

TDH...-15.../PPO TDI...-15.../PPO

Function

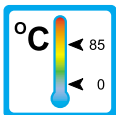
The flowmeters type TDH...-15.../PPO and TDI...-15.../PPO are turbine flowmeters.



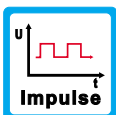
Application

The turbine flowmeters type TDH...-15.../PPO and TDI...-15.../PPO are employed to measure and monitor volume flow of liquids.

Areas of application:



- Medicine technology
- Pharmaceutical Industry
- Chemical Industry
- Research and Development



Features

The rotors of the series TDH...-15.../PPO are equipped with magnets and a Hall-sensor detects the rotation of the rotor.

The rotors of the series TDI...-15.../PPO are equipped with Stainless Steel-pins and an inductive proximity switch detects the rotation.

Further characteristics of both series are:

- special designed guide vanes ensure a proportionate stream to the rotor
- superior sapphire seating
- high accuracy
- Outputs (alternatively): frequency-, analog- or switch output
- Plastic version optional: body in Brass

Installation hints

The installation of the flowmeter can be done in any orientation in the system. The flow direction must be observed.

The flowmeter must not be used as a supporting part in a pipe construction.

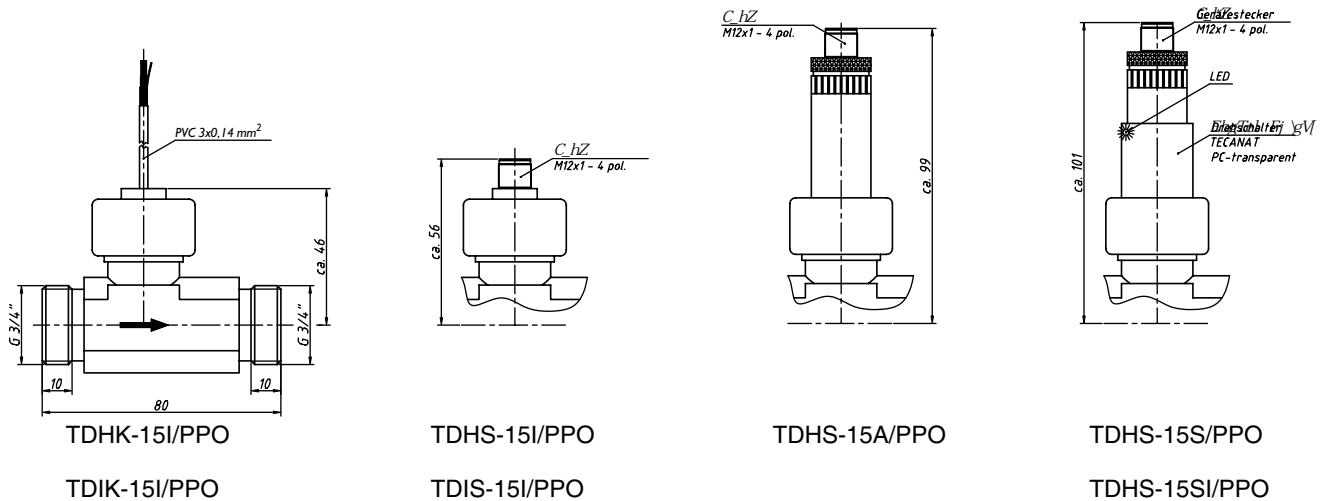
The medium must not contain any solids! We recommend the installation of a strainer.

External magnetic fields influence the measurement. Keep sufficient distance to magnetic fields (e.g. electromotors).

The operating instructions for TDH...-15.../PPO and TDI...-15.../PPO must be observed under any circumstances.



Technical data



Versions

| Type | Measuring value sensing | | Output | | |
|----------------------|-------------------------|----------------------------|-----------------------------|----------------------------|----------------------------|
| | Hall-Sensor | Inductive proximity switch | Impulse output (see page 3) | Analog output (see page 4) | Switch output (see page 4) |
| TDHK-15I/PPO | ▲ | | ▲ | | |
| TDIK-15I/PPO | | ▲ | ▲ | | |
| TDHS-15I/PPO | ▲ | | ▲ | | |
| TDIS-15I/PPO | | ▲ | ▲ | | |
| TDHS-15A/PPO | ▲ | | | ▲ | |
| TDHS-15S/PPO | ▲ | | | | ▲ |
| TDHS-15SI/PPO | ▲ | | ▲ | | ▲ |

Besides the standard version (.../PPO) optional a Brass-version (.../MS) is available.

Technical data

| | Units with hall-sensor TDH... | Units with inductive proximity switch TDI... |
|---------------------------------------|---|---|
| Process connection: | G 3/4" male thread with screw nuts and flat seals | |
| Nominal range: | DN 15 | |
| Max. medium temperature: | 85 °C | |
| Nominal pressure: | PN 10 | |
| Range: | | |
| standard bearing | 2 - 40 l/min, at continuous load max 20 l/min | |
| strengthened bearing | 4 - 40 l/min | |
| Start of signal output: | 0,3 l/min | |
| Max. size of solids in medium: | 0,5 mm | |
| Electric connection: | | |
| Cable connection (TDHK... or TDIK...) | 1,5 m shielded PVC-cable | 2,0 m shielded PVC-cable |
| | $T_{max} = 70\text{ °C}$ | $T_{max} = 70\text{ °C}$ |
| Plugs (TDHS... or TDIS...) | 4-Pin-Plug M12x1 | 4-Pin-Plug M12x1 |
| Power supply (Pulse output): | 4,5...24 VDC | 12...24 VDC |
| Ingress protection: | IP 54 | |
| Electric output: | see page 3 and 4 | |
| Options: | | |
| Strainer | cap form, screen aperture size 0,5 mm, $T_{max} = 60\text{ °C}$ (continuous load), $T_{max} = 85\text{ °C}$ (max 1 h) | |

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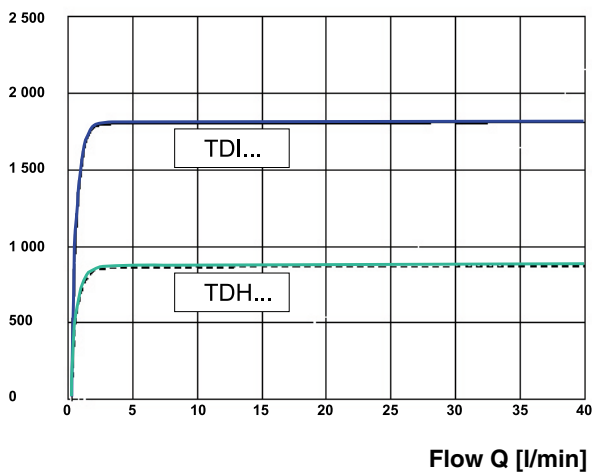


Materials, Technical data, Signal output

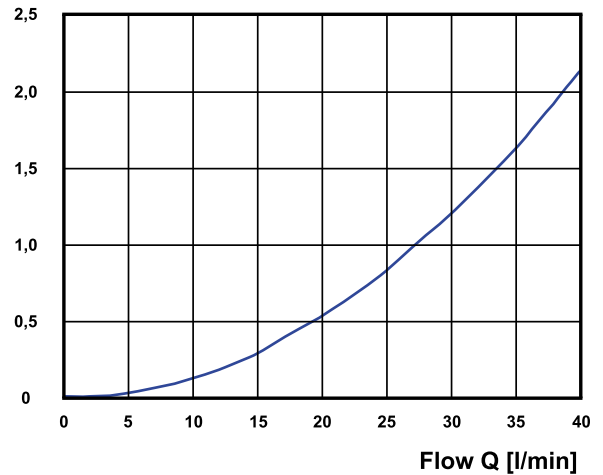
Materials

| | Wetted part ? | Units with Hall-Sensor TDH... | Units with inductive proximity switch TDI... |
|-------------------------------------|---------------|--|---|
| Measuring tube | yes | | |
| Standard version (.../PPO) | | PPO (Noryl GFN3) | |
| Brass version (.../MS) | | Brass (CuZn36Pb2As) | |
| Sensor | yes | PPO (Noryl GFN3) | |
| Screw cap | no | PA GF 30 | |
| Turbine chamber and impeller | yes | PEI ULTEM | |
| O-Ring / gasket | yes | NBR | NBR (standard), Viton (option) |
| Bearing / Axle | yes | Axle Arcap AP1D with hard metal pins in sapphire bearing | |
| Bearing support | yes | Arcap AP1D | |
| Impeller magnets | yes | Hard Ferrite magnet | Stainless Steel pins |
| Strainer (option) | yes | POM / Stainless Steel | |

Impulse rate [1/l]



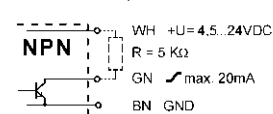
Pressure drop Δp [bar]



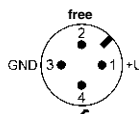
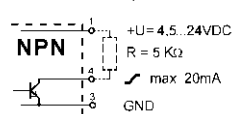
Technical data impulse output (TDHK-15l/PPO, TDHS-15l/PPO, TDIK-15l/PPO and TDIS-15l/PPO)

| | Units with Hall-Sensor TDH... | Units with inductive proximity switch TDI... |
|--------------------------------|----------------------------------|---|
| Accuracy: | $\pm 1\%$ of range | $\pm 0,5\%$ of range |
| Repeatability: | $\pm 0,2\%$ | $\pm 0,1\%$ |
| Output signal: | | |
| Pulse rate / K-factor | 855 Pulses / Liter | 1795 Pulses / Liter |
| Resolution | 1,2 ml / Pulse | 0,6 ml / Pulse |
| Signal form | square wave | square wave |
| Signal current | NPN open collector | PNP or NPN open collector |
| Signal current | max. 10 mA | max. 10 mA |
| Connection diagram | A1 and A2 (see below) | B1, B2, C1 and C2 (see below) |
| Start of signal output: | 0,3 l/min | 0,3 l/min |

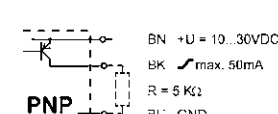
A1: TDHK-15l/PPO (Cable)



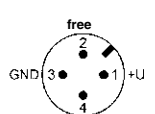
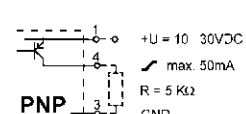
A2: TDHS-15l/PPO (Plug)



B1: TDIK-15l/PPO (PNP, Cable)



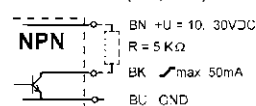
B2: TDIS-15l/PPO (PNP, Plug)



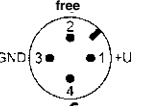
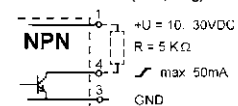
BK = black
BU = blue
WH = white

BN = brown
GN = green

C1: TDIK-15l/PPO (NPN, Cable)



C2: TDIS-15l/PPO (NPN, Plug)



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Electric output

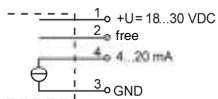
Technical data analog output (TDHS-15A/PPO)

| | | | | |
|---|---|--------------|--------------|--------------|
| Accuracy: | ± 1% of range | | | |
| Repeatability: | ± 0,2% | | | |
| Output signal: | 4...20 mA | | | |
| Current limit: | approx. 26 mA | | | |
| Scale: | | | | |
| (Please state with order) | 0...5 l/min | 0...10 l/min | 0...20 l/min | 0...40 l/min |
| Power supply: | 18...30 VDC | | | |
| Max. current consumption: | 30 mA | | | |
| Max. ohmic resistance: | 250 Ω against GND | | | |
| Residual ripple: | 0,2 mA _{SS} through whole scale | | | |
| Design: | 3-way, galvanically not insulated combined GND of supply voltage and output signal | | | |
| Electric connection: | 4-Pin Plug, M12x1 | | | |
| Ingress protection: | IP 54 | | | |
| Diagram of connection: | D1 | | | |
| Max. medium temperature: | 80 °C | | | |
| Material measuring transducer housing: | Plastic PA | | | |

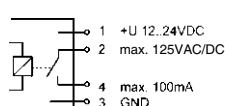
Technical data switch output (TDHS-15S/PPO) / switch output + pulse output (TDHS-15SI/PPO)

| | | | | | | | | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| Switch point setup: | by rotary switch | | | | | | | | | | | | | | | |
| Switch point table: | | | | | | | | | | | | | | | | |
| Switch position | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| Switch point [l/min] | 0,5 | 1,0 | 1,5 | 2,0 | 2,5 | 3,0 | 3,5 | 4,5 | 5,5 | 7,5 | 9,5 | 11,5 | 15,5 | 19,5 | 24,5 | 29,5 |
| | Switch points for decreasing flow | | | | | | | | | | | | | | | |
| Switch hysteresis: | 0,5 l/min above switch-off point | | | | | | | | | | | | | | | |
| Accuracy: | ± 0,2 l/min ±2 % of selected switch point | | | | | | | | | | | | | | | |
| Output: | | | | | | | | | | | | | | | | |
| TDHS-15S/PPO (Switch output only) | potential free contact, opens below setpoint contact rating max. 125 VAC/DC, 100 mA | | | | | | | | | | | | | | | |
| TDHS-15SI/PPO (Switch output + pulse output) | Switch output switches against supply voltage contact rating max. 100 mA Impulse output delivers flow proportional frequency signal NPN open collector, max. 10 mA | | | | | | | | | | | | | | | |
| Power supply: | 12...24 VDC | | | | | | | | | | | | | | | |
| Current input: | max. 25 mA | | | | | | | | | | | | | | | |
| Ingress protection: | IP 54 with closed hull and attached cable box | | | | | | | | | | | | | | | |
| Indication, internal: | LED yellow = ok, LED red = alarm | | | | | | | | | | | | | | | |
| Max. medium temperature: | 80 °C | | | | | | | | | | | | | | | |
| Electric connection: | 4-Pin Plug, M12x1 | | | | | | | | | | | | | | | |
| Diagram of connection: | E1 and E2 (see below) | | | | | | | | | | | | | | | |
| Material housing: | Plastic PA, transparent | | | | | | | | | | | | | | | |

D1: TDHS-15A/PPO



E1: TDHS-15S/PPO



E2: TDHS-15SI/PPO

