Metal Tube Flowmeters

SC250

Features:

- Metallic tube with a robust construction
- Indication by means of magnetic coupling
- High performance measurement in extreme working conditions and high resistance to corrosion
- Low pressure drop
- Damping mechanism to avoid float bounces in gas and steam applications

Features Continued:

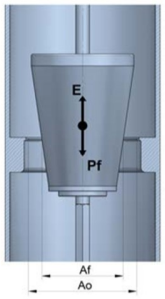
- Flow rate (model SC250)
  - Water: 16 l/h — 30m^3/h
  - Air: 500 NI/H — 900Nm^3/h
- Accuracy: 2.5% (q_G=50%) / 1.6% (q_G=50%) on request
- Connections:
  - Model SC250: DN15 — DN80
  - EN1092-1 or ANSI flanges. Other flange standards on request (JIS,…)
  - Threaded connections BSP or NPT
  - Other connections available on request
- Materials: EN 1.4404 (AISI 316L), other materials available on request
- Local indication
- Options:
  - 1 or 2 limit switches
  - Electronic transmitter with 4-20mA 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)

Description:

Flowmeters are based in the variable area principle. The metering system consists on a calibrated orifice and a conical float. The force from the fluid, as it flows from the bottom to the top, displaces the float until it reaches an equilibrium point that is a function of:

- E = force of the fluid flow
- Pf = weight of the float
- AI = free area of flow

(AI= Ao, calibrated orifice area, - Af, float area)
Each float position represents an area between the float and the orifice. This area corresponds to a flow rate.



Ao = calibrated orifice area
Af= float area
Pf= weight of the float
E= force of the fluid flow
AI= Ao-Af = free area of flow

Applications:

- Water treatment plants, pulp & paper and food industry
- Pharmaceutical, chemical and petrochemical industry
- Power plants and nuclear generating plants
- Heating and cooling circuits
- Saturated steam circuits
- Oven treatments and control of gas burners

TT Electronics | Roxspur Measurement & Control
2 Downgate Drive, Sheffield, South Yorkshire, S4 8BT, UK |Ph: +44 (0) 114-244-2521
www.ttelectronics.com | sheffield.admin@ttelectronics.com

Model SC250 Technical Data

Accuracy, acc. To VDI/VDE 3513 sheet 2 (q_G = 50%)	2.5% / 1.6% on request
Direct scales in engineering units or in %	
Scale range	10:1
Fluid density	No restrictions
Fluid viscosity	Up to 10mPas approx., depending on flow rate

Fluid Temperature	
EN 1.4404 (AISI 316L)	-50°C — +300°C

Ambient Temperature	
EN 1.4404 (AISI 316L) & PTFE	-5°C — +40°C

Working Pressure

SC250/INOX (EN 1.4404 — AISI 316L)	
PN40	DN15...DN50
PN16	DN80
Others on request	

TT Electronics | Roxspur Measurement & Control
2 Downgate Drive, Sheffield, South Yorkshire, S4 8BT, UK |Ph: +44 (0) 114-244-2521
www.ttelectronics.com | sheffield.admin@ttelectronics.com

Metal Tube Flowmeters

SC250

Connections:

- DN15...DN80 EN 1092-1 flange or ANSI equivalent. Other flange standards on request (JIS,…)
- Threaded connections BSP or NPT

Operations:

- Vertical with upwards flow (BD)

Limit Switches and Transmitters:

- SC-AMD1...2: 1 or 2 adjustable inductive detectors (+ relays on request)
- TH7T Ex...: 4-20mA transmitter + totalizer 2 wires Ex ia IIC T4 or T6 (ATEX). HART protocol is available on request.

Housing:

- IP65—coated aluminum. EN 1.4404 (AISI 316L) with glass window, on request

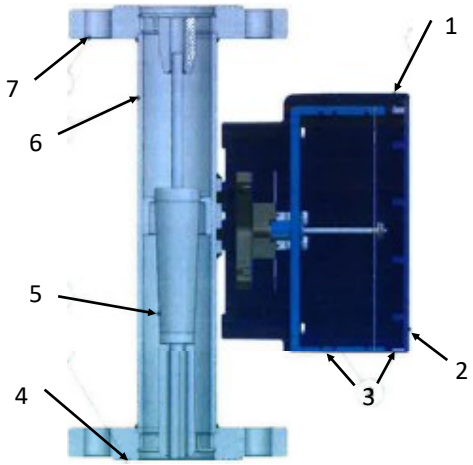
The tapered floats are constructed in AISI 316L as standard or other materials on request, according to the characteristics of the process fluid.

The maximum working viscosity for these floats is 10 mPa•s approx., depending on flow rate.

DN15...DN80

Materials

N°	Description	Materials
1	Enclosure	Coated aluminium
2	Window	Polycarbonate (UV resistant)
3	O-rings	NBR
4	Flange seat	EN 1.4404
5	Float	EN 1.4404
6	Flow tube	EN 1.4404
7	Flanges	EN 1.4404

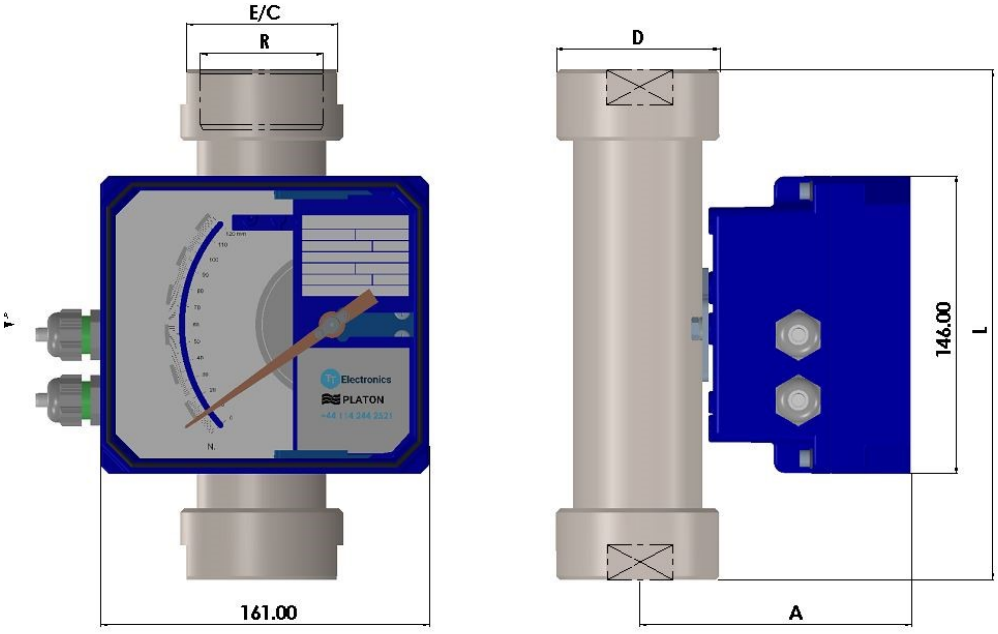


TT Electronics | Roxspur Measurement & Control
2 Downgate Drive, Sheffield, South Yorkshire, S4 8BT, UK |Ph: +44 (0) 114-244-2521
www.ttelectronics.com | sheffield.admin@ttelectronics.com

Dimensions

Models SC250

Threaded connection BSP/NPT (EN 1.4404)



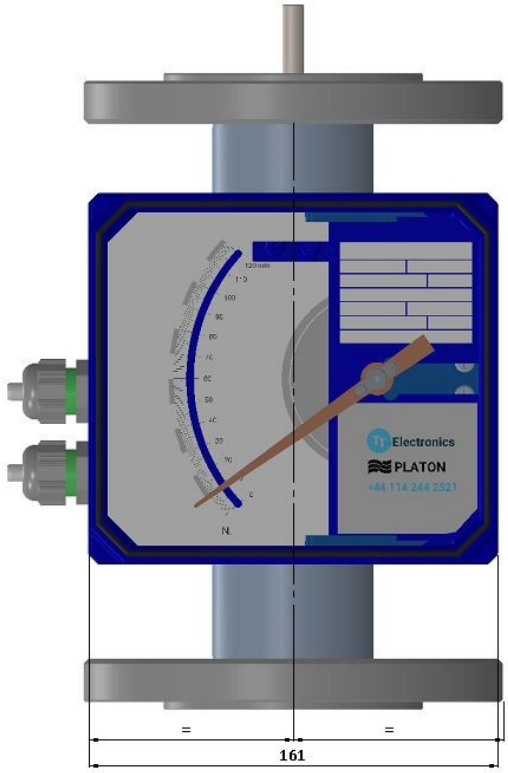
R	1/2"	1/2"	3/4"	1"	1 1/2"	2"
L	282	313	282	285	305	305
D	35	37	40	55	65	80
A	114	118	118	124	129	135
E/C	30	32	35	45	60	70
DIN EQ.	15 (PC)*	15	15	25	40	50

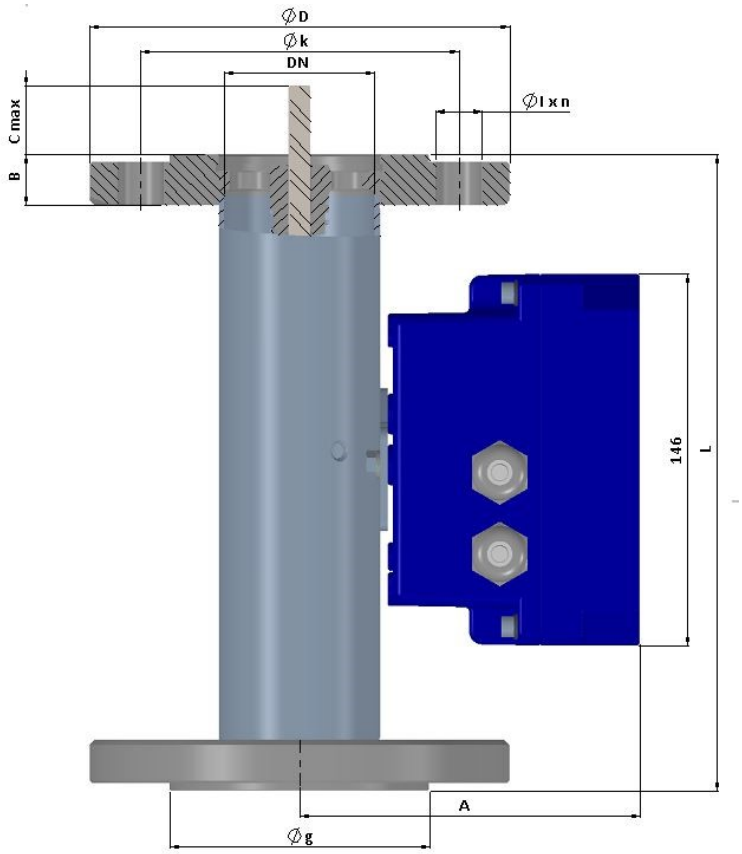
*Max flow rate 250 l/h H_2O

TT Electronics | Roxspur Measurement & Control
2 Downgate Drive, Sheffield, South Yorkshire, S4 8BT, UK |Ph: +44 (0) 114-244-2521
www.ttelectronics.com | sheffield.admin@ttelectronics.com

Dimensions

EN1092-1 flanges (dimensions in mm)										
							A	C max		
DN	PN	Ø D	Ø k	Ø g	Ø l x n	B	SC250	SC250	L	Weight kg
15	40	95	65	49	14 x 4	16	133	38	250	3.5
25	40	115	85	68	14 x 4	18	146	38	250	4.5
40	40	150	110	88	18 x 4	18	154	40	250	7.3
50	40	165	125	102	18 x 4	20	167	40	250	8.3
80	16	200	160	138	18 x 8	20	148	40	250	12





TT Electronics | Roxspur Measurement & Control
2 Downgate Drive, Sheffield, South Yorkshire, S4 8BT, UK |Ph: +44 (0) 114-244-2521
www.ttelectronics.com | sheffield.admin@ttelectronics.com

Dimensions

ANSI flanges (dimensions in mm)										
							A	C max		
DN	Pressure class lbs	Ø D	Ø k	Ø g	Ø l x n	B	SC250	SC250	L	Weight kg
1/2"	150	88.9	60.3	44.0	15.90 x 4	11.1	122	-	250	3.5
3/4"	150	98.4	69.8	42.9	15.90 x 4	12.7	133	38	250	4.5
1"	150	107.9	79.4	50.8	15.90 x 4	14.3	146	38	250	7.3
1 1/4"	150	117.5	88.9	63.5	15.90 x 4	15.9	146	38	250	8.3
1 1/2"	150	127.0	98.4	73.0	15.90 x 4	17.5	154	40	250	10
2"	150	152.4	120.6	92.1	19.05 x 4	19.1	167	40	250	12
3"	150	190.5	154.2	127	19.05 x 4	23.8	148	40	250	20

Flow Ranges

					Flow Range: L = l/h, G = m3/h													
					15		19		25		40		50		80			
Model	Housing/Transmitter/Alarm Al/TH7T/Ex/2AMD	Connections	Size		L	G	L	G	L	G	L	G	L	G	L	G	Fluid
FSC250	*	*	*						*									*
	X Al/TH7T/Ex/2AMD	F1 PN40	1 15mm 1/2"	1	160	5			1000	30	6300	180	8000	240	20000	600	L	Liquid
			2 19mm 3/4"	2	250	7.5			1600	50	10000	240	10000	300	25000	750	G	Gas
			3 25mm 1"	3	400	12			2500	75			15000	450	30000	900		
			4 40mm 1 1/2"	4	600	18			4000	120			20000	600				
			5 50mm 2"															
			6 80mm 3"															
		F2 A150 lb	1 15mm 1/2"	1	160	5	400	12	1000	30	6300	180	8000	240	20000	600	L	Liquid
			2 19mm 3/4"	2	250	7.5	600	18	1600	50	10000	240	10000	300	25000	750	G	Gas
			3 25mm 1"	3					2500	75			15000	450	30000	900		
			4 40mm 1 1/2"	4					4000	120			20000	600				
			5 50mm 2"															
			6 80mm 3"															
		S1 BSP S2 NPT	1 15mm 1/2"	1	160	5	400	12	1000	30	6300	180	8000	240	20000	600	L	Liquid
			2 19mm 3/4"	2	250	7.5	600	18	1600	50	10000	240	10000	300	25000	750	G	Gas
			3 25mm 1"	3					2500	75			15000	450	30000	900		
			4 40mm 1 1/2"	4					4000	120			20000	600				
			5 50mm 2"															
			6 80mm 3"															

TT Electronics | Roxspur Measurement & Control

2 Downgate Drive, Sheffield, South Yorkshire, S4 8BT, UK |Ph: +44 (0) 114-244-2521

www.ttelectronics.com | sheffield.admin@ttelectronics.com

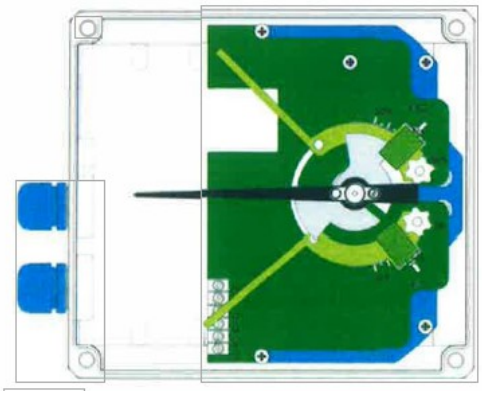
Adjustable limit switch SC-AMD

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

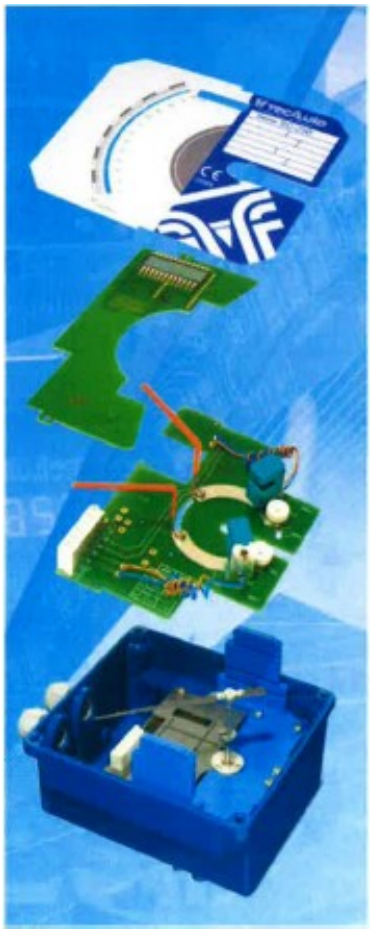
- SC-AMD1...2: 1 … 2 adjustable limit switches
- Power supply: 8 VDC
- Ambient temperature: -25°C — +70°C
- ATEX certificate Ex ia IIC T6

Control relay (on request)
NAMUR (EN 60947-5-6) for 1 or 2 inductive detectors.

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



SC-AMD



Modular housing

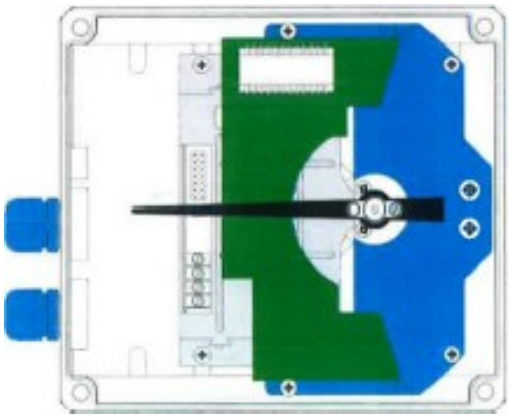
TT Electronics | Roxspur Measurement & Control
2 Downgate Drive, Sheffield, South Yorkshire, S4 8BT, UK |Ph: +44 (0) 114-244-2521
www.ttelectronics.com | sheffield.admin@ttelectronics.com

Transmitter and Totalizer

Transmitter TH7T

The TH7T electronic transmitters provide an analog output proportional to the flow rate and a digital output. They include a display for volume totalization. They are based on the Hall effect and mounted inside the indicator housing.

- TH7T Transmitter + totalizer
- Optional HART protocol version available
- TH7TH Transmitter + totalizer + HART protocol



TH7T Ex

ATEX version (EX ia IIC T4 or T6)

Technical data

- ATEX certificate Ex II 1 GD
- Power supply: 14...30VDC, 2-wire system
- Power consumption: 4-20mA for 0… 100% of scale
- 4-20mA analog output:
  - Error: <0.6% of magnet position
  - Maximum load in 4-20mA loop: 900Ω (with 30 VDC power supply)
- Totalizer: 8 digits, 4.5mm high. Reset by potential free contact
- Ambient temperature: -5°C — 40°C

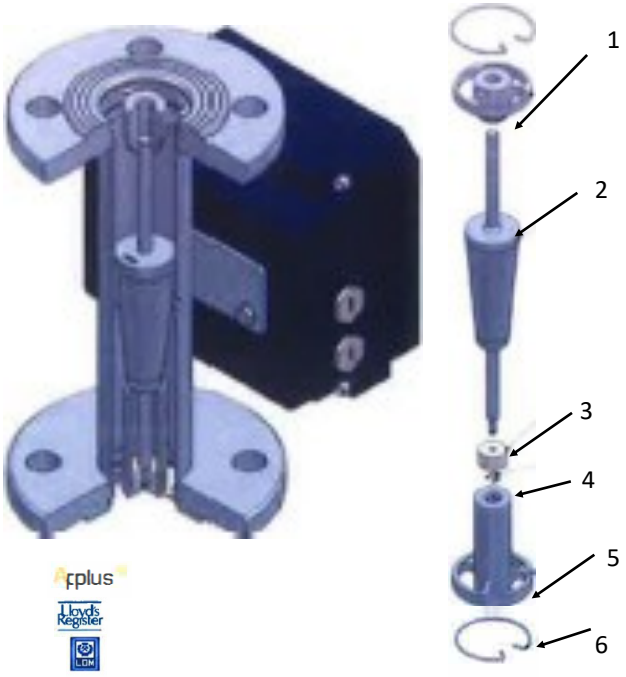
Both limit switches AMD and electronic transmitters TH7T can be mounted together in the same housing.

The TH7T Ex transmitters belong to group II. They are intended for use in potentially explosive atmospheres, except in mining.

Float Damping System
(For gas and steam applications)

Ceramic, PEEK or metallic piston system for avoiding float oscillations in flowmeters for gas and steam service, obtaining stable readings even with very low working pressures and low gas densities.
Available for DN15...DN80

1. Upper float stop
2. Float
3. Piston
4. Piston locking circlip
5. Guide cylinder
6. Circlips for locking upper float stop & guide cylinder



Quality management System ISO 9001 certified by
Pressure Equipment Direction 97/23/CE certified by
ATEX European Directive 94/9/CE certified by
HART is a registered trademark of HART® Communication Foundation

TT Electronics | Roxspur Measurement & Control
2 Downgate Drive, Sheffield, South Yorkshire, S4 8BT, UK |Ph: +44 (0) 114-244-2521
www.ttelectronics.com | sheffield.admin@ttelectronics.com