

Target disk flowmeters Series DP

Metallic flowmeter for liquids and gases

- Metallic, simple and robust construction
- Available for all flow directions
- Suitable for extreme pressure and temperature conditions
- Low pressure drop
- Straight pipe run requirement of only 3 x DN before and after the flowmeter
- Provides a good measurement for fluids containing suspended solids
- Flow rate:
 - Water: 0.8 m³/h ... 1600 m³/h
 - Air: 45 Nm³/h ... 24000 Nm³/h
- Accuracy: ±2.5% f.s. (±1.6% f.s. on request)
- Connections:
 - DP65: DN40 ... DN300, between flanges (wafer)
 - DP500: DN250 ... DN500, with EN 1092-1 flanges

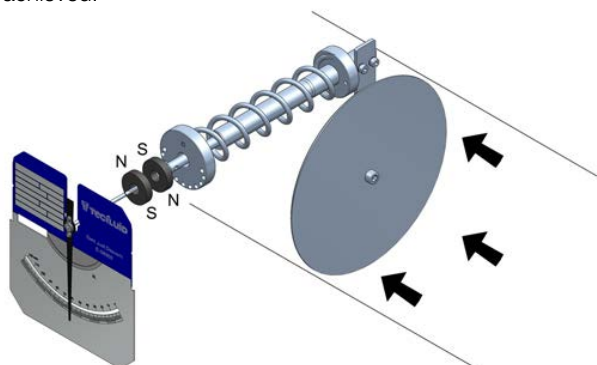
Other flange standards on request
- Materials: EN 1.4404 (AISI 316L), plastic coated steel
- Local indication
- Options:
 - 1 or 2 limit switches
 - Electronic transmitter with 4-20 mA analog output for safe or hazardous area (Ex ia IIC T4 or T6 protection, ATEX certified). HART protocol available on request
 - Local volume totalizer. Remote volume totalizer by means of pulse output (not available for Ex transmitters)



Working principle

A target disk flowmeter is based on the indirect measurement of the force which is exerted on a disk suspended in the trajectory where a fluid flows at a certain speed.

The disk is held by a shaft which is perpendicular to the fluid direction, so that the force applied by it affects the shaft rotation. At the same time, a spring attached to the shaft is opposed to its turn. When the force applied on the spring is equal to the force exerted by the fluid, an equilibrium point of the turn angle of the disk, which is equivalent to a flow rate, is achieved.



The flow reading is made by means of magnetic coupling with the housing indication system, thus avoiding fluid leakage to it.

Applications

- Water treatment & distribution
- Pharmaceutical, chemical and paper industry
- Heating and cooling circuits
- Swimming pools
- Fire protection systems
- Automotive industry (cutting oil, paint lines and refrigeration systems)
- Power plants and lubrication oil circuits

Models

- DP65 mounting between flanges (wafer)
- DP500 mounting with flanged connection
- DP65 ... DP500/Fe R body in plastic coated steel
- DP65 ... DP500/Fe body in steel
- DP65 ... DP500/INOX body in EN 1.4404 (AISI 316L)

Technical data

- Accuracy:
 - DP65: $\pm 2.5\%$ full scale
 $\pm 1.6\%$ full scale on request
 - DP500: $\pm 4\%$ full scale
- Direct scales in engineering units or in %

- Straight pipe run required of 3 x DN before and after the flowmeter

• Fluid temperature:

- Body in plastic coated steel: -20°C ... +130°C
- Body in EN 1.4404 (AISI 316L)
PTFE bearings: -20°C ... +150°C
- Body in EN 1.4404 (AISI 316L)
Bronze bearings: -20°C ... +300°C

For higher temperatures, see thermal separator p. 5

- Ambient temperature: -20°C ... +80°C

• Working pressure:

- DP65:
 - DN40 ... DN80: PN40
 - DN100 ... DN300: PN16
- DP500:
 - DN250 ... DN500: PN10

Other pressure ratings available on request

• Connections:

- DP65: DN40 ... DN300, mounting between flanges
Counterflanges and gaskets not supplied
- DP500: DN250 ... DN500, with EN 1092-1 flanges

Other flange standards on request

• Mounting length:

- DP65: DN40 ... DN300: 65 mm
- DP500: DN250 ... DN300: 500 mm
DN350 ... DN400: 600 mm
DN500: 700 mm

- Housing: IP65 - coated aluminium (IP65 - PP or IP67 - EN 1.4404 (AISI 316L) with glass window, on request)

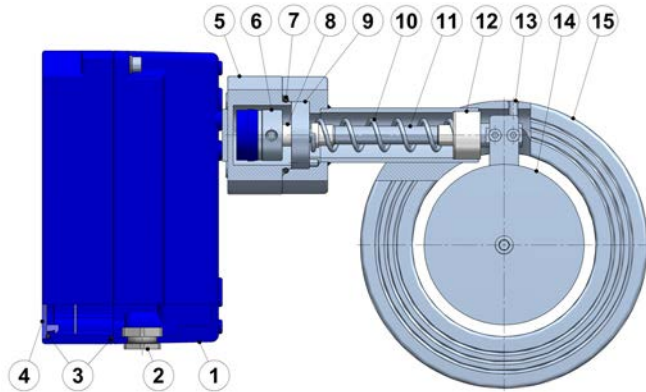
Operation

- Vertical with upwards flow (BD)
- Vertical with downwards flow (DAB)
- Horizontal with left to right flow (ED)
- Horizontal with right to left flow (DES)

Limit switches and transmitters

- DP-AMM1 ... 2: 1 or 2 adjustable micro-switches
- DP-AMD1 ... 2: 1 or 2 adjustable inductive detectors (+ relays on request)
- TH7 ... TH7H: 4-20 mA transmitter 2 wires + pulse output. HART protocol with model TH7H
- TH7T ... TH7TH: 4-20 mA transmitter + totalizer 2 wires + pulse output. HART protocol with model TH7TH
- TH7 Ex ... TH7H Ex: 4-20 mA transmitter 2 wires Ex ia IIC T4 or T6 (ATEX). HART protocol with model TH7H Ex
- TH7T Ex ... TH7TH Ex: 4-20 mA transmitter + totalizer 2 wires Ex ia IIC T4 or T6 (ATEX). HART protocol with model TH7TH Ex

Materials



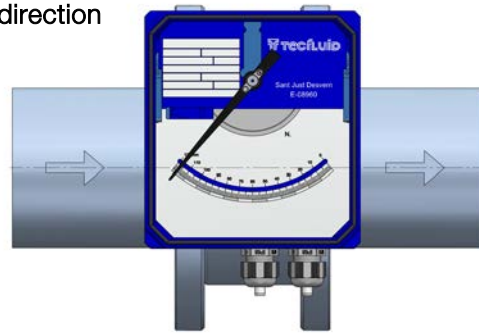
N°	Description	Materials	
		DP65 Fe R	DP65 INOX
1	Scale plate	Coated aluminium	
2	Plug/gland M16 + gasket	Polyamide + NBR	
3	Gasket	NBR	
4	Window	Polycarbonate *	
5	Closing disk	EN 1.4404 (AISI 316L)	
6	Magnet group	EN 1.4404 (AISI 316L) + Alnico (coated)	
7	Gasket	NBR	
8	Bearing	PTFE / Bronze	
9	Shaft support disk	EN 1.4401 (AISI 316)	
10	Spring	EN 1.4310 (AISI 304)	
11	Shaft	EN 1.4401 (AISI 316)	
12	Bearing	PTFE / Bronze	
13	Disk stop	EN 1.4404 (AISI 316L)	
14	Disk	EN 1.4404 (AISI 316L)	
15	Body	Polyamide	EN 1.4404
		coated steel	(AISI 316L)

* UV resistant

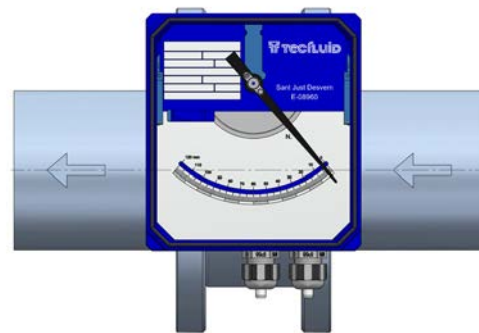
Target disk flowmeters Series DP

Mounting

Flow direction



ED



DES

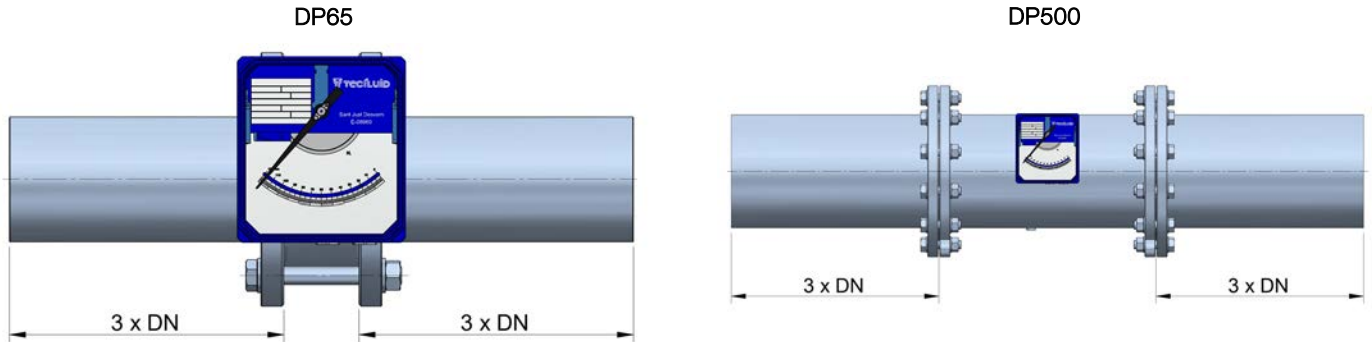


DAB



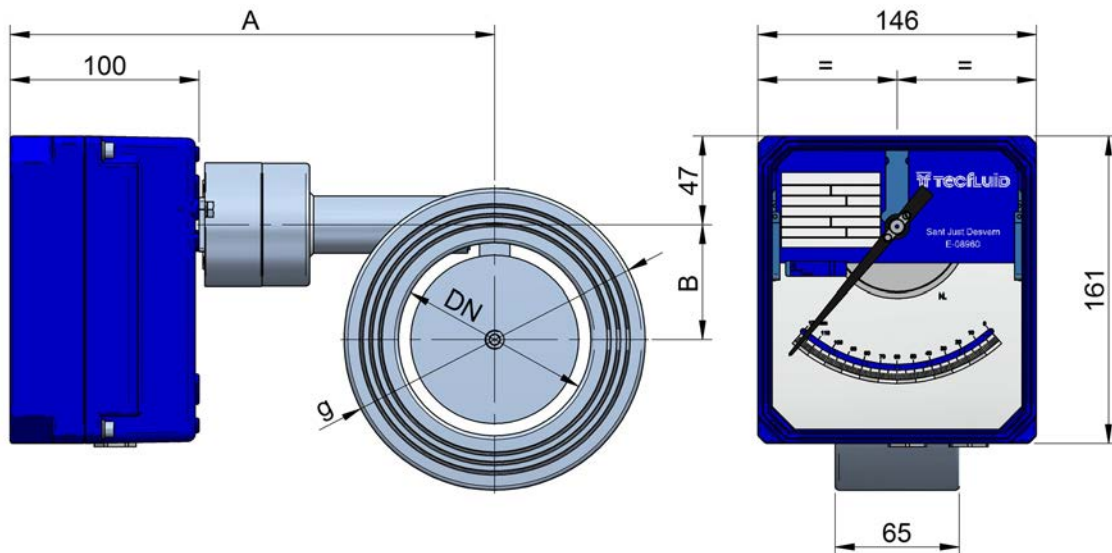
BD

Straight pipe run requirement



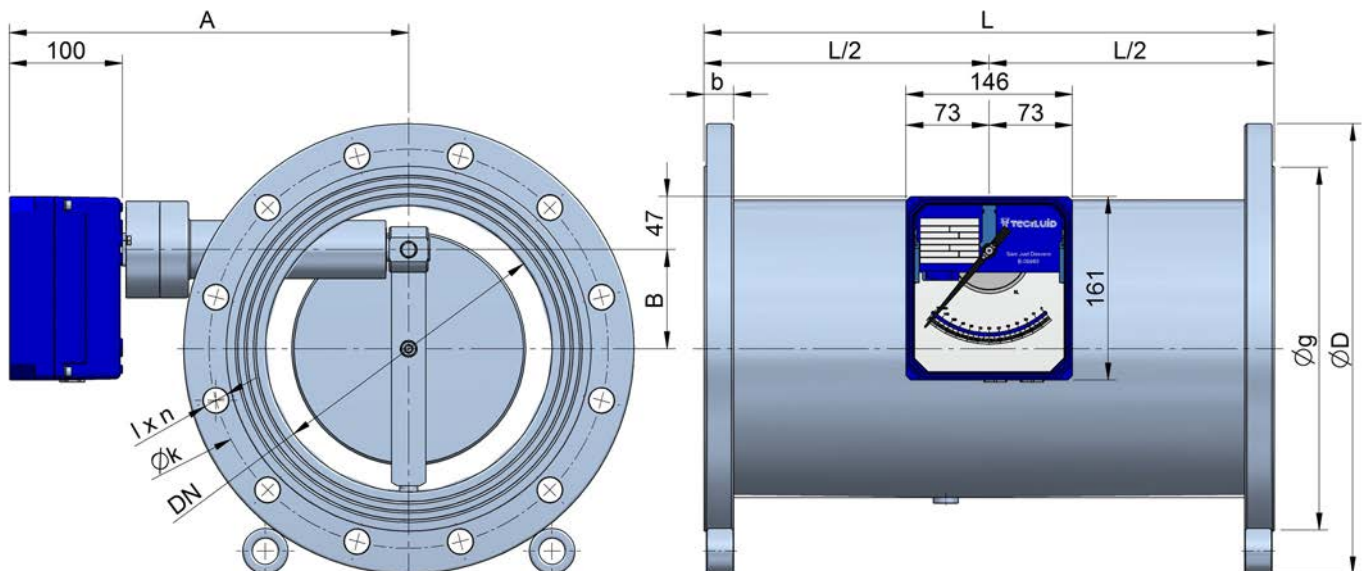
Dimensions

Model DP65 (DN40 ... DN300)



For dimensions g, B y A, please refer to page 5

Model DP500 (DN250 ... DN500)



For dimensions L, A, B, Ø D, Ø k, Ø g, b y l x n, please refer to page 5

Flow ranges

Model DP65 (DN40 ... DN300)

DN	Flow scales						Weights and dimensions			
	m ³ /h water						g	B	A	Weight (kg)
40	0.8-4	0.8-6	1-8	2-10	3-16	-	88	28	250	5
50	0.8-6	1-8	2-10	3-16	3-25	-	102	33	250	6
65	2-10	3-16	3-25	4-30	5-35	6-40	122	40	250	7
80	2-16	3-25	5-40	6-45	8-50	10-60	138	50	250	8
100	5-40	8-60	10-80	12-90	15-100	-	158	60	250	10
125	8-60	15-100	15-120	20-135	-	-	188	70	280	12
150	15-100	20-160	25-200	40-220	50-250	-	212	78	280	14
200	20-160	30-250	40-350	50-400	-	-	268	90	320	20
250	25-200	50-400	60-500	80-600	-	-	320	102	350	29
300	30-250	50-400	80-600	100-800	-	-	370	115	370	35

Equivalent scales for Air @ 1.013 bar abs, 20°C in Nm³/h = m³/h H₂O x 30 (approx.)

Model DP500 (DN250 ... DN500)

DN	Flow scales			Weights and dimensions								
	m ³ /h water			L	A	B	Ø D	Ø k	Ø g	b	l x n	Weight (kg)
250	25-200	50-400	60-500	500	330	90	395	350	320	26	23 x 12	70
300	30-250	50-400	80-600	500	330	115	445	400	370	26	23 x 12	78
350	40-300	60-500	100-800	600	350	124	505	460	430	26	23 x 16	86
400	50-400	80-600	120-1000	600	350	142	565	515	482	26	27 x 16	97
500	80-600	120-1000	200-1600	700	430	160	670	620	585	28	27 x 20	115

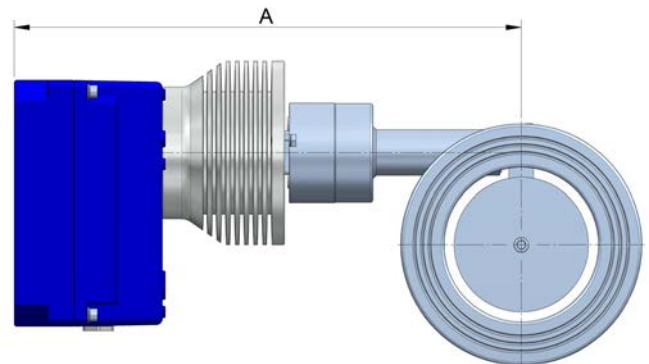
Equivalent scales for Air @ 1.013 bar abs, 20°C in Nm³/h = m³/h H₂O x 30 (approx.)

Accessories

Thermal separator

- Standard in aluminium, optional in EN 1.4404 (AISI 316L)
- For working with fluids at high and low temperatures
- Body in steel and EN 1.4404 (AISI 316L):
 - With electronics:

DN40 ... DN100:	+400°C
DN125 ... DN150:	+320°C
DN200 ... DN300:	+280°C
DN350 ... DN500:	+250°C
 - Without electronics: DN40 ... DN500: +400°C
- Reference ambient temperature: 20°C

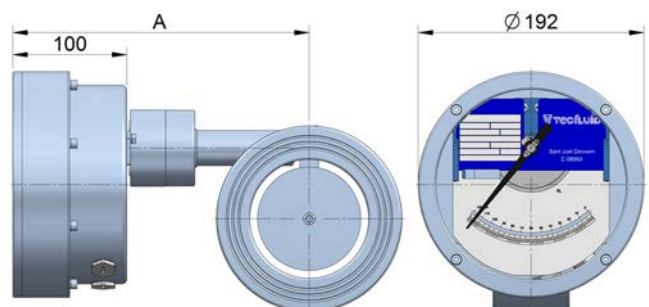


	DN	40 ... 100	125	150	200	250	300	350	400	500
DP65	A	325	355	355	395	425	443			
DP500	A					405	405	425	425	505

Stainless steel housing

- Specially indicated for working within sanitary or sterile installations, saline atmospheres (marine platforms), etc.
- All stainless steel construction EN 1.4404 (AISI 316L), with glass window
- Can fit standard limit switches and TH transmitters
- Ingress protection: IP67

A distance is the same as for standard aluminium housing



Limit switches

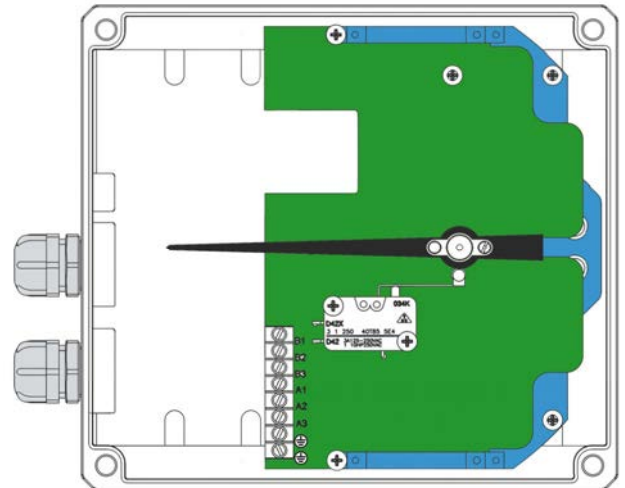
Adjustable limit switch DP-AMM



Electrical micro-switch mounted in the indicator housing.

- DP-AMM1 ... 2: 1 ... 2 adjustable limit switches
- Ratings: 3(1) A, 250 V (VDE/CEE)
- Hysteresis: $\pm 10\%$ of full scale value
- Ambient temperature: -25°C ... $+80^{\circ}\text{C}$
- Mechanical life: 10^7 operations
- ATEX certificate Ex ia IIC T6

Gold plated contacts on request.



DP-AMM

Adjustable limit switch DP-AMD



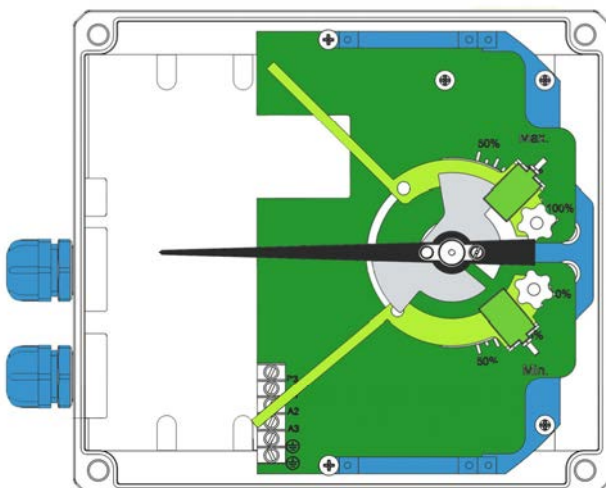
NAMUR (EN 60947-5-6) 3.5 mm slot type inductive detector activated by vane, mounted in the indicator housing.

- DP-AMD1 ... 2: 1 ... 2 adjustable limit switches
- Power supply: 8 VDC
- Ambient temperature: -25°C ... $+70^{\circ}\text{C}$
- ATEX certificate Ex ia IIC T6

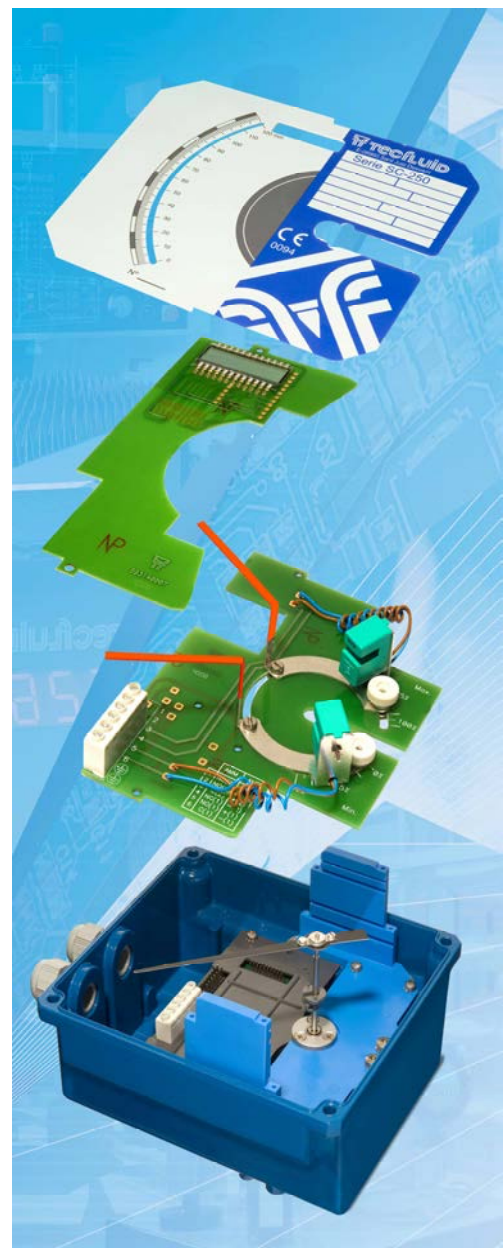
Control relay (on request)

NAMUR (EN 60947-5-6) for 1 or 2 inductive detectors.

- Power supply: 24 ... 253 VAC 50-60 Hz
24 ... 300 VDC
- Input: NAMUR Ex ia IIC
- Output: 1 or 2 relay contacts
- Output rating: 2 A 250 VAC 100 VA / 1 A 24 VDC
- Ambient temperature: -20°C ... $+60^{\circ}\text{C}$



DP-AMD



Modular housing

Target disk flowmeters

Series DP

Transmitters and totalizers

Transmitter TH7



The TH7 electronic transmitters provide an analog output proportional to the flow rate and a digital output selectable either as a pulse or an alarm output (except for the Ex versions). They can also include a display for volume totalization. They are based on the Hall effect and mounted inside the indicator housing.

- TH7 transmitter
- TH7H transmitter + HART protocol
- TH7T transmitter + totalizer
- TH7TH transmitter + totalizer + HART protocol

Technical data

- Power supply: 12 ... 36 VDC, 2-wire system
- Power consumption: 4-20 mA for 0 ... 100% of scale
- 4-20 mA analog output:

- Error: < 0.6% of the magnet position
- Maximum load in 4-20 mA loop: 1.1 k Ω (with 36 VDC power supply)

- Digital output: Potential free N channel MOSFET, I_{max} 200 mA, for either pulse or alarm output:

- Pulse output:
 - Max. frequency 6 Hz
 - Pulse duration approx. 62.5 ms
- Alarm output, adjustable in one point of the scale. Programmable by means of Winsmeter TH7 software

- Totalizer: 8 digits, 4.5 mm high
- Reset by potential free contact
- Ambient temperature: -5°C ... +70°C
- Easy programmable by means of software, available online.

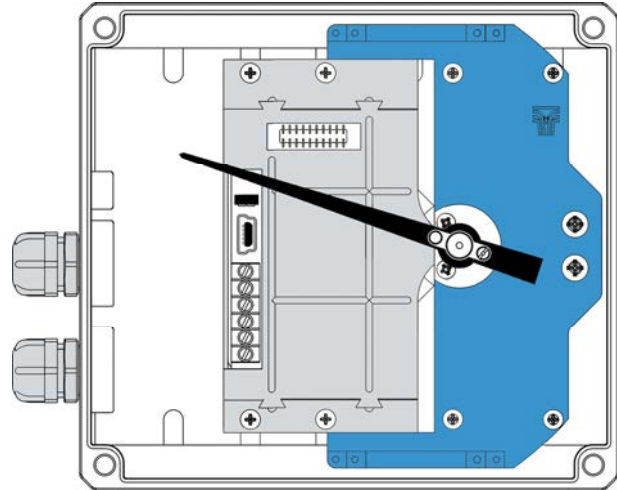
ATEX version (Ex ia IIC T4 or T6)

Technical data

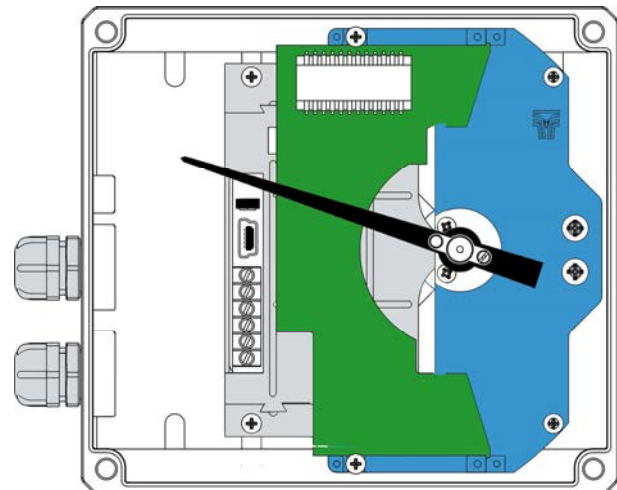
- ATEX certificate Ex II 1 GD
- Power supply: 14 ... 30 VDC, 2-wire system
- Power consumption: 4-20 mA for 0 ... 100% of scale
- 4-20 mA analog output:

- Error: <0.6% of the magnet position
- Maximum load in 4-20 mA loop: 900 Ω (with 30 VDC power supply)

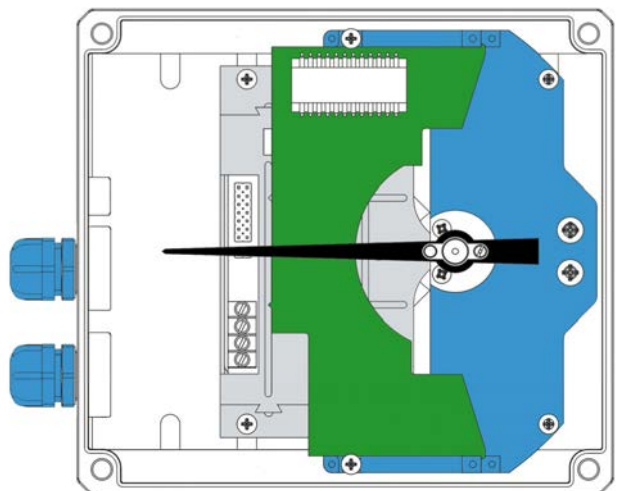
- Totalizer: 8 digits, 4.5 mm high
- Reset by potential free contact
- Ambient temperature: -5°C ... +40°C



TH7



TH7T



TH7T Ex

Both limit switches AMM or AMD and electronic transmitters TH7 or TH7T can be mounted together in the same housing. The TH7 Ex and TH7T Ex transmitters belong to group II. They are intended for use in potentially explosive atmospheres, except in mining

