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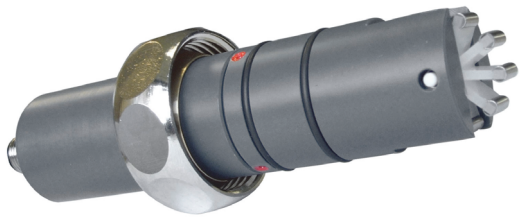
Flow Switch LABO-RR.032-S



- **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	

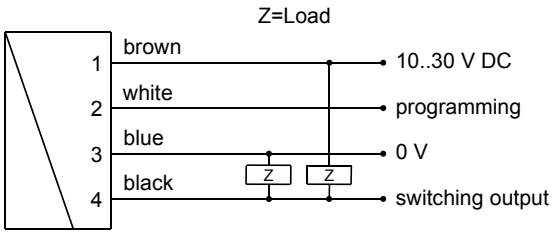
Materials medium-contact	LABO-RRI	LABO-RRH
Housing	PVC	1.4305
Tapping sleeve	PP	PP
Rotor	PVDF / 1.4310 or titanium	PVDF / Magnets
Bearing	Iglidur X	Iglidur X
Axis	Ceramic Zr02-TZP	Ceramic Zr02-TZP
Seal	FKM	FKM
Materials, non-medium-contact	Sensor tube:	CW614N nickelled
	Adhesive:	epoxy resin
	Flange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

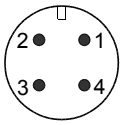
Nominal width	Switching range l/min H_2O	Q_{max} l/min
DN 32	15.. 200	220
DN 40	15.. 300	360
DN 50	25.. 400	480
DN 65	40.. 500	600
DN 80	50.. 700	840
DN 100	85..1000	1200

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



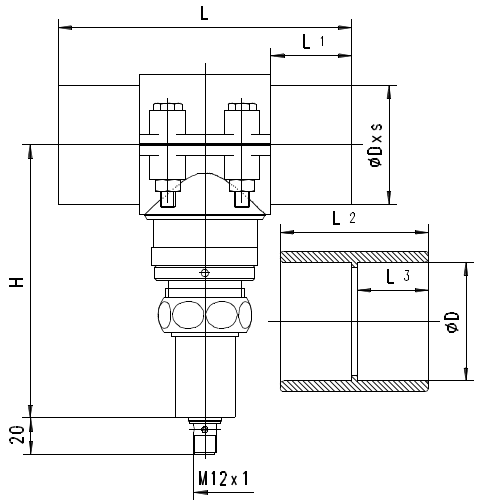
Connection example: PNP NPN



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

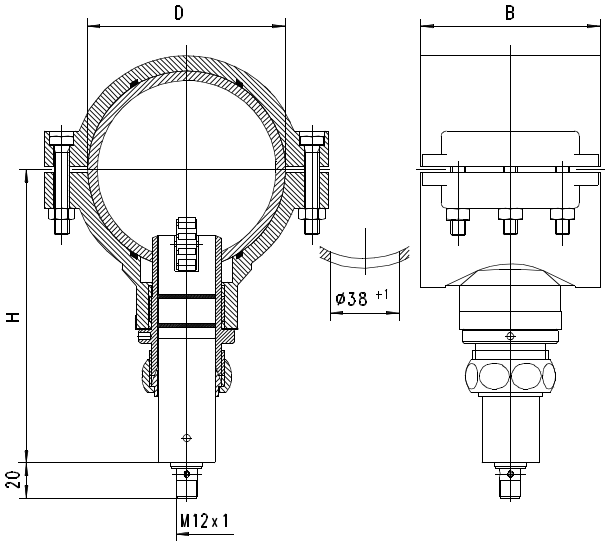
Dimensions

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



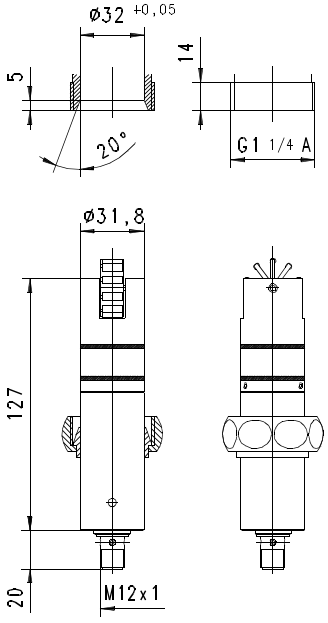
Nominal width	Type	ØD	s	H	L	L1	L2	L3
DN 32	RR.-032MH032.	40	1.9	145.0	132	31	55	26
DN 40	RR.-032MH040.	50	2.4		142	36	65	31
DN 50	RR.-032MH050.	63	3.0		156	43	79	38
DN 65	RR.-032MH065.	75	3.6	153.5	178	49	92	44
DN 80	RR.-032MH080.	90	4.3	156.0	202	56	107	51
DN 100	RR.-032MH100.	110	5.3	166.0	232	66	128	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)

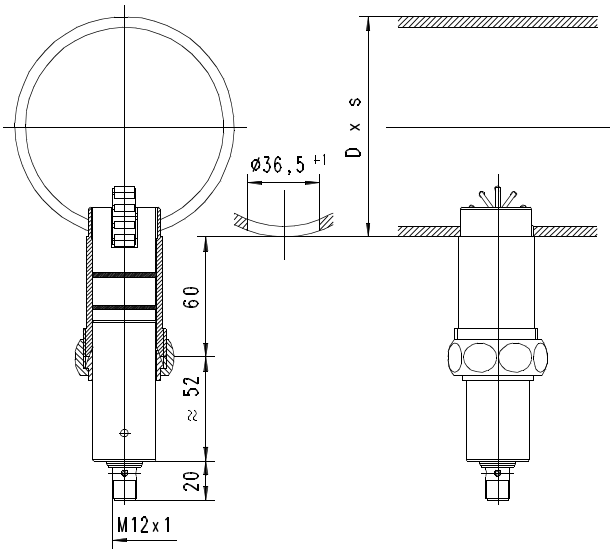


Nominal width	Type	D	B	H
DN 50	RR.-032BB050.	63	70	145.0
DN 65	RR.-032BB065.	75	80	153.5
DN 80	RR.-032BB080.	90	90	156.0
DN 100	RR.-032BB100.	110	100	166.0
DN 125	RR.-032BB125.	140	125	172.0
DN 150	RR.-032BB150.	160	130	180.0

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



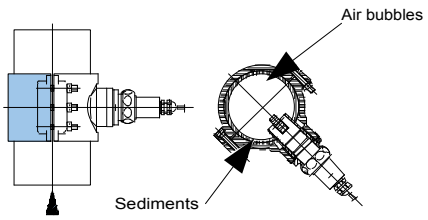
Connection: welded-on nozzle RR.-032VK000. (optionally)



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:

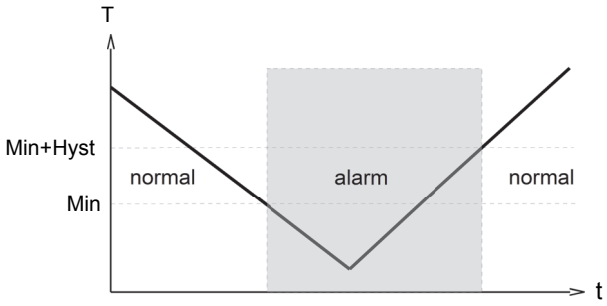
- Apply the flow rate to be set to the device.
- Apply an impulse of at least 0.5 seconds and max. 2 seconds duration to pin 2 (e.g. via a bridge to the supply voltage or a pulse from the PLC), in order to accept the measured value.
- When the teaching is complete, pin 2 should be connected to 0 V, so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



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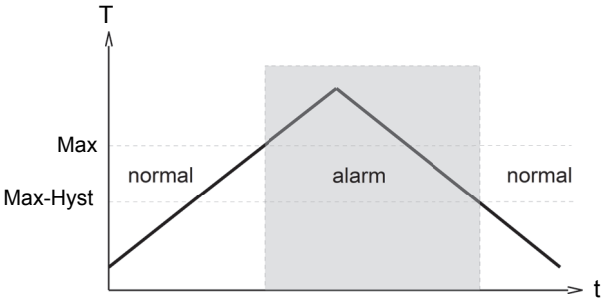
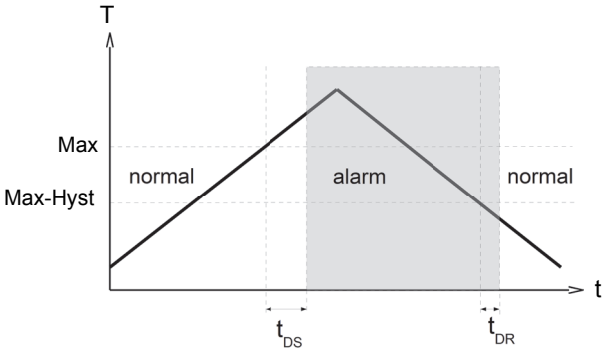
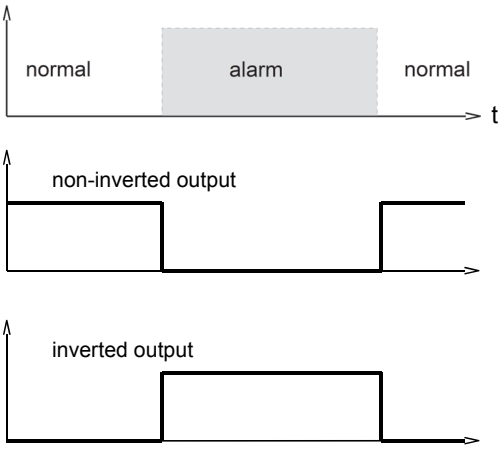
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



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 1¼							
3.	**Mechanical connection**								
	MH	tapping sleeve with piping section and PVC glue sockets							
	BB ❍	PP tapping sleeve							
	RM	screw-in probe G 1¼ 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