



EXTERNAL CAGE MAGNETICALLY COUPLED LEVEL SWITCH FLOAT OR DISPLACER OPERATED



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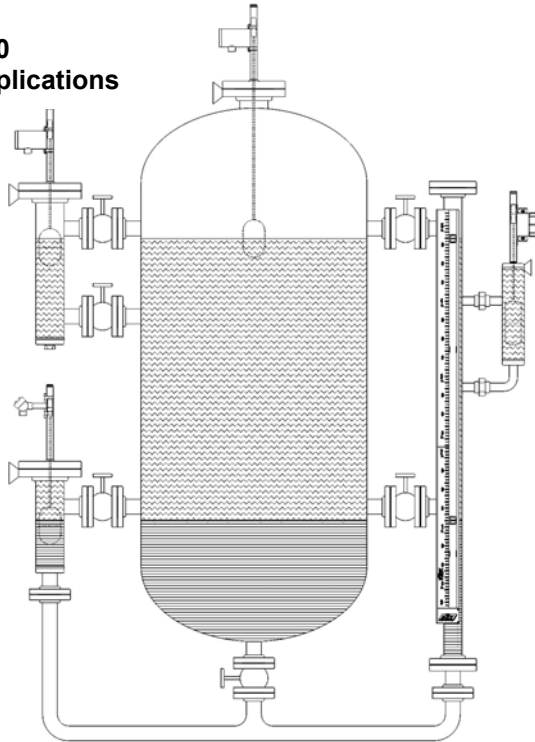
ISO9001 Certified

Model LS20

FEATURES:

- Easy To Isolate From Process Vessel
- Switch Is Isolated From Process Fluids
- Choice Of Single Or Multiple Switch Points
- Unique Magnetic Coupling And Latching Eliminates The Need For Bias Springs And Adjustments.
- Designed To ANSI/ASME B31.1, B31.3 As Applicable
- ASME Code "S", "U", Or "UM" Stamp Available
- Certification To NACE MRO175-97 Available
- Interface Or Total Level

K-TEK LS20 Sample Applications



PRINCIPLE OF OPERATION:

The LS20 is a float or displacer operated, magnetically coupled level switch with an external cage as an option. As the fluid level in the vessel (or cage) rises or falls, the position of the float or displacer changes with it. Magnets inside the sensing tube, attached to the float or displacer, move with the changing level as well. A switch, attached to the exterior of the sensing tube, detects movement of the magnet past its location, and transfers the contact positions. This is an adaptation of our proven KM26 Magnetic Liquid Level Indicator. There are over 50,000 KM26's in service around the world today. The LS20 is identical to the KM26T (top mounted indicator) except that it is not fitted with a magnetically coupled indicator. Use of the LS20 instead of conventional float switches allows easy access to the switches. Installation of isolation valves on the inlet and outlet of the cage allows removal of the entire unit without draining the vessel.

LS20 MODEL NUMBER

OPTIONS:

SENSING UNIT TYPES:

LS20 Float Operated Switch
LS20D Displacer Operated Switch

/a DESIGN RATING

LLX LOW PRESS / LOW S.G.
LMX LOW PRESS / MOD. S.G.
LHX LOW PRESS / HIGH S.G.
MLX MOD. PRESS / LOW S.G.
MMXMOD. PRESS / MOD. S.G.
MHX MOD. PRESS / HIGH S.G.
HLX HIGH PRESS / LOW S.G.
HMX HIGH PRESS / MOD. S.G.
HHX HIGH PRESS / HIGH S.G.

/b CAGE MATERIAL

CS - CARBON STEEL
S4 - 304 SS
S6 - 316 SS
HC - HASTELLOY C-276
SP - OTHER

/c CAGE ACCESS

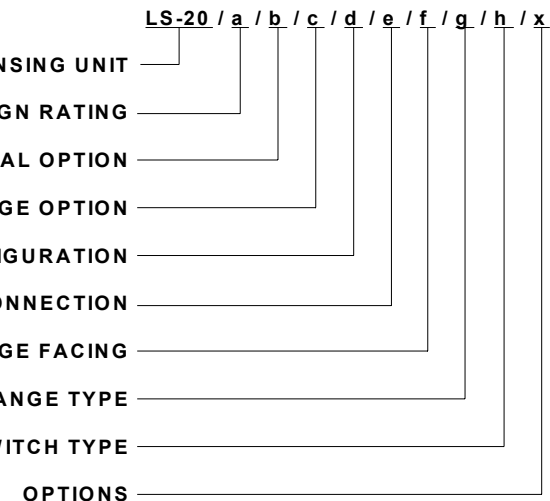
A - FLANGED*
B - SEALED w/ SENSOR
TUBE THREADED
C - SEALED w/ SENSOR
TUBE WELDED

/d CONFIGURATION

A - SIDE/SIDE
B - SIDE/BOTTOM
C - SIDE/SIDE/DRAIN
D - TOP MOUNT

/e PROCESS CONNECTION

11	1" 150 LB FLANGE
12	1" 2500 LB FLANGE
13	1" 300 LB FLANGE
15	1" 1500 LB FLANGE
16	1" 600 LB FLANGE
19	1" 900 LB FLANGE
51	1.5" 150 LB FLANGE
52	1.5" 2500 LB FLANGE
53	1.5" 300 LB FLANGE
55	1.5" 1500 LB FLANGE
56	1.5" 600 LB FLANGE
59	1.5" 900 LB FLANGE
21	2" 150 LB FLANGE
22	2" 2500 LB FLANGE
23	2" 300 LB FLANGE
25	2" 1500 LB FLANGE
26	2" 600 LB FLANGE
29	2" 900 LB FLANGE
1S	1" SW HALF-COUPLING
5S	1.5" SW HALF-COUPLING
2S	2" SW HALF-COUPLING
1T	1" FNPT HALF-COUPLING
5T	1.5" FNPT HALF-COUPLING
2T	2" FNPT HALF-COUPLING
XX	CUSTOM



/f FLANGE FACING

R RAISED FACE*
F FLAT FACE
J RING JOINT
N NOT APPLICABLE
O OTHER
(specify separately)

/g FLANGE TYPE

S SLIP-ON*
K SOCKET
L LAPPED
T THREADED
W WELD NECK
N NOT APPLICABLE
O OTHER

/h SWITCH TYPE

1 AMP SPDT
A MS-30
B MS-30/EX
4 AMP SPDT
C MS-21
D MS-21/EX
E MS-21/EX/B
1/2A DC; 10A AC

F MS-40
G MS-40/EX
H MS-40/EX/B
K MS-41 HERM SEALED
PNEUMATIC
I PS-35 (H or L)
J PS-45 (H or L)

/x OPTIONS

IP INSULATION PAD
IH HIGH TEMP INSUL.
IL LOW TEMP INSUL

OPTION NOTES:

* STANDARD

SENSING UNIT TYPES

A float operated switch uses only the buoyant force on the float to move with changing fluid levels. A float will have an immersed depth that varies only with changes in specific gravity; it therefore changes level directly with changing fluid level.

A displacer operated switch is typically for applications where low specific gravity with very high pressure exists. To withstand high pressures, the displacer must be solid or thick-walled; on its own, a displacer will sink and must have its weight supported by a spring. A displacer operated switch uses both a spring force and a buoyant force to move. As the fluid level in the cage changes, the immersed depth of the displacer changes to provide a varying force on the spring to create movement. Movement is a function of the spring rate and specific gravity of the fluid.

/a DESIGN RATING

Design rating is based upon the cage and/or the float pressure capacity. 150# and 300# class flanged cages fall into the low pressure range, 600# and 900# class flanged cages fall into the moderate range, and 1500# and 2500# class flanged cages fall into the high pressure range. The specific gravity range is relative to the float choices available for the material and pressure selected. A number is assigned to standard floats; check the rating code chart for standard units. Several floats can exist for each range (X = 1,2,3,...) and custom floats can be designed if your needs are not met by those given. These devices are considered instruments designed to meet the maximum pressure given at the time of order. Customer requirements for hydrostatic testing at 1.5 times maximum allowable working pressure must be specified when ordering to insure the integrity of the float at these higher pressures; the cage will always withstand hydrostatic testing pressures for the maximum pressure specified.

	CHAMBER DETAILS									FLOAT DETAILS		
TEMP	100°F			450°F			750°F			GROUP	MIN S.G.	BUOYANT MATERIAL
DESIGN RATING	PRESSURE RATING IN PSIG											
	CS	S4	S6	CS	S4	S6	CS	S4	S6			
LL1	285	275	275	185	180	182	95	95	95	3	0.64	S6F
LL2	740	720	720	617	480	497	505	415	425	4	0.60	S6F
LL3	740	720	720	617	480	497	505	415	425	6	0.44	S6F
LM1	740	720	720	617	480	497	505	415	425	3	0.65	T2F
LH1	740	720	720	617	480	497	505	415	425	3	0.83	S6F
ML1	1480	1440	1440	1235	962	990	1010	830	855	4	0.70	S6F
ML2	950	950	950	655	655	655	560	560	560	4	0.64	S6F
MM1	1800	1800	1800	1201	1201	1201	1037	1037	1037	4	0.75	S6F
MM2	1200	1200	1200	825	825	825	712	712	712	3	0.77	S6F
MH1	1540	1540	1540	1027	1027	1027	887	887	887	3	0.77	S6F
HL1	3750	3600	3600	3427	2407	2480	2520	2075	2135	4	0.40	S6D

Buoyant material is:

S6 - 316 SS	HC - Hastelloy C276	T2 - Titanium	F - Float	D - Displacer
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Hastelloy floats are available for alloy chambers with specific ratings available upon request. The GROUP relates to the size of the cage and determines the minimum dimensional requirements. Specific dimensional information is available upon request. This list only shows those ratings that have currently been standardized and is subject to periodic updates. Please check with the factory for the latest information or specify your requirements and we will determine if a device can be built within your constraints.

/b CAGE MATERIAL

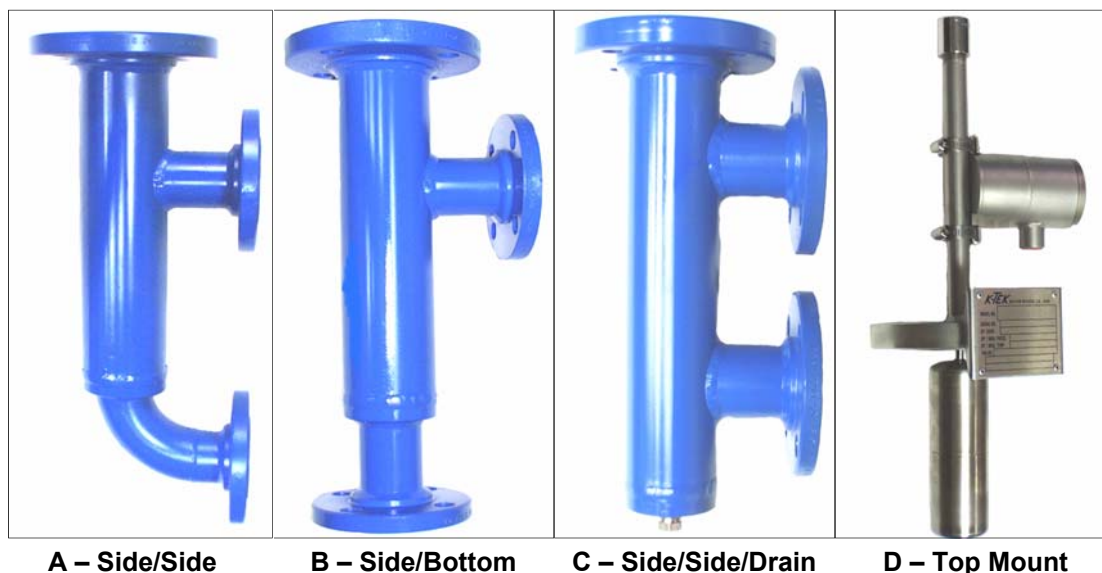
Standard material for the cage is carbon steel with a 316/316L stainless steel sensor tube. Sensor tubes must always be non-magnetic material. Standard float material is 316/316L stainless steel. HC units are made entirely of Hastelloy C-276. Titanium floats are available for low specific gravity applications. Other materials are available upon request.

/c CAGE ACCESS

Flanged cages are recommended for serviceability. They allow complete access to the float and hardware. A sealed cage is a lower cost alternative, but it does not allow access to the float. A threaded sensor tube allows access to the magnet assembly and connecting rod. A sealed unit with welded sensor tube does not allow access to any of the internal components.

/d CONFIGURATION / E. PROCESS CONNECTION

Flanged process connections are shown for example only. Any type of standard connection can be used. If a desired connection type is not shown, specify XX in the model number and indicate the connection required after the full model number. A top mount that extends beyond 24" below the flange face or that is installed into a turbulent vessel should utilize a stilling well or support tube; the process connection should allow float and sensor well installation unless provision is made for installation from inside the vessel. Stilling wells can be provided as optional hardware specified after the full model number. Support tubes are extensions of the sensor tube into the vessel to prevent the magnet rod from bending when stilling wells are not present; these are restricted to high level switching.



/f FLANGE FACING / G. FLANGE TYPE

This refers to any flange supplied on the unit. If no flange is provided use N in the model number for these options. If different facings or types of flanges are to be used, indicate special requirements after the full model number.

/h SWITCH TYPE

Specification sheets for each switch are provided separately. Reference locations are provided for “switch on rising fluid” or “switch on falling fluid” points on the sensor tube. The dead-band for each switch determines the distance between the transfer states as the magnet passes. All switches are set to “switch on rising fluid” at the upper reference line unless specified otherwise; they will reset when the dead-band distance is reached when the fluid falls. Switches set to “switch on falling fluid” at the lower reference line will reset when the dead-band distance is reached as the fluid rises.

Type	MS-21	MS-21/EX	MS-21/EX/B	MS-30	MS-30/EX	MS-40	MS-40/EX	MS-40/EX/B	MS-41	PS-35	PS-45
DEAD BAND	15/16	3/4	7/8	1/8	1/8	7/8	13/16	13/16	15/16	1	15/16

Standard, single-point chamber dimensional information is available separately. Multiple switch points can be provided to a desired differential, but the dimensional information of these chambers will be determined by the differential requirement and customized drawings provided upon request (See individual data sheets).

/x OPTIONS

An N in this field signifies a standard unit. Any equipment options that are custom require an X in the final field of the model number, followed by a description of the custom item.