

KDG Rotameter®

Variable Area Flowmeter

Metal Tube Series 250

Data sheet
1718

Features

- Choice of connections
- Industry standard length
- High accuracy calibration option
- Robust design
- Magnetically coupled local indicator, transmitter option
- Alarm options
- PTFE versions available
- Fastrack delivery on selective models

Applications

The metal tube 250 series variable area flowmeter is a specially designed instrument for measuring the flow of liquids and gases.

Its robust design makes it highly suitable for use on hazardous and corrosive applications as found in most industrial processes.

Principle

The instrument must be mounted in a vertical pipe with fluid circulation in the upwards direction.

The self guiding cylindrical float is positioned inside a tapered tube. When the flow passes through the meter the float rises to a position of equilibrium where the weight of the float is balanced by the net force due to the fluid pressure. The float is magnetically coupled to a pointer indicating the rate of flow on the front scale.

Description

The instrument comprises :

- A body formed in stainless steel with fixed flange connection
- A stainless steel or an alloy float fitted with a magnet, with guide rods at each end
- Two end stops in stainless steel used as a guide for the float
- An indicator housing unit in aluminium alloy.



Technical Characteristics

MATERIALS		MECHANICAL	
Body & stops:	316 Stainless steel, PTFE optional	Fluid temp.:	-40°C to +200°C, high temp. versions available on request (PTFE reduced temp.)
Float:	316 Stainless steel, PTFE optional	Ambient temp.:	-40°C to +80°C, (with transmitter +70°C)
Indicator housing:	Aluminium, 316 st. st. optional	Max. operating pressure:	40 bar standard, higher on request
Finish:	Polyester paint, epoxy paint optional	Connections:	Flanged ANSI or BS4504 Flange rating options, threaded ends or hygienic connections refer to factory
Backplate:	Anodised alloy	EMC COMPLIANCE	
Connections:	316 Stainless steel	Emissions:	EN50081-1 (1992)
PERFORMANCE		Immunity:	EN50082-1 (1992)
Accuracy:	+/-2% of full scale. Class 1.6 available on request. PTFE version +/-3% of max. flow		
Turndown ratio:	1 to 10 nominally		
Protection :	IP65		

Flow Range Table

Maximum capacities shown. Turndown ratio typically 10:1

Normal size	LIQUID		GAS		PRESSURE DROP	PTFE LINED	
	M code	Max liquid flow rates SG = 1	MG code	Flow capacity Air - 20°C Atmospheric pressure	mbar	Code MP	Max liquid flow SG = 1
15 (½")	M1	100 l/h			35		
	M2	160 l/h	MG2	5 m³/h	60	MP2	160 l/h
	M3	250 l/h	MG3	7.5 m³/h	60	MP3	250 l/h
	M4	400 l/h	MG4	12 m³/h	60	MP4	400 l/h
	M5	600 l/h	MG5	18 m³/h	65	MP5	600 l/h
	M6	1 m³/h	MG6	30 m³/h	70	MP6	1 m³/h
25 (1")	M5	600 l/h	MG5	18 m³/h	45	MP5	600 l/h
	M6	1 m³/h	MG6	30 m³/h	80	MP6	1 m³/h
	M7	1.6 m³/h	MG7	48 m³/h	55	MP7	1.6 m³/h
	M8	2.5 m³/h	MG8	75 m³/h	80	MP8	2.5 m³/h
	M9	4 m³/h	MG9	120 m³/h	85	MP9	4 m³/h
50 (2")	M10	6 m³/h	MG10	180 m³/h	125		
	M8	2.5 m³/h	MG8	75 m³/h	55	MP8	2.5 m³/h
	M9	4 m³/h	MG9	120 m³/h	80	MP9	4 m³/h
	M10	6 m³/h	MG10	180 m³/h	55	MP10	6 m³/h
	M11	10 m³/h	MG11	300 m³/h	80	MP11	10 m³/h
	M12	16 m³/h	MG12	480 m³/h	95		
80 (3") or 100 (4")	M13	25 m³/h	MG13	750 m³/h	130		
	M11	10 m³/h	MG11	300 m³/h	60	MP10	6 m³/h
	M12	16 m³/h	MG12	480 m³/h	90	MP11	10 m³/h
	M13	25 m³/h	MG13	750 m³/h	60	MP12	16 m³/h
	M14	40 m³/h	MG14	1000 m³/h	125	MP13	25 m³/h
	M15	50 m³/h	MG15	1500 m³/h	140		
M16	60 m³/h	MG16	1800 m³/h	165			
M17	80 m³/h	MG17	2400 m³/h	220			

Alarm Contacts Option

Alarm type: Inductive detector to NAMUR and DIN 19324 standards. Two adjustable contacts (high and low alarm) over whole scale. Settings with indicator on flow scale. Can be used with electronic transmitter.

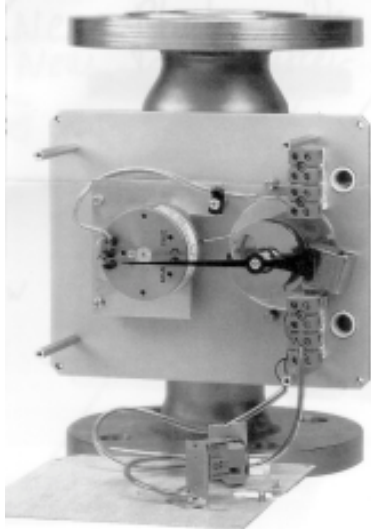
Repeatability: <0.5% of scale maximum.

Detector features: 2-wire dc current detector.
Rated voltage : 8V = (R ~ 1 KR).
Operating voltage : 5 to 25 V.
Typical power consumption: >3 mA.
Control line resistance: <100W

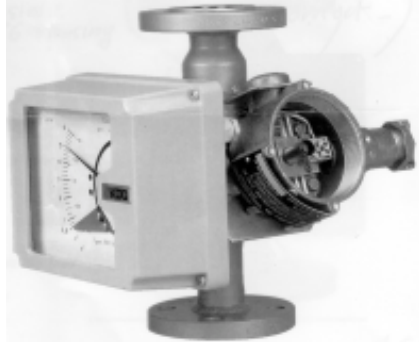
Characteristics of associated relay amplifier:

Mains supply: 220V 50/60 Hz (other voltages on request).
Switch Rating:
Maximum voltage : 250 V ac.
Maximum current : 4 A.
Maximum power : 500 VA.
Mounted on 35mm DIN rail or individual attachment by screws with IP20 protection.
Ambient temperature : -25°C to +60°C.
Fail-safe version EEx ia II C to CENELEC

Two wire electronic transmitter option

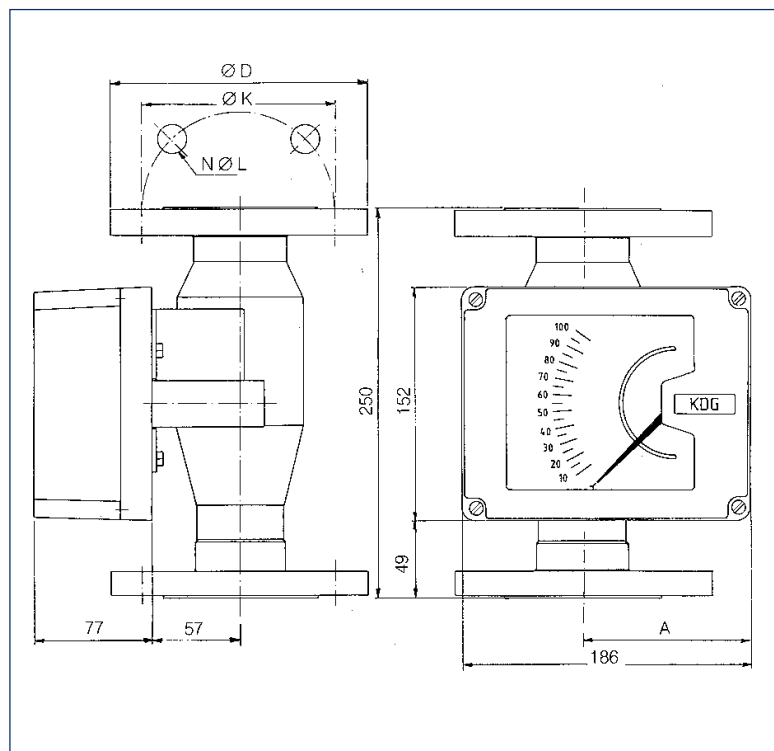
Output signal:	4-20 mA proportional to flow	
Power supply voltage:	V = 12 to 30 V dc, residual ripple <10%	
Maximum load k Ω:	$\frac{V_B - 12 V}{20}$	
Ambient temperature:	-20°C to 70°C	
Linearity:	<± 0.4% of full scale	
Temperature deviation:	<0.02% per °C	
Output current residual ripple:	<0.3%	
Response time:	<5ms	
INTRINSICALLY SAFE VERSION:		
CENELEC EEx ia IIC T6		
No-load power supply <30V. P<1W		
Short circuit current <160 mA.		
The system circuit must conform with IS barriers to the relevant certification standard		
Pneumatic transmitter also available on request		

Flowmeter with reed switch option

SPDT Reed Switch contact inside EExd IIC T6 housing		
Contact:	Bi-stable change over SPDT	
Max voltage:	220V	
Max current:	1A	
Max power:	60VA, 30W resistive load	
Service life:	10 ⁶ operations	
Protection Class:	IP54	

Dimensions

Standard model dimensions						
Size	PN	∅ D	∅ K	∅ L	N	A
15	16	95	65	14	4	80
	40	95	65	14	4	80
½"	150 lbs	88.9	60.3	15.9	4	80
	300 lbs	95.2	66.7	15.9	4	80
25	16	115	85	14	4	92
	40	115	85	14	4	92
1"	150 lbs	107.9	79.4	15.9	4	92
	300 lbs	123.8	88.9	19	4	92
50	16	165	125	18	4	108
	40	165	125	18	4	108
2	150lbs	152.4	120.6	19	4	108
	300 lbs	165.1	127	19	8	108
80	16	200	160	18	8	122.5
	150 lbs	190.5	152.4	19	4	122.5
100	16	220	180	18	8	124
	150 lbs	228.6	190.5	19	8	124



Ordering Information

250 Series 250 metal tube VA meter	
Code	Connection code
15	DN15 ISO flanges NFE 29 203
25	DN25 ISO flanges NFE 29 203
50	DN50 ISO flanges NFE 29 203
80	DN80 ISO flanges NFE 29 203
100	DN100 ISO flanges NFE 29 203
½"	Flanges ANSI B16-ND ½"
1"	Flanges ANSI B16-ND 1"
2"	Flanges ANSI B16-ND 2"
3"	Flanges ANSI B16-ND 3"
4"	Flanges ANSI B16-ND 4"
Code	Construction code & end connections
C1	316ss PN16 (DIN 2635)
C2	316ss PN 40 (DIN 2635)
C3	316ss ANSI 150lb RF
C4	316ss ANSI 300lb RF
C5	PTFE PN16 (DIN 2635)
C6	PTFE ANSI 150 RF
CX	Special - Threaded, hygienic or higher pressure - please state
Code	Measuring element code
M*	See flow range tables
Code	Transmitter code
T0	No transmitter
T1	Electronic transmitter, 4-20mA std
T2	Electronic transmitter, 4-20mA - IS version
T3	Pneumatic transmitter, 0.2-1 bar with ¼" NPT connection (alarms code "S" are not available)
Code	Alarm code
S0	No alarms
S1	1 contact, low alarm (without relay)
S2	1 contact, high alarm (without relay)
S3	2 contacts, high and low alarms (without relay)
S4	1 contact, low alarm (with relay)
S5	1 contact, high alarm (with relay)
S6	2 contacts, high and low alarms (with relay)
Code	Options
Z0	No options
Z1	Damping system essential with all gas flows
Z2	High temperature screen
Z4	Accuracy class 1.6 (liquid within viscosity limits)
Z5	Intrinsic safety for codes T or S
Z6	Special scale (non standard units)
Z9	Epoxy painted aluminium indicator housing
Z10	Degreasing
Z13	Calibration certificate

250 25 C1 M8 T1 S3 Z0 Example of coding to be suffixed with all fluid information, flow range, scale units

Information required for quote or order:

Fluid type to be measured.

Maximum and minimum flow rate required.

Specific gravity and viscosity at operating conditions.

Normal working temperature of fluid to be measured.

Installation and maintenance:

Make sure the Rotameter is positioned as upright as possible and fluid flow is upwards.

Keep the inside of the instrument in a good clean state.

Maximum temperature of fluid to be measured.

Normal pressure of fluid to be measured.

Maximum pressure of fluid to be measured.

Scale flow units M³/hr or litres per min.

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