



Flap Flow Meter for Liquids



measuring
•
monitoring
•
analysing

TSK



- Range:
0.5 - 3.5 ... 200 - 1500 m³/h
- Accuracy: ± 2.0 of reading
- p_{\max} : PN 40, t_{\max} : -40 ... +300 °C
- Connection: wafer flange
DN 25 ... 500
- Material: stainless steel,
Hastelloy C, PP, PTFE
- Option: limit contacts,
analogue output with HART® or
PROFIBUS-PA®, Counter



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Description

The Kobold flap flowmeter type TSK is suitable for flow measurement of liquid products in pipes. The special advantage is that it can be used for all directions of flow. It shows the current flow rate in volume or mass per unit in time. The meter's design makes it ideal for processes under difficult and adverse operating conditions. The devices are available with additional electrical equipment for process monitoring and control.

Function

If a medium flows with sufficient velocity through the horizontally or vertically mounted TSK fitting, the paddle will swivel around the axle until the force of the medium and the opposing force of the paddle surface plus the spring tension establish equilibrium. The angular position or the position of equilibrium of the paddle in the measuring compartment is the measure for the flow. The encapsulated ring-type permanent magnet at the end of the paddle axis transmits this position to the scale and the optional electronic evaluators through the magnet tracking indicator system. This happens safely and without packing glands.

The flow rates shown on the scale only apply to the calibrated medium or to a medium with the same physical characteristics.

Additional advantages

- A large spectrum of wetted materials and linings
- Magneto-resistive signal transmission
- Special design for high temperature applications

Applications

- Control of cooling- and flushing processes
- Chemical industry
- Water- and waste-water technology
- Power-plants
- Machinery-building

Technical details

Sensor

Materials:	1.4404 (316 L) / 1.4571 (316 Ti) (TSK-S) Steel / Stainless steel (TSK-C from DN125) Hastelloy C-22 (TSK-H) Polypropylene / Stainless steel (TSK-H) Polypropylene / Hastelloy C-22 (TSK-J) PTFE / Hastelloy C-22 (TSK-P) other materials on request
Process connection:	Sandwich acc. EN 1092, ASME B16.5, DIN 2512, special connections on request
Nominal pressure:	PN 40, ASME Cl150 / 300 (standard) (TSK-S/C/H) PN 16, ASME Cl150 (standard) (TSK-K/J/P) higher pressure rates optional
Process temperature:	-40 °C ... +300 °C (TSK-S/C/H) 0 °C ... +80 °C (TSK-K/J) -20 °C ... +125 °C (TSK-P)
Ambient temperature:	-40 °C ... +80 °C
Accuracy:	liquid/gas: ±2% of reading ±1% of upper range value ±0,2% with transmitter (ES)
Protection:	IP 65 (EN 60529)

Certification

Explosion protection:	BVS 03 ATEX H/B 112
CE-Marking:	Pressure Equipment Directive 97/23/EG

Display

Materials:	Aluminum (stove-enameled) Stainless steel (as option)
Electrical outputs:	inductive switch microswitch others on request
Ambient temperature:	-40 °C ... +80 °C (without switch) -40 °C ... +65 °C (with switch)



Technical details (suite)

Transmitter

- ES with HART®-protocol
- ES with HART®-protocol and 2 NAMUR-switches
- ES with HART®-and 1 NAMUR-switch
- 1 pulse output
- ES with PROFIBUS-PA®
- ES with HART®-protocol and counter module

Power supply:	14 -30 V _{DC}
Outputs:	passive, galvanically isolated
Analogue:	4-20 mA
Binary 1 and 2:	U _i = 30 V, I _i = 20 mA, P _i = 100 mW
Input Binary:	Counter reset (only for ES with counter module)
Ambient temperature:	-40 °C ... +70 °C
Protection:	IP 20

Certification

Explosion protection:	DMT 00 ATEX E 075
Type of protection:	II 2G EEx ia IIC T6
CE-Marking:	Explosion Protection Directive 94/9/EG



Flap Flow Meter for Liquids Model TSK

Order Details (Example: TSK-S 109C A1 U 6 V 00 S 1 0 0)

Model	Process connection 1... = flange Form C DIN 2501 2... = flange RF ASME B16.5-2003	Range m ³ /h water	Flow direction	Temperature class	Seal
TSK-S = Armatur stainless steel, built-in parts stainless steel TSK-H = Armatur and built-in parts Hastelloy C-22 TSK-K ²⁾ = Armatur PP, built-in parts stainless steel TSK-J ²⁾ = Armatur PP, built-in parts Hastelloy C-22 TSK-P ³⁾ = Armatur PTFE, built-in parts Hastelloy C-22 TSK-C ¹⁾ = Armatur steel, built-in parts stainless steel	109C = DN25 PN40	A1 = 0,5 - 3,5	U = from the bottom to the top O = from the top to the bottom L = from the left to the right R = from the right to the left	6 ²⁾ = max. 80 °C, Magnet encapsulation PVDF 5 = max. 100 °C, Magnet encapsulation PVDF 4 = max. 135 °C, Magnet encapsulation PVDF, forward advanced display 3 = max. 200 °C, Magnet encapsulation stainless steel, forward advanced display 2 = max. 300 °C, Magnet encapsulation stainless steel, forward advanced display	V = FPM (max. 150 °C) F = FEP (max. 200 °C) S = stainless steel (max. 300 °C)
	117C = DN40 PN40	B1 = 1,5 - 6			
	205R = 1 1/2" Class 150	B2 = 1,5 - 10			
	225R = 1 1/2" Class 300	B3 = 3 - 15			
	121C = DN50 PN40	C1 = 1,5 - 10 C2 = 3 - 30			
	206R = 2" Class 150				
	226R = 2" Class 300				
	126C = DN65 PN40	D1 = 1,5 - 14 D2 = 4 - 30 D3 = 6 - 50			
	207R = 2 1/2" Class 150				
	227R = 2 1/2" Class 300				
	131C = DN80 PN40	E1 = 4 - 24 E2 = 10 - 60			
	208R = 3" Class 150				
	228R = 3" Class 300	F1 = 6 - 40 F2 = 8 - 80			
	135C = DN100 PN16				
	210R = 4" Class 150	G1 = 10 - 60 G2 = 20 - 120			
	230R = 4" Class 300				
	140C = DN125 PN16	H1 = 15 - 100 H2 = 30 - 200			
	211R = 5" Class 150				
	231R = 5" Class 300	J1 = 25 - 160 J2 = 50 - 275 J3 = 60 - 400			
	145C = DN150 PN16				
212R = 6" Class 150	K1 = 50 - 200 K2 = 75 - 400 K3 = 80 - 500				
232R = 6" Class 300					
150C = DN200 PN16	L1 = 80 - 400 L2 = 100 - 600				
213R = 8" Class 150					
155C = DN250 PN10	M1 = 120 - 700 M2 = 150 - 1000				
214R = 10" Class 150					
162C = DN300 PN10	N1 = 150 - 800 N2 = 200 - 1300				
215R = 12" Class 150					
169C = DN350 PN10	P1 = 200 - 1300 P2 = 200 - 1500				
216R = 14" Class 150					
175C = DN400 PN10					
217R = 16" Class 150					
180C = DN500 PN10					
219R = 20" Class 150					

¹⁾ only available for Nominal diameter DN125 / 5" ²⁾ Model TSK-K and TSK-J (Armatur PP) only max. 80 °C possible! ³⁾ TSK-P max. 125 °C

Special seal	Certificate	Display	Scale	Electr. outputs	Accessories
0 = without 1 ⁴⁾ = FPM, (max. +150 °C) 2 ⁴⁾ = FEP, (max. +200 °C)	0 = without 1 = Certificate of compliance with the order 2.1 2 = Test report 2.2 B = Inspection certificate 3.1 C = Inspection certificate 3.2	S = Standard (Aluminum) E = Stainless steel display IP 66 T = Standard (Aluminum) with pressure compensation	1 = %-Scale (Water) 2 = Range-scale (Water) 4 = %-Scale (Media) 5 = Range-scale (Media)	0 = without 1 = 1x inductive limit contact 2 = 2x inductive limit contacts 6 = electr. transmitter ES, HART®, 4-20 mA, EExia 7 = electr. transmitter ES, HART®, 4-20 mA, EExia, 2x Namur contacts 9 = electr. transmitter ES, PROFIBUS-PA®, EExia I = 4-20 mA with HART® and counter module K = electr. transmitter ES, Fieldbus Foundation®	0 = without X = with (see separate specifications)

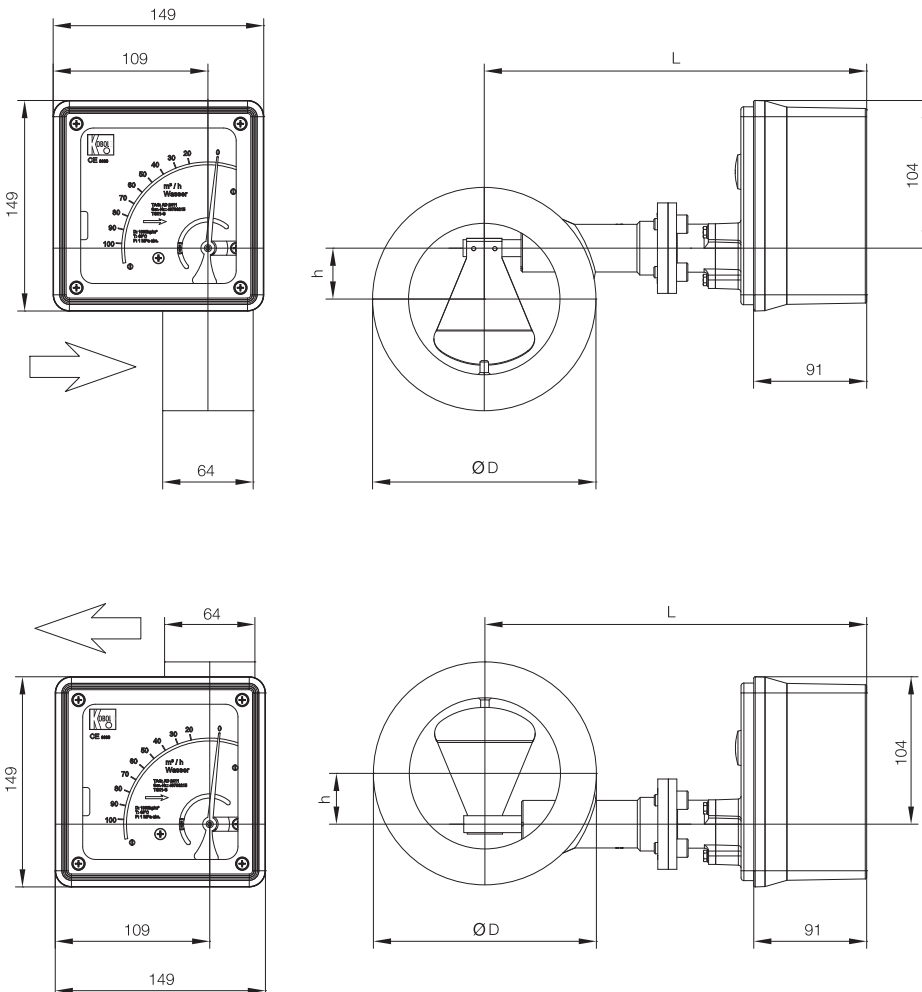
⁴⁾ Protection of incoming solids (f. ex. metal chippings) in the transmission chamber



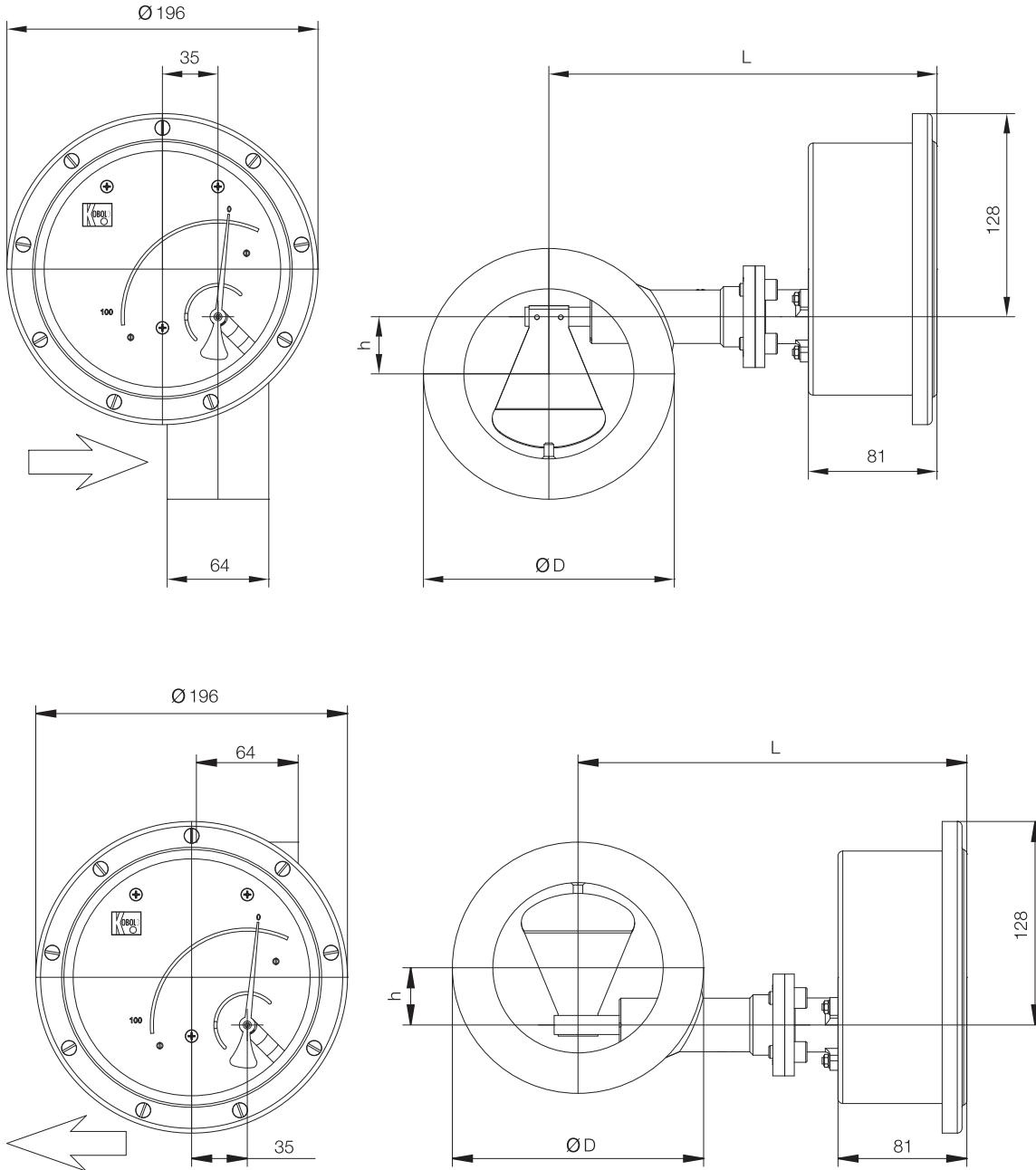
Dimensions

Size		Nominal pressure (standard)		L [mm]		D [mm]		h [mm]
DIN/EN	ASME	PN	class	Display aluminium	Display stainless steel	DIN-/EN-flange	ASME-flange	
50	2"	40	300	272	261	102	92,1	17
65	2 1/2"	40	300	272	261	122	102	21 (ASME = 17)
80	3"	40	300	272	261	138	127	31
100	4"	16	150	272	261	158	158	36
125	5"	16	150	352	341	186	186	45
150	6"	16	150	352	341	212	212	53
200	8"	16	150	352	341	268	268	80
250	10"	16	150	352	341	320	320	90
300	12"	10	150	372	361	370	381	100
350	14"	10	150	442	431	430	413	100
400	16"	10	150	452	441	482	470	130
500	20"	10	150	492	481	585	585	130

Design with standard display for horizontal flow



Design with stainless steel display for horizontal flow



Design for vertical flow

