

Flow Transmitter/Switch LABO-HD1K / -HD2K



- 4..20 mA output linearised
- 0..10V output linearised
- Frequency output proportional, linear
- Switching output push-pull (small hysteresis possible)
- Programmable through teaching
- LED for status display
- All metal housing
- Fully potted IP 67
- All parameters programmable via USB interface ECI-1

Characteristics

The LABO electronics provide the smallest and most economical option for electronic connection to a PLC or to another electronic unit.

The position of the piston is determined via analog Hall sensors, and is converted to the desired outputs by means of a 16-bit microcontroller. Adjustment and calibration is carried out automatically in the factory, and the flow values are presented proportionally and linearly at the output. The Flash memory guarantees the exchangeability of all programs.

There is a choice between an analog output (4..20 mA or 0..10 V) or a switch with a transistor output (push-pull). The switch can be provided either as a limit switch or a frequency output. Many options are available for the switching outputs in all versions:

- Variable ranges for the analog outputs
- Minimum or maximum switches
- Adjustable hysteresis (also very small)
- Inversion of the outputs
- Window function
- Delay after switching voltage on
- Separately adjustable switching and switch-back delays
- Teaching offsets

In contrast to electromechanical switches (Reed contacts or microswitches), electronic switches are insensitive to impact and wear. Hysteresis is much smaller than in electromechanical switches.

There is no galvanic separation from the supply circuit.

Technical data

Sensor	analog Hall sensors	
Nominal width	DN 8..25	
Process connection	female thread G 1/4..G 1	
Metering range	0.1..80 l/min	for details see see table "Ranges"
Pressure loss	0.4..3.5 bar at Q _{max.}	
Q _{max.}	to 100 l/min	
Tolerance	±3 % of full scale value	
Pressure resistance	PN 200, optionally PN 500	
Media temperature	-20..+85 °C optionally -20..+150 °C	
Ambient temperature	-20..+70 °C	
Media	water, oils (gases and aggressive media available on request)	
Wiring	see section "Wiring"	
Supply voltage	18..30 V DC	
Power consumption	< 1 W	
Outputs	LABO-....I: current output 4..20 mA (alternatively 0..20 mA) max. load 500 Ohm LABO-....U: voltage output 0..10 V (alternatively 2..10 V) load min. 1 kOhm LABO-....F: frequency output transistor output "push-pull" (resistant to short circuits, and reversal polarity protected) I _{out} = 100 mA max. selectable frequency, max. 2 kHz LABO-....S: limit switch transistor output "push-pull" (resistant to short circuits, and reversal polarity protected) I _{out} = 100 mA max.	
Display	yellow LED indicates the switching status of the output or the presence of the supply voltage	
Ingress protection	IP 67	
Electrical connection	for round plug connector M12x1, 4-pole	
Materials medium-contact	Brass construction: CW614N nickelled, CW614N, 1.4310, hard ferrite, NBR	Stainless steel construction: 1.4571, 1.4404, 1.4310, hard ferrite PTFE-coated, FKM
Non-medium-contact materials	CW614N nickelled	
Weight	see table "Dimensions and weights"	
Installation location	Standard: horizontal inwards flow; other installation positions are possible; the installation position affects the metering and switching range.	

Product Information

Sensors and Instrumentation

Ranges

Details in the table apply to horizontal inwards flow with increasing flow rate.

Standard type LABO-HD1K

Metering range l/min H ₂ O	Q _{max.} recommended	Pressure loss bar at Q _{max.} H ₂ O
0.1 - 1	6	0.4
0.5 - 5	10	0.5
1.0 - 10	20	0.6
2.0 - 20	30	0.4
3.0 - 30	40	
4.0 - 40	60	0.8
6.0 - 60	80	1.4
20.0 - 80	100	1.6

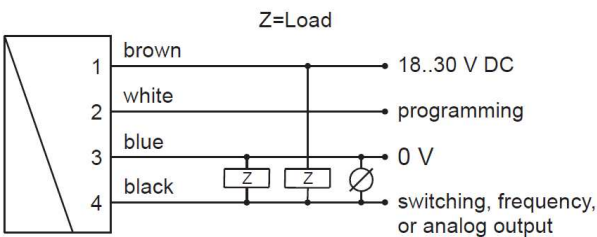
Special ranges are available.

Viscosity compensated type LABO-HD2K

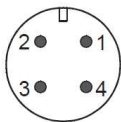
Metering range l/min oil 30..330 mm ² /s	Q _{max.} recommended	Pressure loss bar at Q _{max.} oil mm ² /s					Viscosity stability
		30	60	100	205	330	
0.5 - 8	12	1.1	1.4	1.6	2.8	3.5	±0.3 l/min
1.5 - 15	22	2.2	2.3	2.4			±0.5 l/min
2.5 - 25	35	1.9	2.0	2.1	2.3	2.9	±0.8 l/min
6.0 - 40	60					2.6	±2.7 l/min
12.0 - 60	80	2.1	2.3	2.4	2.6	2.8	±3.0 l/min

Special ranges are available.

Wiring

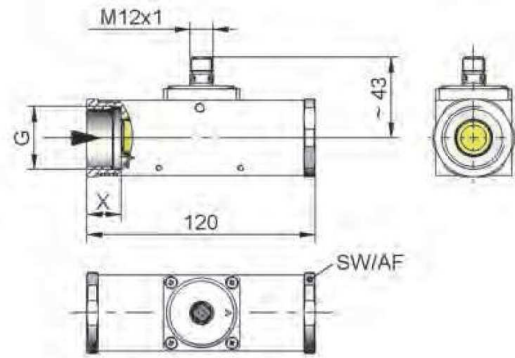


Connection example: PNP NPN



Dimensions and weights

	G	Types	SW	X	Weight kg
Brass	G 1/4	...-008GM	40	15	1.5
	G 3/8	...-010GM			
	G 1/2	...-015GM		18	1.4
	G 3/4	...-020GM			
	G 1	...-025GM			
Stainless steel	G 1/4	...-008GK	41	15	1.5
	G 3/8	...-010GK			
	G 1/2	...-015GK		18	1.4
	G 3/4	...-020GK			
	G 1	...-025GK			



Handling and operation

Note

- Include straight calming section of 5 x DN in inlet and outlet.
- Include a filter if the media are dirty (use magnetic filter for ferritic components)

Programming

The switching value is programmed via the plug, by applying a 1 second pulse to pin 2 at the level of the supply voltage. The electronics then accept the applied value as the switching value or full scale value of the analog or frequency output. A teaching offset can also be used to set a value with a percentage displacement from the present value (must be specified when ordering).

The LED flashes during the programming procedure. Immediately after the programming, the switching output goes into the normal state (LED on, output at supply level, if this is not the inverted model).

Programmability can be blocked by the manufacturer, and a fixed value can be set instead.

Product Information

Sensors and Instrumentation

Ordering code

The basic device is ordered e.g. HD1K-015GM005E with electronics e.g. LABO-HD1K1LO

HD 1. - 2. 3. **G** 4. 5. 6. **E**

LABO-HD 7. 8. 9. 10.

1. Construction		
1K	standard	
2K	viscosity compensated	
2. Nominal width		
008	DN 8 - G 1/4	
010	DN 10 - G 3/8	
015	DN 15 - G 1/2	
020	DN 20 - G 3/4	
025	DN 25 - G 1	
3. Process connection		
G	female thread	
4. Connection material		
M	brass	
K	stainless steel	
5. HD1K - Metering range H₂O for horizontal inwards flow		
001	0.1 - 1 l/min	●
005	0.5 - 5 l/min	●
010	1.0 - 10 l/min	●
020	2.0 - 20 l/min	●
030	3.0 - 30 l/min	●
040	4.0 - 40 l/min	●
060	6.0 - 60 l/min	●
080	20.0 - 80 l/min	●
HD2K - metering range oil 30..330 mm²/s for horizontal inwards flow		
008	0.5 - 8 l/min	●
015	1.5 - 15 l/min	●
025	2.5 - 25 l/min	●
040	6.0 - 40 l/min	●
060	12.0 - 60 l/min	●
6. Connection for		
E	electronics	● ●
7. For base device		
1K	standard	●
2K	viscosity compensated	●
8. Analog output		
I	current output 4..20 mA	
U	voltage output 0..10 V	
S	push-pull (compatible with PNP and NPN)	
R	frequency output	
9. Function set to switching output		
L	minimum	
H	maximum	
10. Switching output level		
O	standard	
I	inverted	

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)
- End frequency (max. 2000 Hz):** Hz
- Switching delay** (from Normal to Alarm): s
- Switchback delay** (from Alarm to Normal): s
- Power-On delay** (after connecting the supply, time during which the switching output is not activated): s
- Switching output fixed:** l/min
- Special hysteresis** (standard = 2 % EW): %
- Gooseneck**
(recommended at operating temperatures above 70 °C)

If the fields are not completed, the standard setting is selected automatically.

Options

- Measured values for oil or gas
- Special quantities
- Temperature display 0..120 °C
- reinforced piston

Accessoires

- Cable/round plug connector (KB...) see additional information "Accessories"

Ordering information

- Specify direction of flow, medium, and metering range.
- For viscous media specify viscosity, temperature, and medium (e.g. ISO VG 68) (enquire about metering range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (request metering range)