

DHGF-2, DHGF-4



- limit value monitoring
- frequency divider
- relay output
- mounting via T-piece

05

DHSF-2, DHSF-4



- high accuracy
- threaded connection
- PP-version

05

DIGA-2, DIGA-4



- limit value monitoring
- frequency divider
- relay output

05

DHGF-10



- high accuracy
- high reliability
- any orientation
- mounting via T-piece

05

DIGA-10



- any orientation
- high reliability
- threaded connection

05

DHTF-1



- any orientation
- high reliability
- threaded connection

05



DHTF-1SE



- limit value monitoring
- frequency divider
- relay output
- mounting via T-piece

05

DHTF-2



- high accuracy
- threaded connection
- PP-version

05

DHTF-2SE



- limit value monitoring
- frequency divider
- relay output

05

DHTA-1SE DHTA-2SE



- high accuracy
- high reliability
- any orientation
- mounting via T-piece

05

FRA



- any orientation
- high reliability
- threaded connection

05

FAA



- any orientation
- high reliability
- threaded connection

05



FAB



- any orientation
- for high temperatures
- threaded connection

05

KAA



- wide indicating range
- for high temperatures
- threaded connection

05

TD...-15.../PPO



- wide measuring range
- high accuracy
- plastic version

05

TD...-25.../MS



- wide measuring range
- high accuracy
- sturdy brass version

05

TD...-25.../PP



- wide measuring range
- high accuracy
- PP-version

05

TD...-40.../MS



- wide measuring range
- high accuracy
- sturdy brass-version

05

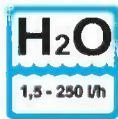


Impeller Flowmeter

DHGF-2 DHGF-4

Function

The flowmeters type DHGF-2 and DHGF-4 are impeller flowmeters.

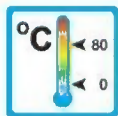


Application

The impeller flowmeters type DHGF-2 and DHGF-4 are employed to measure volume flow of liquids.

Areas of application:

- Mechanical Engineering
- Pharmaceutical Industry
- Chemical Industry
- Research and Development



Features

The series proves itself through reliable function and easy handling. Further characteristics of this model are:

- Universal mounting
- High accuracy
- High chemical resistance (ECTFE-Version)
- Threaded connection

Installation hints

The installation of the flowmeter can be done in any way in the system. The optimum deaeration will be achieved with horizontal mounting. The flow direction must be observed.

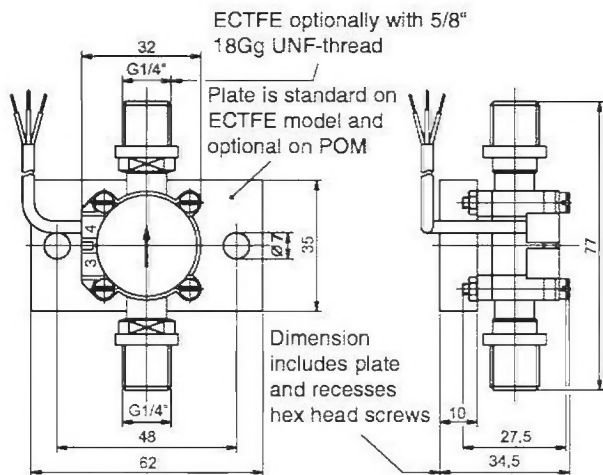
The flowmeter must not be used as a supporting part in a pipe construction.

The liquid must not contain any solids.

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

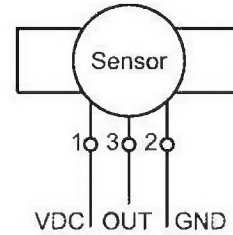


Ranges, Technical data



Connection diagram

- 1 VDC white
- 2 GND brown
- 3 OUT green



Operating data	DHGF-2	DHGF-4
Flow range (H ₂ O at 22 °C):	1,5 - 100 l/h	6 - 250 l/h
Sensing principle:	Hall-effect, touchless	
Viscosity range:	1 - 10 cSt	
Accuracy:	± 2 % from scale value (at same operating conditions)	
Repeatability:	< ± 0,8 % from scale value (at same operating conditions)	
Max. operating pressure:	6 bar	
Burst pressure (at 22 °C):	>15 bar	
Operating temperature:	0° C to +80 °C	
Ingress protection:	IP65	
Output signal:	square wave (push-pull output stage)	
Max. output current (at 24 V):	11 mA	
Power supply:	4,5 - 24 VDC (POM-Version), 10 - 24 VDC (ECTFE-Version)	
Connection cable (1,9 m):	Round cable 3 x 0,14 mm ² LIYY	

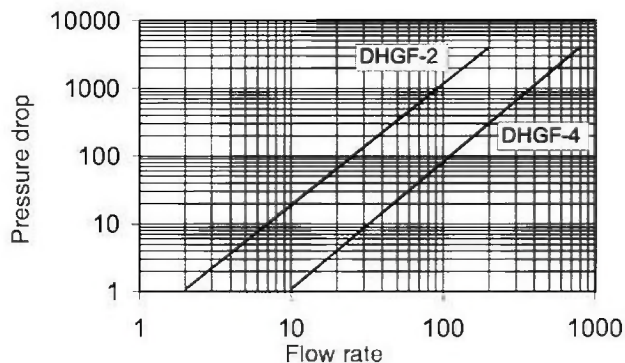
Materials	POM-Version	ECTFE-Version
Housing:	POM	ECTFE
Impeller:	POM	ECTFE
Bearing (spigot bearing) for DHGF-2 (axle / bearing):	Corepoint® / POM	Saphir / Rubin
for DHGF-4 (axle / bearing):	Corepoint® / POM	Saphir / Rubin
Magnets:	sinter ceramic	ECTFE-encapsulated
O-Rings:	FKM or EPDM *	FKM or EPDM *
Weight:	approx. 45 g	approx. 50 g
Process connection:	G 1/4"	G 1/4" or 5/8" UNF

* FKM: green colourcode

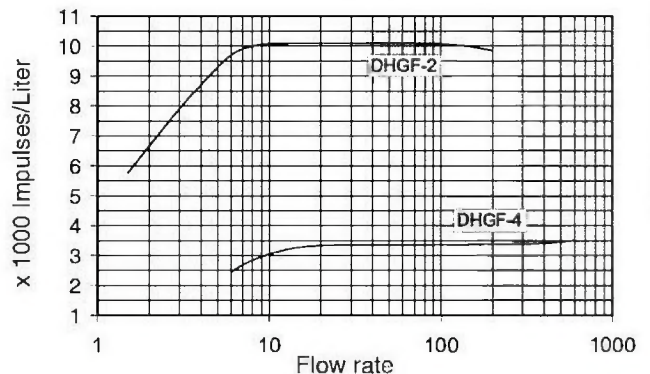
EPDM: black colourcode

KALREZ (optional): white colourcode

Pressure drop diagram



Pulse curve



DHGF-2/4 2 0003 09-06 E.M



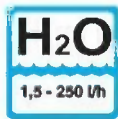
Impeller Flowmeter

DHSF-2 DHSF-4



Function

The flowmeters type DHSF-2 and DHSF-4 are impeller flowmeters.

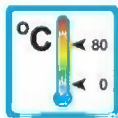


Application

The impeller flowmeters type DHSF-2 and DHSF-4 are employed to measure volume flow of liquids.

Areas of application:

- Mechanical Engineering
- Chemical Industry
- Research and Development



Features

The series proves itself through reliable function and easy handling. Further characteristics of this model are:

- Universal mounting
- High accuracy
- Hose connection

Installation hints

The installation of the flowmeter can be done in any way in the system. The optimum deaeration will be achieved with vertical mounting. The flow direction must be observed.

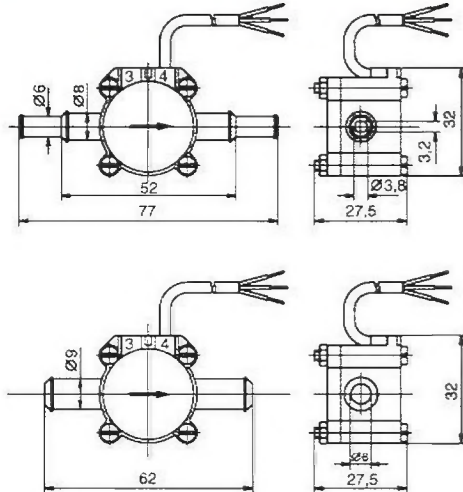
The flowmeter must not be used as a supporting part in a pipe construction.

The liquid must not contain any solids.

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

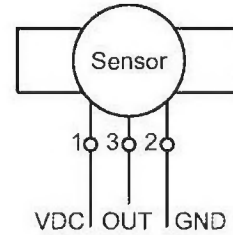


Ranges, Technical data



Connection diagram

1 VDC white
2 GND brown
3 OUT green



Operating data	DHSF-2	DHSF-4
Flow range (H ₂ O at 22 °C):	1,5 - 100 l/h	6 - 250 l/h
Sensing principle:	Hall-effect, touchless	
Viscosity range:	1 - 10 cSt	
Accuracy:	± 2 % from scale value (at same operating conditions)	
Repeatability:	< ± 0,8 % from scale value (at same operating conditions)	
Max. operating pressure:	6 bar	
Burst pressure (at 22 °C):	>15 bar	
Operating temperature:	0° C to +80 °C	
Ingress protection:	IP65	
Output signal:	square wave (push-pull output stage)	
Max. output current (at 24 V):	11 mA	
Power supply:	4,5 - 24 VDC	
Connection cable (1 m):	Round cable 3 x 0,14 mm ² LIYY	

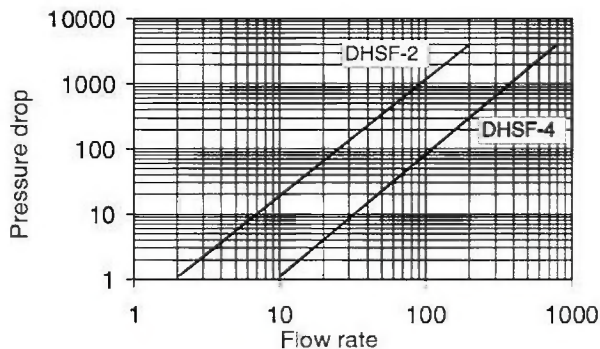
Materials	POM-Version
Housing:	POM
Impeller:	POM
Bearing (spigot bearing) for DHSF-2 (axle / bearing):	Corepoint® / POM
for DHSF-4 (axle / bearing):	Corepoint® / POM
Magnets:	sinter ceramic
O-Rings:	FKM or EPDM *
Weight:	approx. 45 g
Process connection:	6 mm / 8 mm hose connection on DHSF-2 9 mm hose connection on DHSF-4

* FKM: green colourcode

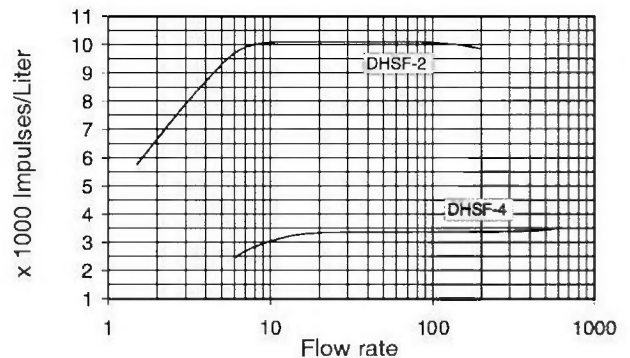
EPDM: black colourcode

KALREZ (optional): white colourcode

Pressure drop diagram



Pulse curve



DHSF-2/4 2 0003 09-06 E.M



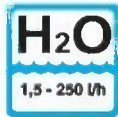
Impeller Flowmeter

DIGA-2 DIGA-4



Function

The flowmeters type DIGA-2 and DIGA-4 are impeller flowmeters.

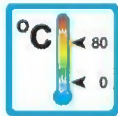


Application

The impeller flowmeters type DIGA-2 and DIGA-4 are employed to measure volume flow of liquids.

Areas of application:

- Mechanical Engineering
- Pharmaceutical Industry
- Chemical Industry
- Research and Development



Features

The series proves itself through reliable function and easy handling. Further characteristics of this type are:

- Universal mounting
- High accuracy
- Analog output (4 - 20 mA)
- High chemical resistance (ECTFE-Version)
- Threaded connection

Installation hints

The installation of the flowmeter can be done in any way in the system. The optimum deaeration will be achieved with vertical mounting. The flow direction must be observed.

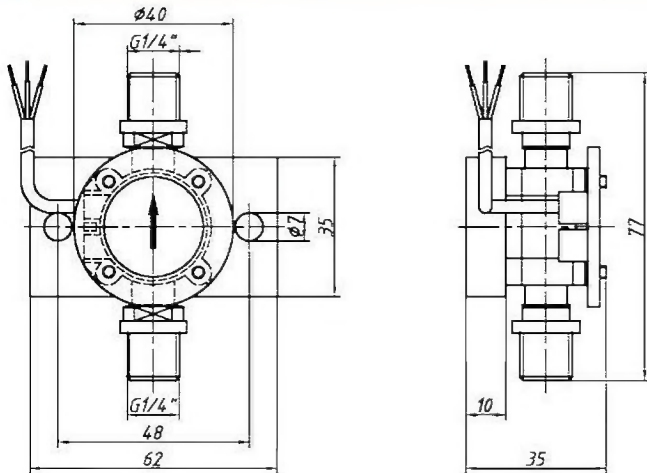
The flowmeter must not be used as a supporting part in a pipe construction.

The liquid must not contain any solids particles.

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

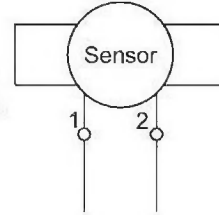


Ranges, Technical data



Connection diagram

1: 4 - 20 mA, white
2: 4 - 20 mA, brown



Operating data	DIGA-2	DIGA-4
Flow range (H ₂ O at 22 °C):	1,5 - 100 l/h	6 - 250 l/h
Sensing principle:	inductive, touchless	
Viscosity range:	1 - 10 cSt	
Accuracy:	± 2 % f.s.d. (at same operating conditions)	
Repeatability:	< ± 0,8 % f.s.d. (at same operating conditions)	
Max. operating pressure:	10 bar	
Burst pressure (at 22 °C):	>15 bar	
Operating temperature:	0 °C to +80 °C	
Ingress protection:	IP65	
Output signal:	4 - 20 mA (The limiting values for 4 and 20 mA are adjustable by means of a magnetic pin)	
Power supply:	10 - 24 VDC (see example „Operating circuit“)	
Connection cable (1,9 m):	Round cable 2 x 0,14 mm ² LIYY	

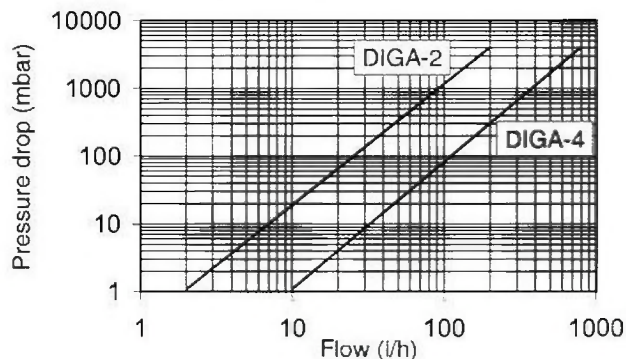
Materials	POM-Version	ECTFE-Version
Housing:	POM	ECTFE
Impeller:	POM	ECTFE
Bearing (spigot bearing)		
for DIGA-2 (axle / bearing):	Corepoint® / POM	Saphir / Rubin
for DIGA-4 (axle / bearing):	Corepoint® / POM	Saphir / Rubin
Magnets:	sinter ceramic	ECTFE-encapsulated
O-Rings:	FKM or EPDM *	FKM or EPDM *
Weight:	approx. 45 g	approx. 50 g
Process connection:	G 1/4"	G 1/4" or 5/8" UNF

* FKM: green colourcode

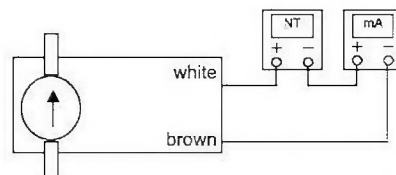
EPDM: black colourcode

KALREZ (optional): white colourcode

Pressure drop diagram



Operating circuit (example)



DIGA-2/4 2 0002 04-05 E M

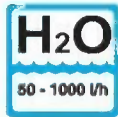
Impeller Flowmeter

DHGF-10



Function

The flowmeters type DHGF-10 are impeller flowmeters.



Application

The impeller flowmeters type DHGF-10 are employed to measure volume flow of liquids. Areas of application:

- Mechanical Engineering
- Pharmaceutical Industry
- Chemical Industry
- Research and Development



Features

The series proves itself through reliable function and easy handling. Further characteristics of this model are:

- Universal mounting
- High accuracy
- High chemical resistance (ECTFE-Version)
- Threaded connection

Installation hints

The installation of the flowmeter can be done in any way in the system. The optimum deaeration will be achieved with horizontal mounting. The flow direction must be observed.

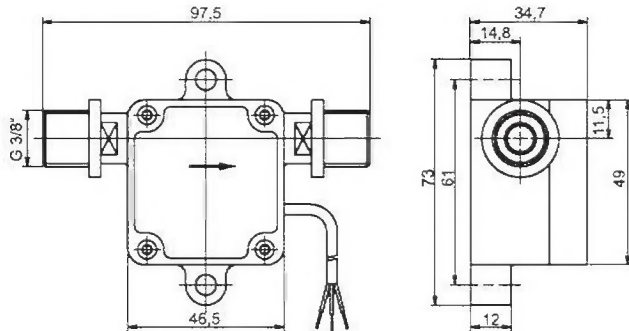
The flowmeter must not be used as a supporting part in a pipe construction.

The liquid must not contain any solids.

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

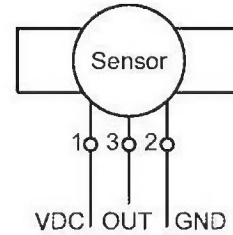


Ranges, Technical Data



Connection diagram

- 1 VDC white
- 2 GND brown
- 3 OUT green



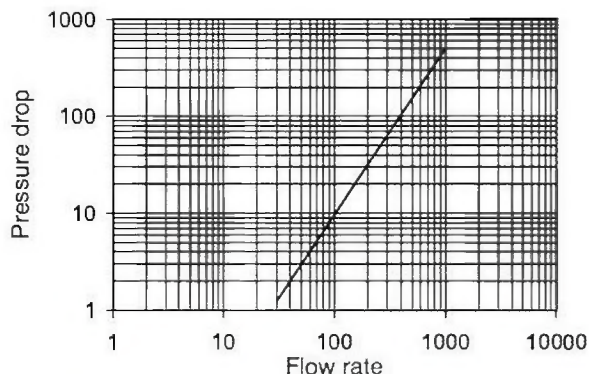
Operating data	DHGF-10 POM-Version	DHGF-10 ECTFE-Version
Flow range (H ₂ O at 22 °C)		
standard:	50 - 500 l/h	50 - 1000 l/h
optional (with ceramic bearing):	50 - 1000 l/h	—
Sensing principle:	Hall-effect, touchless	
Viscosity range:	1 - 10 cSt	
Accuracy:	± 2 % from scale value (at same operating conditions)	
Repeatability:	< ± 0,8 % from scale value (at same operating conditions)	
Max. operating pressure:	5 bar	
Burst pressure (at 22 °C):	8 bar	
Operating temperature:	0° C to +80 °C	
Ingress protection:	IP65	
Output signal:	square wave (push-pull output stage)	
Max. output current (at 24 V):	11 mA	
Power supply:	4,5 - 24 VDC	
Connection cable (1 m):	Round cable 3 x 0,14 mm ² LIYY	

Materials	POM-Version	ECTFE-Version
Housing:	POM	ECTFE
Impeller:	POM	ECTFE
Bearing (spigot bearing)		
standard (axle / bearing):	Corepoint® / POM	ceramic / ceramic
optional (axle / bearing):	ceramic / ceramic	—
Magnets:	POM-encapsulated	ECTFE-encapsulated
O-Rings:	FKM or EPDM *	FKM or EPDM *
Weight:	approx. 80 g	approx. 140 g
Process connection:	G 3/8"	G 3/8"

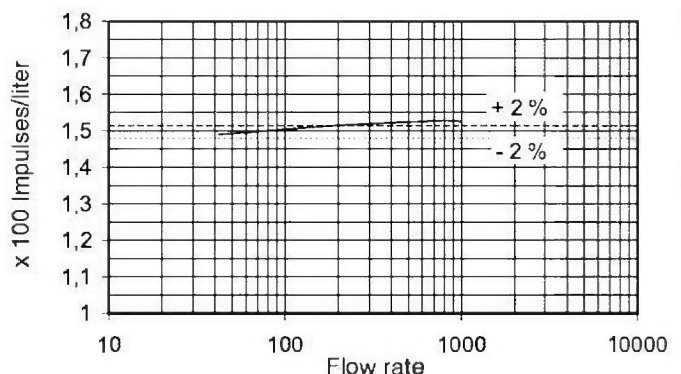
* FKM: green colourcode

EPDM: black colourcode

Pressure drop diagram



Pulse curve



DHGF-10 2 0002 04-05 E.M

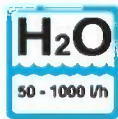
Impeller flowmeter

DIGA-10



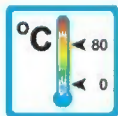
Function

The flowmeters type DIGA-10 are impeller flowmeters.



Application

The impeller flowmeters type DIGA-10 are used for measuring volume flow of liquids.



Areas of application:

- Mechanical engineering
- Pharmaceutical industry
- Chemical industry
- Research and development



Features

The series proves itself through reliable function and easy handling. Further characteristics of this type are:

- Universal mounting
- High accuracy
- Analog output (4 - 20 mA)
- High chemical resistance (ECTFE-Version)
- Threaded connection

Installation hints

The installation of the flowmeter can be done in any orientation in the system.

The optimum deaeration will be achieved with vertical mounting. The flow direction must be observed.

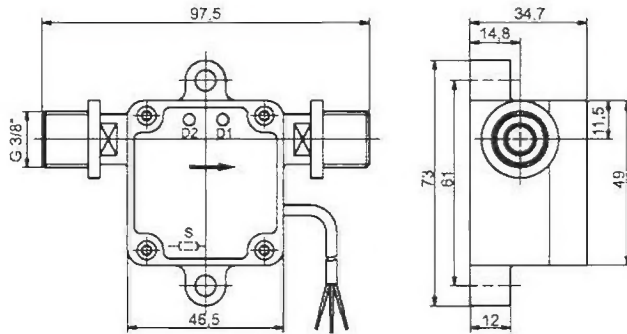
The flowmeter must not be used as a supporting part in a pipe construction.

The liquid must not contain any solids.

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

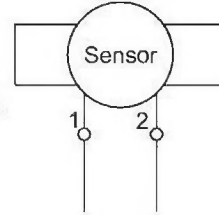


Ranges, technical data



Connection diagram

1: 4 - 20 mA, white
2: 4 - 20 mA, brown



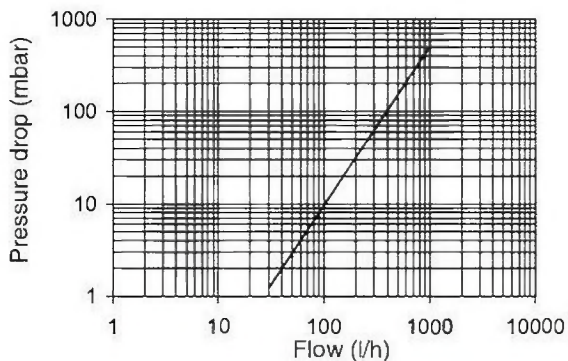
Operating data	DIGA-10 POM-version	DIGA-10 ECTFE-version
Flow range (H ₂ O at 22 °C):		
standard:	50 - 500 l/h	50 - 1000 l/h
optional (with ceramic bearing):	50 - 1000 l/h	—
Sensing principle:	inductive, touchless	
Viscosity range:	1 - 10 cSt	
Accuracy:	± 2 % of full scale (at same operating conditions)	
Repeatability:	< ± 0,8 % of full scale (at same operating conditions)	
Max. operating pressure:	5 bar	
Burst pressure (at 22 °C):	8 bar	
Operating temperature:	0° C to +80 °C	
Ingress protection:	IP65	
Output signal:	4 - 20 mA (The limiting values are adjustable by user)	
Power supply:	10 - 24 VDC (see example „Operating circuit“)	
Connection cable (1 m):	round cable 2 x 0,14 mm ² LIYY	

Materials	POM-version	ECTFE-version
Housing:	POM	ECTFE
Impeller:	POM	ECTFE
Bearing (spigot bearing)		
standard (axle / bearing):	Corepoint® / POM	ceramic / ceramic
optional (axle / bearing):	ceramic / ceramic	—
Magnets:	POM-encapsulated	ECTFE-encapsulated
O-Rings:	FKM or EPDM *	FKM or EPDM *
Weight:	approx. 80 g	approx. 140 g
Process connection:	G 3/8"	G 3/8"

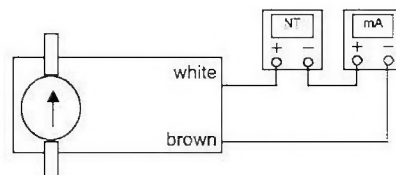
* FKM: green colourcode

EPDM: black colourcode

Pressure drop diagram



Operating circuit (example)



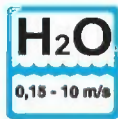
DIGA-10 2 0002 06-05 E M

DHTF-1



Function

The flowmeters type DHTF-1 are impeller flowmeters.



Application

The impeller flowmeters type DHTF-1 are employed to measure and monitor volume flow of liquids.



Areas of application:



- Mechanical engineering
- Chemical industry
- Research and development



Features

The series proves itself through reliable function and easy handling. Further characteristics of this model are:

- PP-Version
- High accuracy
- Mounting in different pipe diameters possible (mounting via T-piece)

Installation hints

The flowmeter can be installed vertically or horizontally. The unit must not be installed upside down (Danger of sedimentation). The flow direction must be observed.

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

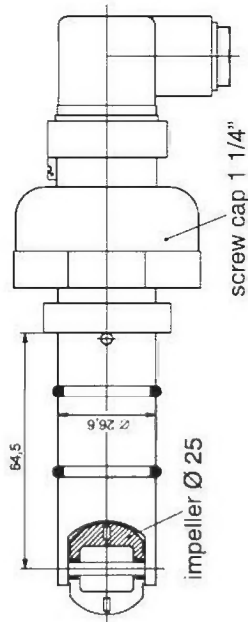
The liquid must not contain any solids.

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



Technical data

Dimension outline drawing DHTF-1



Electric connections

Plug DIN 43650 Form A

Power supply: 4,5 - 24 VDC

Ingress protection: IP 65

Pin allocation: PIN 1: 4,5 - 24 VDC

PIN 2: signal

PIN Ⓣ : ground

Operating data

Flow range (H ₂ O at 22 °C):	0,15 - 10 m/s
Sensing principle:	Hall effect, touchless
Viscosity:	0,5 - 20 cSt
Accuracy:	± 1 % of full scale over calibrated range
Repeatability:	± 0,5 % of full scale over calibrated range
max. operating pressure:	10 bar
Burst pressure (at 22 °C):	15 bar
Operating temperature:	0° C to +80 °C
Output:	open collector
Output signal:	square wave
Output frequency:	42 Hz / m/s
max. output current (at 24 V):	11 mA*

* at temperatures < 60 °C: 15 mA

Materials

Sensor housing:	PP
Impeller:	ECTFE (HALAR®)
Bearing (axle / bearing):	ceramic (AL ₂ O ₃) / ceramic (AL ₂ O ₃)
Magnets:	ECTFE-encapsulated
O-Rings:	Viton® (optional: EPDM)
Weight:	approx. 126 g
Process connection:	Mounting in pipe connection via T-piece

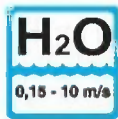
DHTF-1 2 0002 07-05 E M

DHTF-1SE



Function

The flowmeters type DHTF-1SE are impeller flowmeters.



Application

The impeller flowmeters type DHTF-1SE are employed to measure and monitor volume flow of liquids.



Areas of application:



- Mechanical engineering
- Chemical industry
- Research and development



Features

The series proves itself through reliable function and easy handling. Further characteristics of this model are:

- PP-version
- High accuracy
- Mounting in different pipe diameters possible (mounting via T-piece)
- Options:
 - frequency divider
 - frequency doubling
 - limit value monitoring
 - range monitoring
 - relay output

Installation hints

The flowmeter can be installed vertically or horizontally. The unit must not be installed upside down (Danger of sedimentation). The flow direction must be observed.

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

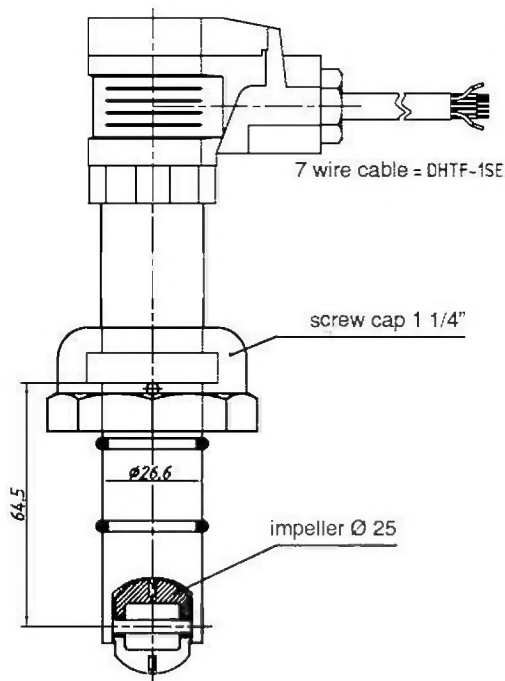
The liquid must not contain any solids.

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



Technical data

Dimension outline drawing DHTF-1SE



Electric connections

Cable		
Power supply: 8 - 24 VDC		Ingress protection: IP 65
Pin allocation:		
Colour	Explanation	Characteristic data
white	Power supply (V_{in})	8 - 24 VDC
brown	Ground	0 VDC
green	Digital Output (push-pull output stage)	0 - ($V_{in}-1,5$) VDC
yellow	Contact A of relay 1	max. 24 VDC / 0,1 A
grey	Contact B of relay 1	max. 24 VDC / 0,1 A
pink	Contact A of relay 2	max. 24 VDC / 0,1 A
blue	Contact B of relay 2	max. 24 VDC / 0,1 A

Operating data

Flow range (H_2O at 22 °C):	0,15 - 10 m/s
Sensing principle:	Hall-effect, touchless
Viscosity range:	0,5 - 20 cSt
Accuracy:	± 1 % of f.s.d. over calibrated range
Repeatability:	$\pm 0,5$ % of f.s.d. over calibrated range
Max. operating pressure:	10 bar
Burst pressure (at 22 °C):	15 bar
Operating temperature:	0° C to +80 °C
Output:	push-pull output stage
Output signal:	square wave
Output frequency:	approx. 42 Hz / m/s
Max. current output (at 24 V):	11 mA
Options:	see options beneath

Options

For the flowmeters type DHTF-1SE additional to the frequency output the following options can be selected:

Frequency divider	The input frequency is divided by a whole number and then provided at the output (max. input frequency 150 Hz). The divider is programmed variable and determined by the customer. LEDs indicate the sensor status.
Frequency doubling	The input frequency is multiplied by 2 and provided at the output (max. input frequency 250 Hz). LEDs indicate the sensor status.
Limit value monitoring	The input pulses are counted via a given time frame and compared with a limit value. The result is provided at the outputs. The limit value can be programmed by the user (teach-in-function). LEDs indicate the sensor status.
Range monitoring	The input pulses are counted via a given time frame and compared with two limit values so that a limit frame is created. The result is provided at the outputs. The limit values can be programmed by the user (teach-in-function). LEDs indicate the sensor status.
Relay output	Up to two solid-state relays (semiconductor relays) are realizable.

Remark: Combination of different options are possible.

Materials

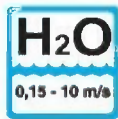
Housing:	PP
Impeller:	ECTFE (HALAR®)
Bearing (axle / bearing):	ceramic (AL_2O_3) / ceramic (AL_2O_3)
Magnets:	ECTFE-encapsulated
O-Rings:	Viton® (optional EPDM)
Weight:	approx. 126 g
Process connection:	Mounting in pipe connection via T-piece

DHTF-2



Function

The flowmeters type DHTF-2 are impeller flowmeters.



Application

The impeller flowmeters type DHTF-2 are employed to measure and monitor volume flow of liquids.



Areas of application:



- Mechanical engineering
- Chemical industry
- Research and development



Features

The series proves itself through reliable function and easy handling. Further characteristics of this model are:

- PP-version
- High accuracy
- Threaded connection

Installation hints

The flowmeter can be installed vertically or horizontally. The unit must not be installed upside down (Danger of sedimentation). The flow direction must be observed.

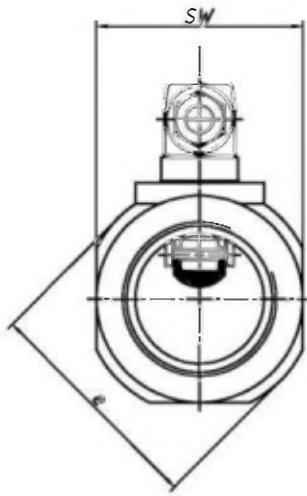
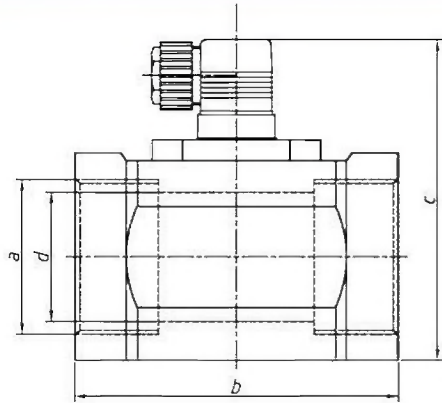
The flowmeter must not be used as a supporting part in a pipe construction.

The liquid must not contain any solids.

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



Ranges, technical data



Electric connection

Plug DIN 43650 Form A		
Power supply: 4,5 - 24 VDC		Ingress protection: IP 65
Pin allocation:	PIN 1: 4,5 - 24 VDC	PIN 2: signal
	PIN \oplus : ground	

Dimensions

Fitting	Overall dimensions [mm]					
	a	SW	e	d	c	b
DN 25	G 1"	70	74	25	109	110
DN 32	G 1 1/4"	70	78	32	115	110
DN 40	G 1 1/2"	75	80	40	118	120
DN 50	G 2"	75	89	50	125	125

Operating data

Flow range (H ₂ O at 22 °C):	0,15 - 10 m/s
Sensing principle:	Hall effect, touchless
Viscosity range:	0,5 - 20 cSt
Accuracy:	± 1 % of f.s.d. over calibrated range
Repeatability:	± 0,5 % of f.s.d. over calibrated range
Max. operating pressure:	10 bar
Burst pressure (at 22 °C):	15 bar
Operating temperature:	0 °C to 80 °C
Output:	Open-Collector NPN sinking
Output signal:	square wave
Output frequency:	approx. 42 Hz / m/s
Max. current output (at 24 V):	11 mA

Materials

Housing:	PP / PP
Impeller:	ECTFE (HALAR®)
Bearing (axle / bearing):	ceramic (AL ₂ O ₃) / ceramic (AL ₂ O ₃)
Magnets:	ECTFE-encapsulated
O-Rings:	Viton® (optional EPDM)
Process connection:	Threaded connection

DHTF-2 0002 07-05 E M

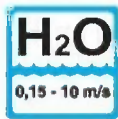


DHTF-2SE



Function

The flowmeters type DHTF-2SE are impeller flowmeters.



Application

The impeller flowmeters type DHTF-2SE are employed to measure and monitor volume flow of liquids.

Areas of application:

- Mechanical engineering
- Chemical industry
- Research and development



Features

The series proves itself through reliable function and easy handling. Further characteristics of this model are:

- PP-Version
- High accuracy
- Threaded connection
- Options:
 - frequency divider
 - frequency doubling
 - limit value monitoring
 - range monitoring
 - relay output

Installation hints

The flowmeter can be installed vertically or horizontally. The unit must not be installed upside down (Danger of sedimentation). The flow direction must be observed.

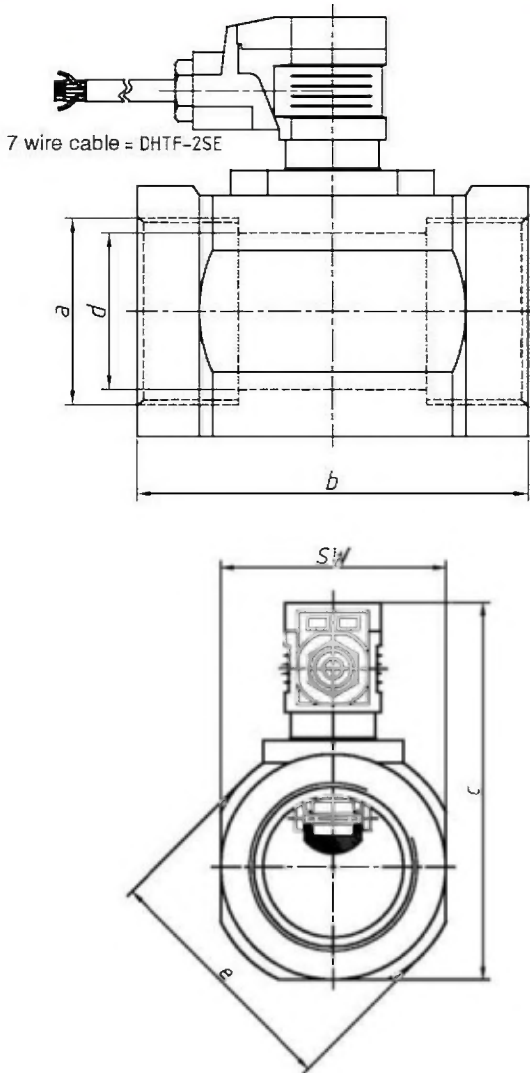
The flowmeter must not be used as a supporting part in a pipe construction.

The liquid must not contain any solids.

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



Ranges, technical data



Electric connections

cable

Power supply: 8 - 24 VDC

Ingress protection: IP 65

Pin allocation:

Colour	Explanation	Characteristic data
white	Power supply (V_{in})	8 - 24 VDC
brown	Ground	0 VDC
green	Digital Output (push-pull output stage)	0 - ($V_{in}-1,5$) VDC
yellow	Contact A of relay 1	max. 24 VDC / 0,1 A
grey	Contact B of relay 1	max. 24 VDC / 0,1 A
pink	Contact A of relay 2	max. 24 VDC / 0,1 A
blue	Contact B of relay 2	max. 24 VDC / 0,1 A

Dimensions

Fitting	Nominal size [mm]					
	a	SW	e	d	c	b
DN 25	G 1"	70	74	25	109	110
DN 32	G 1 1/4"	70	78	32	115	110
DN 40	G 1 1/2"	75	80	40	118	120
DN 50	G 2"	75	89	50	125	125

Operating data

Flow range (H_2O at 22 °C):	0,15 - 10 m/s
Sensing principle:	Hall-effect, touchless
Viscosity range:	0,5 - 20 cSt
Accuracy:	± 1 % of f.s.d. over calibrated range
Repeatability:	$\pm 0,5$ % of f.s.d. over calibrated range
Max operating pressure:	10 bar
Burst pressure (at 22 °C):	15 bar
Operating temperature:	0° C to +80 °C
Output:	push-pull output stage
Output signal:	square wave
Output frequency:	approx. 42 Hz / m/s
Max. current output (at 24 V):	11 mA
Options:	see options beneath

Options

For the flowmeters type DHTF-2SE additional to the frequency output the following options can be selected:

Frequency divider	The input frequency is divided by a whole number and then provided at the output (max. input frequency 150 Hz). The divider is programmed variable and determined by the customer. LEDs indicate the sensor status.
Frequency doubling	The input frequency is multiplied by 2 and provided at the output (max. input frequency 250 Hz). LEDs indicate the sensor status.
Limit value monitoring	The input pulses are counted via a given time frame and compared with a limit value. The result is provided at the outputs. The limit value can be programmed by the user (teach-in-function). LEDs indicate the sensor status.
Range monitoring	The input pulses are counted via a given time frame and compared with two limit values so that a limit frame is created. The result is provided at the outputs. The limit values can be programmed by the user (teach-in-function). LEDs indicate the sensor status.
Relay output	Up to two solid-state relays (semiconductor relays) are realizable.

Remark: Combination of different options are possible.

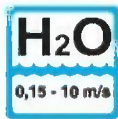
Materials

Fitting / Sensor head:	PP / PP
Impeller:	ECTFE (HALAR®)
Bearing (axle / bearing):	ceramic(AL_2O_3) / ceramic (AL_2O_3)
Magnets:	ECTFE-encapsulated
O-Rings:	Viton® (optional EPDM)
Process connection:	Threaded connection

DHTA-1SE DHTA-2SE

Function

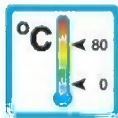
The flowmeters type DHTA-1SE and DHTA-2SE are impeller flowmeters.



Application

The impeller flowmeters type DHTA-1SE and DHTA-2SE are employed to measure and monitor volume flow of liquids. Areas of application:

- Mechanical Engineering
- Pharmaceutical Industry
- Chemical Industry
- Research and Development



Features

The series proves itself through reliable function and easy handling. Further characteristics of this model are:

- PP-Version
- High accuracy
- Analog output (4 - 20 mA)
- DHTA-1SE:
Mounting in different pipe diameters possible (mounting via T-piece)
- DHTA-2SE:
Threaded connection

Installation hints

The flowmeter can be installed vertical or horizontal. The unit must not be installed on the bottom (Danger of sedimentation). The flow direction must be observed.

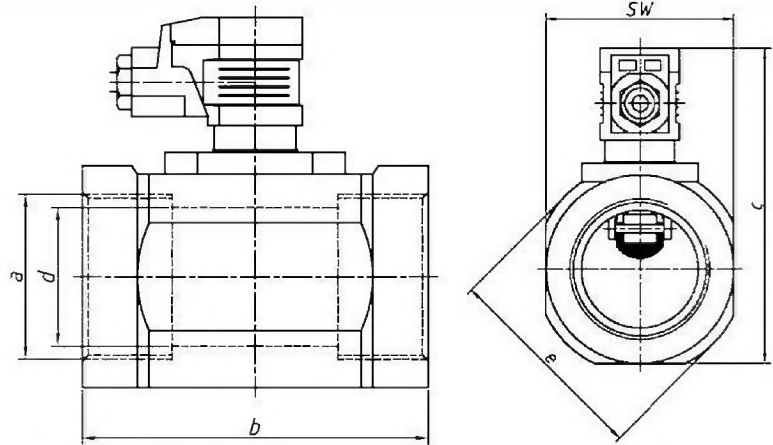
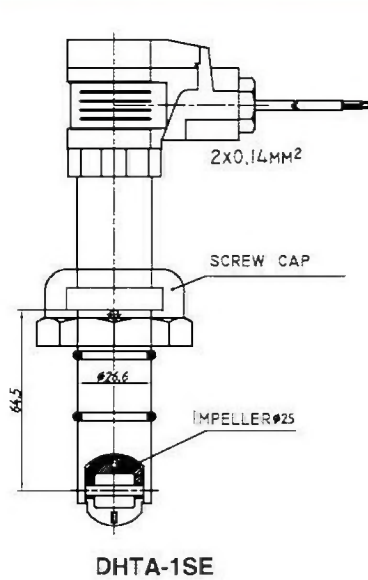
The flowmeter must not be used as a supporting part in a pipe construction.

The liquid must not contain any solids.

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



Ranges, Technical data



Dimensions DHTA-2SE

Fitting	Dimensions [mm]					
	a	SW	e	d	c	b
DN 25	G 1"	70	74	25	119	110
DN 32	G 1 1/4"	70	78	32	123	110
DN 40	G 1 1/2"	75	80	40	125	120
DN 50	G 2"	75	89	50	135	125

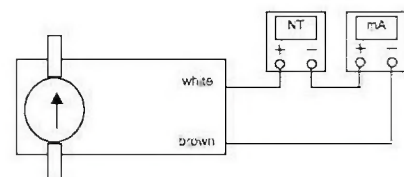
Operating data	DHTA-1SE	DHTA-2SE
Flow range (H ₂ O at 22 °C):		0,15 - 10 m/s
Sensing principle:		inductive, touchless
Viscosity range:		0,5 - 20 cSt
Accuracy:		± 1 % f.s.d. over calibrated range
Repeatability:		± 0,5 % f.s.d. over calibrated range
Max. operating pressure:		10 bar
Burst pressure (at 22 °C):		15 bar
Operating temperature:		0 °C to +80 °C
Ingress protection:		IP 65
Output signal:		4 - 20 mA (adjustable)
Power supply:		10 - 24 VDC (see example „Operating circuit“)
Connection cable:		Round cable 2 x 0,14 mm² LIYY

Materials	DHTA-1SE	DHTA-2SE
Fitting / Sensor head:	—	PP / PP
Housing:	PP	—
Impeller:	ECTFE	ECTFE
Bearing (spigot / bearing):	ceramic (AL ₂ O ₃) / ceramic (AL ₂ O ₃)	ceramic (AL ₂ O ₃) / ceramic (AL ₂ O ₃)
Magnets:	ECTFE-encapsulated	ECTFE-encapsulated
O-Rings:	Viton (optional EPDM)	Viton (optional EPDM)
Weight:	approx. 126 g	depends on fitting
Process connection:	Mounting in pipe connection via T-piece	Threat connection

Connection diagram

Colour	Explanation	Characteristic data
white	4 - 20 mA signal line	4 - 20 mA
brown	4 - 20 mA signal line	4 - 20 mA

Operating circuit (example)

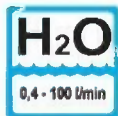


Flow Indicator

FRA

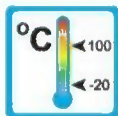
Operation

The models FRA are impeller flow indicators



Application

The flow indicators model FRA are used to indicate flow of liquid media.



Areas of application :



– Coolingsystems and cooling-circuits

– Mechanical Engineering



– Watertreatment

– Pharma industry

– Research and development

Features

The FRA series proves itself through reliable function and easy handling. Further characteristics of this sturdy type are:

- universal orientation
- high reliability
- threaded connection

Installation hints

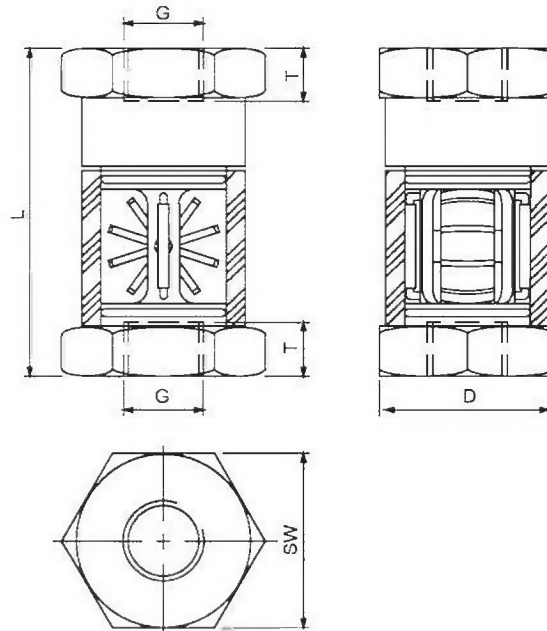
The installation of the flow indicator can be done in any way in the system. The flow direction must be observed. In case of very low flow we suggest a vertical mounting.

The flow indicator must not be used as a supporting part in a pipe construction!

The medium must not contain any solid particles! We recommend the installation of strainers type SFD or type SFM.



Technical Data



Summary of types FRA

Type	Flowrate min. H ₂ O [l/min]	Flowrate max. H ₂ O [l/min]	G	Overall dimensions mm				Weight approx. [g]
				SW	D	T	L	
FRA-8	0,7	4	1/4"	36	30	12	71	300
FRA-10	0,8	8	3/8"	36	30	14	75	300
FRA-15	1,4	12	1/2"	46	40	14	86	600
FRA-20	1,4	25	3/4"	46	40	16	95	600
FRA-25	1,7	40	1"	46	40	18	105	600
FRA-32	8,0	80	1 1/4"	70	65	20	120	1500
FRA-40	8,0	100	1 1/2"	70	65	22	130	1600

Operating data	FRA	
Operating pressure max.:	PN 16 bar	
Operating temperature max.:	100 °C	
Pressure drop:	0,25 bar	
Material	Brass	Stainless Steel
Body:	Brass nickel-plated	1.4305
Rotor (DN 8 to DN 25):	POM red	POM red
Rotor (DN 32 to DN 40):	Nylon white	Nylon white
Wiper:	Polyolitin	Polyolitin
Gaskets:	Perbunan	Viton

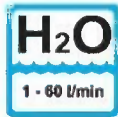
FRA 2 0002 05-07 E M

Flow Indicator

FAA

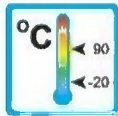
Operation

The models FAA are impeller-flow indicators



Application

The flow indicators model FAA are used to indicate flow of liquid media.



Areas of application for example:



– Coolingsystems and cooling-circuits

– Mechanical Engineering



– Watertreatment

– Pharma industry

– Research and development

Features

The FAA series proves itself through reliable function and easy handling. Further characteristics of this sturdy type are:

- universal mounting
- high reliability
- threaded connection

Installation hints

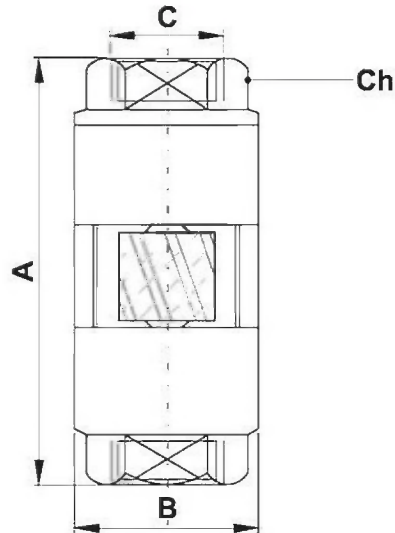
The installation of the flow indicator can be done in any way in the system. The flow direction must be observed. In case of very low flow we suggest a vertical mounting.

The flow indicator must not be used as a supporting part in a pipeconstruction!

The medium must not contain any solid particles! We recommend the installation of strainer type SFD or SFM.



Technical Data



Summary of types FAA

Type	Flowrate H ₂ O [l/min]	A	B	C	Ch	Weight [g]	max. Press. [bar]	max. Temp. [°C]
FAA-8	1 - 10	59	25	1/4"	19	123	10	90
FAA-10	2 - 20	71	30	3/8"	24	190	8	90
FAA-15	3 - 30	71	30	1/2"	24	160	8	90
FAA-20	4 - 40	106	47	3/4"	40	675	5	90
FAA-25	6 - 60	106	47	1"	40	572	5	90

NPT-thread on request

Material:	Brass
Body:	Brass nickel-plated
Impeller:	Hostaform® red
Sight glass:	Pyrex®
Gaskets:	NBR

Stainless steel model (Aisi 304/316) on request

FAA 2 0002 02-05 E M

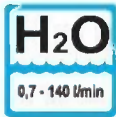
Flow indicator

FAB



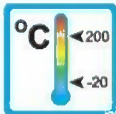
Operation

The FAB flow indicators are impeller indicators.



Application

The FAB flow indicators are used to indicate flow of liquid media.



The glass visualizes colour changes of the media or gas contents.



This flow indicators are for example used in following areas:



- Cooling systems
- Engineering
- Water treatment
- Medical industry
- Research and development

Features

The FAB series proves itself through reliable function and easy handling. Further characteristics of this type are:

- Universal mounting
- Bi-directional flow
- High temperature durability
- Special threads on request

Installation hints

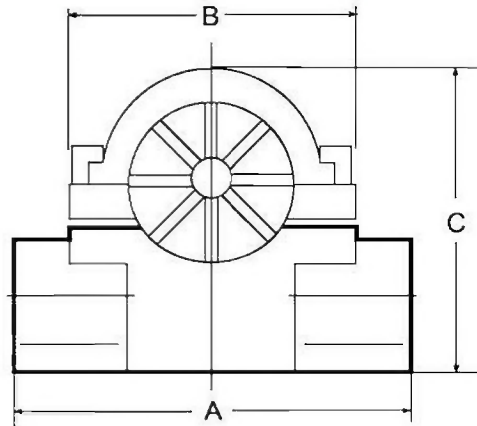
The installation of the flow indicator can be done in any way in the system. The flow direction should be observed.

The flow indicator must not be used as a supporting part in a pipe construction!

The medium must not contain any solid particles!
We recommend the installation of strainer type SFD or SFM.



Technical Data



Summary of types FAB

Type	Flowrate H ₂ O		Pressure drop (at v = 2 m/s)	DN	G	A	B	C	Weight
	min.	max.							
	[l/min]		[bar]	[mm]		[mm]	[mm]	[mm]	[kg]
FAB-8	0,7	30	0,14	8	1/4"	76	63	65	0,68
FAB-10	0,8	40	0,16	10	3/8"	76	63	65	0,65
FAB-15	1,0	55	0,22	15	1/2"	76	63	65	0,62
FAB-20	1,2	90	0,19	20	3/4"	89	63	83	1,25
FAB-25	1,5	140	0,50	25	1"	89	63	83	1,20

NPT-threads on request

Operating data	FAB	
Operating pressure max.:	PN 16 bar	
Operating temperature max.:	200 °C	
Pressure drop:	see summary of types	
Material	Bronze-version	Stainless steel-version
Body:	Bronze (LG2)	Stainless steel 1.4408
Clampring:	Bronze	Stainless steel
Spinner:	Plastic PPS yellow	
Sight glass:	Borosilikat	
O-ring:	Viton®	
Gaskets:	Klingersil® (C-4400)	
Screws:	Stainless steel	

FAB 2 0001 04-06 E M



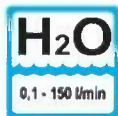
Flow indicator

KAA



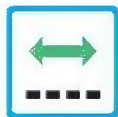
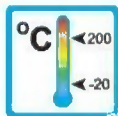
Operation

The KAA flow indicators are rising ball visual indicators. The flow lifts a Teflon[®] ball out of his base position. The ball rises depending on the flow and finally becomes full visible.



Application

The KAA flow indicators are used to indicate flow of liquid media. The glass visualizes colour changes and changes of media conditions. The flow indicators are for example used in following areas:



- Cooling systems
- Engineering
- Water treatment
- Medical industry
- Research and development

Features

The KAA series proves itself through reliable function and easy handling. Further characteristics of this type are:

- Large indication range
- High chemical resistance (stainless steel-version)
- High temperature durability
- Special threads on request

Installation hints

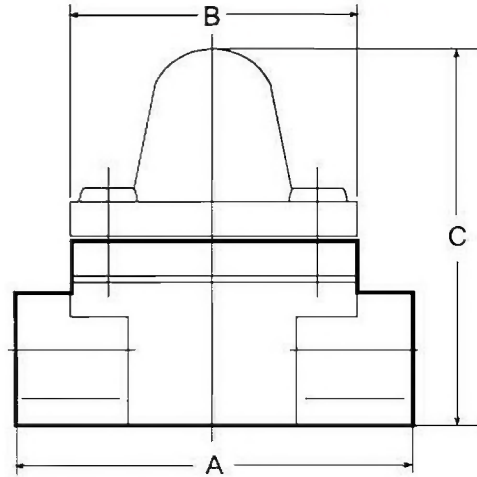
The KAA flow indicators must be mounted horizontal with the sight glass on top. The flow direction must be observed.

The flow monitor must not be used as a supporting part in a pipe construction!

The medium must not contain any solid particles!
We recommend the installation of strainers type SFD or SFM!



Technical Data



Summary of types KAA

Type	Flowrate (H ₂ O)			Pressure drop (at v = 2 m/s) [bar]	DN [mm]	G	A [mm]	B [mm]	C [mm]	Weight [kg]
	min. [l/min]	ball visible [l/min]	max. (recommended) [l/min]							
KAA-8	0,1	1,0	6	0,13	8	1/4"	76	63	79	0,72
KAA-10	0,1	1,0	10	0,16	10	3/8"	76	63	79	0,69
KAA-15	0,1	1,0	20	0,19	15	1/2"	76	63	79	0,65
KAA-20	2,4	5,2	40	0,16	20	3/4"	89	63	95	1,30
KAA-25	2,7	5,5	60	0,40	25	1"	89	63	95	1,25
KAA-32	11,0	16,0	100	0,20	32	1 1/4"	117	75	125	2,50
KAA-40	16,0	21,0	150	0,23	40	1 1/2"	117	75	125	2,35

NPT-thread on request

Operating data	KAA	
Operating pressure max.:	PN 16 bar	
Operating temperature max.:	200 °C	
Pressure drop:	see summary of types	
Material	Bronze-version	Stainless steel-version
Body:	Bronze (LG2)	stainless steel 1.4408
Clamp ring:	Bronze	stainless steel
Ball:	PTFE	
Sight glass:	Borosilikat	
O-ring:	Viton®	
Gaskets:	Klingersil® (C-4400)	
Screws:	stainless steel	

KAA 2 0002 05-06 E.M

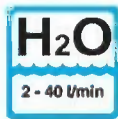


Flowmeter

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

Function

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

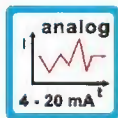
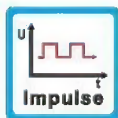
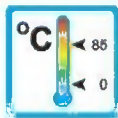


Application

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.

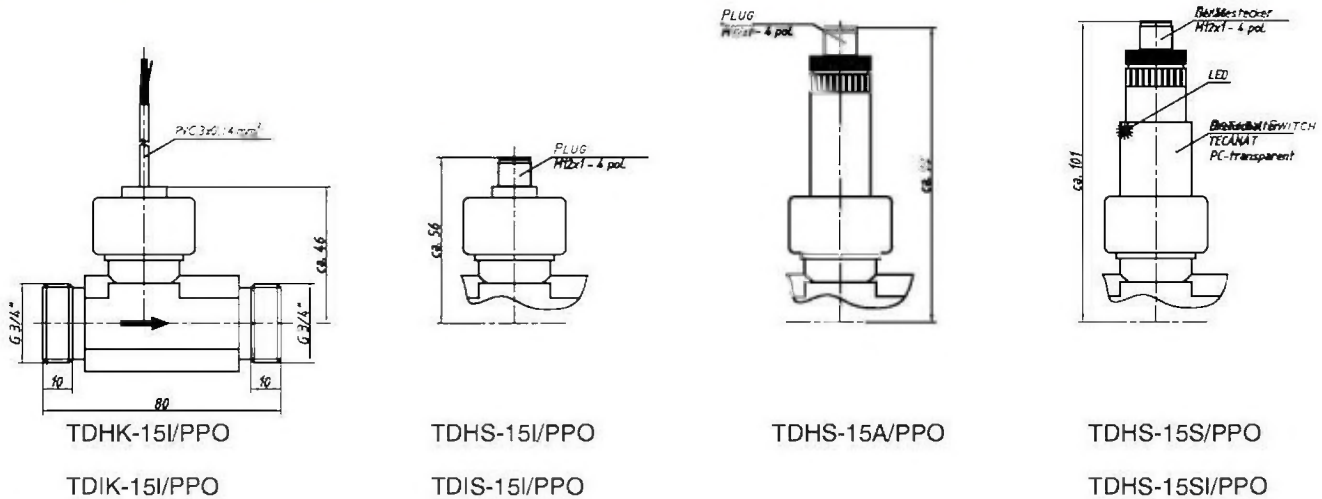
The medium must not contain any solids! We recommend the installation of a strainer.

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

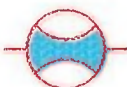
Type	Measuring value sensing		Output		
	Hall-Sensor	Inductive proximity switch	Impulse output (see page 3)	Analog output (see page 4)	Switch output (see page 4)
TDHK-15I/PPO	▲		▲		
TDIK-15I/PPO		▲	▲		
TDHS-15I/PPO	▲		▲		
TDIS-15I/PPO		▲	▲		
TDHS-15A/PPO	▲			▲	
TDHS-15S/PPO	▲				▲
TDHS-15SI/PPO	▲		▲	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

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:	2 - 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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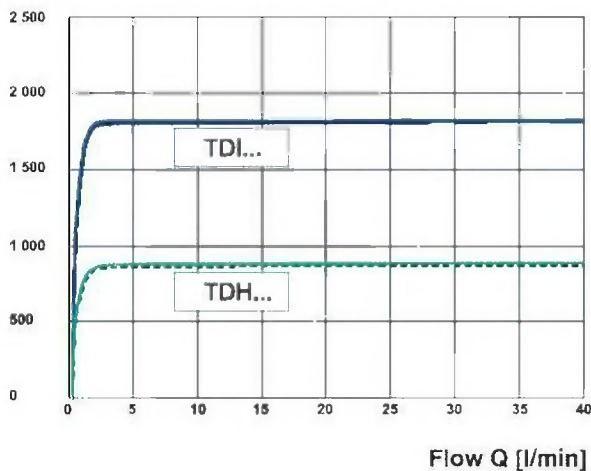


Materials, Technical data, Signal output

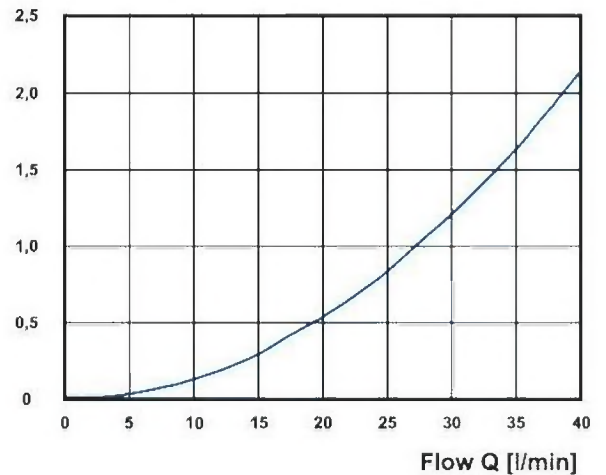
Materials

	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]



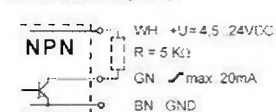
Pressure drop Δp [bar]



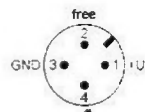
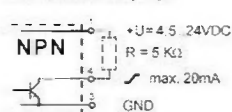
Technical data impulse output (TDHK-15l/PPO, TDHS-15l/PPO, TDIK-15l/PPO and TDIS-15l/PPO)

	Units with Hall-Sensor TDH...	Units with inductive proximity switch TDI...
Accuracy:	± 1% of range	± 0,5 % of range
Repeatability:	± 0,2 %	± 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
	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

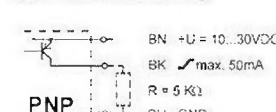
A1: TDHK-15l/PPO (Cable)



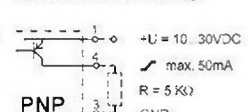
A2: TDHS-15l/PPO (Plug)



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



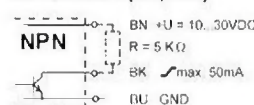
B2: TDIS-15l/PPO (PNP, Plug)



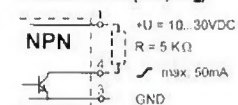
BK = black
BU = blue
WH = white

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)

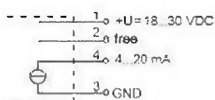
Accuracy:	± 1% of range			
Repeatability:	± 0,2%			
Output signal:	4...20 mA			
Current limit:	approx. 26 mA			
Scale:				
(Please state with order)	0...5 l/min	0...10 l/min	0...20 l/min	0...40 l/min
Power supply:	18...30 VDC			
Max. current consumption:	30 mA			
Max. ohmic resistance:	250 Ω against 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)

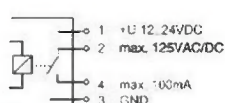
Switch point setup:	by rotary switch															
Switch point table:																
Switch position	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Switch point [l/min]	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,5	5,5	7,5	9,5	11,5	15,5	19,5	24,5	29,5
	Switch points for decreasing flow															
Switch hysteresis:	0,5 l/min 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															

TD-15/PPO 4 0002 08-05 E M

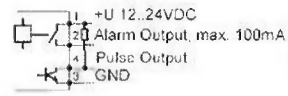
D1: TDHS-15A/PPO



E1: TDHS-15S/PPO



E2: TDHS-15SI/PPO



Flowmeter

TDH...-25.../MS TDI...-25.../MS



Function

The flowmeters type TDH...-25.../MS and TDI...-25.../MS are turbine flowmeters.

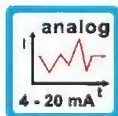
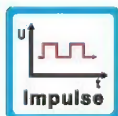
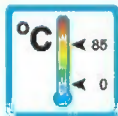


Application

The turbine flowmeters type TDH...-25.../MS and TDI...-25.../MS 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...-25.../MS are equipped with magnets and a Hall-sensor detects the rotation of the rotor.

The rotors of the series TDI...-25.../MS are equipped with Stainless Steel-pins and an inductive proximity switch detects the rotation.

Further characteristics of both series are:

- Large measuring range
- Sapphire/PA-seating
- High accuracy
- Outputs (alternatively): frequency-, analog- or switch output
- Sturdy Brass-Version

Installation hints

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

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

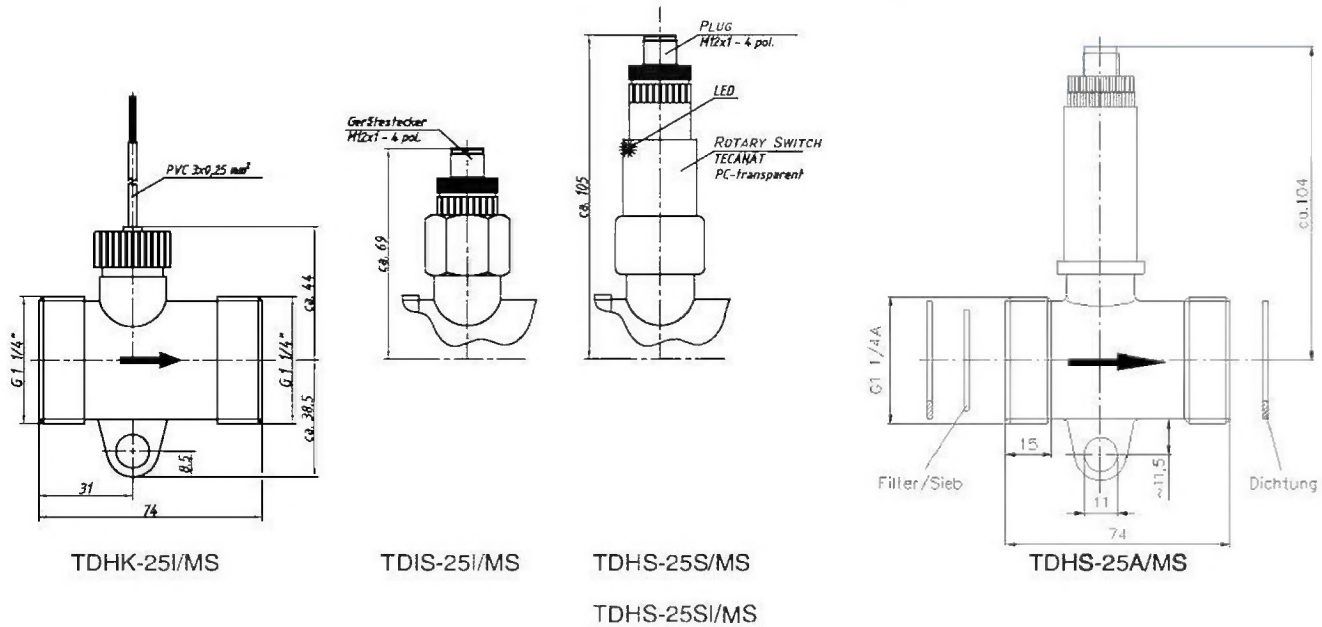
The medium must not contain any solids! We recommend the installation of a strainer.

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

The operating instructions for TDH...-25.../MS and TDI...-25.../MS must be observed under any circumstances.



Technical data



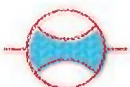
Versions

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-25I/MS	▲		▲		
TDIS-25I/MS		▲	▲		
TDHS-25S/MS	▲				▲
TDHS-25SI/MS	▲		▲		▲
TDHS-25A/MS	▲			▲	

Technical data

	Units with hall-sensor TDH...	Units with inductive proximity switch TDI...
Process connection:	G 1 1/4" male thread Additional connection fitting absolutely necessary	
Nominal size:	DN 25	
Max. medium temperature:	85 °C	60 °C
Nominal pressure:	PN 10	
Range:	4 - 160 l/min, at continuous load max 80 l/min	
Start of signal output:	1 l/min	
Max. size of solids in medium:	0,5 mm	
Electric connection:		
Cable connection (TDHK...)	2 m shielded PVC-cable	—
Plug (TDHS... or TDIS...)	$T_{max} = 75 °C$ 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 pages 3 and 4	
Options:		
Strainer	Screen strainer, screen aperture size 0,63 mm	

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Materials, Technical data, Signal output

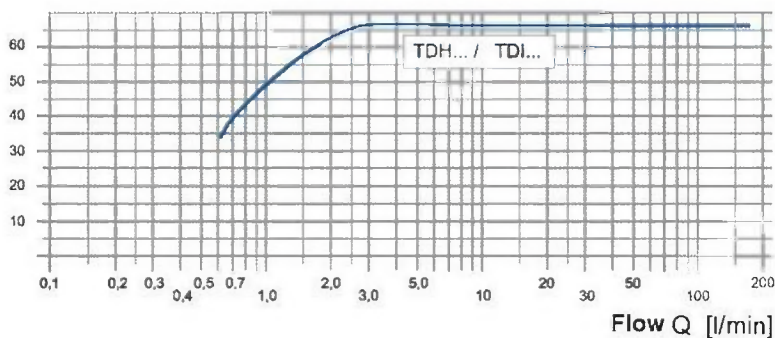
Materials

	Contact with medium?	Units with Hall-Sensor TDH...	Units with inductive proximity sensor TDI...
Measuring tube	yes	Brass (CuZn36Pb2As)	
Turbine chamber	yes	PA Grivory HTV4X1	
Impeller	yes	PP	
Impeller magnets	yes	Permanent magnets, Recona 28 nickel-plated	Stainless Steel 1.4571
Axle	yes	Stainless Steel 1.4436	
Bearing	yes	Saphir / PA	
Sensor bush	yes	POM Delrin 100 P	
O-Ring	yes	72 NBR 872	
Strainer (option)	yes	Stainless Steel 1.4301 (according O-Ring: 70 EPDM 281)	

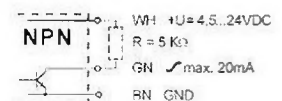
Technical data impulse output (TDHK-25I/MS, TDIS-25I/MS)

	Units with Hall-Sensor TDH...	Units with inductive proximity sensor TDI...
Accuracy:	± 3 % of range	
Repeatability:	± 0,5 %	
Output signal:		
Pulse rate / K-factor	67 Pulses / Liter	
Resolution	15 ml / Pulse	
Signal form	square wave NPN open collector	square wave PNP open collector
Signal current	max. 100 mA	max. 10 mA
Diagram of connection	A1 (see below)	B1 (see below)
Start of signal output:	1 l/min	

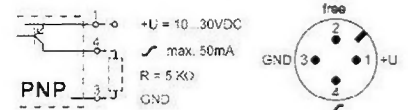
Pulse rate [1/l]



A1: TDHK-25I/MS (Cable)

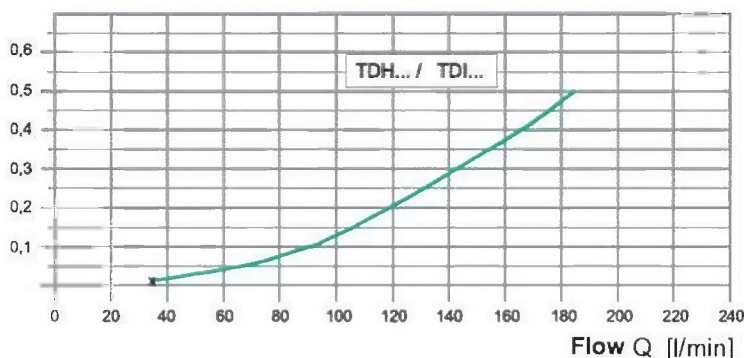


B1: TDIS-25I/MS (PNP, Plug)

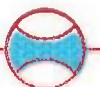


BK = black BN = brown
 BU = blue GN = green
 WH = white

Pressure drop Δp [bar]



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Electric output

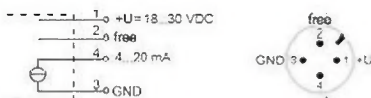
Technical data analog output (TDHS-25A/MS)

Accuracy:	± 3% of range			
Repeatability:	± 0,5%			
Output signal:	4...20 mA			
Current limit:	approx. 26 mA			
Scale:				
(Please state with order)	0...60 l/min	0...100 l/min	0...160 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:	C1			
Max. medium temperature:	85 °C			
Material measuring transducer housing:	Brass			

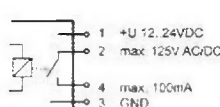
Technical data Switch output (TDHS-25S/MS) / Switch output + Pulse output (TDHS-25SI/MS)

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 increasing flow [l/min]	3	5	8	8	10	12	15	18	20	25	30	35	40	50	70	100
Switch point decreasing flow [l/min]	5	7	8	10	12	14	17	20	22	27	33	38	44	55	75	105
Accuracy:	± 0,8 l/min ±4 % of selected switch point															
Output:																
TDHS-25S/MS (Switch output only)	potential free contact, opens below setpoint contact rating max. 125 VAC/DC, 100 mA															
TDHS-25SI/MS (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															
Electric connection:	4-Pin Plug, M12x1															
Diagram of connection:	D1 and D2 (see below)															
Max. medium temperature:	80 °C															
Housing material:	Plastic PA, transparent															

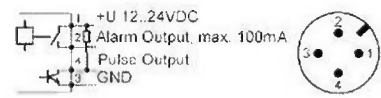
C1: TDHS-25A/MS



D1: TDHS-25S/MS



D2: TDHS-25SI/MS



TDH...-25.../PP



Function

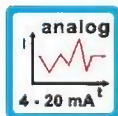
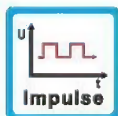
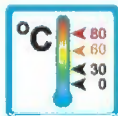
The flowmeters type TDH...-25.../PP are turbine flowmeters.



Application

The turbine flowmeters type TDH...-25.../PP 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...-25.../PP are equipped with magnets and a Hall-sensor detects the rotation of the rotor.

Further characteristics of the series are:

- Large measuring range
- Sapphire/PA-seating
- High accuracy
- Outputs (alternatively):
frequency-, analog- or switch output
- PP-Version

Installation hints

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

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

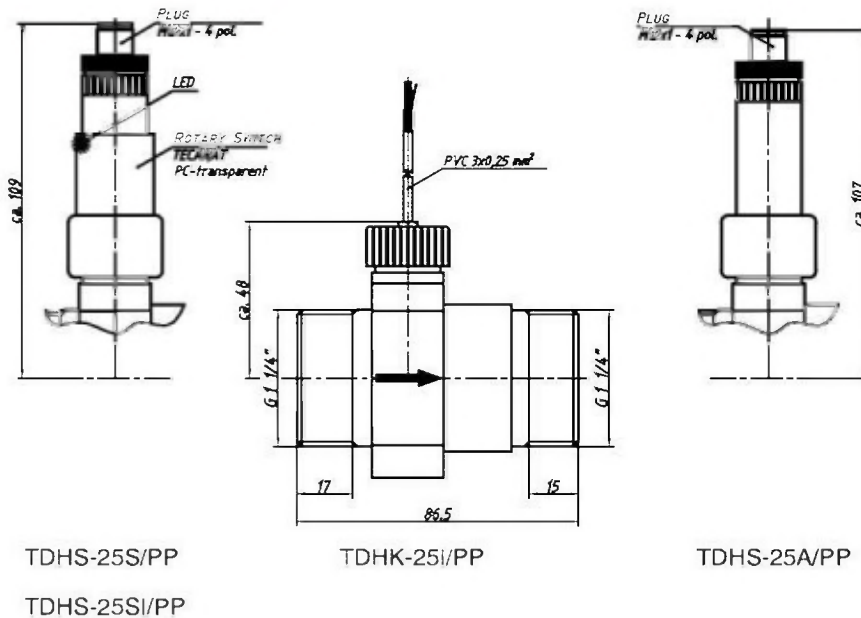
The medium must not contain any solids! We recommend the installation of a strainer.

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

The operating instructions for TD...-25.../PP must be observed under any circumstances.



Technical Data



TDHS-25S/PP
TDHS-25SI/PP

TDHK-25I/PP

TDHS-25A/PP

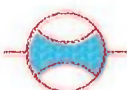
Versions

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-25I/PP	▲		▲		
TDHS-25A/PP	▲			▲	
TDHS-25S/PP	▲				▲
TDHS-25SI/PP	▲		▲		▲

Technical data

	Units with hall-sensor TDH...			
Process connection:	G 1 1/4" male thread			
Nominal size:	DN 25			
Max. medium temperature:	30 °C at 10 bar	60 °C at 5 bar	80 °C at 2 bar	
Nominal pressure:	PN 10 (see max. medium temperature)			
Range:	4 - 160 l/min, at continuous load max 80 l/min			
Start of signal output:	1 l/min			
Max. size of solids in medium:	0,5 mm			
Electric connection:				
Cable connection (TDHK...)	2 m shielded PVC-cable			
Plug (TDHS...)	T _{max} = 75 °C 4-Pin-Plug M12x1			
Power supply (Pulse output):	4,5...24 VDC			
Ingress protection:	IP 54			
Electric output:	see pages 3 and 4			
Options:				
Strainer	Screen strainer, screen aperture size 0,63 mm			

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Materials, Technical data, Signal output

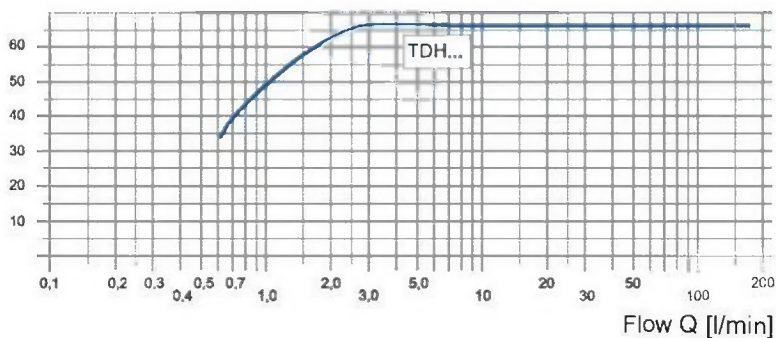
Materials

	Contact with medium?	Units with Hall-Sensor TDH...
Measuring tube	yes	PP
Turbine chamber	yes	PA Grivory HTV4X1
Impeller	yes	PP
Impeller magnets	yes	Permanent magnets, Recona 28 nickel-plated
Axis	yes	Stainless Steel 1.4436
Bearing	yes	Saphir / PA
Sensor bush	yes	POM Delrin 100 P
O-Ring	yes	72 NBR 872
Strainer (option)	yes	Stainless Steel 1.4301 (according O-Ring: 70 EPDM 281)

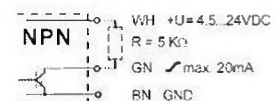
Technical data impulse output (TDHK-25I/PP)

	Units with Hall-Sensor TDH...
Accuracy:	± 3 % of range
Repeatability:	± 0,5 %
Output signal:	
Pulse rate / K-factor	67 Pulses / Liter
Resolution	15 ml / Pulse
Signal form	square wave
	NPN open collector
Signal current	max 100 mA
Diagram of connection	A1 (see below)
Start of signal output:	1 l/min

Pulse rate [1/l]

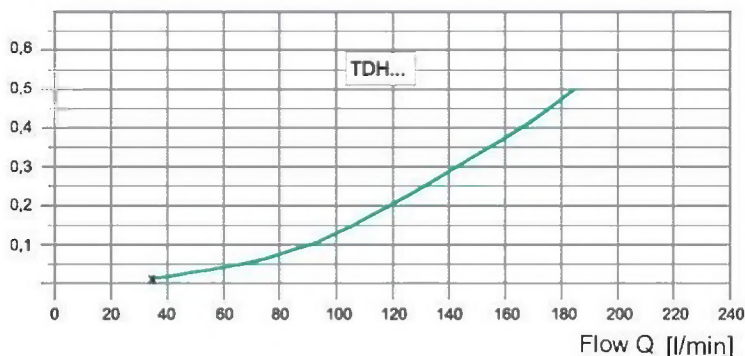


A1: TDHK-25I/PP (Cable)



BK = black BN = brown
 BU = blue GN = green
 WH = white

Pressure drop Δp [bar]



TD-25/PP 3 0001 04-05 E M



Electric output

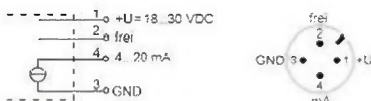
Technical data analog output (TDHS-25A/PP)

Accuracy:	± 3% of range		
Repeatability:	± 0,5%		
Output signal:	4...20 mA		
Current limit:	approx. 26 mA		
Scale:			
(Please state with order)	0...60 l/min	0...100 l/min	0...160 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:	B1		
Max. medium temperature:	30 °C at 10 bar	60 °C at 5 bar	80 °C at 2 bar
Material measuring transducer housing:	Plastic PA		

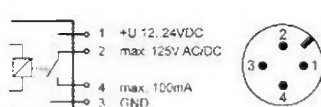
Technical data Switch output (TDHS-25S/PP) / Switch output + Pulse output (TDHS-25SI/PP)

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 increasing flow [l/min]	3	5	8	8	10	12	15	18	20	25	30	35	40	50	70	100
Switch point decreasing flow [l/min]	5	7	8	10	12	14	17	20	22	27	33	38	44	55	75	105
Accuracy:	± 0,8 l/min ±4 % of selected switch point															
Output:																
TDHS-25S/PP (Switch output only)	potential free contact, opens below setpoint contact rating max. 125 VAC/DC, 100 mA															
TDHS-25SI/PP (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															
Electric connection:	4-Pin Plug, M12x1															
Diagram of connection:	C1 and C2 (see below)															
Max. medium temperature:	30 °C at 10 bar	60 °C at 5 bar	80 °C at 2 bar													
Housing material:	Plastic PA, transparent															

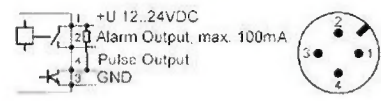
B1: TDHS-25A/PP



C1: TDHS-25S/PP



C2: TDHS-25SI/PP

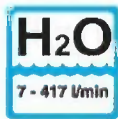


Flowmeter

TDH...-40.../MS TDI...-40.../MS

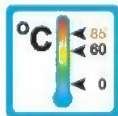
Function

The flowmeters type TDH...-40.../MS and TDI...-40.../MS are turbine flowmeters.



Application

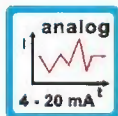
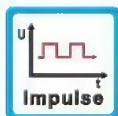
The turbine flowmeters type TDH...-40.../MS and TDI...-40.../MS are employed to measure and monitor volume flow of liquids.



Areas of application:



- Research and development
- Mechanical engineering
- Plant construction



Features

The rotors of the series TDH...-40.../MS are equipped with magnets and a Hall-sensor detects the rotation of the rotor.

The rotors of the series TDI...-40.../MS are equipped with stainless steel-pins and an inductive proximity switch detects the rotation. Further characteristics of both series are:

- Large measuring range
- Sapphire/PA-seating
- High accuracy
- Outputs (alternatively): frequency-, analog- or switch output
- Sturdy brass-version
- Integrated strainer

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.

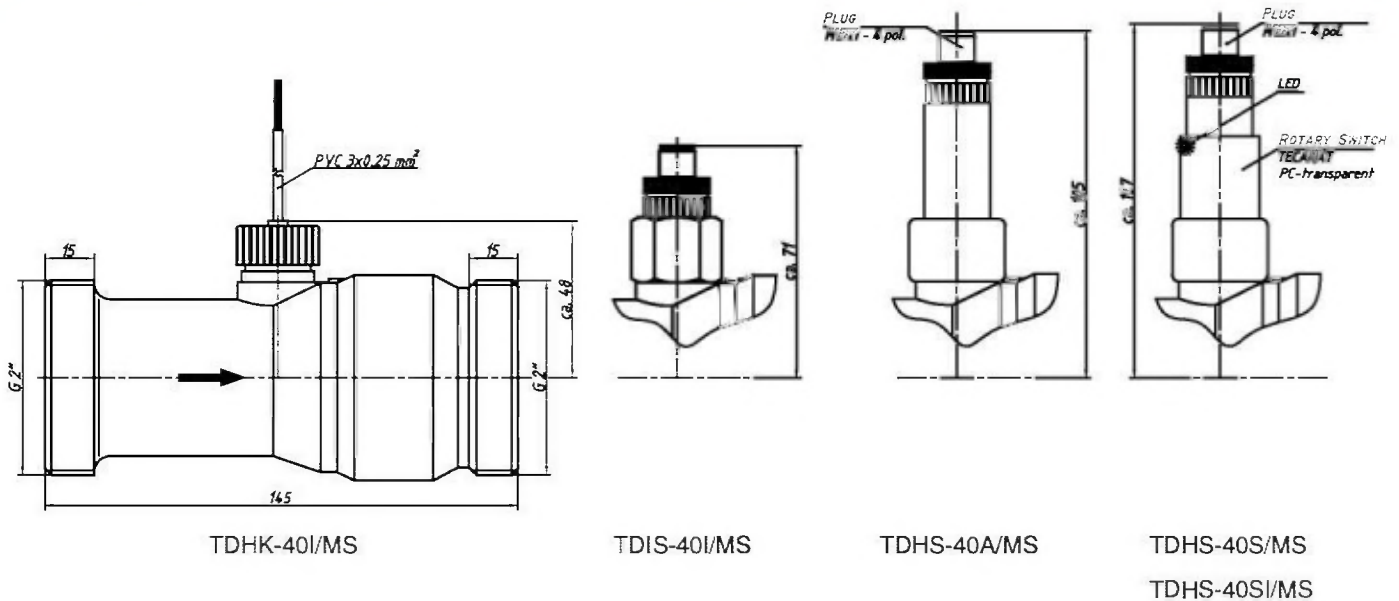
The medium must not contain any solids!

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

The operating instructions for TDH...-40.../MS and TDI...-40.../MS must be observed under any circumstances.



Technical data



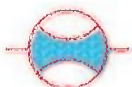
Versions

Type	Sensing method		Output		
	Hall-Sensor	Inductive proximity switch	Impulse output (see page 3)	Analog output (see page 4)	Switch output (see page 4)
TDHK-40I/MS	▲		▲		
TDIS-40I/MS		▲	▲		
TDHS-40A/MS	▲			▲	
TDHS-40S/MS	▲				▲
TDHS-40SI/MS	▲		▲		▲

Technical data

	Units with Hall-Sensor TDH...	Units with inductive proximity switch TDI...
Process connection:	G 2" male thread Additional connection fitting recommended!	
Nominal size:	DN 40	
max. medium temperature:	85 °C	60 °C
Nominal pressure:	PN 10	
Range:	6,7 - 417 l/min (0,4...25 m³/h)	
Start of signal output:	0,1 m³/h	
max. size of solids in medium:	0,5 mm	
Electric connection:		
Cable connection (TDHK...)	2 m shielded PVC-cable	—
	$T_{max} = 75\text{ °C}$	—
Plug (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 pages 3 and 4	
Integrated strainer:	plain strainer, screen aperture size 0,63 mm	

TD -40/MS 2 0001 05-05 E M



Materials, technical data, signal output

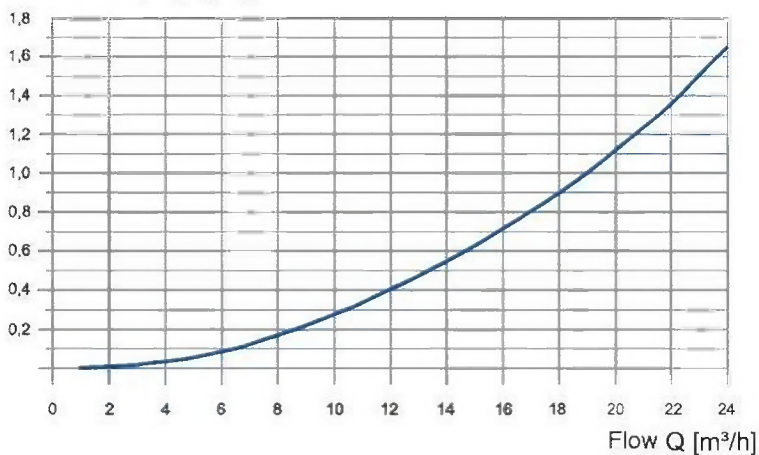
Materials

	Wetted part?	Units with Hall-sensor	Units with inductive proximity switch
		TDH...	TDI...
Measuring tube	yes	brass (CuZn36Pb2As)	
Turbine chamber	yes	PA Grivory HTV4X1	
Impeller	yes	PP	
Impeller magnets	yes	permanent magnets, nickel-plated Recona 28	stainless steel 1.4571
Axis	yes	stainless steel 1.4436	
Bearing	yes	sapphire / PA	
Sensor bush	yes	POM Delrin® 100 P	
O-ring	yes	72 NBR 872	
Flow straightening cone	yes	POM Celcom	
Strainer	yes	stainless steel 1.4301	
Guard ring	yes	bronze 2.1030.34	

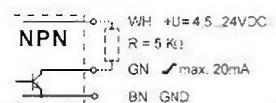
Technical data impulse output (TDHK-40/MS, TDIS-40/MS)

	Units with Hall-sensor	Units with inductive proximity switch
	TDH...	TDI...
Accuracy:		
0,4... 3 m³/h	± 5 % of range	
3 ...25 m³/h	± 3 % of range	
Repeatability:	± 0,5 %	
Output signal:		
Pulse rate	26,6 Pulses / Liter	
Resolution	37,6 ml / Pulse	
Signal form	square wave NPN open collector	square wave PNP open collector
Signal current	max. 100 mA	max. 10 mA
Connection diagram	A1 (see below)	B1 (see below)
Start of signal output:	0,1 m³/h	

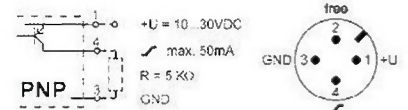
Pressure drop Δp [bar]



A1: TDHK-40/MS (Cable)



B1: TDIS-40/MS (PNP, Plug)



BK = black BN = brown
 BU = blue GN = green
 WH = white

TD -40 /MS 3 0001 08-05 E M



Electric output

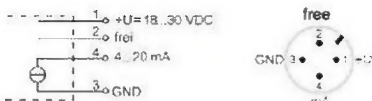
Technical data analog output (TDHS-40A/MS)

Accuracy:			
0,4... 3 m ³ /h		± 5 % of range	
3 ...25 m ³ /h		± 3 % of range	
Repeatability:		± 0,5%	
Output signal:		4...20 mA	
Current limit:		approx. 26 mA	
Range:			
(Please state with order)	0...150 l/min	0...250 l/min	0...400 l/min
Power supply:		18...30 VDC	
max. current consumption:		30 mA	
max. load:		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	
Connection diagram:		C1	
max. medium temperature:		80 °C	
Measuring transducer housing material:		plastic PA	

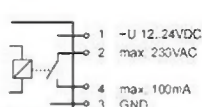
Technical data Switch output (TDHS-40S/MS) / Switch output + Pulse output (TDHS-40SI/MS)

Switch point setup:	by rotary switch															
Switch point table:																
Switch point	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Switch point decreasing flow [l/min]	7	10	15	20	25	30	35	40	50	65	80	100	130	160	200	275
Switch point increasing flow [l/min]	10	13	19	24	30	35	40	47	58	75	90	115	150	190	230	310
Accuracy:	± 2,0 l/min ±6 % of selected switch point															
Output:																
TDHS-40S/MS (Switch output only)	potential free contact, opens below setpoint contact rating max. 125 VAC/DC, 100 mA															
TDHS-25SI/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															
Electric connection:	4-Pin Plug, M12x1															
Connection diagram:	D1 and D2 (see below)															
max. medium temperature:	80 °C															
Housing material:	plastic PA, transparent															

C1: TDHS-40A/MS



D1: TDHS-40S/MS



D2: TDHS-40SI/MS

