



## Electronic Flow Monitor for liquids



measuring  
•  
monitoring  
•  
analysing

### KAL-D



- Range: 0.04 - 2 m/s
- $p_{\max}$ : 40 bar;  $t_{\max}$ : 80 °C (140 °C CIP-compatible, without function)
- Connections:  
G 1/4, G 1/2, 1/4" NPT, 1/2" NPT, M12x1
- Material: stainless steel
- No moving parts
- Negligible pressure loss



SS

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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 microcontroller.

### 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)

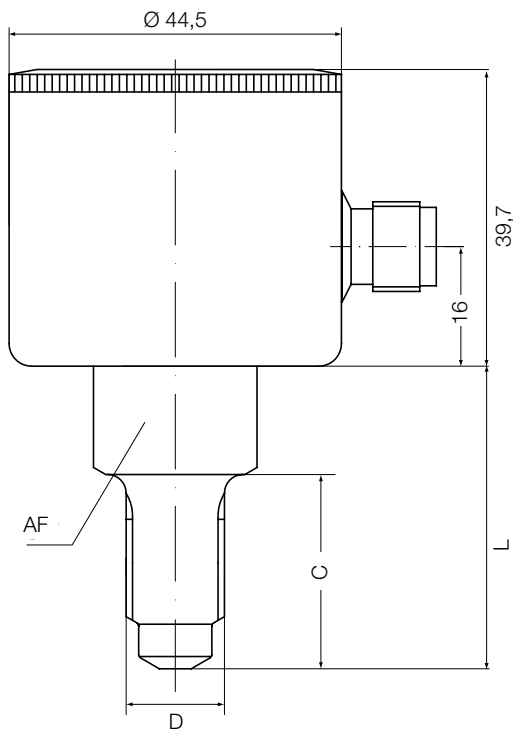
- Power supply: 24 V<sub>DC</sub> ±10%
- Power consumption: max. 3,6 W
- Ambient temperature: -20°C ... +60°C
- Medium temperature: -20°C ... +80°C
- CIP-compatible: max. 140°C without function
- Max. pressure: 40 bar
- Time delay before availability: max. 12 s
- Switching range: approx. 0,04 m/s ... 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: G 1/4, G 1/2, 1/4" NPT, 1/2" NPT M12x1 of stainless steel 1.4404



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

Connection	Model	Type of contact	Electrical connection
M12x1	KAL-D0412	<b>N</b> = NPN / N/O contact <b>P</b> = PNP / N/O contact <b>M</b> = NPN / N/C contact <b>R</b> = PNP / N/C contact	...ST3 = plug connector M12x1; 24 V <sub>DC</sub>
G ¼	KAL-D1408		
G ½	KAL-D1415		
¼" NPT	KAL-D5408		
½" NPT	KAL-D5415		

**Dimensions** [mm]



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

