

Variable area flowmeters SGM - 250



- **Magnetic transmission**
- **Ranges from 2.5 l/h up to 100 m³/h (Water)**
- **Body and float: AISI 316; PTFE; PVC; PPH**
- **Fittings: Flanges or threaded BSP**
- **Outputs: Contacts; 4/20 mA + totalizer**
- **ATEX Version**

APPLICATIONS

- Direct reading of flow-rate on gases or on liquids: - Water treatment, Industrial process (paper mill, textiles etc.), Chemical and pharmaceutical industries, Heating and cooling plants

The SGM flowmeters are suitable when glass or plastic reading tubes are not useful because of fluid opacity or their high temperature and pressure or for safety reasons. These flowmeters can be calibrated on our benches, according to each fluid and according to the operating conditions.

The small distance between fittings (250 mm) allows an installation in a small space; Straight unimpeded pipe runs should have a length equal to 5x DN upstream and 3x DN downstream of the installation location.

DESCRIPTION

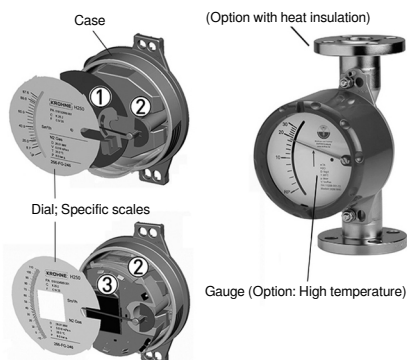
The measuring principle is that of the variable area flowmeter, the float is moved by the fluid inside a calibrated conical measuring tube. The vertical position of the float is transmitted magnetically to a dial gauge. The circulation of the fluid lifts the float to the point of equilibrium resulting from its weight, the pushing force and the free passage section. Bodies and floats are available in various materials to provide excellent resistance in adequation with dangerous, hot or aggressive fluids and for total safety.

The SGM - 250 indicator is a case, modular, to accommodate all electrical options and the graduated scale. The electrical accessories are plugged-in onto a rack. So, they can be replaced or upgraded without stopping the process and without having to remove the pointer. The HT version of SGM -250 is suitable for use in extreme temperatures.

The flowmeter can be ordered with magnetic filter and/or float damper. These can also be retrofitted at any time.

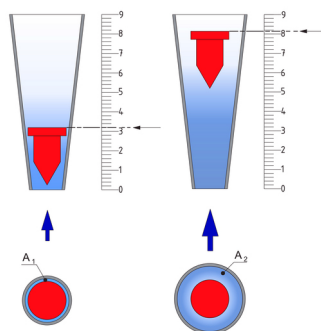
In the case of variable or pulsating flow, a damper can additionally be installed for the pointer. SGM - 250 can be equipped with a limit value switch and/or measuring transmitter with electrical analog output for a PLC or a totalizer.

These flowmeters are only suitable for vertical installation, with the direction of flow being from bottom to top.



- (3) : Flow totalizer (EMZ)
- (1) : Contacts, IK1, IK2, IKS1, IKS2
- (2) : Output signal (EM)

Fig A : Modules



Principle

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01-06-2021

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TECHNICAL FEATURES

	AISI 316 L version		PVC or PP versions	
Accuracy	VA/C4 (Standard) PTFE/ Ceramic *	1.6 acc. VDI/VDE 3513 pt. 2 2.5 acc. VDI/VDE 3513 pt. 2	SG-PP-/PVC	2.5 acc. VDI/VDE 3513 pt. 2
Pressure	DN 15, 25, 50 DN 80 , DN 100	PN 40 PN 16	DN 25, DN 50 DN 65, DN 80, DN 100	PN 16 PN 10
Fittings	Flanges BSP-M	According to EN-1092-1 ANSI B 16.5, JIS B 2220 ¹⁾ DIN 11851, DIN EN ISO 228	Flanges Spigot ends or PP or PVC	According to EN-1092-1 ANSI B 16.5, JIS B 2220 ¹⁾ DIN 11851, DIN EN ISO 228 ¹⁾
Indicator	Scale: l/h; m ³ /h; Graduated along 90 mm; Scale factor 1:10 Case, pointer: Painted aluminum; Dial: Sheath aluminum; Window: Glass			

* : Alternative (on request) ----- ¹⁾ : Option

Model	Tube / Float	Temperature	Ambient	Version	Tube / Float	Temperature	Ambient
SGM/VA	AISI 316 L	-70...+300 °C	-40...+120 °C	SGM-PP	PP	0...+80 °C	0...+80 °C
SGM/C4	Hastelloy C4	-70...+300 °C	-40...+120 °C	SGM-PVC	PVC	0...+40 °C	0...+40 °C
SGM/PTFE	PTFE ¹⁾ /PTFE	-70...+70 °C	-40...+70 °C	<----- ¹⁾ : Tube of AISI 306 L with lining			
SGM/PTFE/K	PTFE ¹⁾ / Ceramic	-70...+150 °C	-40...+70 °C				
SGM / TFM / K	TFM ¹⁾ / Ceramic	-70...+250 °C	-40...+120 °C				

Models

Materials

VA	Stainless steel 316 L
C4	Hastelloy C4
PTFE	PTFE ¹⁾ /PTFE
PTFE/K	PTFE ¹⁾ / Ceramic
TFMK	TFM ¹⁾ / Ceramic
PP	Polypropylene
PVC	Polyvinyl chloride

Inductive contacts

O	Without contact
IK1	With 1 inductive contact (SC3,5-NO-Y)
IK2	With 2 inductive contacts (SC3,5-NO-Y)
IKS1	with one electronic switch (SB3,5-E2)
IKS2	With two electronic switches (SB3,5-E2)

Analogue output 4-20 mA

O	Without transmitter
EM	With output 4-20 mA
EMZ	With output 4-20 mA + totalizer

Contact-s + output 4-20 mA

O	Without
IK-EM	With 1 inductive contact + output 4-20 mA
IK1-EMZ	With 1 inductive contact + output 4-20 mA + totalizer
IK2-EM	With 2 inductive contacts + output 4-20 mA
IK2-EMZ	With 2 inductive contacts + output 4-20 mA + totalizer
IKS1-EM	With 1 electronic contact + output 4-20 mA
IKS1-EMZ	With 1 electronic contact + output 4-20 mA + totalizer
IKS2-EM	With 2 electronic contacts + output 4-20 mA + totalizer
IKS2-EMZ	

ATEX, Explosion-proof design

O	Standard
EEx	Explosion-proof version, all metal
EM-EEx	Explosion proof version, with output 4-20 mA
IK1-EEx	Explosion proof version, with 1 inductive contact
IK2-EEx	Explosion proof version, with 2 inductive contacts
IK1-EM EEx	Explosion proof version, with 1 inductive contact + output 4-20 mA
IK2-EM EEx	Explosion proof version, with 2 inductive contacts + output 4-20 mA

SGM VA O EM O O

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MEASURING RANGES

Stainless steel versions				
Fittings	H ₂ O scale / AISI 316 float	Δ P [mbar]	Air scale at 0 °C and 1013 mbar ABS	Δ P [mbar]
DN 15 or ½"	2.5 - 25 l/h	26	65 - 650 l/h	21
	4 - 40 l/h	26	100 - 100 l/h	21
	6.3 - 63 l/h	26	150 - 1500 l/h	21
	10 - 100 l/h	26	220 - 2200 l/h	21
	16 - 160 l/h	26	360 - 3600 l/h	21
	25 - 250 l/h	26	550 - 5500 l/h	21
	40 - 400 l/h	28	1 - 10 m ³ /h	21
	63 - 630 l/h	32	1.4 - 14 m ³ /h	22
	70 - 700 l/h	38	1.8 - 18 m ³ /h	38
	100 - 1000 l/h	50	2.8 - 28 m ³ /h	50
	160 - 1600 l/h	85	5 - 50 m ³ /h 85	85
DN 25 or 1"	63 - 630 l/h	32	1.4 - 14 m ³ /h	24
	100 - 1000 l/h	33	2.3 - 23 m ³ /h	24
	160 - 1600 l/h	34	3.5 - 35 m ³ /h	25
	250 - 2500 l/h	38	5 - 50 m ³ /h	26
	400 - 4000 l/h	45	9.5 - 95 m ³ /h	30
	630 - 6300 l/h	103 ²⁾	11 - 110 m ³ /h 18 - 180 m ³ /h	78 103 ²⁾
DN 50 or 2"	630 - 6300 l/h	74	8 - 80 m ³ /h	13
	1 - 10 m ³ /h	77	11 - 110 m ³ /h	13
	1.6 - 16 m ³ /h	84	15 - 150 m ³ /h	13
	2.5 - 25 m ³ /h	104	23 - 230 m ³ /h	60
			35 - 350 m ³ /h	69
70 - 700 m ³ /h	104			
DN 80 or 3"	2.5 - 25 m ³ /h	68	35 - 350 m ³ /h	16
	4 - 40 m ³ /h	89	40 - 400 m ³ /h	16
	6.4 - 64 m ³ /h	125	100 - 1000 m ³ /h	95
180 - 1800 m ³ /h			125	
DN 100 or 4"	6.3 - 63 m ³ /h	120		
	10 - 100 m ³ /h	220		

²⁾ : 300 mbar with damper

The float damping system is recommended for use with gases.

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PTFE versions				
fittings	H ₂ O scale / PTFE float	Δ P [mbar]	Air scale at 0 °C and 1013 mbar ABS	Δ P [mbar]
DN 15 or ½"	2.5 - 25 l/h	65	70 - 700 l/h	65
	4 - 40 l/h	66	110 - 1100 l/h	66
	6.3 - 63 l/h	66	180 - 1800 l/h	66
	10 - 100 l/h	68	280 - 2800 l/h	68
	16 - 160 l/h	72	480 - 4800 l/h	72
	25 - 250 l/h	86	700 - 7000 l/h	86
	40 - 400 l/h	111	1,000 - 10,000 l/h	111
DN 25 or 1"	63 - 630 l/h	70	1.6 - 16 m ³ /h	70
	100 - 1000 l/h	80	3 - 30 m ³ /h	80
	160 - 1600 l/h	108	4.5 - 45 m ³ /h	108
	250 - 2500 l/h	158	7 - 70 m ³ /h	158
	400 - 4000 l/h	290	12 - 120 m ³ /h	194
DN 50 or 2"	400 - 4000 l/h	81	11 - 110 m ³ /h	81
	630 - 6300 l/h	110	18 - 180 m ³ /h	110
	1 - 10 m ³ /h	170	25 - 250 m ³ /h	170
DN 80 or 3"	1.6 - 16 m ³ /h	81		
	2.5 - 25 m ³ /h	95		
DN 100 or 4"	4 - 40 m ³ /h	100		

The float damping system is recommended for use with gases.

Ceramic versions				
Fittings	H ₂ O scale / Ceramic float	Δ P [mbar]	Air scale at 0 °C and 1013 mbar ABS	Δ P [mbar]
DN 15 or ½"	3 - 30 l/h	62		
	5 - 50 l/h	64	180 - 1800 l/h	64
	7 - 70 l/h	66	240 - 2400 l/h	66
	13 - 130 l/h	68	400 - 4000 l/h	68
	20 - 200 l/h	70	650 - 6500 l/h	70
	25 - 250 l/h	72	900 - 9000 l/h	72
DN 25 or 1"	50 - 500 l/h	55	1,8 - 18 m ³ /h	55
	70 - 700 l/h	60	2,2 - 22 m ³ /h	60
	110 - 1100 l/h	70	3 - 30 m ³ /h	70
	160 - 1600 l/h	82	5 - 50 m ³ /h	82
	250 - 2500 l/h	100	7,5 - 75 m ³ /h	100
DN 50 or 2"	450 - 4500 l/h	70	14 - 140 m ³ /h	70
	630 - 6300 l/h	80	20 - 200 m ³ /h	80
	1.1 - 11 m ³ /h	110	35 - 350 m ³ /h	110
DN 80 or 3"	1.6 - 16 m ³ /h	70		
	2.5 - 25 m ³ /h	85		

The float damping system is recommended for use with gases.

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PVC and PP versions				
Fittings	H ₂ O scale / PVC or PP float	Δ P [mbar]	Air scale at 0 °C and 1013 mbar ABS	Δ P [mbar]
DN 15 or ½"	10 - 100 l/h	15	0,4 - 4 m ³ /h	25
	16 - 160 l/h	15	0,6 - 6 m ³ /h	25
	25 - 250 l/h	15	1 - 10 m ³ /h	25
	40 - 400 l/h	15	1,6 - 16 m ³ /h	25
	60 - 600 l/h	15	2 - 20 m ³ /h	25
DN 25 or 1"	16 - 160 l/h	10	0,6 - 6 m ³ /h	20
	25 - 250 l/h	10	1 - 10 m ³ /h	20
	40 - 400 l/h	10	1,6 - 16 m ³ /h	20
	60 - 600 l/h	10	2,5 - 25 m ³ /h	20
	100 - 1000 l/h	10	4 - 40 m ³ /h	20
	160 - 1600 l/h	10	6 - 60 m ³ /h	20
	240 - 2400 l/h	10	9 - 96 m ³ /h	20
DN 40 or 1 ½"	150 - 1500 l/h	20	5 - 50 m ³ /h	25
	250 - 2500 l/h	20	8 - 80 m ³ /h	25
	400 - 4000 l/h	20	14 - 140 m ³ /h	25
DN 50 or 2"	250 - 2500 l/h	15	9 - 90 m ³ /h	25
	400 - 4000 l/h	15	15 - 150 m ³ /h	25
	600 - 6000 l/h	15	20 - 200 m ³ /h	25
	1,000 - 10,000 l/h	15	35 - 350 m ³ /h	25
DN 65 or 2 ½"	800 - 8000 l/h	15	25 - 250 m ³ /h	25
	1 - 10 m ³ /h	15	40 - 400 m ³ /h	25
DN 80 or 3"	1 - 10 m ³ /h	15	40 - 400 m ³ /h	25
	1.6 - 16 m ³ /h	15	60 - 600 m ³ /h	25
DN 100 or 4"	1.6 - 16 m ³ /h	20	60 - 600 m ³ /h	25
	2 - 20 m ³ /h	20	100 - 1000 m ³ /h	25
DN 125 or 5"	3 - 30 m ³ /h	20	150 - 1500 m ³ /h	30
	4 - 40 m ³ /h	20	200 - 2000 m ³ /h	30
	6 - 60 m ³ /h	20	220 - 2200 m ³ /h	30
DN 150 or 6"	8 - 80 m ³ /h	25	250 - 2500 m ³ /h	35
	10 - 100 m ³ /h	25	300 - 3200 m ³ /h	35

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OUTPUTS FEATURES

SC3,5-N0-Y (2-wire); IP 67 (EN 60529/IEC 529)

Function	NC (normally closed) - NAMUR
Rated current U_0	8 V
Consumption	≥ 3 mA when pointer vane not sensed ≤ 1 mA when Pointer vane sensed
Ambient temperature	-25...+100 °C
EMV	According to NE 21
SIL	According to IEC 61508
Agreement	PTB 99 ATEX 2219X (only with isolation switching amplifier)

SB3,5-E2 (3-wire); IP 67 (EN 60529/IEC 529)

Function	PNP / NO (normally open)
Rated current U_0	10...30 V DC
Consumption	$\leq 0,3$ V DC UB -3 V DC
Ambient temperature	-25...+70 °C
Continuous current, Max.	100 mA
No load current	IO ≤ 15 mA
EMV according to	EN 60947-5-2

4-20 mA output, transmitter EM

Power supply	12...30 V DC (HART®: Min. 20 V DC)
Consumption	4...20 mA (0 to 100 % measuring scale)
NAMUR failure signal	> 21 mA
Repeatability	< 0,1 % F.S.
Linearity error	< 0,1%
Influence of supply power	< 0,1%
External resistance dependence	< 0,1%
Temperature effect	<10 μ A /K
Max. load impedance	Max. 0 (250 *) ...800 Ω maxi
Certificate	PTB 00 ATEX 2063

* With HART®-communication, this value is the minimum value.

For use in potentially explosive areas: Built-in equipment may only be connected to separate intrinsically safe circuits.

Counter / Totalizer EMZ

Outputs: Two binary outputs, passive, galvanically isolated

Power	Rated voltage: 24 V DC (Max. 30 V DC)
Load RL	250...1000 Ω
Continuous current, Max.	100 mA
Pmax.	500 mW

Connection types: 2 off NAMUR (EN 60947-5-6) ¹⁾ or Transistor output (passive, open collector)

U_0	8.2 V DC
R_i	1000 Ω
Signal current	> 3 mA (Switching value reached) < 1 mA (Switching value not reached)

2 pulse outputs

T on	Set up between 50 and 500 ms
T off	Depending on flow rate
Frequency Max.	10 Hz
Pulse output	Set up in flow units e.g. 5 pulses per m ³
Ambient temperature	-40...+70 °C

¹⁾ Switching amplifier with $U_0 = 8,2$ V DC and $R_i = 1000 \Omega$

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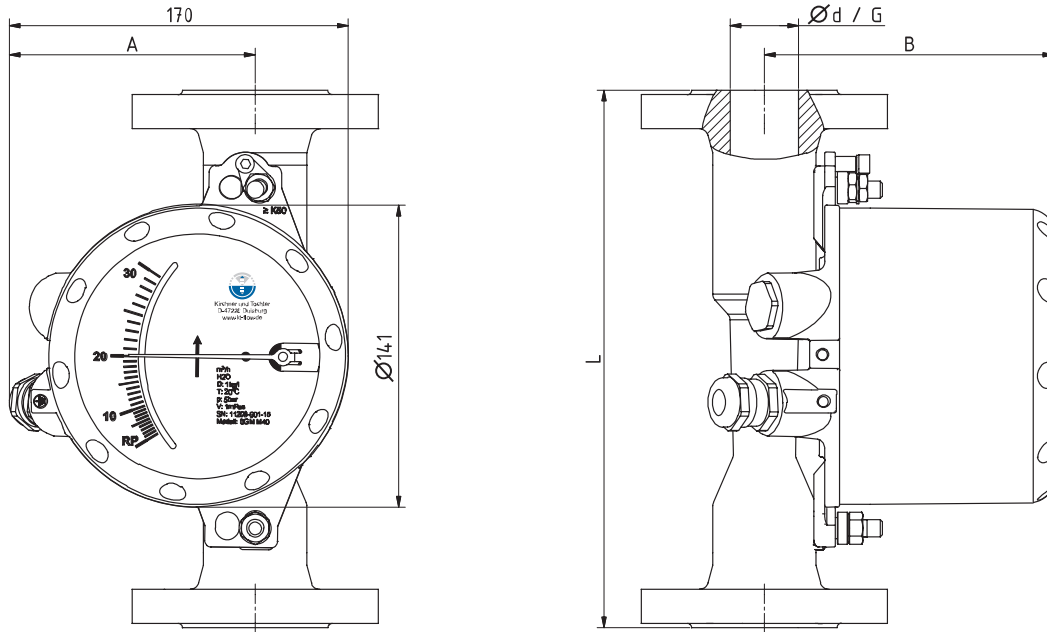
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DIMENSIONS



Flanged stainless steel version

DN	PN	L [mm]	A [mm]	B [mm]	Ø d [mm]	AISI 316 [kg]	Ceramic/ PTFE [kg]
15	40	250	104	114	20	3.5	3.5
25	40	250	104	127	32	5	5
50	40	250	117	139	65	8,2	10
80	16	250	117	155	89	12.2	13
100 ¹⁾	16	250	117	164	114	14	15

¹⁾ Only with PTFE lining

Overall length for devices with internal thread to DIN EN ISO 228: 300 mm; To ANSI B 16.5 (from 3"/ 300 Lbs and over): 300 mm
Other fitting types on request

Female threads fittings, stainless steel version

DN	G	L [mm]	A [mm]	B [mm]	Ø d [mm]	Mass [kg]
15	G ½"	300	104	114	20	3.5
15	½" NPT	300	104	114	20	3.5
15	¾" NPT	300	104	114	20	3.5
15	G 1"	300	104	114	20	3.5
25	G 1"	300	104	127	32	5
25	1" NPT	300	104	127	32	5

Plastic versions, PVC or PP

DN	PN	L [mm]	A [mm]	B [mm]	Ø d [mm]	PP [kg]	PVC [kg]
15	16	250	104	153	25	1.6	1.8
25	16	250	104	158	40	1.8	2
50	10	250	104	171	60	2.8	3.2
65	10	250	104	185	75	3.6	4
80	10	250	117	188	90	4.2	4.9
100	10	250	117	200	114	4.8	5.6

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