



Instruction Manual

DTH04

***Calorimetric flow transmitter and switch
in Ø 12 mm housing***



PKP Prozessmesstechnik GmbH
Borsigstraße 24
D-65205 Wiesbaden-Nordenstadt
Tel.: ++49-(0)6122-7055-0
Fax: ++49-(0)6122-7055-50
Email: info@pkp.de

Safety Information

General Instructions

The device should only be operated according to the specifications in the instruction manual. The requisite Health & Safety regulations for a given application must also be observed. This also applies to the use of accessories.

Proper Usage

Model DTH04 devices are designed to measure the flow of liquids, which do not attack the device materials.

Because of the low flow resistance and their relative insensitivity to contamination by solids they offer a good alternative to paddle type devices. Because of their structural shape the flow switches are suitable for every pipe diameter.

Just a minimal flow velocity is required at the sensor tip. Calorimetric flow switches are widely used in the steel and metal working industries. As well as throughout the chemical and beverage sector. Typical applications are coolant monitoring for welding robots, plasma-pumps or cooling units, dry run protection for pumps, and water monitoring in sprinkler systems.

All other usage is regarded as being improper and outside the scope of the device.

The series DTH04 devices should not be deployed as the sole agents to prevent dangerous conditions occurring in plant or machinery. Machinery and plant need to be designed so that faulty conditions do not arise that could pose a safety risk for operators.

Qualified Personnel

DTH04 devices may only be installed by trained, qualified personnel who are able to mount the devices correctly. Qualified personnel are persons, who are familiar with assembling, installation, placing in service and operating these devices and who are suitably trained and qualified.

Mounting

There are various installation options available:

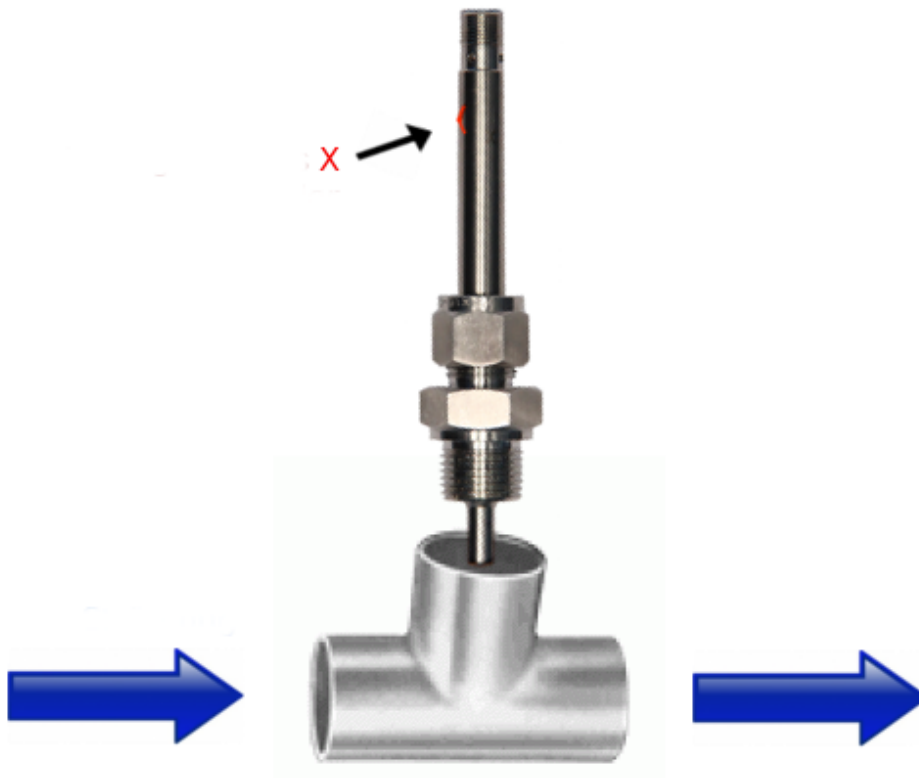
The stainless steel compression fitting is screwed into a G ½ threaded drilling. For this, a G ½ welded-on nozzle is also available. When a suitable seal is used, this arrangement can take pressures up to 10 bar. The stainless steel threaded connection is first tightened by hand, and then by ¼ of a turn, using a spanner.

The connection ring of the threaded connection can then no longer be removed from the sensor, and the immersion depth can therefore not be changed further!

The plastic cone is fitted to the separately available welded-on nozzle intended for this purpose, or to a suitable T-piece, using the union nut provided (available in brass or stainless steel). The union nut must be tightened to a torque of 20 Nm. It is possible to loosen the connection again, and so the immersion depth can be changed. This arrangement is suitable for pressures up to 10 bar.

When installing, it should also be noted that the sensors are directional (comply with the marking on the housing). The reduction of the sensor must be at 1/3...1/2 depth of the pipe diameter.

Avoid bubbles or deposits on the sensor. It is therefore best to install at the side.

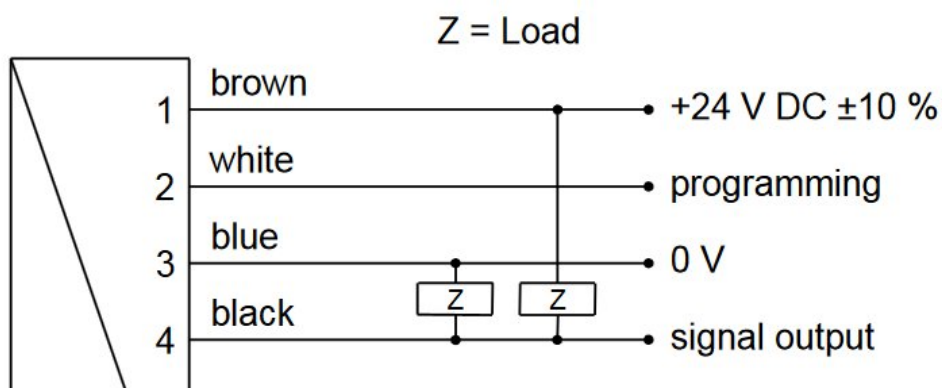


Electrical Connection

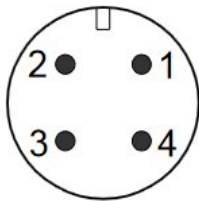
Please note: we recommend to use only shielded cables.

The devices are equipped with an integrated electronic unit and can be used out of the box.

- Before carrying out the electrical installation, make sure that the supply voltage corresponds to the data provided!
- Switch off any power supply before the electrical installation.
- The analogue output is factory adjusted, corresponding flow rate see attached label.



Connection example: PNP NPN



The use of shielded cabling is recommended.

Option: Programming

If desired, the metering range endpoint can be set by the user by means of teaching.

For this, proceed as follows:

- Apply the flow rate end range to the device
- Apply an impulse of at least 0.5 seconds and max. 2 seconds duration to pin 2 (e.g. via a bridge to the supply voltage or a pulse from the PLC), in order to accept the measured value.
- When the teaching is complete, pin 2 should be connected to 0 V, so as to prevent unintended programming.

The devices have a yellow LED which flashes during the programming pulse. During operation, the LED acts as a display for the operating voltage.

Note:

Requirement for programmability must be stated when ordering, otherwise the device cannot be programmed. See also programming options by PC for all parameters and for adjustment (accessory).

DTH04

Calorimetric Flow Transmitter and Switch in Ø12mm Housing

- For liquids
- No moving parts
- Short response time
- High temperature gradient
- Handling capability
- Works independent of pipe diameter
- Reliable monitoring in two measuring ranges of 2...150 cm/s and 3...300 cm/s



Description:

The calorimetric measuring technology is based on the fact, that heat energy is transferred from the surface of the probe to the medium. The higher the velocity of the medium, the more heat energy is taken away by the medium. An unheated Pt100 resistance temperature detector (RTD) embedded in the stainless steel sensor tip serves to record the medium temperature. A second RTD is electrically heated and exposed to the flow. The temperature difference of these two RTDs is proportional to the flow velocity and therefore to the flow volume. For range two, when a value of about 300 cm/s is reached there is so much heat absorbed by the medium that both RTDs have almost the same temperature, and hence the upper limit of the measuring range. is reached.

The DTH04 is a compact device and consists of a stainless steel sensor and an integral electrical unit as standard. This can be configured as a switch-, voltage-, electrical-, frequency- or counting pulse output version.

Typical Applications:

The DTH04 units are designed for effective monitoring of liquid media. Because of the low flow resistance and their relative insensitivity to contamination by solids they offer a good alternative to paddle type devices. Because of their structural shape the flow switches are suitable for every pipe diameter.

Just a minimal flow velocity is required at the sensor tip. Calorimetric flow switches are widely used in the steel and metal working industries. As well as throughout the chemical and beverage sector. Typical applications are coolant monitoring for welding robots, plasma-pumps or cooling units, dry run protection for pumps, and water monitoring in sprinkler systems.

Models:

DTH04 Calorimetric Flow transmitter and switch in a Ø12 mm housing

Process connection:

The universally popular and versatile compression fitting has been adopted as standard. The connection is available in brass or stainless steel. It is equipped with a metal ferrule or PTFE compression gland. It is also possible to deliver the devices ready mounted in a T-piece made of brass or stainless steel (P1N10 with GFR POM seal). In this case the calibration in l/min can be done directly. As an option there is also an integrated inlet and outlet pipe available. The calibration can be done in l/min directly, too.

Sensors:

The sensors are integrated into the complete device, available lengths are: 123, 175 and 223 mm.

Output:

In the switch, frequency- and pulse output versions, the devices are equipped with a push-pull transistor output. The analogue output version provides 0...10 V, or 4...20 mA signals. The switch output is programmable through a "teach-in" function on site.

Electrical connection:

The DTH04 is equipped with an M12 x 1, 4-pole plug system.

Electrical Data:

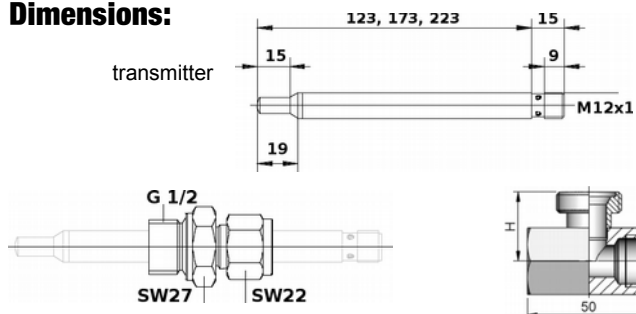
Voltage supply:	24 VDC ± 10 %
Power consumption:	50 mA no-load condition
Connection:	M12 x 1, 4-pole plug
Protection system:	IP67, reverse polarity protected, and short-circuit proof
Output:	switch, frequency, pulse output: push-pull transistor, max 50 mA pulse output with 50 ms width
	analogue output: 0...10 V, min 1 kOhm 4...20 mA, max 500 Ohm

With an analogue or pulse output signal, the nominal pipe bore has to be specified.

Technical Data:

Max. pressure:	40 bar (580 psi) with thread 25 bar with compression fitting 10 bar all others
Media temp. range:	-20 °C to 70 °C, optional 100 °C
Ambient temperature:	0 °C to 70 °C (32 °F to 158 °F)
Housing:	stainless steel 1.4571 T-piece st. steel. or brass, POM seal
Connection:	G1/2 male thread compression fitting
Measuring ranges:	2 to 150 cm/s and 3 to 300 cm/s
Accuracy:	+/- 10% F.S., when calibrated in T-piece: 5%, repeatability: 1% temperature gradient: +/- 0,01 %/K < 3 seconds
Response time:	about 50 g without fittings
Weight:	

Dimensions:



Fitting	T-piece					
Size	G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
H [mm]	28	29	33	37	40	49

Model Code:

Order Number: DTH04. 1. U. 1. 1. GF. 15. 0

Calorimetric Flow Transmitter and Switch

Measuring range:

1 = 2...150 cm/s
3 = 3...300 cm/s

Output signal for flow:

SL = 1 switching output, minimum switch
SH = 1 switching output, maximum switch
I = 4...20 mA analogue output
U = 0...10 V analogue output
F = frequency output*, please specify desired fmax value (2000 Hz max)
Z = counting pulse*, please specify desired pulse value

* only in connection with T-piece or inlet pipe

Electrical connection:

1 = M12 x 1 plug, 4 pole

Sensor length:

1 = 123 mm
2 = 173 mm
3 = 223 mm

Process connection:

GF = plain pipe without thread
TM = with t-piece of brass
calibrator in l/min
TV = with T-piece of stainless steel
calibrator in l/min

Connection size:

00 = without thread
15 = G ½ female
20 = G ¾ female
25 = G 1 female
32 = G 1 ¼ female
40 = G 1 ½ female
50 = G 2 female

Options:

0 = none
HT = Tmax (medium) 100 °C

Accessories:

SVQ.V.15.P.12 compression fitting G ½

Material: stainless steel 1.4571, PTFE ring
max. pressure 25 bar, max. temperature 100 °C

Order code: SM12. 4. 2. G. 0

M12-plug with PVC cable

Number of poles:

4 = 4-pole

Cable length:

0 = without cable for self assembly
2 = 2 m PVC cable (standard)
5 = 5 m PVC cable
10 = 10 m PVC cable

Construction:

G = straight
W = angled

Option:

0 = none
9 = Please specify in writing

