Senseca Germany GmbH
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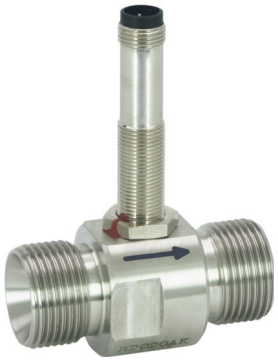
Flow Transmitter LABO-RT-I / U / F / C



- **High precision**
- **No magnetic components in the flow space**
- **High pressure resistance**
- **0..10 V, 4..20 mA , frequency/pulse output, completely configurable**

Characteristics

A turbine acts as the primary sensor; its rotational speed is proportional to the flow rate. The rotational speed is detected by means of pre-tensioned Hall sensors, i.e. there are no magnets in the flow space.

The LABO-RT electronics make various output signals available:

- Analog signal 0/4..20 mA (LABO-RT-I)
- Analog signal 0/2..10 V (LABO-RT-U)
- Frequency signal (LABO-RT-F) or
- Value signal pulse / x litres (LABO-RT-C)

A model with switching output is also available (see separate datasheet).

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

Technical data

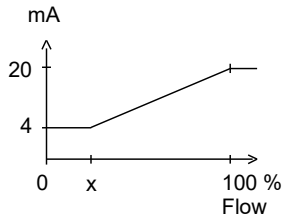
Sensor	turbine with biased Hall sensor
Nominal width	DN 15..50 (others on request)
Process connection	G $^1/_2$ A...G 2 A
Metering ranges	see table "Ranges"
Measurement accuracy	±1 % of full scale value in the specified metering range including linearity and repeatability
Max. particle size	0.5 mm
Pressure loss	0.3 bar at $Q_{max.}$
Pressure resistance	PN 250 bar
Medium temperature	-20..+85 °C optionally -20..+150 °C (for 8 bar min.)
Ambient temperature	-20..+70 °C
Storage temperature	-20..+80 °C

Materials medium-contact	Housing Turbine Bearing	stainless steel 315 stainless steel 430 tungsten carbide
Material Electronics housing	CW614N nickelled	
Supply voltage	10..30 V DC voltage output 10 V: 15..30 V DC	
Power consumption	< 1 W (without load)	
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 (LA-BO-RT-I / U) or output status (LA-BO-RT-F / C) (rapid flashing = Programming)	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 67	
Weight	see table in "Dimensions"	
Conformity	CE	

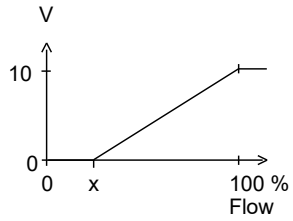
Signal output curves

Value x = Begin of the specified range

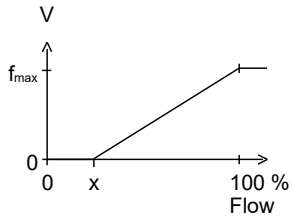
Current output



Voltage output



Frequency output



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

Other characters on request.

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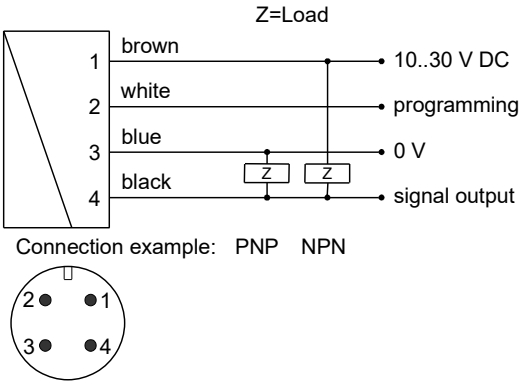
Product Information

LABO-RT-I / U / F / C

Ranges

Types	Metering range (1..5 mm²/s)	
	l/min	m³/h
RT-015AK001.	1.8.. 18	0.11.. 1.1
RT-020AK002.	3.7.. 37	0.22.. 2.2
RT-020AK004.	6.7.. 67	0.40.. 4.0
RT-020AK008.	13.3.. 133	0.80.. 8.0
RT-025AK016.	26.7.. 267	1.60..16.0
RT-040AK034.	56.7.. 567	3.40..34.0
RT-050AK068.	113.3..1133	6.80..68.0

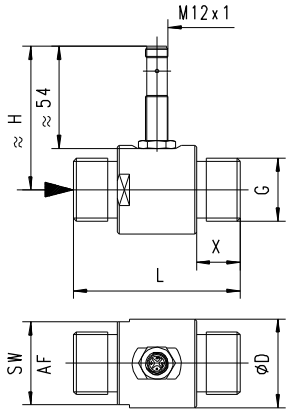
Wiring



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 or pulse output version can as desired be switched as a PNP or an NPN output.

Dimensions



DN	G	ØD	SW / AF	H	L	X	Range m³/h at 1-5 mm² /s	Weight kg
15	1/2	38	35	69	64	19	0.11 – 1.1	0.32
20	3/4	38	35	70	64	19	0.22 – 2.2	0.42
20	3/4	38	35	70	64	19	0.40 – 4.0	0.42
20	3/4	40	38	73	83	22	0.80 – 8.0	0.42
25	1	47	44	76	88	23	1.60 – 16.0	0.63
40	1 1/2	60	52	82	114	28	3.40 – 34.0	1.42
50	2	70	64	87	132	29	6.80 – 68.0	1.92

Handling and operation

Installation

As with all flow meters, if possible the turbine should be installed ahead of a valve (on the pressure side). Good degassing should be ensured. 10 x D calming sections are recommended before and after the turbine in order to maintain the specified accuracies. The turbine should be filled with fluid at all times.
The electronics housing does not project into the flow space.

Note

The fullscale 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 device configurator.

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Product Information

LABO-RT-I / U / F / C

Ordering code

The base device RT-XXX is ordered with electronics
e.g. LABO-RT-xxxx

	1.	2.	3.	4.	5.
RT -		**A**	**K**		**E**

	6.	7.	8.	9.
LABO - RT-			**S**	

❍=Option

1.	**Nominal width**							
	015	DN 15 - G 1/2 A						
	020	DN 20 - G 3/4 A						
	025	DN 25 - G 1 A						
	040	DN 40 - G 1 1/2 A						
	050	DN 50 - G 2 A						
2.	**Mechanical connection**							
	A	male thread						
3.	**Housing material**							
	K	stainless steel						
4.	**Metering range**							
	001	0.11.. 1.1 m³/h						●
	002	0.22.. 2.2 m³/h					●	
	004	0.40.. 4.0 m³/h					●	
	008	0.80.. 8.0 m³/h					●	
	016	1.60..16.0 m³/h				●		
	034	3.40..34.0 m³/h			●			
	068	6.80..68.0 m³/h		●				
5.	**Connection for**							
	E	electronics						

6.	**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")
7.	**Programming**		
	N		cannot be programmed (no teaching)
	P	❍	programmable (teaching possible)
8.	**Electrical connection**		
	S		for round plug connector M12x1, 4-pole
9.	**Optional**		
	H	❍	100 °C version (with 300 mm cable)

Required ordering information

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

For LABO-RT-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 actuated or set to defined values)

Further options available on request.

Options

- Flanged model,
- max. temperature 150 °C
- DN 80-300 PN 16
- model for air / gas
- range from 0.05 m³/h

Accessories

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