

**Product Information**

**LABO-RRH-S**

# 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 switch 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**

|                               |                                                                                                                                                                                                                   |                                           |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| <b>Sensor</b>                 | hall element                                                                                                                                                                                                      |                                           |
| <b>Nominal width</b>          | DN 10 (LABO-RRH-010)<br>DN 25 (LABO-RRH-025)                                                                                                                                                                      |                                           |
| <b>Mechanical Connection</b>  | female thread G 3/8, G 1<br>male thread G 3/8 A, G 1 A<br>hose nozzle Ø11, Ø30<br>(other threaded, crimped, and plug-in connections, connections with constant flow rate device or limiters available on request) |                                           |
| <b>Switching ranges</b>       | 0.1..100 l/min<br>for details, see table "Ranges"                                                                                                                                                                 |                                           |
| <b>Measurement accuracy</b>   | ±3 % of the measured value                                                                                                                                                                                        |                                           |
| <b>Repeatability</b>          | ±1 % of full scale value                                                                                                                                                                                          |                                           |
| <b>Pressure loss</b>          | max. 0.5 bar                                                                                                                                                                                                      |                                           |
| <b>Compressive strength</b>   | PN 100 (RRH-025..M: PN 40)                                                                                                                                                                                        |                                           |
| <b>Medium temperature</b>     | 0...60 °C, optionally 0...100 °C                                                                                                                                                                                  |                                           |
| <b>Storage temperature</b>    | -20...+80 °C                                                                                                                                                                                                      |                                           |
| <b>Materials (wetted)</b>     | Housing                                                                                                                                                                                                           | CW614N nickelled or 1.4305                |
|                               | Rotor                                                                                                                                                                                                             | PVDF with magnets, glued with epoxy resin |
|                               | Bearing                                                                                                                                                                                                           | Iglidur X                                 |
|                               | Axis                                                                                                                                                                                                              | Ceramic ZrO <sub>2</sub> -TZP             |
|                               | Seal                                                                                                                                                                                                              | FKM                                       |
| <b>Materials (non-wetted)</b> | Clamps                                                                                                                                                                                                            | 1.4301                                    |
|                               | Electronic housing                                                                                                                                                                                                | CW614N nickelled                          |
| <b>Supply voltage</b>         | 10...30 V DC                                                                                                                                                                                                      |                                           |
| <b>Power consumption</b>      | < 1 W (for unloaded outputs)                                                                                                                                                                                      |                                           |
| <b>Switching output</b>       | transistor output "push-pull" (resistant to short circuits and polarity reversal) I <sub>out</sub> = 100 mA max.                                                                                                  |                                           |
| <b>Display</b>                | yellow LED<br>(On = Normal / Off = Alarm / rapid flashing = Programming)                                                                                                                                          |                                           |
| <b>Electrical connection</b>  | for round plug connector M12x1, 4-pole                                                                                                                                                                            |                                           |
| <b>Ingress protection</b>     | IP 67                                                                                                                                                                                                             |                                           |
| <b>Weight</b>                 | LABO-RRH-010                                                                                                                                                                                                      | approx. 0.6 kg                            |
|                               | LABO-RRH-025                                                                                                                                                                                                      | approx. 1.9 kg                            |
| <b>Conformity</b>             | CE                                                                                                                                                                                                                |                                           |

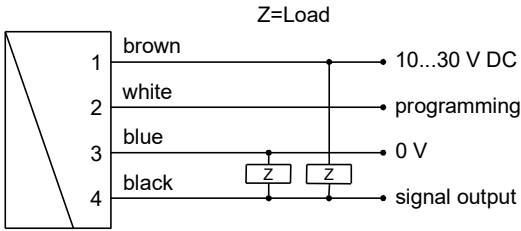
**Ranges**

| Metering range<br>l/min (H <sub>2</sub> O) | Types              | Q <sub>max</sub><br>l/min (H <sub>2</sub> O) |
|--------------------------------------------|--------------------|----------------------------------------------|
| 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                                        |

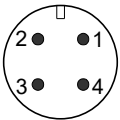
**Product Information**

**LABO-RRH-S**

**Wiring**



Connection example: PNP NPN

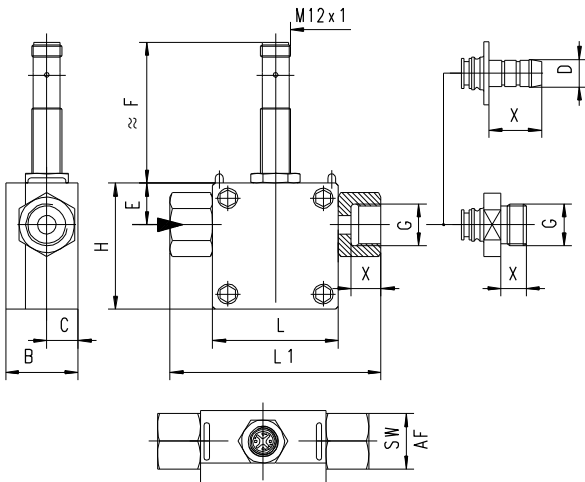


Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.

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 |
|       |    | RRH-010A |     |     |    |      |      |    |    |    |
| G 1   | 25 | RRH-025G | 70  | 110 | 53 | 23.0 | 27.5 | 51 | 18 | 38 |
|       |    | RRH-025A |     | 122 |    |      |      |    |    |    |

NPT threads on request

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 |

Custom specific connectors on request

**Handling and operation**

**Installation**

The flow switch 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 in the 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 %.*

**Product Information**

**LABO-RRH-S**

**Ordering code**

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

|             |                      |                      |                      |                      |                      |                      |                      |                      |                      |
|-------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| RRH-        | 1.                   | 2.                   | 3.                   | 4.                   | 5.                   | 6.                   | 7.                   | 8.                   | 9.                   |
|             | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
|             |                      |                      |                      |                      |                      |                      |                      | V                    | E                    |
| LABO - RRH- | 10.                  | 11.                  | 12.                  | 13.                  | 14.                  | 15.                  | 16.                  |                      |                      |
|             | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | S                    | S                    |

○=Option

|                                            |                                         |   |
|--------------------------------------------|-----------------------------------------|---|
| <b>1. Nominal width</b>                    |                                         |   |
| 010                                        | DN 10                                   |   |
| 025                                        | DN 25                                   |   |
| <b>2. Mechanical connection</b>            |                                         |   |
| G                                          | female thread                           |   |
| A                                          | male thread                             |   |
| T                                          | hose nozzle                             |   |
| <b>3. Connection material</b>              |                                         |   |
| M                                          | CW614N nickelled                        |   |
| K                                          | 1.4305                                  |   |
| <b>4. Housing material</b>                 |                                         |   |
| M                                          | CW614N                                  |   |
| K                                          | 1.4305                                  |   |
| <b>5. Inwards flow drilling</b>            |                                         |   |
| 020                                        | Ø 2.0                                   | • |
| 050                                        | Ø 5.0                                   | • |
| 070                                        | Ø 7.0                                   | • |
| 080                                        | Ø 8.0                                   | • |
| 120                                        | Ø12.0                                   | • |
| 160                                        | Ø16.0                                   | • |
| <b>6. Seal material</b>                    |                                         |   |
| V                                          | FKM                                     |   |
| E                                          | ○ EPDM                                  |   |
| N                                          | ○ NBR                                   |   |
| K                                          | ○ Kemraz                                |   |
| <b>7. Rotor</b>                            |                                         |   |
| 05                                         | with 5 magnets                          |   |
| 02                                         | ○ with 2 magnets                        |   |
| <b>8. Rotor material</b>                   |                                         |   |
| V                                          | PVDF                                    |   |
| <b>9. Connection for</b>                   |                                         |   |
| E                                          | electronics                             |   |
| <b>10. For nominal width</b>               |                                         |   |
| 010                                        | DN 10                                   | • |
| 025                                        | DN 25                                   | • |
| <b>11. Switching output (Limit switch)</b> |                                         |   |
| S                                          | push-pull (compatible with PNP and NPN) |   |
| <b>12. Programming</b>                     |                                         |   |
| P                                          | programmable (teaching possible)        |   |
| N                                          | ○ cannot be programmed (no teaching)    |   |
| <b>13. Switching function</b>              |                                         |   |
| L                                          | minimum switch                          |   |
| H                                          | maximum switch                          |   |
| <b>14. Switching signal</b>                |                                         |   |
| O                                          | standard                                |   |
| I                                          | ○ inverted                              |   |
| <b>15. Electrical connection</b>           |                                         |   |
| S                                          | for round plug connector M12x1, 4-pole  |   |
| <b>16. Optional</b>                        |                                         |   |
| 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 (K04PU) see additional information "Accessories"
- Device configurator ECI-3