Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

# Electronic Flow Monitor

for Liquids

measuring • monitoring • analysing


- Switching range: 0.04 - 2 m/s
- Pressure: max. 40 bar
- Temperature: max. 80 °C (140 °C CIP-compatible, without function)
- Connections: G 1/4, G 1/2, 1/4 NPT, 1/2 NPT, M12 x 1
- Material: stainless steel
- No moving parts
- Negligible pressure loss

KOBOLD offices exist in the following countries:

ARGENTINA, AUSTRIA, BELGIUM, BRAZIL, CANADA, CHINA, FRANCE, GREAT BRITAIN, ITALY, NETHERLANDS, POLAND, SWITZERLAND, USA, VENEZUELA

KOBOLD Messring GmbH
Nordring 22-24
D-65719 Hofheim/Ts.
☎ (06192) 299-0
Fax (06192) 23398
E-mail: info.de@kobold.com
Internet: www.kobold.com

**Model:**
KAL-D...



01/0502/Ko/10

### 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.

### Measuring /switching ranges

| NW [mm] | Approximate measuring range L/min water | NW [mm] | Approximate 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.

### 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.

### Technical details (electronics)

| | |
|---|---|
| Power supply: | 24 $V_{DC}$ ±10% |
| Power consumption: | max. 3.6 W |
| Ambient temperature: | -20 °C to +60 °C |
| Medium temperature: | -20 °C to +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 to 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 M12 x 1 |
| Protection type: | 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 M12 x 1 of stainless steel 1.4404 |

**Order details** (example: **KAL-D1408 N ST3**)

| Connection | Model | Type of contact | Electr. connection |
|---|---|---|---|
| M12x1 | **KAL-D0412** | **..N** = NPN/ N/O contact<br>**..P** = PNP/ N/O contact<br>**..M** = NPN/ N/C contact<br>**..R** = PNP/ N/C contact | **..ST3** = plug connector M12x1; 24 $V_{DC}$ |
| G 1/4 | **KAL-D1408** | | |
| G 1/2 | **KAL-D1415** | | |
| 1/4 NPT | **KAL-D5408** | | |
| 1/2 NPT | **KAL-D5415** | | |







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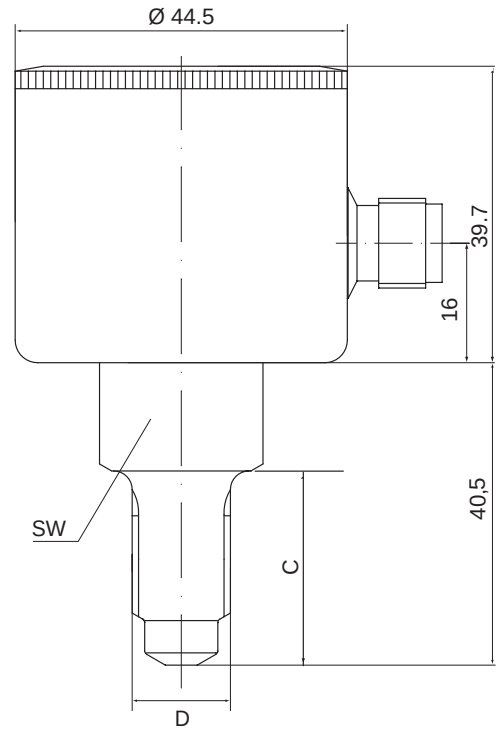
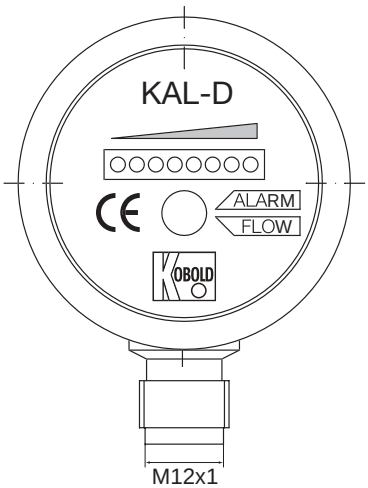
## Dimensions




| D | L | SW |
|---|---|---|
| M12x1 | 22.5 | 19 |
| G 1/4 | 26.5 | 19 |
| G 1/2 | 25.0 | 27 |
| 1/4 NPT | 42.0 | 19 |
| 1/2 NPT | 42.0 | 27 |



## Flow measurement solutions are to be found in...


## ...our brochures »S1, S2, S3, S4, S5 and S6«







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