DT-02

Calorimetric Flow Sensor as Separate Unit

- **Requires less space**
- **Vibration-proof**
- **Stainless steel sensors**
- **Additional relay output**
- **230 V AC or 24 V DC versions**

Description:
The calorimetric principle of measurement while monitoring flow is based on the premise that transmission of heat from a wall surface to a fluid improves as the velocity of flow increases and thus more energy passes to the flowing medium. In the tip of a sensor made of stainless steel, an unheated PT100 resistance records the medium's temperature while a second one is heated electrically and exposed to the flow. The difference in temperature of both these resistances is proportional to the speed of flow and, therefore, to the volume of flow.

On reaching a value of approx. 150 cm/s so much of heat is released to the fluid that both the resistances indicate the same temperature which determines the upper limit of the operating range. The DT-02 is a calorimetric flow sensor as a separate unit and consists of a stainless steel sensor that is connected to an evaluator by means of a cable. This is designed as a rail-mounted housing. It evaluates the sensor and transmits the results to a PNP/NPN output and to another relay output (in 230 V AC version only). Optionally, the device can be supplied also with an additional temperature setpoint.

Range of application::
Wherever the compact DT-01 cannot be used due to lack of space, vibrations or hostile environment, the DT-02 offers an ideal solution thanks to the physical separation of sensor and electronics. Calorimetric flow sensors are intended for cost-effectively monitoring flow of water-like media. Due to their low resistance to flow and their insensitivity to soiling by sold particles, they provide an excellent alternative to the vane method. Thanks to their design the sensors are suited for use in any type of tube diameter. However, it must be ensured that a certain minimum speed of flow is present at the tip of the sensor. Calorimetric flow sensors are widely used in steel and metal-processing industries including the chemical and beverage industries. Some of the typical applications are, for example, monitoring coolants in automated welding machines, plasma pumps or cooling aggregates, as protection against pump dry running and monitoring water flow in sprinkler systems.

www.profimess.com
Schleusenstraße 3 · 27568 Bremerhaven · ☎ +49 471 98 24 -151 · 🖷 +49 471 98 24 -152 · E-Mail: info@profimess.de

Versions:

DT-02 Calorimetric Flow Sensor as Separate Unit

Configuration: The device can be provided with an additional adjustable temperature switch so as to facilitate besides the flow monitoring of media temperature.

Electrical connection for the sensor: The DT-02 sensors are equipped with an M12 x 1, 4-pole plug system.

Process connection for the sensor: The available thread variants are G1/2" and G1/4" male thread as a standard. Also a sensor with Tri-Clamp connectivity can be supplied.

Sensor: The tip of the device is available in two different lengths. The short version projects 16 mm, the long version 27 mm into the tube. The Tri-Clamp sensor has a standard length of 56 mm.

Output: Selectively, the device can be supplied with PNP or NPN transistor output(s). The 230 V AC version has additional relay outputs, change-over-contact 5 A for 230 V.

Supply: The evaluator unit of the DT-02 is available as 24 V DC or as 230 V AC device. The 24 V DC version has a PNP/NPN transistor output for the flow setpoint and an optionally available PNP/NPN transistor output for monitoring temperature. The 230 V AC version has additionally a relay output for flow and an optionally available relay output for temperature.

Ordering codes:

Ordering number:	DT-02.	1.	1.	2.	1.	1.	1.

DT-02 Calorimetric Flow Sensor as Separate Unit

Configuration:
1 = standard
2 = with additional temperature setpoint

Electrical connection for the sensor:
1 = plug connection M12 x 1, 4-pole.

Process connection for the sensor:
1 = G1/4" male thread
2 = G1/2" male thread
3 = Tri-Clamp

Sensor:
1 = short sensor
2 = long sensor (not G1/4")
3 = Tri-Clamp

Transistor output:
1 = PNP
2 = NPN

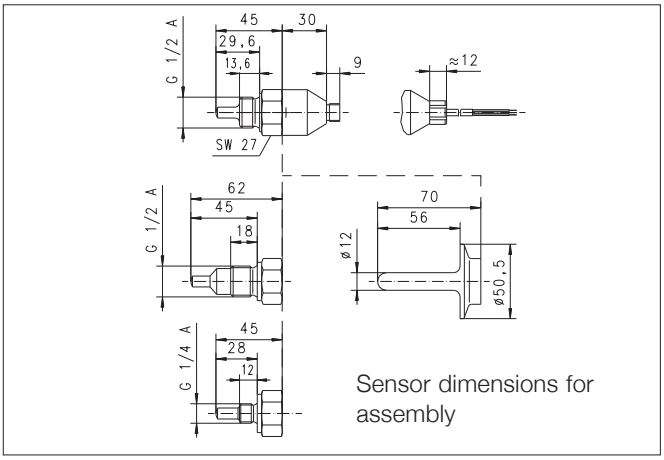
Supply voltage:
1 = 230 V AC (with additional relay outputs)
2 = 24 V DC (with PNP/NPN outputs only)

Electrical specifications:

Supply voltage: 24 VDC +/- 20% or 230 VAC
Power consumption: 70 mA for 24 V DC (no load), 7 VA for 230 V AC
El. connection: supply and outputs over screw terminal bar, sensor over plug M12x1, 4-pole
Protection class: Sensor: IP67
Evaluator device: IP30 (front)
Display: 9-digit LED
Potentiometer: single lead
Output: PNP, NPN, 200 mA max., additionally change-over-contact 5 A for 230 V AC (for 230 V version only)
Types of el. protection: short-circuit-proof, polarity-reversal-proof

Technical specifications:

max. pressure: 100 bar, 60 bar for Tri-Clamp, intermittent
max. media temp.: 15°C to 70°C
max. ambient temp.: 0°C to 60°C
Temperature gradient.: 4°C/s max.
Housing: Polycarbonate, ABS, Macrolon
Fixture for housing: floor assembly or snap-fitting on rails (DIN EN 50 022)
Sensor: stainless steel 1.4571
Process connection: G1/4”-male, G1/2”-male, Tri-Clamp
Operating range: water 20 cm/s to 50 cm/s, optional 1 cm/s to 150 cm/s oil (on request)
Response time: 1 s to 13 s, optimally at 2 s



Sensor dimensions for assembly