electronics 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.

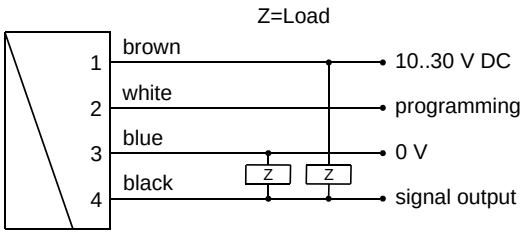
Technical data

Sensor	hall element	
Nominal width	DN 10 (LABO-RRH-010) DN 25 (LABO-RRH-025)	
Mechanical Connection	female thread G $^3/_8$, G 1 male thread G $^3/_8$ A, G 1 A hose nozzle Ø11, Ø30 (other threaded, crimped, and plug-in connections, connections with constant flow rate device or limiters available on request)	
Switching ranges	0.1..100 l/min for details, see table "Ranges"	
Measurement accuracy	±3 % of the measured value	
Repeatability	±1 % of full scale value	
Pressure loss	max. 0.5 bar	
Pressure resistance	PN 100 bar	
Medium temperature	0..60 °C, optionally 0..100 °C	
Storage temperature	-20..+80 °C	
Materials medium-contact	Housing	CW614N nickelled or 1.4305
	Rotor	PVDF with magnets, glued with epoxy resin
	Bearing	Iglidur X
	Axis	Ceramic $Zr0_2$-TZP
	Seal	FKM
Materials, non-medium-contact	Clamps	1.4301
	Electronic housing	CW614N nickelled
Supply voltage	10..30 V DC at voltage output 10 V: 15..30 V DC	
Power consumption	< 1 W (for no-load outputs)	
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 67	
Weight	LABO-RRH-010	approx. 0.6 kg
	LABO-RRH-025	approx. 1.9 kg
Conformity	CE	

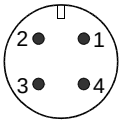
Ranges

Metering range l/min (H_2O)	**Types**	**Q_{max}** l/min (H_2O)
0.1.. 1.5	LABO-RRH-010...020	1.8
0.2.. 10.0	LABO-RRH-010...050	12.0
0.4.. 12.0	LABO-RRH-010...070	14.4
2.0.. 30.0	LABO-RRH-025...080	36.0
3.0.. 60.0	LABO-RRH-025...120	72.0
4.0..100.0	LABO-RRH-025...160	120.0

Wiring



Connection example: PNP NPN

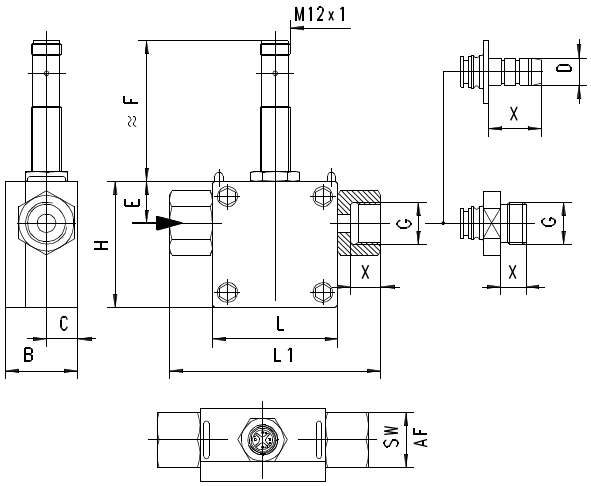


Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.

It is recommended to use shielded wiring.

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

Dimensions



Threaded connection

G	DN	Types	H/L	L1	B	C	E	F	X	SW
G 3/8	10	RRH-010G	50	84	29	12.5	16.5	56	12	22
G 3/8 A		RRH-010A							14	
G 1	25	RRH-025G	70	110	53	23.0	27.5	51	18	38
G 1 A		RRH-025A		122						

Hose nozzle connection

D	DN	Types	H/L	L1	B	C	E	F	X
Ø11	10	RRH-010T	50	96	29	12.5	16.5	56	21
Ø30	25	RRH-025T	70	176	53	23.0	27.5	51	45

Handling and operation

Installation

The Rototron device is installed in the pipework with the aid of the rotatable adapter pieces. If necessary, the adapters can be removed from the body of the housing after the stainless steel clips have been removed from the housing. Before reinstalling, it should be ensured that both the adapter with the O-ring and the sealing surface in the body are clean and undamaged. The adapters should be fitted carefully in the housing (it is best to turn them), so that the O-ring is not damaged.

With this flow sensor, there is no need for run-in and run-out sections. However, it should be ensured that the flow sensor is at all times filled with medium. Any preferred installation position is possible, but the best possible venting position should be chosen (rotor axis horizontal, flow horizontal or from bottom to top).

Air bubbles affect the measurement results. For filling processes, the valve should be installed behind the sensor. A running up time of approx. 0.5 seconds and a running down time of approx. 3 seconds should be noted.

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

- The flow rate 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).

To avoid the need to transit to an undesired operating status for the purpose of teaching, 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 %.

Ordering code

The basic device is ordered e.g. RRH-010xxx with electronics e.g. LABO-RRH-010xxx

	1.	2.	3.	4.	5.	6.	7.	8.	9.
RRH-								**V**	**E**

	10.	11.	12.	13.	14.	15.	16.
LABO - RRH-		**S**				**S**	

❍=Option

1.	**Nominal width**				
	010		DN 10		
	025		DN 25		
2.	**Mechanical connection**				
	G		female thread		
	A		male thread		
	T		hose nozzle		
3.	**Connection material**				
	M		CW614N nickelled		
	K		1.4305		
4.	**Housing material**				
	M		CW614N		
	K		1.4305		
5.	**Inwards flow drilling**				
	020		Ø 2.0		●
	050		Ø 5.0		●
	070		Ø 7.0		●
	080		Ø 8.0	●	
	120		Ø12.0	●	
	160		Ø16.0	●	
6.	**Seal material**				
	V		FKM		
	E	❍	EPDM		
	N	❍	NBR		
	K	❍	Kemraz		
7.	**Rotor**				
	05		with 5 magnets		
	02	❍	with 2 magnets		
8.	**Rotor material**				
	V		PVDF		
9.	**Connection for**				
	E		electronics		
10.	**For nominal width**				
	010		DN 10		●
	025		DN 25	●	
11.	**Switching output (Limit switch)**				
	S		push-pull (compatible with PNP and NPN)		
12.	**Programming**				
	P		programmable (teaching possible)		
	N	❍	cannot be programmed (no teaching)		
13.	**Switching function**				
	L		minimum-switch		
	H		maximum switch		
14.	**Switching signal**				
	O		standard		
	I	❍	inverted		
15.	**Electrical connection**				
	S		for round plug connector M12x1, 4-pole		
16.	**Optional**				
	H	❍	100 °C version (with 300 mm cable)		

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.

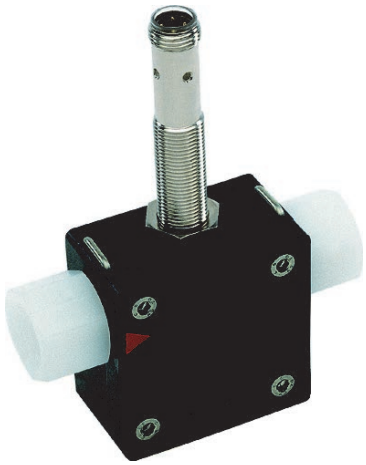
Options

- Transparent cover DN 10
- Air or gas model

Accessories

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

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



- **Uncomplicated measurement of flow rates**
- **No magnets; uses inductive sensor**
- **Long working life thanks to high quality ceramic axis and special plastic bearing**
- **Run-in and run-out sections are not necessary.**
- **Modular construction with various connection systems**
- **Plug-in and rotatable connections**
- **0..10 V, 4..20 mA , frequency/pulse output, completely configurable**
- **Optionally, non-return valve, filter, constant flow rate device in the connections**

Characteristics

The flow meter consists of a spinner which is rotated by the flowing medium. The rotor's rotational speed is proportional to the flow volume per unit time. The rotor is fitted with stainless steel clamps (optionally titanium or Hastelloy®). An inductive proximity switch records the rotational speed, which is proportional to the flow rate.

The LABO-RRI electronics make various output signals available:

- Analog signal 0/4..20 mA (LABO-RRI-I)
- Analog signal 0/2..10 V (LABO-RRI-U)
- Frequency signal (LABO-RRI-F) or
- Value signal Pulse / x Litres (LABO-RRI-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".

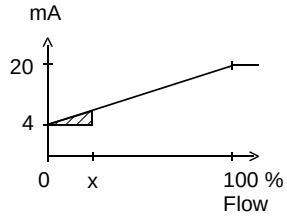
Technical data

Sensor	inductive	
Nominal width	DN 10 (FLEX-RRI-010) DN 25 (FLEX-RRI-025)	
Mechanical Connection	female thread G $^3/_8$, G 1 male thread G $^3/_8$ A, G 1 A hose nozzle Ø11, Ø30 (other threaded, crimped, and plug-in connections, connections with constant flow rate device or limiters available on request)	
Metering ranges	0.1..100 l/min for details, see table "Ranges"	
Measurement accuracy	±3 % of the measured value	
Repeatability	±1 % of full scale value	
Pressure loss	max. 0.5 bar	
Pressure resistance	PN 16 bar	
Medium temperature	0..60 °C	
Storage temperature	-20..+80 °C	
Materials medium-contact	Housing	PPS (Fortron 1140L4)
	Rotor	PVDF
	Clamps	1.4310 optionally: titanium or Hastelloy®
	Bearing	Iglidur X
	Axis	Ceramic $Zr0_2$-TZP
	Seal	FKM
Materials, non-medium-contact	Clamps	1.4301
	Electronic housing	CW614N nickelled
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. output frequency dependent on metering range, standard 500 Imp/l (corresponds to 666.7 Hz at 80 l/min) Rrange for small values: 5000 Imp/l (corresponds to 500 Hz at 6 l/min) (other frequencies available on request)	
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-RRI-I / U) or output status (LABO-RRI-F / C) (rapid flashing = Programming)	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 67	
Weight	LABO-RRI-010	approx. 0.2 kg
	LABO-RRI-025	approx. 0.5 kg
Conformity	CE	

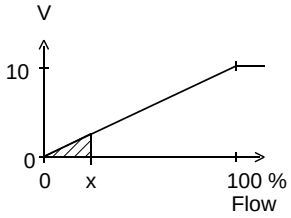
Signal output curves

Value x = Begin of the specified range
= not specified range

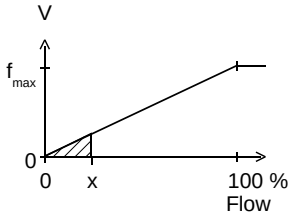
Current output



Voltage output



Frequency output



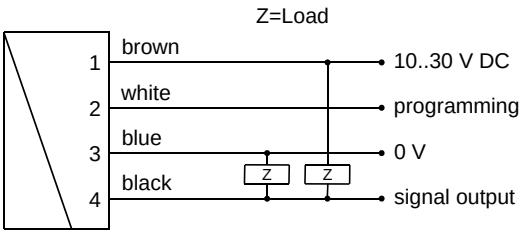
f_{max} selectable in the range of up to 2000 Hz

Other characters on request.

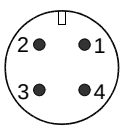
Ranges

Metering range l/min (H_2O)	Types	Q_{max} l/min (H_2O)
0.1.. 1.5	LABO-RRI-010...020	1.8
0.2.. 10.0	LABO-RRI-010...050	12.0
0.4.. 12.0	LABO-RRI-010...070	14.4
2.0.. 30.0	LABO-RRI-025...080	36.0
3.0.. 60.0	LABO-RRI-025...120	72.0
4.0..100.0	LABO-RRI-025...160	120.0

Wiring



Connection example: PNP NPN

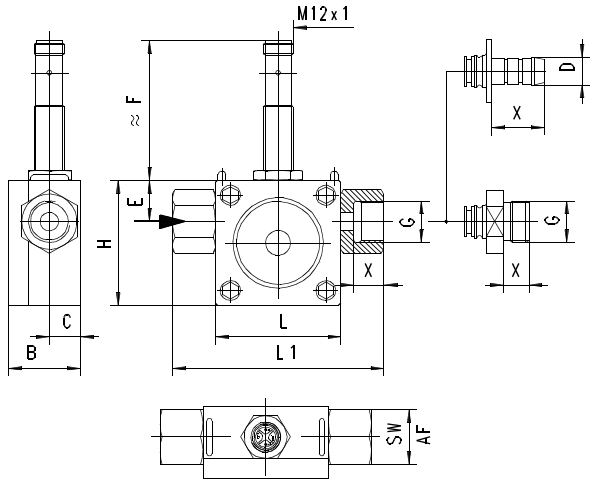


Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.

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



Threaded connection

G	DN	Types	H/L	L1	B	C	E	F	X	SW
G 3/8	10	RRI-010G	50	84	29	12.5	16.5	56	12	22
G 3/8 A		RRI-010A							14	
G 1	25	RRI-025G	70	110	53	23.0	27.5	51	18	38
G 1 A		RRI-025A		122						

Hose nozzle connection

D	DN	Types	H/L	L1	B	C	E	F	X
Ø11	10	RRI-010T	50	96	29	12.5	16.5	56	21
Ø30	25	RRI-025T	70	176	53	23.0	27.5	51	45

Handling and operation

Installation

The Rototron device is installed in the pipework with the aid of the rotatable adapter pieces. If necessary, the adapters can be removed from the body of the housing after the stainless steel clips have been removed from the housing. Before reinstalling, it should be ensured that both the adapter with the O-ring and the sealing surface in the body are clean and undamaged. The adapters should be fitted carefully in the housing (it is best to turn them), so that the O-ring is not damaged.

With this flow sensor, there is no need for run-in and run-out sections. However, it should be ensured that the flow sensor is at all times filled with medium. Any preferred installation position is possible, but the best possible venting position should be chosen (rotor axis horizontal, flow horizontal or from bottom to top).

Air bubbles affect the measurement results. For filling processes, the valve should be installed behind the sensor. A running up time of approx. 0.5 seconds and a running down time of approx. 3 seconds should be noted.

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 flow rate 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 %.

If necessary, a far greater number of parameters can also be programmed using the ECI-1 device configurator.

Ordering code

The basic device is ordered e.g. RRI-010xxx with electronics e.g. LABO-RRI-010xxx

	1.	2.	3.	4.	5.	6.	7.	8.	9.
RRI-									**E**

	10.	11.	12.
LABO-RRI-			

❍=Option

1.	**Nominal width**			
	010		DN 10	
	025		DN 25	
2.	**Mechanical connection**			
	G		female thread	
	A		male thread	
	T		hose nozzle	
3.	**Connection material**			
	V		PVDF	
	M	❍	CW614N nickelled	
	K	❍	1.4305	
4.	**Housing material**			
	Q		PPS	
	V		PVDF	
	A	❍	PPS with transparent cover PSU	
5.	**Inwards flow drilling**			
	020		Ø 2.0	●
	050		Ø 5.0	●
	070		Ø 7.0	●
	080		Ø 8.0	●
	120		Ø12.0	●
	160		Ø16.0	●
6.	**Seal material**			
	V		FKM	
	E	❍	EPDM	
	N	❍	NBR	
7.	**Rotor**			
	10		with 10 clamps	
	02	❍	with 2 clamps	
	05	❍	with 5 clamps	
8.	**Material for clamps**			
	K		1.4310	
	T	❍	titanium	
	H	❍	Hastelloy®	
9.	**Connection for**			
	E		electronics	

10.	**Signal output**		
	I		current output 4..20 mA
	U		voltage output 0..10 V
	F		frequency output (see "Ordering information")
	C		pulse output (see "Ordering information")
11.	**Programming**		
	N		cannot be programmed (no teaching)
	P	❍	programmable (teaching possible)
12.	**Electrical connection**		
	S		for round plug connector M12x1, 4-pole

Required ordering information

For LABO-RRI-F:
Output frequency at full scale ☐☐☐☐ Hz
Maximum value: 2.000 Hz

For LABO-RRI-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.

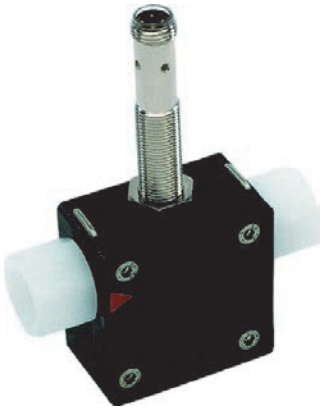
Options

- Rotor with titanium clamps

Accessories

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

Flow Switch LABO-RRI-S



- **Uncomplicated monitoring of flow rates**
- **No magnets; uses inductive sensor**
- **Long working life thanks to high quality ceramic axis and special plastic bearing**
- **Run-in and run-out sections are not necessary.**
- **Modular construction with various connection systems**
- **Plug-in and rotatable connections**
- **Optionally, non-return valve, filter, constant flow rate device in the connections**

Characteristics

The flow meter consists of a spinner which is rotated by the flowing medium. The rotor's rotational speed is proportional to the flow volume per unit time. The rotor is fitted with stainless steel clamps (optionally titanium or Hastelloy®). An inductive proximity switch records the rotational speed, which is proportional to the flow rate.

The LABO-RRI electronics 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.

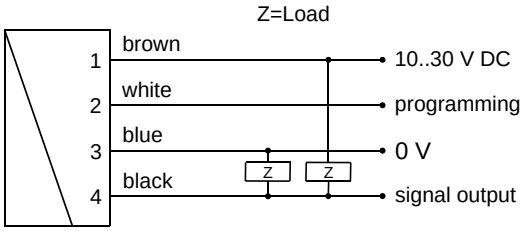
Technical data

Sensor	inductive	
Nominal width	DN 10 (LABO-RRI-010) DN 25 (LABO-RRI-025)	
Mechanical Connection	female thread G $^3/_8$, G 1 male thread G $^3/_8$ A, G 1 A hose nozzle Ø11, Ø30 (other threaded, crimped, and plug-in connections, connections with constant flow rate device or limiters available on request)	
Switching ranges	0.1..100 l/min for details, see table "Ranges"	
Measurement accuracy	±3 % of the measured value	
Repeatability	±1 % of full scale value	
Pressure loss	max. 0.5 bar	
Pressure resistance	PN 16 bar	
Medium temperature	0..60 °C	
Storage temperature	-20..+80 °C	
Materials medium-contact	Housing	PPS (Fortron 1140L4)
	Rotor	PVDF
	Clamps	1.4310 optionally: titanium or Hastelloy®
	Bearing	Iglidur X
	Axis	Ceramic $Zr0_2$-TZP
	Seal	FKM
Materials, non-medium-contact	Clamps	1.4301
	Electronic housing	CW614N nickelled
Supply voltage	10..30 V DC at voltage output 10 V: 15..30 V DC	
Power consumption	< 1 W (for no-load outputs)	
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 67	
Weight	LABO-RRI-010	approx. 0.2 kg
	LABO-RRI-025	approx. 0.5 kg
Conformity	CE	

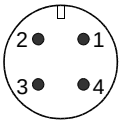
Ranges

Metering range l/min (H_2O)	Types	Q_{max} l/min (H_2O)
0.1.. 1.5	LABO-RRI-010...020	1.8
0.2.. 10.0	LABO-RRI-010...050	12.0
0.4.. 12.0	LABO-RRI-010...070	14.4
2.0.. 30.0	LABO-RRI-025...080	36.0
3.0.. 60.0	LABO-RRI-025...120	72.0
4.0.. 100.0	LABO-RRI-025...160	120.0

Wiring



Connection example: PNP NPN

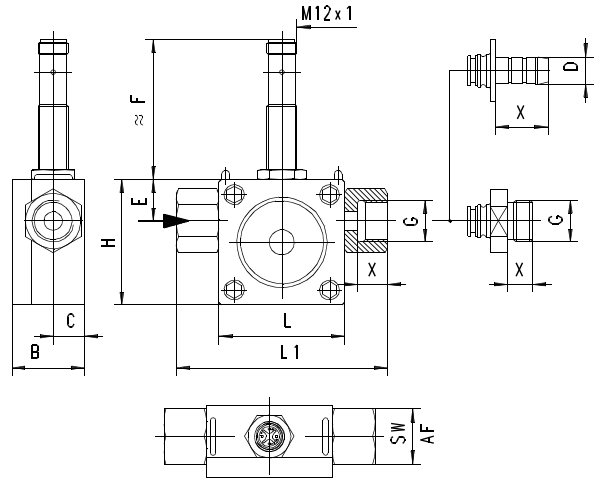


Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.

It is recommended to use shielded wiring.

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

Dimensions



Threaded connection

G	DN	Types	H/L	L1	B	C	E	F	X	SW
G 3/8	10	RRI-010G	50	84	29	12.5	16.5	56	12	22
G 3/8 A		RRI-010A							14	
G 1	25	RRI-025G	70	110	53	23.0	27.5	51	18	38
G 1 A		RRI-025A		122						

Hose nozzle connection

D	DN	Types	H/L	L1	B	C	E	F	X
Ø11	10	RRI-010T	50	96	29	12.5	16.5	56	21
Ø30	25	RRI-025T	70	176	53	23.0	27.5	51	45

Handling and operation

Installation

The Rototron device is installed in the pipework with the aid of the rotatable adapter pieces. If necessary, the adapters can be removed from the body of the housing after the stainless steel clips have been removed from the housing. Before reinstalling, it should be ensured that both the adapter with the O-ring and the sealing surface in the body are clean and undamaged. The adapters should be fitted carefully in the housing (it is best to turn them), so that the O-ring is not damaged.

With this flow sensor, there is no need for run-in and run-out sections. However, it should be ensured that the flow sensor is at all times filled with medium. Any preferred installation position is possible, but the best possible venting position should be chosen (rotor axis horizontal, flow horizontal or from bottom to top).

Air bubbles affect the measurement results. For filling processes, the valve should be installed behind the sensor. A running up time of approx. 0.5 seconds and a running down time of approx. 3 seconds should be noted.

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

- The flow rate 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 %.

Ordering code

The basic device is ordered e.g. RRI-010xxx with electronics e.g. LABO-RRI-010xxx

	1.	2.	3.	4.	5.	6.	7.	8.	9.
RRI-									**E**

	10.	11.	12.	13.	14.	15.
LABO- RRI-		**S**				**S**

❍=Option

1.	**Nominal width**			
	010		DN 10	
	025		DN 25	
2.	**Mechanical connection**			
	G		female thread	
	A		male thread	
	T		hose nozzle	
3.	**Connection material**			
	V		PVDF	
	M	❍	CW614N nickelled	
	K	❍	1.4305	
4.	**Housing material**			
	Q		PPS	
	V		PVDF	
	A	❍	PPS with transparent cover PSU	
5.	**Inwards flow drilling**			
	020		Ø 2.0	●
	050		Ø 5.0	●
	070		Ø 7.0	●
	080		Ø 8.0	●
	120		Ø12.0	●
	160		Ø16.0	●
6.	**Seal material**			
	V		FKM	
	E	❍	EPDM	
	N	❍	NBR	
7.	**Rotor**			
	10		with 10 clamps	
	02	❍	with 2 clamps	
	05	❍	with 5 clamps	
8.	**Material for clamps**			
	K		1.4310	
	T	❍	titanium	
	H	❍	Hastelloy®	
9.	**Connection for**			
	E		electronics	

10.	**For nominal width**			
	010		DN 10	●
	025		DN 25	●
11.	**Switching output (Limit switch)**			
	S		push-pull (compatible with PNP and NPN)	
12.	**Programming**			
	P		programmable (teaching possible)	
	N	❍	cannot be programmed (no teaching)	
13.	**Switching function**			
	L		minimum-switch	
	H		maximum-switch	

14.	**Switching signal**		
	O		standard
	I	❍	inverted
15.	**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

- Rotor with titanium clamps

Accessories

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

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Сургут (3462)77-98-35
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Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
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