

## Target disk flowmeters Series DP



### Metallic flowmeter for liquids and gases

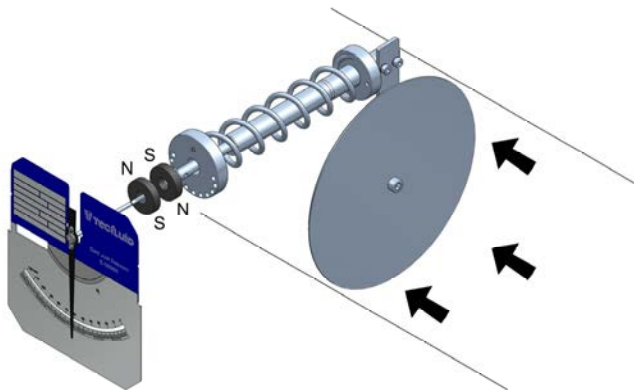
- Metallic, simple and robust construction
- Available for all flow directions
- Suitable for extreme pressure and temperature conditions
- Low pressure drop
- Straight pipe run requirement of only 3 x DN before and after the flowmeter
- Provides a good measurement for fluids containing suspended solids
- Flow rate:
  - Water: 0.8 m³/h ... 1600 m³/h
  - Air: 45 Nm³/h ... 24000 Nm³/h
- Accuracy:
  - DP65: ±2.5% f.s. (±1.6% f.s. on request)
  - DP500: ±4% f.s.
- Connections:
  - DP65: DN40 ... DN300, between flanges EN 1092-1 (wafer)
  - DP500: DN250 ... DN500, with EN 1092-1 flanges
 Other flange standards on request
- Materials: galvanized and painted steel and EN 1.4404 (AISI 316L)
- Local indication
- Options:
  - 1 or 2 limit switches
  - Electronic transmitter with 4-20 mA analog output for safe or hazardous area (Ex ia or Ex d protection, ATEX certified, IECEx certified). HART, MODBUS protocol available on request
  - Local volume totalizer. Digital output programable as a pulse or an alarm 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 and 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 P body in galvanized and painted steel
- DP65 ... DP500/AISI 316L 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 %

### • Fluid temperature:

- Galvanized and painted steel:  $-20^{\circ}\text{C} \dots +150^{\circ}\text{C}$
- EN 1.4404 (AISI 316L)  
PTFE bearings:  $-20^{\circ}\text{C} \dots +150^{\circ}\text{C}$
- EN 1.4404 (AISI 316L)  
Bronze bearings:  $-20^{\circ}\text{C} \dots +300^{\circ}\text{C}$

For higher temperatures, see thermal separator

### • Ambient temperature: $-20^{\circ}\text{C} \dots +80^{\circ}\text{C}$

### • 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 EN 1092-1. Counter flanges and gaskets not supplied
- DP500: DN250 ... DN500, with EN 1092-1 flanges

Other flange standards on request

### • Housing: IP65 coated aluminium, polycarbonate window. IP67 EN 1.4404 (AISI 316L), glass window or IP65 PP, methacrylate window, on request

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

## 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

- AMM1 ... 2: 1 or 2 adjustable micro-switches
- AMD1 ... 2: 1 or 2 adjustable inductive detectors (+ relays on request)
- TH7 ... TH7H: 4-20 mA transmitter 2 wires + digital output. HART protocol with model TH7H
- TH7T ... TH7TH: 4-20 mA transmitter + totalizer 2 wires + digital output. HART protocol with model TH7TH

All switches and transmitters are available with ATEX / IECEx Ex ia certification

The ATEX / IECEx certified transmitters do not provide a digital output

- MT03A: electronic converter. MODBUS RTU RS485 protocol optional

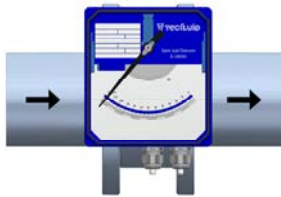
# Target disk flowmeters

## Series DP

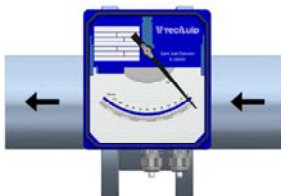
### Mounting

#### Flow direction

Horizontal / left-right—ED



Horizontal / right-left—DES



Vertical upwards—BD

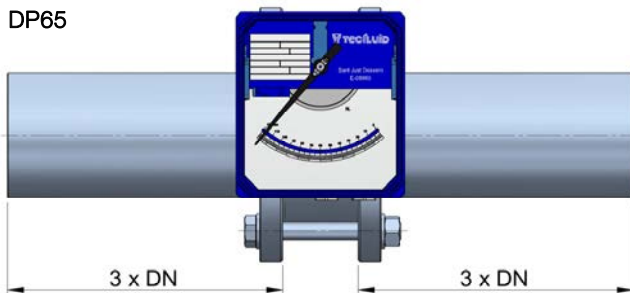


Vertical downwards—DAB



#### Straight pipe run requirement

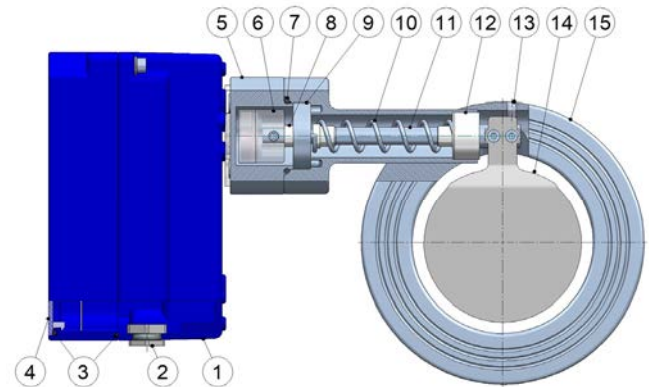
DP65



DP500



### Materials



N°	Description	Materials	
		DP65/Fe P	DP65/AISI 316L
		DP500/Fe P	DP500/AISI 316L
1	Housing	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 (PVDF coated)	
7	Gasket	NBR / VITON® / EPDM	
8	Bearing	PTFE / Bronze	
9	Shaft support disk	EN 1.4401 (AISI 316)	
10	Spring	EN 1.4310 (AISI 302) / EN 1.4401 (AISI 316)	
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	Galvanized and painted	EN 1.4404 (AISI 316L)

\* EN 1.4404 (AISI 316L) and PP on request

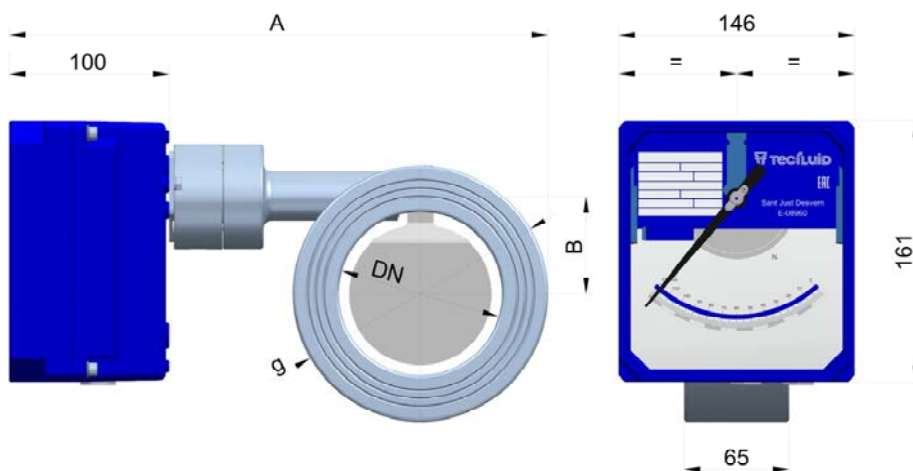
\*\* UV resistant



DP500 / Fe P

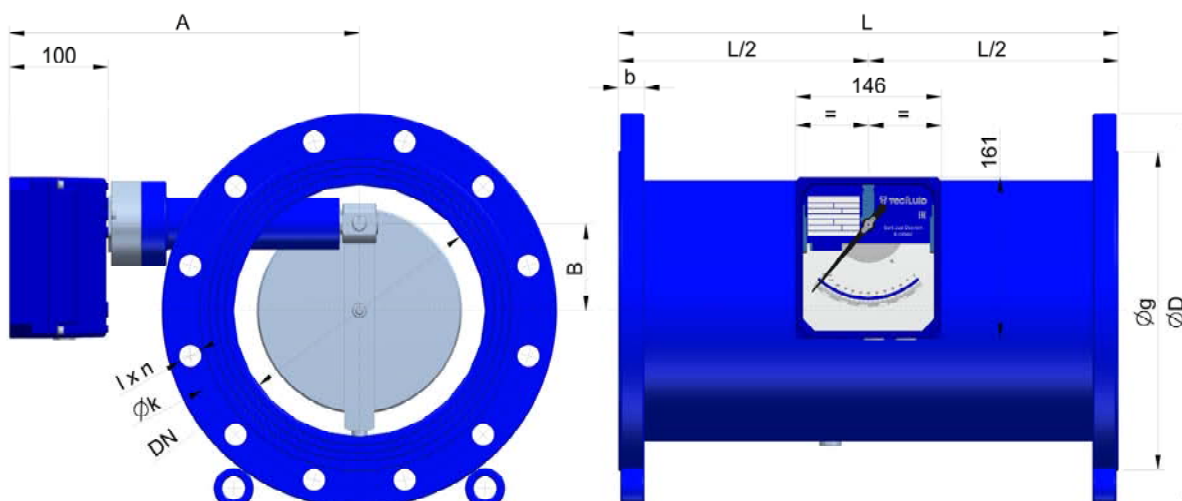
## Dimensions

### Model DP65 (DN40 ... DN300)



DN	NPS	g	B	A	Weight (kg)
40	1 1/2"	94	28	254	5
50	2"	104	33	254	6
65	2 1/2"	122	40	254	7
80	3"	136	50	254	8
100	4"	158	60	254	10
125	5"	189	70	282	12
150	6"	220	78	282	14
200	8"	271	71 / 95	397	20
250	10"	328	88	397	29
300	12"	378	100	412	35

### Model DP500 (DN250 ... DN500)



DN	NPS	L	A	B	Ø D	Ø k	Ø g	b	l x n	Weight
250	10"	500	350	87	395	350	320	26	22 x 12	70
300	12"	500	365	105	445	400	370	26	22 x 12	78
350	14"	600	352	124	505	460	430	26	22 x 16	86
400	16"	600	352	142	565	515	482	26	26 x 16	97
500	20"	700	402	180	670	620	585	28	26 x 20	115



### Flow ranges

#### Model DP65 (DN40 ... DN300)

DN	NPS	Flow scales					
		m³/h water					
40	1 ½"	0.8-4	0.8-6	1-8	2-10	3-16	-
50	2"	0.8-6	1-8	2-10	3-16	3-25	-
65	2 ½"	2-10	3-16	3-25	4-30	5-35	6-40
80	3"	2-16	3-25	5-40	6-45	8-50	10-60
100	4"	5-40	8-60	10-80	12-90	15-100	-
125	5"	8-60	15-100	15-120	20-135	-	-
150	6"	15-100	20-160	25-200	40-220	50-250	-
200	8"	20-160	30-250	40-350	50-400	-	-
250	10"	25-200	50-400	60-500	80-600	-	-
300	12"	30-250	50-400	80-600	100-800	-	-

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

#### Model DP500 (DN250 ... DN500)

DN	NPS	Flow scales		
		m³/h water		
250	10"	25-200	50-400	60-500
300	12"	30-250	50-400	80-600
350	14"	40-300	60-500	100-800
400	16"	50-400	80-600	120-1000
500	20"	80-600	120-1000	200-1600

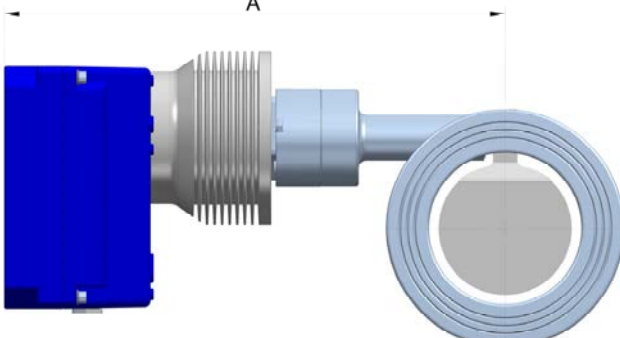
Equivalent scales for air @ 1.013 bar abs, 20°C in Nm³/h = m³/h H₂O x 30 (approx.)

### Accessories

#### Thermal separator

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

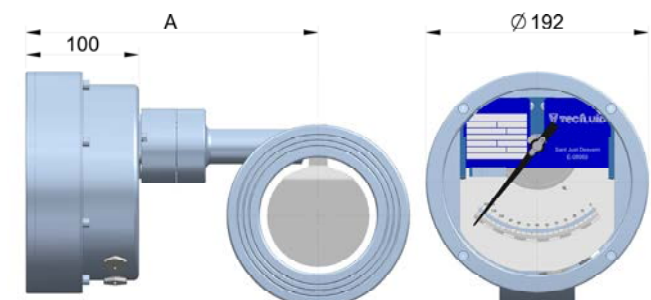
DN40 ... DN100:	-180°C ... +400°C
DN125 ... DN150:	-180°C ... +320°C
DN200 ... DN300:	-180°C ... +280°C
DN350 ... DN500:	-180°C ... +250°C
- Without electronics: DN40 ... DN500: -180°C ... +400°C
- Reference ambient temperature: 20°C



	DN	40 ... 100	125	150	200	250	300	350	400	500
DP65		334	362	362	477	477	492			
DP500	A					430	445	432	432	482

#### EN 1.4404 (AISI 316L) 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
- Available with switches and transmitters
- Ingress protection: IP67



A dimension, same as for model with aluminium housing

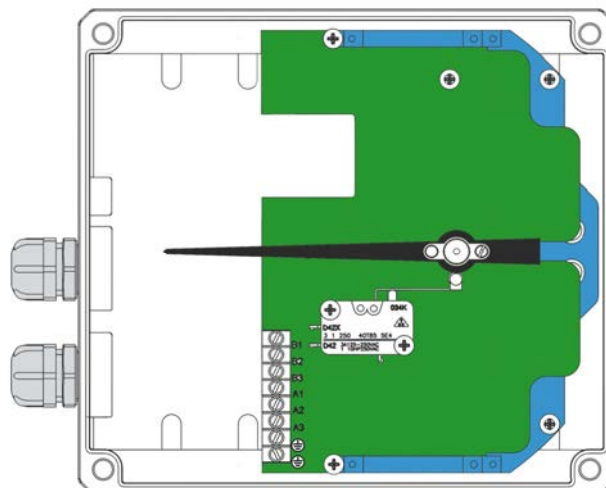
## Limit switches

### Adjustable limit switch AMM



Electrical micro-switch.

- AMM1 ... 2: 1 ... 2 adjustable limit switches
- Ratings: 3(1) A, 250 V (EN 61058)
- Hysteresis:  $\pm 10\%$  of full scale value
- Ambient temperature:  $-25^{\circ}\text{C} \dots +100^{\circ}\text{C}$
- Mechanical life:  $10^7$  operations
- ATEX / IECEx certificate Ex ia IIC T6 Ga / Ex ia IIIC T $^{+}\text{C}$  Da
- Gold plated contacts on request.



AMM

### Adjustable limit switch AMD



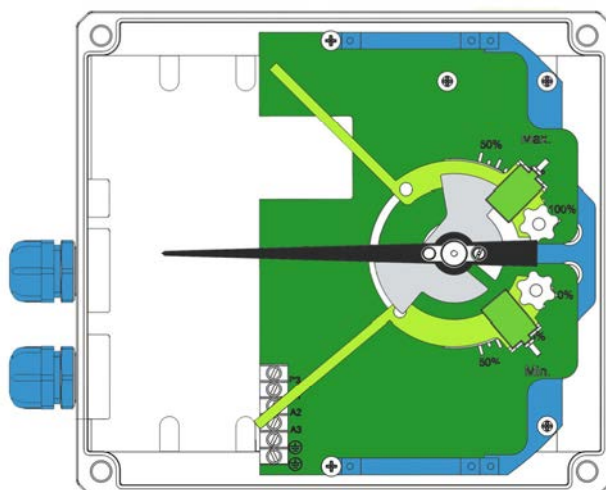
NAMUR (EN 60947-5-6) 3.5 mm slot type inductive detector activated by vane.

- AMD1 ... 2: 1 ... 2 adjustable limit switches
- Nominal voltage: 8.2 V / Working voltage: 5 ... 25 V
- Ambient temperature:  $-25^{\circ}\text{C} \dots +100^{\circ}\text{C}$
- ATEX / IECEx certificate Ex ia IIC T6 Ga / Ex ia IIIC T $^{+}\text{C}$  Da

### Control relay (on request)

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

- Power supply: 20 ... 30 VDC
- Consumption:  $<1.3 \text{ W}$
- Relay output:
  - $V_{\text{max}}$ : 253 VAC / 2A // 40 VDC / 2A resistive load
- Ambient temperature:  $-20^{\circ}\text{C} \dots +60^{\circ}\text{C}$



AMD

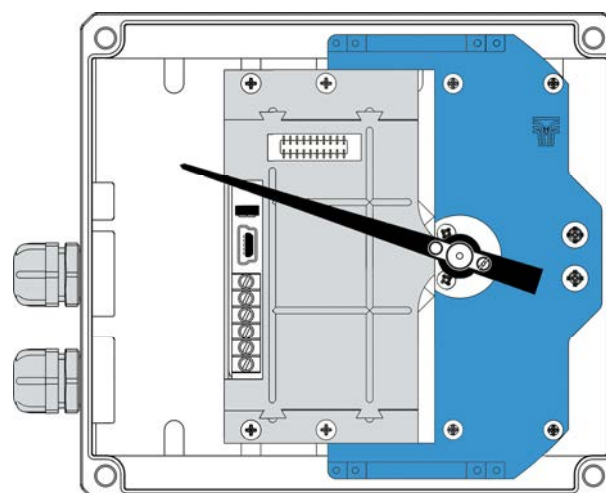
## Transmitters and totalizers

### Transmitter TH7



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

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



TH7

# Target disk flowmeters

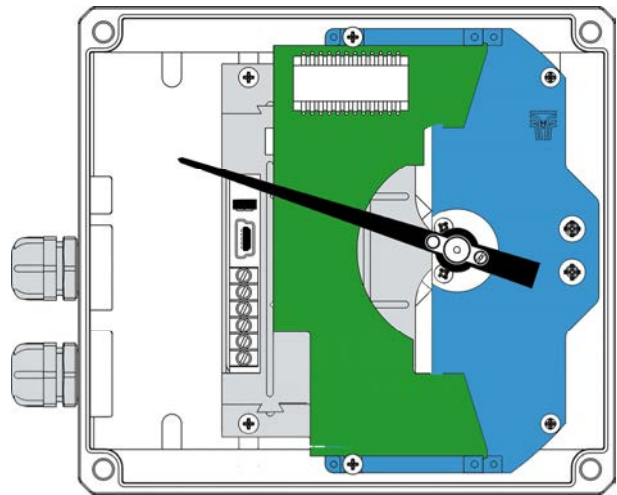
## Series DP

### Technical data

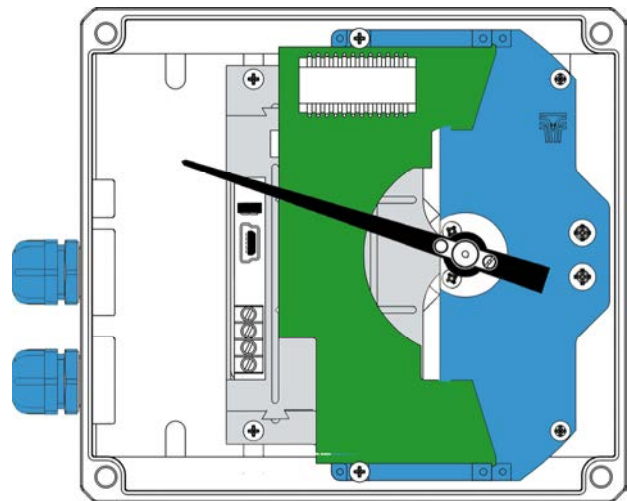
- Power supply: 12 ... 36 VDC (18 ... 36 VDC with HART protocol), 2-wire system
- Power consumption: 4-20 mA for 0 ... 100% of scale
- 4-20 mA analog output:
  - Error: < 0.6% of the magnet position
  - Maximum load in 4-20 mA loop: 1.1 k $\Omega$  (with 36 VDC power supply)
- Digital output: Potential free N channel MOSFET,  $I_{max}$  200 mA, for pulse or alarm output:
  - Pulse output:
    - Maximum 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: -20°C ... +70°C
- Easy programmable by means of Tecfluid's Winsmeter TH7 software, available for download at [www.tecfluid.com](http://www.tecfluid.com)

### ATEX / IECEx version

- ATEX / IECEx certificate  
Ex ia IIC T6 ... T4 Ga / Ex ia IIIC T85°C Da
- 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  $\Omega$  (with 30 VDC power supply)
- Totalizer: 8 digits, 4.5 mm high. Reset by potential free contact
- Ambient temperature: -20°C ... +40°C



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

### Electronic converter



#### Model MT03A

- Electronic converter for flow applications
- Resistance and current inputs
- Programmable via USB cable by means of Tecfluid S.A. Winsmeter MT03 software or by means of keyboard and graphic display with intuitive menus
- Panel mounting with dimensions 96 x 96 mm DIN 43700
- Power supply: 100 ... 240 VAC 50 / 60 Hz  
18 ... 36 VDC
- Full diagnosis. User selectable password protection
- 5 digits local flow rate indication and 8 digits totalizer and partial totalizer. Possibility of remote reset
- Programmable 4-20 mA analog output
- 2 x relay outputs programmable as flow rate alarms

- Mass flow rate can be measured programming the product density
- Ingress protection: IP50 front, IP30 back (Optional IP65 front with silicone cover)
- Ambient temperature: -20°C ... +60°C
- MODBUS RTU RS485 protocol on request



MT03A

## PRESENCE IN MORE THAN 50 COUNTRIES ALL OVER THE WORLD



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