Electronic Flow Monitor

for liquids

KAL-D

- Range: 0.04 - 2 m/s
- p_{max}: 40 bar; t_{max}: 80 °C (140 °C CIP-compatible, without function)
- Connections:
  G¼, G½, ¼" NPT, ½" NPT, M12x1
- Material: stainless steel
- No moving parts
- Negligible pressure loss

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Functioning of the unit

The electronic flow monitor model KAL-D... continuously monitors flowing media. It finds service in all applications where flow currents with minimum pressure loss are to be accurately monitored. The one-part design of measuring probe considerably reduces dirt sensitivity

Operating principle

The electronic flow monitor model KAL-D... works according to the calorimetric principle. The sensor tip is heated to a few degrees above the temperature of the flowing medium. When the medium flows, heat generated in the probe is dissipated by the medium. In other words, the probe is cooled down. This cooling sequence is a precise measure of the flow velocity.

The sensor signal is compared with reference data stored in a microcontroller. An alarm signal is generated when the desired flow velocity is reached. Simple calibration and optimal temperature compensation is achieved with a micro-controller.

Temperature compensation

Temperature compensation in the KOBOLD flow monitor is achieved by a microcontroller. All information necessary for temperature compensation is programmed at the factory. The devices can easily be adjusted by the customer to suit the process conditions.

Due to the adaptation of the sensors to the operating data the sensors switch absolutely consistently even with large temperature gradient.

Measuring/switching ranges

NW [mm]	approx. measuring range l/min water	NW [mm]	approx. measuring range l/min water
8	0.12 - 6.0	40	3.0 - 150
10	0.19 - 9.4	50	4.7 - 235
15	0.42 - 21.8	60	6.8 - 340
20	0.75 - 37.7	80	12.0 - 603
25	1.18 - 59.0	100	18.8 - 942
30	1.7 - 84.8	150	42.4 - 2120

Important: For the given measuring ranges, the flow velocity has been calculated according to the pipe diameter. Please note that the flow velocity in the pipe approaches to zero in the direction of the wall. Depending on the nominal pipe dia, depth of immersion of the sensor and the flow profile, large deviations from the specified values may occur.

Technical Details (electronics)

Power supply:	24 V_{DC} ±10%
Power consumption:	max. 3,6 W
Ambient temperature:	-20 °C ... +60 °C
Medium temperature:	-20 °C ... +80 °C
CIP-compatible:	max. 140 °C without function
Max. pressure:	40 bar
Time delay before availability:	max. 12 s
Switching range:	approx. 0,04 m/s ... 2 m/s
Temperature gradient:	unlimited
Response time:	5,6 ... 12 s typical
Flow indication:	trend indication with 8-position LED chain
Switching point setting:	with potentiometer, optical display on LED chain by flashing LED
Output state indicator:	1 Duo LED
Switching output:	semiconductor, PNP or NPN max. 400 mA, short-circuit-proof, N/O contact or N/C set at the factory
Electrical connection:	plug connector M12x1
Protection:	IP 65
Case material:	housing: stainless steel 1.4301 cover: stainless steel 1.4301
Process connection:	G¼, G½, ¼" NPT, ½" NPT M12x1 of stainless steel 1.4404

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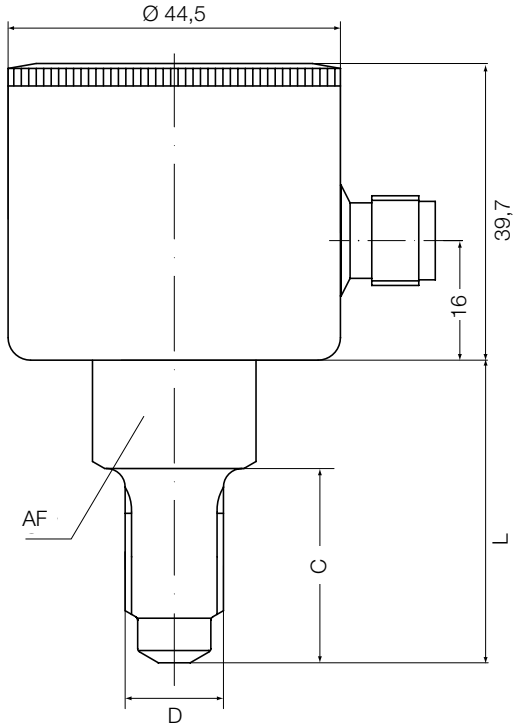
Order Details (Example: **KAL-D1408 N ST3**)

Connection	Model	Type of contact	Electrical connection
M12x1	**KAL-D0412**	**N** = NPN / N/O contact **P** = PNP / N/O contact **M** = NPN / N/C contact **R** = PNP / N/C contact	**...ST3** = plug connector M12x1; 24 V_{DC}
G¼	**KAL-D1408**		
G½	**KAL-D1415**		
¼" NPT	**KAL-D5408**		
½" NPT	**KAL-D5415**		

Dimensions [mm]



D	C [mm]	AF [mm]	L
M12x1	23	19	40,5
G¼	26	19	40,5
G½	43	27	55,5
¼" NPT	26	19	40,5
½" NPT	43	27	55,5