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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 Rotor Clamps Bearing Axis Seal	PPS (Fortron 1140L4) PVDF 1.4310 optionally: titanium or Hastelloy® Iglidur X Ceramic $Zr0_2$-TZP FKM
Materials, non-medium-contact	Clamps Electronic housing	1.4301 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 (LA-BO-RRI-I / U) or output status (LA-BO-RRI-F / C) (rapid flashing = Programming)	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 67	
Weight	LABO-RRI-010 LABO-RRI-025	approx. 0.2 kg approx. 0.5 kg
Conformity	CE	

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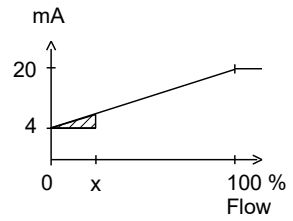
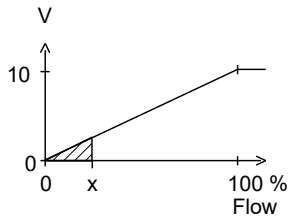
Signal output curves

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

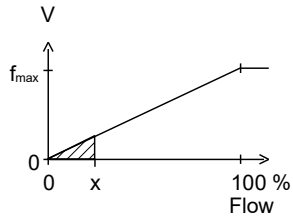
Current output



Voltage output



Frequency output



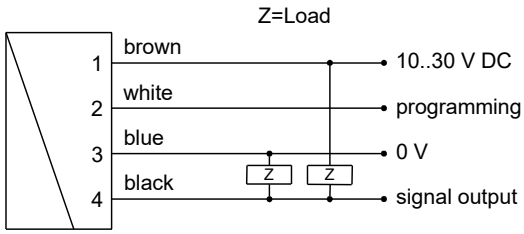
f_{max} selectable in the range of up to 2000 Hz

Other characters on request.

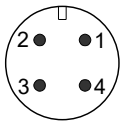
Ranges

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

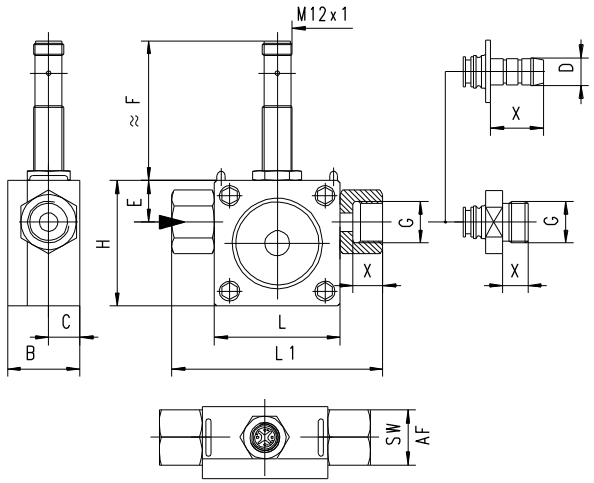


Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.

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						

NPT threads on request

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

Custom specific connectors on request

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.

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Product Information

LABO-RRI-I / U / F / C

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

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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