Flap-Type Flowmeter

measuring • monitoring • analyzing

TSK

- Range: 6.6...26.4 to 880...6600 GPM
- Accuracy: ± 2.5% of Full Scale
- P_{max}: 580 PSI
- T_{max}: -40 …572 °F
- Connection: Wafer Flange 1.5" …20" ASME
- Material: Stainless Steel, Hastelloy C-22®, PTFE
- Options: Limit Contacts, Analog Output with HART®, FOUNDATION® Fieldbus™, or Counter Module

KOBOLD companies worldwide:

AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHINA, CZECHIA, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, SPAIN, SWITZERLAND, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

KOBOLD Instruments, Inc.
1801 Parkway View Drive
Pittsburgh, PA 15205
Main Office:
1.800.998.1020
1.412.788.4890
info@koboldusa.com
www.koboldusa.com

GV/08-11-2026

Description

The KOBOLD TSK measures liquid flow in pipes and can be used in all directions of flow. It shows the current flow rate in volume or mass per unit time. It is designed to handle difficult and adverse operating conditions. It is available with electronic options for remote process monitoring and control. The principal of operation is as follows: If a media flows with sufficient velocity through the horizontally or vertically mounted TSK fitting, the paddle swivels around the axle until the force of the media 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 media or to a media with the same physical characteristics.

Specifications

Sensor Materials:

TSK-S:	316L SS / 316-Ti SS
TSK-H:	Hastelloy C-22® / Hastelloy C-22®
TSK-P:	PTFE / Hastelloy C-22®
Option:	Others on Request, Consult Factory

Process Connection:	Wafer Acc. EN 1092, ASME B16.5, DIN 2512, Special Connections on Request
Nominal Pressure	
TSK-S/H:	580 PSIG, ASME Cl150/Cl300 (Standard)
TSK-P:	232 PSIG, ASME Cl150 (Standard) Higher Pressure Ratings Optional
Process Temperature:	
TSK-S/H:	-40...572 °F
TSK-P:	-4...257 °F
Ambient Temperature:	-40...176 °F
Ingress Protection:	IP 65 (EN60529)
Accuracy (Liquid):	± 2.5% of Full Scale ± 0.2% with Transmitter (ES)
Repeatability:	± 0.5%
Certification:	
Explosion Protection:	HMT21-4151X (Conformity Statement)
Ex Marking (Armature):	II 2G Ex h IIC T2...T6 Gb II 2D Ex h IIIC T85ºC/T300ºC Db
CE-Marking:	Pressure Equipment Directive 97/23/EC

Display

Materials:	Aluminum (Enameled) Stainless Steel (Option)
Outputs:	Inductive Switch or Microswitch (Reed Switch V_{max}: 175 V_{DC}, I_{max}: 0.25 A, P_{max}: 5 W)
Ambient Temperature:	-40...176 °F (without Switch) -40...149 °F (with Switch)
Ingress Protection:	IP 65 (Aluminum Housing) IP 65, IP66, & IP67 (SS Housing)

Transmitter

ES with HART®-Protocol
ES with HART®-Protocol and 2 NAMUR-Switches
ES with HART®-Protocol and Counter Module
ES with HART®-Protocol, 1 NAMUR-Switches, and Pulse
ES with Foundation® Fieldbus™

Power Supply:	14 - 30 V_{DC}
Output:	Passive, Galvanically Isolated
Current:	4-20 mA
Binary 1 and 2:	Ui=30 V, I i=20mA, Pi=100 mW
Input Binary:	Counter Reset (only for ES with Counter Module)
Ambient Temperature:	-40...158 °F
)	
Certification	
Explosion Protection:	DMT 00 ATEX E 075
Type of Protection:	II 2G EEx ia IIC T6
CE-Marking:	ATEX (IECEx) Directive 2014/34/EU

No responsibility taken for errors;
subject to change without prior notice.

Order Details (Example: **TSK-S 205R B1 U 5 V 00 S 1 0 0K**)

See diagrams on pgs. 5 and 6 for details on how to specify the flow direction section of the configuration code.

Model	Process Connection	Water Range (GPM)	Flow Direction	Temperature Class	Seal
TSK-S.. = Armature and Built-in Parts Stainless Steel **TSK-H..** = Armature and Built-in Parts Hastelloy C-22® **TSK-P**[3]**..**= Armature PTFE, Built-in Parts Hastelloy C-22®	**..205R..** = 1-1/2" Class 150	**..B1..** = 6.6...26.4 **..B2..** = 6.6...44 **..B3..** = 13.2...66	**..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	**..2**[11]**..** = Max. 572 °F, Magnet Encapsulation Stainless Steel, Forward Advanced Display **..3**[11]**..** = Max. 392 °F, Magnet Encapsulation Stainless Steel, Forward Advanced Display **..4**[11]**..** = Max. 275 °F, Magnet Encapsulation PVDF, Forward Advanced Display **..5..** = Max. 212 °F, Magnet Encapsulation PVDF	**..V..** = FKM (Max. 302 °F) **..F..** = FEP (Max. 392 °F) **..S..** = Stainless Steel (Max. 572 °F)
	..225R.. = 1-1/2" Class 300				
	..206R.. = 2" Class 150	**..C1..** = 6.6...44 **..C2..** = 13.2...132			
	..226R.. = 2" Class 300				
	..207R.. = 2-1/2" Class 150	**..D1..** = 6.6...61.6 **..D2..** = 17.6...132 **..D3..** = 26.4...220			
	..227R.. = 2-1/2" Class 300				
	..208R.. = 3" Class 150	**..E1..** = 17.6...106 **..E2..** = 44...264			
	..228R.. = 3" Class 300				
	..210R.. = 4" Class 150	**..F1..** = 26.4...176 **..F2..** = 35.2...352			
	..230R.. = 4" Class 300				
	..211R.. = 5" Class 150	**..G1..** = 44...264 **..G2..** = 88...528			
	..231R.. = 5" Class 300				
	..212R.. = 6" Class 150	**..H1..** = 66...440 **..H2..** = 132...880			
	..232R.. = 6" Class 300				
	..213R.. = 8" Class 150	**..J1..** = 110...704.5 **..J2..** = 220...1211 **..J3..** = 264...1760			
	..214R.. = 10" Class 150	**..K1..** = 220...880 **..K2..** = 330...1760 **..K3..** = 352...2202			
	..215R.. = 12" Class 150	**..L1..** = 352...1760 **..L2..** = 440...2640			
	..216R.. = 14" Class 150	**..M1..** = 528...3082 **..M2..** = 660...4400			
	..217R.. = 16" Class 150	**..N1..** = 660...3520 **..N2..** = 880...5724			
	..219R.. = 20" Class 150	**..P1..** = 880...5724 **..P2..** = 880...6605			

Configuration table continues on the following page

[3] Reccomended for fluids containing particles
[3] TSK-P max. 257 °F
[5] Suitable for cable galnds with M20 x 1.5 thread
[6] SIL 1 - IEC 61508-2:2010 conformity examined by EXIDA
[7] SIL 1 - IEC 61508-2:2000 conformity examined by EXIDA
[8] SIL 2 - IEC 61508-2:2000 conformity examined by EXIDA
[9] Stainless steel display housing is not compatible with the counter module
[11] Not for PTFE armature
[12] SIL conformity only with "Accessories" option "SK"
[13] Only in combination with "Electrical Output" for options "3", "4", "6", "7", or "8"
[8] Only for the flow direction from the bottom to the top

No responsibility taken for errors;
subject to change without prior notice.

Order Details Continued (Example: **TSK-S 205R B1 U 5 V 00 S 1 0 0K**)

See diagrams on pgs. 5 and 6 for details on how to specify the flow direction section of the configuration code.

Special Seal	Certificate	Display	Scale	Electrical Outputs	Accesories
(For protection against incoming solids, ie; metal shavings and small debris, from entering the transmission chamber.) **..0..** = Without **..1[2]..** = FKM, Max 302°F **..2[2]..** = FEP, Max 392°F	**..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[5]..** = Standard (Aluminum) **..E[5]..** = Stainless Steel Display IP 67 **..T[5]..** = Standard (Aluminum) with Pressure Compensation	**..1..** = %-Scale (Water) **..2..** = Range-Scale (Water) **..4..** = %-Scale (Media) **..5..** = Range-Scale (Media) **..F..** = Dual-Scale (Media) Customer Preference	**..0..** = Without **..1..** = 1x Inductive Switch, Type SJ 3,5 N **..2..** = 2x Inductive Switch Type SJ 3,5 N **..3[6][7][12]..** = 1x Inductive Switch, Type SJ 3,5 SN (Safety Design) **..4[6][7][12]..** = 2x Inductive Switch, Type SJ 3,5 SN (Safety Design) **..6[7][12]..** = Transmitter ES, HART® Protocol, 4-20 mA, Ex ia **..7[7][12]..** = Transmitter ES, HART® Protocol, 4-20 mA, Ex ia, 2x Namur Contacts **..8[7][12]..** = Transmitter ES, HART® Protocol, 4-20 mA, Ex ia, 1x Namur Contact, 1x Pulse Output **..L..** = 1x Microswitch Limit Contact **..M..** = 2x Microswitch Limit Contacts **..E..** = 1x Inductive Switch (3-wire)t **..F..** = 2x Inductive Switch (3-wire) **..G..** = 1Inductive Switch Type NCB2-12GM40-Z0 **..I[9][14]..** = Transmitter ES with HART® Protocol & Counter Module **..K..** = Transmitter ES with Foundation® Fieldbus™	**..0K** = Without **..SK[13]** = SIL Conformity Assessment by EXIDA **..XK** = Special (Please Specify)

[2] Reccomended for fluids containing particles
[3] TSK-P max. 257 °F
[5] Suitable for cable galnds with M20 x 1.5 thread
[6] SIL 1 - IEC 61508-2:2010 conformity examined by EXIDA
[7] SIL 1 - IEC 61508-2:2000 conformity examined by EXIDA
[8] SIL 2 - IEC 61508-2:2000 conformity examined by EXIDA
[9] Stainless steel display housing is not compatible with the counter module
[11] Not for PTFE armature
[12] SIL conformity only with "Accessories" option "SK"
[13] Only in combination with "Electrical Output" for options "3", "4", "6", "7", or "8"
[14] Only for the flow direction from the bottom to the top

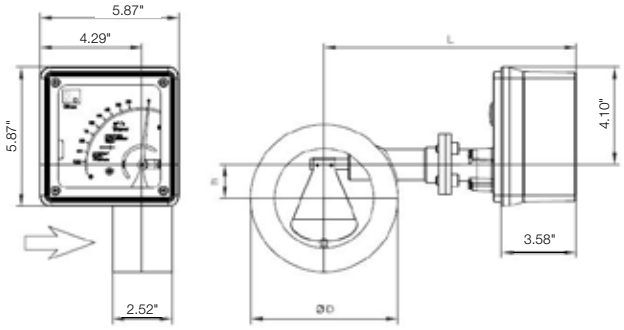
No responsibility taken for errors;
subject to change without prior notice.

Dimensions

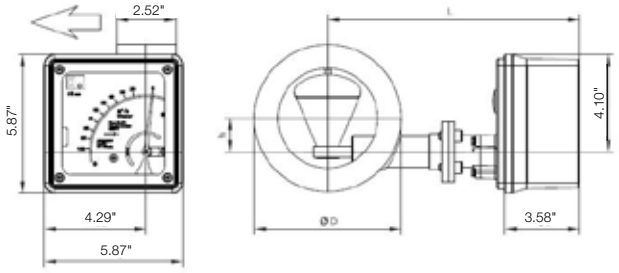
Size (inch) ASME	Nominal Pressure (Standard) Class	L (inch) Display Aluminium	L (inch) Display Stainless Steel	D (inch) ASME- Flange	h (inch)
2	300	10.71	10.28	3.63	0.67
2-1/2	300	10.71	10.28	4.02	0.83 (ASME = 0.67)
3	300	10.71	10.28	5.00	1.22
4	150	10.71	10.28	6.22	1.42
5	150	13.85	13.43	7.32	1.77
6	150	13.85	13.43	8.35	2.09
8	150	13.85	13.43	10.55	3.15
10	150	13.85	13.43	12.60	3.54
12	150	14.65	14.21	15.00	3.94
14	150	17.40	16.97	16.26	3.94
16	150	17.79	17.36	18.50	5.12
20	150	19.37	18.94	23.03	5.12

Standard Display for Horizontal Flow

From the Left to the Right (..R..)

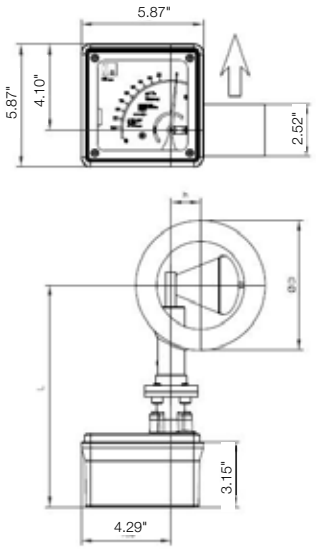


From the Right to the Left (..L..)

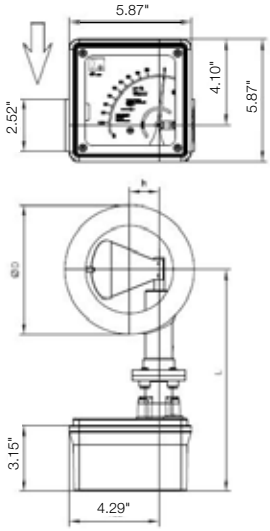


Standard Display for Vertical Flow

From the Bottom to the Top (..U..)



From the Top to the Bottom (..O..)

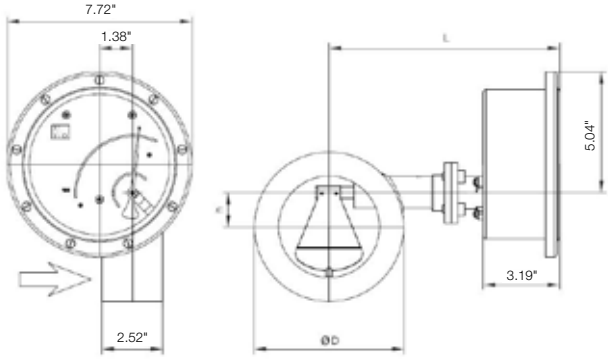


No responsibility taken for errors;
subject to change without prior notice.

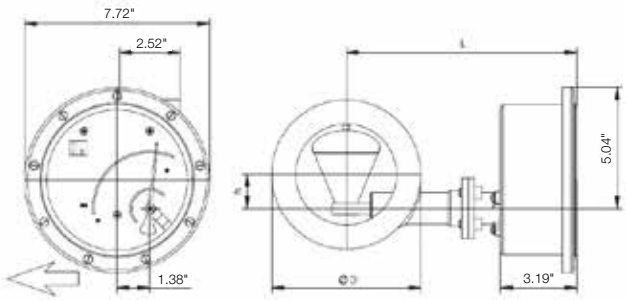
Size (inch) ASME	Nominal Pressure (Standard) Class	L (inch) Display Aluminium	L (inch) Display Stainless Steel	D (inch) ASME- Flange	h (inch)
2	300	10.71	10.28	3.63	0.67
2-1/2	300	10.71	10.28	4.02	0.83 (ASME = 0.67)
3	300	10.71	10.28	5.00	1.22
4	150	10.71	10.28	6.22	1.42
5	150	13.85	13.43	7.32	1.77
6	150	13.85	13.43	8.35	2.09
8	150	13.85	13.43	10.55	3.15
10	150	13.85	13.43	12.60	3.54
12	150	14.65	14.21	15.00	3.94
14	150	17.40	16.97	16.26	3.94
16	150	17.79	17.36	18.50	5.12
20	150	19.37	18.94	23.03	5.12

Stainless Steel Display for Horizontal Flow

From the Left to the Right (..R..)

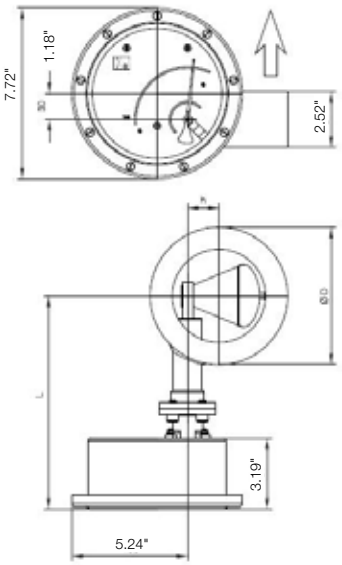


From the Right to the Left (..L..)

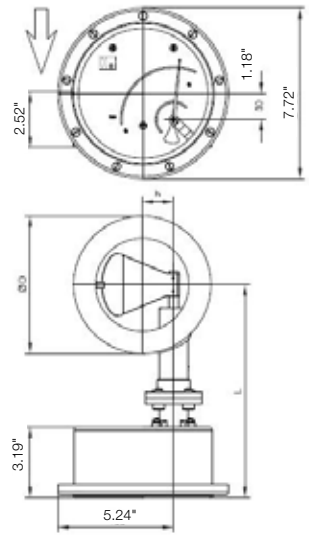


Stainless Steel Display for Vertical Flow

From the Bottom to the Top (..U..)



From the Top to the Bottom (..O..)



No responsibility taken for errors;
subject to change without prior notice.