

Flow switch for monitoring of mass flow in hygienic design

Flowphant T DTT35



- On-site display
- High reproducibility and long-term stability
- Large turndown

i Specs at a glance:

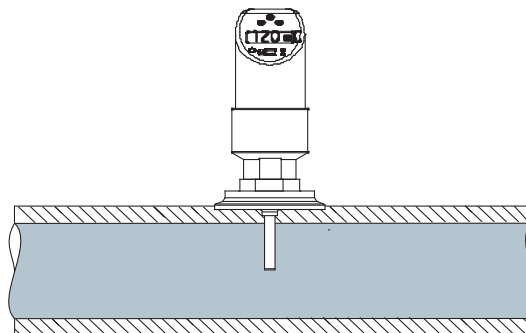
- **Medium:**
Liquids
- **Measuring range:**
0.03 to 3 m/s
(0.1 to 9.84 ft/s)
- **Medium temperature:**
-20 to +85 °C (-4 to +185 °F)
- **Process pressure:**
0 to +100 bar (0 to 1450 psi)
at 20 °C (68 °F)

Application The Flowphant T DTT35 is a flow switch (surface quality $R_a \leq 0.8 \mu\text{m}$ (31.5 μin)) for monitoring, displaying and measuring relative mass flow rates of liquid media in the range from 0.03 to 3 m/s (0.1 to 9.84 ft/s). Application examples include: Monitoring cooling water circulation systems of pumps, turbines, compressors and heat exchangers and filter monitoring in the beverage industry.

Function The device measures the mass flow of a liquid medium with the calorimetric measurement method. The calorimetric measuring principle is based on cooling a heated temperature sensor. Heat is removed from the sensor by forced convection due to medium flowing by. The extent of this heat transfer depends on the medium velocity and the difference in temperature between the sensor and medium (King's law). The higher the velocity or the mass flow of the medium, the greater the temperature sensor cooling.

 Complete product information:
www.e-direct.endress.com/dtt35

Application example



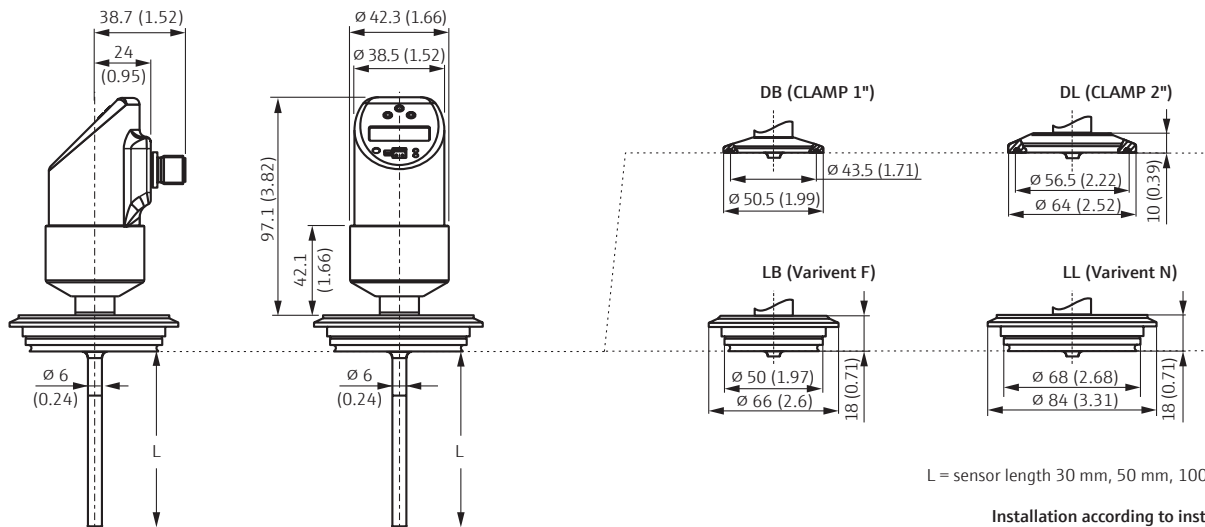
The Flowphant monitors the flow in a cooling circuit and signals when flow drops below a minimum flow rate.

Technical data

Input	
Measurement range	0 to 100 %; resol. 1 %; 0.03 to 3 m/s (0.1 to 9.84 ft/s) for liquids
Output	
Output signal	1 × PNP, 2 × PNP or 1 × PNP with analog output for flow and temperature
Voltage drop PNP	≤2 V
Overload protection	Automatic testing
Performance characteristics	
Reference conditions	According to DIN IEC 60770/61003
Measured error	Switch point and display 0.2 %
Long-term drift	≤0.5 % per year under reference operating conditions
Sensor reaction time	6 to 12 s
Response time	switch output 100 ms
Operating conditions	
Medium temperature	-20 to +85 °C (-4 to +185 °F), 130 °C (266 °F) max. 1h (no measuring at temperatures >85 °C (185 °F))
Ambient temperature	-40 to +85 °C (-40 to +185 °F)
Degree of protection	IP 65 (complete housing)

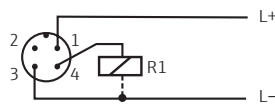
Power supply	
Supply voltage U_b	18 to 30 V DC, reverse polarity protection
Current consumption	Without load <100 mA at 24 V DC
General	
EMC	Interference emiss. as per IEC 61326 Series, class B electrical equipment, interference immunity as per IEC 61326 Series, app. A (industrial use) and NAMUR Recomm. NE 21
Operating elements	3 buttons or PC and ReadWin® 2000
Materials	316L (process connection, protection tube, housing)
Surface quality	$R_a \leq 0.8 \mu\text{m}$ (31.5 μin)
Approvals	
3-A	

Dimensions in mm (inches)

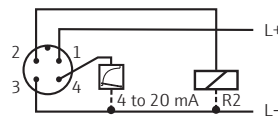


Electrical connection

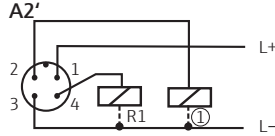
A1



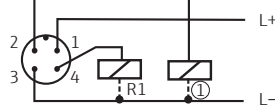
A3



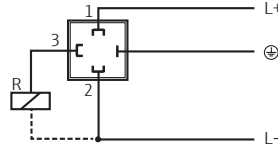
A2



A2'



B



DC voltage version with M12×1 connector

- A1: 1 × PNP switch output
- A2: 2 × PNP switch outputs R1 and (1) (R2)
- A2': 2 × PNP switch outputs R1 and (1) (diagnosis/break contact with adjustment "DESINA")
- A3: PNP switch output, additional analog output

DC voltage version with valve plug M16×1.5" or NPT½"

- B: 1 × PNP switch output

Price table

Process connections

Code	Clamp connections
DB	Clamp ISO2852 DN25-38, 1 to 1-½", 316L, 3A
DL	Clamp ISO2852 DN40-51, 2", 316L, 3A
Varivent	
LB	Varivent F DN25-32, PN40, 316L, 3A
LL	Varivent N DN40-162, PN40, 316L, 3A

Insertion length; diameter D

Code	Length; diameter
2A	30 mm; 6 mm (1.18"; 0.25")
2B	50 mm; 6 mm (1.97"; 0.25")
2C	100 mm; 6 mm (3.94"; 0.25")

Flowphant T DTT35

Process connection	Power supply; output	Electrical connection	Order no.	Price/pcs. in USD		
				1 to 3	4 to 10	11 to 35
Clamp	18 to 30 V DC; 1 × switch PNP	Plug M12	DTT35-A1A111 <input type="checkbox"/> <input type="checkbox"/> AB	390.00	363.00	343.00
		Plug ISO4400 M16×1.5	DTT35-A2A111 <input type="checkbox"/> <input type="checkbox"/> AB	416.00	387.00	366.00
		Plug ISO4400 NPT½"	DTT35-A3A111 <input type="checkbox"/> <input type="checkbox"/> AB	416.00	387.00	366.00
		Plug M12	DTT35-A1B111 <input type="checkbox"/> <input type="checkbox"/> AB	416.00	387.00	366.00
		Plug M12	DTT35-A1C111 <input type="checkbox"/> <input type="checkbox"/> AB	475.00	442.00	418.00
Varivent	18 to 30 V DC; 1 × switch PNP	Plug M12	DTT35-A1A111 <input type="checkbox"/> <input type="checkbox"/> AB	441.00	410.00	388.00
		Plug ISO4400 M16×1.5	DTT35-A2A111 <input type="checkbox"/> <input type="checkbox"/> AB	467.00	434.00	411.00
		Plug ISO4400 NPT½"	DTT35-A3A111 <input type="checkbox"/> <input type="checkbox"/> AB	467.00	434.00	411.00
		Plug M12	DTT35-A1B111 <input type="checkbox"/> <input type="checkbox"/> AB	467.00	434.00	411.00
		Plug M12	DTT35-A1C111 <input type="checkbox"/> <input type="checkbox"/> AB	526.00	490.00	463.00

Accessories

	Order no.	Price/pcs. in USD
Cable M12×1. l=5 m. cable 4 × 0.34 mm ² . molded PVC angled connector	51005148	14.26
Configuration kit TXU10- for PC-programmable devices. Set-up programme+ interface cable for PC with USB-Port. 4 pin plug + ReadWin®2000	TXU10-AA	144.71

Prices valid until 09.30.2019 in U.S. dollars per unit (not including shipping and applicable sales tax). See Endress+Hauser, Inc. Terms and Conditions of Sale for shipping, tax and payment terms. Endress+Hauser retains the right to change or modify pricing at any time. Prices can be verified prior to ordering on www.e-direct.endress.com.

 Complete product information:
www.e-direct.endress.com/dtt35

More products to complete
your measuring point ...



Pressure sensor
Cerabar PMP23



Pressure switch
Ceraphant PTP33B



Temperature switch
Thermophant T TTR35