



External Cage Displacer Actuated Liquid Level Switches

DESCRIPTION

High Pressure Liquid Level Switches are displacer actuated units, utilizing a single switch mechanism for level alarm or control functions. These units are designed for service pressures up to 5000 psig (345 bar) and liquids with specific gravities of 0.40 and above. They utilize the Magnetrol magnetic principle to assure dependable performance.

FEATURES

- Fabricated carbon steel cages are standard for all models.
- B74 available with 304 & 316 SS cages
- Sealed or flanged cages available
- Inconel displacer spring and stainless steel trim
- Stainless steel displacers
- Pressures to 5000 psig (345 bar)
- Temperatures to +500° F (+260° C)
- Specific gravity down to 0.40
- Choice of switch mechanism:
 - Dry contact
 - Pneumatic
 - Hermetically sealed
- Choice of switch enclosure:
 - NEMA 1 carbon steel for pneumatics
 - TYPE 4X/7/9 Class I, Div. 1, Groups C & D polymer coated aluminum
 - TYPE 4X/7/9 Class I, Div. 1, Group B polymer coated aluminum
- Choice of tank connections:
 - NPT
 - Socketweld
 - Side/side flanges
 - Side/bottom flanges



**H13 Sealed Cage Model
with a TYPE 4X/7/9
Switch Housing**

APPLICATIONS

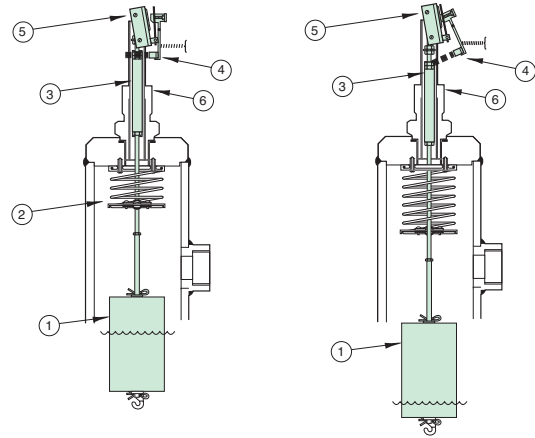
- Hydraulic accumulators
- Natural gas receivers
- H.P. scrubbers
- Hydrocarbon flash tanks

OPTIONS

- Special levels/body extensions
- 316/304 SS chambers
- NACE
- Gold switch contacts
- Interface (except B74)
- Vent and drain connections

TECHNOLOGY

The weight of the displacer ① is supported by the spring ②. Rising liquid level imparts buoyancy forces on the displacer allowing the spring to compress. The attraction sleeve ③, attached to the spring, moves upward into the field of a permanent magnet ④. Magnet motion causes the switch ⑤ to actuate. A non-magnetic barrier tube ⑥ provides a static pressure boundary between the switch mechanism and the displacer assembly.



SPECIFICATIONS

SWITCH MECHANISMS AND ENCLOSURES

SERIES J & K PNEUMATIC SWITCHES

- Suited for applications where electrical power is not available
- Bleed and non-bleed designs
- Process temperatures to +400° F (+204° C)



SERIES F, HS & H1 HERMETICALLY SEALED SWITCHES

- Ideal for use in salt and other corrosive atmospheres
- Series “HS” and “H1” are positively pressurized capsules for entire mechanism and contacts
- Process temperatures to +750° F (+399° C)



SERIES B, C & D DRY CONTACT SWITCHES

- Dry contact for applications where mercury must be avoided
- Designed for AC and DC current applications
- Series C for process temperatures to +450° F (+232° C)



SWITCH ENCLOSURES





- TYPE 4X/7/9 aluminum enclosures
- Designed to meet Class I, Div. 1, Groups C & D and Class I, Div. 1 Group B
- Optional housing heaters and drains available for some enclosures
- Pneumatic switch mechanisms available with a NEMA 1 enclosure



BASIC ELECTRICAL RATINGS

Voltage	Switch Series and Non-Inductive Ampere Rating					
	B	C	D	F	HS	H1
120 VAC	15.00	15.00	10.00	0.25	5.00	1.00
240 VAC	15.00	15.00	—	—	5.00	1.00
24 VDC	6.00	10.00	10.00	4.00	5.00	1.00
120 VDC	0.50	1.00	10.00	0.30	0.50	0.40
240 VDC	0.25	0.50	3.00	—	0.25	—

AGENCY APPROVALS

AGENCY	APPROVED MODEL	AREA CLASSIFICATION
FM  APPROVED	All with an electric switch mechanism and a housing listed as TYPE 4X/7/9	Class I, Div 1, Groups C & D Class II, Div 1, Groups E, F & G
	All with an electric switch mechanism and a housing listed as TYPE 4X/7/9 Class I, Div 1, Group B	Class I, Div 1, Groups B, C & D Class II, Div 1, Groups E, F & G
CSA 	All with a Series F or HS electric switch mechanism and a housing listed as CSA TYPE 4X	Class I, Div 2, Groups B, C & D
	All with an electric switch mechanism and a housing listed as TYPE 4X/7/9	Class I, Div 1, Groups C & D Class II, Div 1, Groups E, F & G
	All with an electric switch mechanism and a housing listed as TYPE 4X/7/9 Class I, Div 1, Group B	Class I, Div 1, Groups B, C & D Class II, Div 1, Groups E, F & G
ATEX / IEC Ex ^① 	All with an electric switch mechanism and an ATEX housing	ATEX II 2 G EEx d IIC T6 IEC Ex Ex d IIC T6
CE 	Low Voltage Directives 73/23/EEC & 93/68/EEC Per Harmonized Standard: EN 61010-1/1993 & Amendment No. 1	Installation Category II Pollution Degree 2

① IEC Installation Instructions:

The cable entry and closing devices shall be Ex d certified suitable for the conditions of use and correctly installed.
For ambient temperatures above +55° C or for process temperatures above +150° C, suitable heat resistant cables shall be used.
Heat extensions (between process connection and housing) shall never be insulated.

Special conditions for safe use:

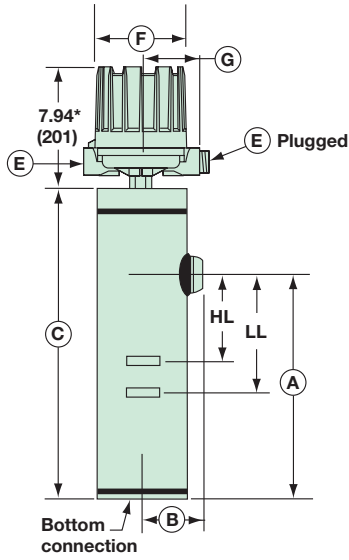
When the equipment is installed in process temperatures higher than +85° C the temperature classification must be reduced according to the following table as per IEC60079-0.

Maximum Process Temperature	Temperature Classification
< 85° C	T6
< 100° C	T5
< 135° C	T4
< 200° C	T3
< 300° C	T2
< 450° C	T1

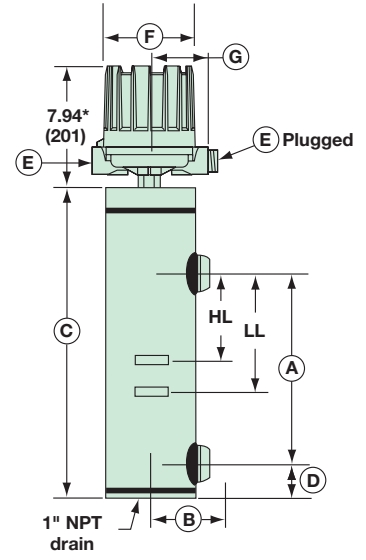
These units are in conformity with IECEx KEM 05.0020X
Classification Ex d IIC T6
T_{ambient} -40° C to +70° C

DIMENSIONAL SPECIFICATIONS INCHES

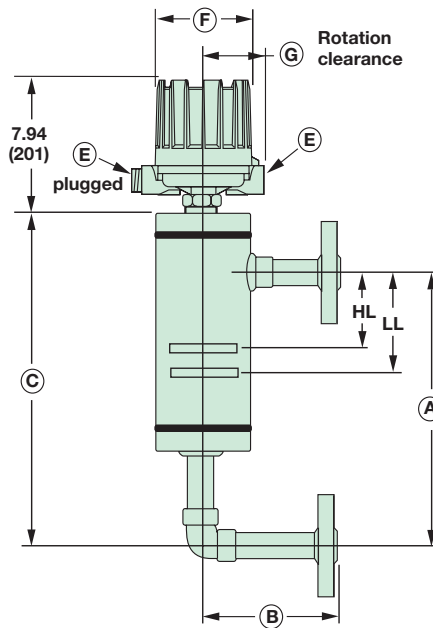
SEALED CAGE DESIGN



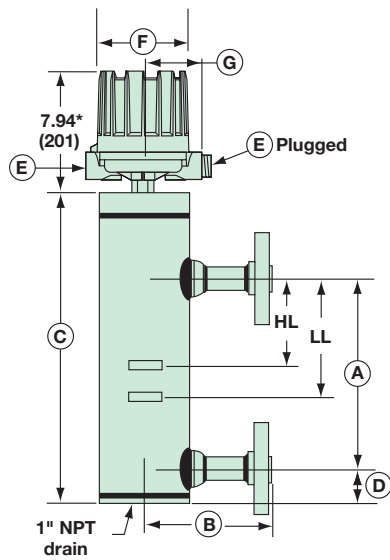
Sealed Chamber w/NPT or Socket weld Side/Bottom Connections (B74, H13, H31, H51)



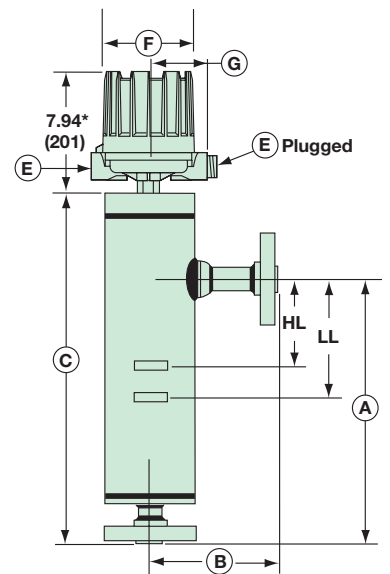
Sealed Chamber w/NPT or Socket weld Side/Side Connections (H13, H31, H51)



Sealed Chamber Side/Side Flange Connections (B74 only)



Sealed Chamber Side/Side Flange Connections (H13, H31, H51)



Sealed Chamber Side/Bottom Flange Connections (B74, H13, H31, H51)

Levels–Sealed Cage

Model Code	Process Temp.	Specific Gravity													
		0.40		0.50		0.60		0.70		0.80		0.90		1.00	
		HL	LL	HL	LL	HL	LL	HL	LL	HL	LL	HL	LL	HL	LL
B74	100° F	1.30	4.77	2.17	5.00	2.73	5.16	3.13	5.28	3.44	5.37	3.67	5.45	3.86	5.51
	200° F	1.24	4.70	2.13	4.95	2.70	5.11	3.11	5.24	3.42	5.34	3.66	5.41	3.85	5.48
	300° F	1.18	4.62	2.09	4.88	2.67	5.06	3.09	5.19	3.40	5.30	3.64	5.38	3.84	5.45
H13	100° F	5.09	9.04	6.26	9.50	7.04	9.81	7.59	10.03	8.01	10.20	8.33	10.33	8.59	10.43
	200° F	4.73	8.63	5.97	9.17	6.79	9.54	7.38	9.80	7.82	9.99	8.17	10.14	8.44	10.27
	300° F	4.31	8.15	5.63	8.79	6.51	9.22	7.14	9.53	7.62	9.76	7.98	9.93	8.28	10.08
H31	100° F	3.74	5.96	5.01	6.88	5.86	7.49	6.46	7.92	6.92	8.25	7.27	8.50	7.55	8.71
	200° F	3.49	5.69	4.81	6.66	5.69	7.31	6.32	7.77	6.80	8.11	7.16	8.38	7.46	8.60
	300° F	3.21	5.39	4.59	6.42	5.51	7.10	6.16	7.59	6.66	7.96	7.04	8.25	7.34	8.48
H51	100° F	1.65	4.16	3.13	5.22	4.11	5.93	4.81	6.43	5.34	6.81	5.75	7.11	6.08	7.34
	200° F	1.37	3.85	2.90	4.97	3.92	5.72	4.65	6.26	5.20	6.66	5.62	6.97	5.96	7.22
	300° F	1.04	3.50	2.64	4.69	3.71	5.49	4.47	6.05	5.04	6.48	5.48	6.81	5.83	7.08

Dimensions–Upper Side/Bottom

Model Code	Connection Size	NPT or SW			Flanges		
		A	B	C	A	B	C
B74	1"		3.27		12.87	6.38	15.12
	1-1/2"	8.32	3.69	10.56	12.56	6.61	14.81
	2"		3.81		12.43	6.68	14.69
H13	1"		2.77			6.39	
	1-1/2"	14.25	3.19	20.63	17.75	6.69	24.12
	2"		3.31			6.81	
H31	1"		4.40			7.90	
	1-1/2"	14.25	4.53	20.00	17.50	7.84	23.25
	2"		4.91			8.14	
H51	1"		4.50			8.00	
	1-1/2"	15.60	4.63	23.81	19.47	7.93	27.69
	2"		5.00			8.23	

Conduit Connections E
Electric Switches: TYPE 4X/7/9: 1" NPT GROUP B: 1" NPT
Pneumatic Switches: NEMA 1: 1/4" NPT

Housing	F	G
NEMA 1	4.69	5.00
TYPE 4X/7/9*	5.93	3.78
TYPE 4X/7/9 Grp B*		

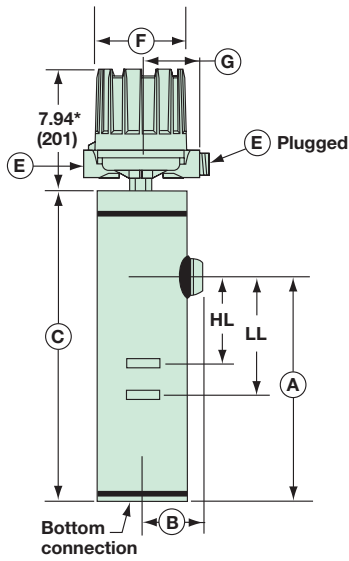
* These dimensions increase by 2.19 when used with Series HS switches with terminal blocks.

Dimensions–Side/Side

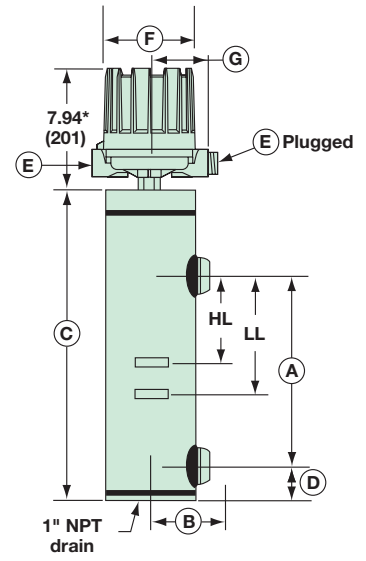
Model Code	Connection Size	NPT or SW						Flanges					
		A		B	C		D	A		B	C		D
		Std	14"		Std	14"		Std	14"		Std	14"	
B74	1"							13.62		6.38	15.88		
	1-1/2"	n/a	n/a	n/a	n/a	n/a	n/a	13.31	n/a	6.61	15.56	n/a	n/a
	2"							13.18		6.68	15.44		
H13	1"			2.77						6.39			
	1-1/2"	11.50	14.00	3.19	20.63	23.12	2.75	11.50	14.00	6.69	20.63	23.12	2.75
	2"			3.31						6.81			
H31	1"			4.40						7.90			
	1-1/2"	11.50	14.00	4.53	20.00	22.50	2.75	11.50	14.00	7.84	20.00	22.50	2.75
	2"			4.91						8.14			
H51	1"			4.50						8.00			
	1-1/2"	11.64	14.00	4.63	23.81	26.19	3.96	11.64	14.00	7.93	23.81	26.19	3.96
	2"			5.00						8.23			

DIMENSIONAL SPECIFICATIONS MILLIMETERS

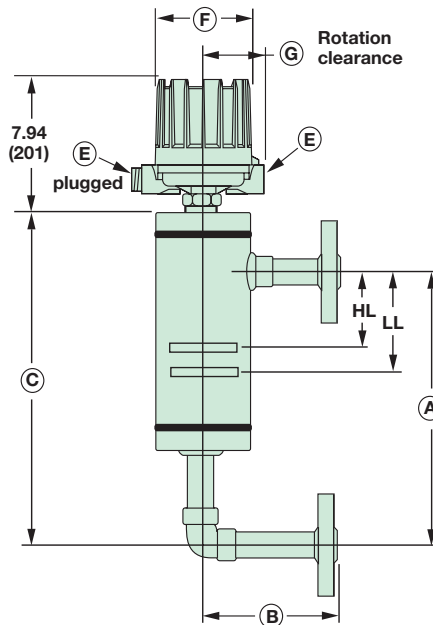
SEALED CAGE DESIGN



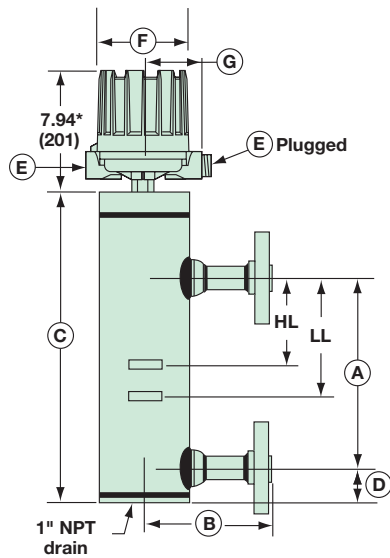
Sealed Chamber w/NPT or Socket weld Side/Bottom Connections (B74, H13, H31, H51)



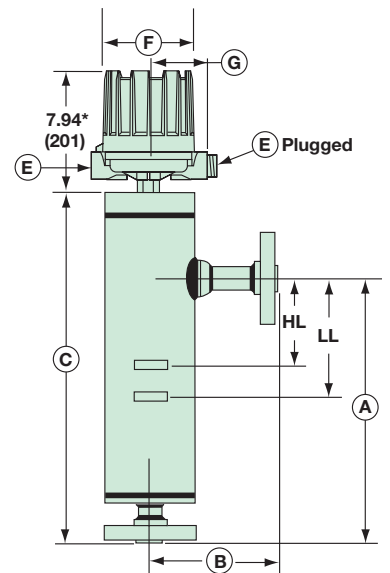
Sealed Chamber w/NPT or Socket weld Side/Side Connections (H13, H31, H51)



Sealed Chamber Side/Side Flange Connections (B74 only)



Sealed Chamber Side/Side Flange Connections (H13, H31, H51)



Sealed Chamber Side/Bottom Flange Connections (B74, H13, H31, H51)

Levels–Sealed Cage

Model Code	Process Temp.	Specific Gravity													
		0.40		0.50		0.60		0.70		0.80		0.90		1.00	
		HL	LL	HL	LL	HL	LL	HL	LL	HL	LL	HL	LL	HL	LL
B74	38° C	33	121	55	127	69	131	80	134	87	136	93	138	98	140
	93° C	31	119	54	126	69	130	79	133	87	136	93	137	98	139
	149° C	30	117	53	124	68	129	78	132	86	135	92	137	98	138
H13	38° C	129	230	159	241	179	249	193	255	203	259	212	262	218	265
	93° C	120	219	152	233	172	242	187	249	199	254	208	258	214	261
	149° C	109	207	143	223	165	234	181	242	194	248	203	252	210	256
H31	38° C	95	151	127	175	149	190	164	201	176	210	185	216	192	221
	93° C	89	145	122	169	145	186	161	197	173	206	182	213	189	218
	149° C	82	137	117	163	140	180	156	193	169	202	179	210	186	215
H51	38° C	42	106	80	133	104	151	122	163	136	173	146	181	154	186
	93° C	35	98	74	126	100	145	118	159	132	169	143	177	151	183
	149° C	26	89	67	119	94	139	113	154	128	165	139	173	148	180

Dimensions–Upper Side/Bottom

Model Code	Connection Size	NPT or SW			Flanges		
		A	B	C	A	B	C
B74	1"		83		327	162	384
	1-1/2"	211	94	268	319	168	376
	2"		97		316	170	373
H13	1"		70			162	
	1-1/2"	362	81	524	451	170	613
	2"		84			173	
H31	1"		112			201	
	1-1/2"	362	115	508	444	199	591
	2"		125			207	
H51	1"		114			203	
	1-1/2"	396	118	605	495	201	703
	2"		127			209	

Conduit Connections E
Electric Switches: TYPE 4X/7/9: 1" NPT GROUP B: 1" NPT
Pneumatic Switches: NEMA 1: 1/4" NPT

Housing	F	G
NEMA 1	119	127
TYPE 4X/7/9*	5.93	96
TYPE 4X/7/9 Grp B*		

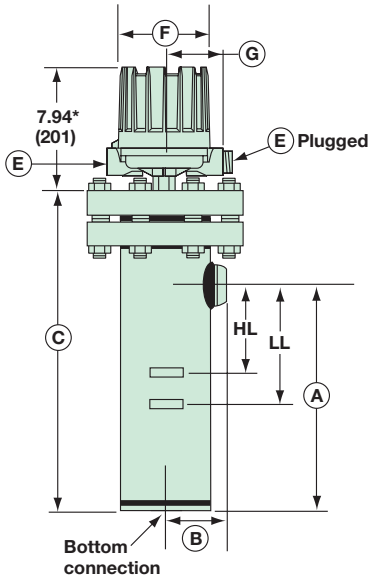
* These dimensions increase by 56 when used with Series HS switches with terminal blocks.

Dimensions–Side/Side

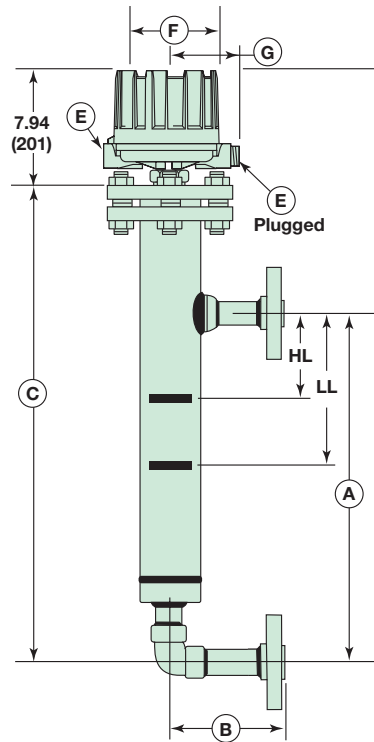
Model Code	Connection Size	NPT or SW						Flanges					
		A		B	C		D	A		B	C		D
		Std	14"		Std	14"		Std	14"		Std	14"	
B74	1"												
	1-1/2"	n/a	n/a	n/a	n/a	n/a	n/a	346	n/a	162	403	n/a	n/a
	2"							338		168	395		
H13	1"			70						162			
	1-1/2"	292	356	81	524	587	70	292	356	170	524	587	70
	2"			84						173			
H31	1"			112						201			
	1-1/2"	292	356	115	508	572	70	292	356	199	508	572	70
	2"			125						207			
H51	1"			114						203			
	1-1/2"	296	356	118	605	665	101	296	356	201	605	665	101
	2"			127						209			

DIMENSIONAL SPECIFICATIONS INCHES

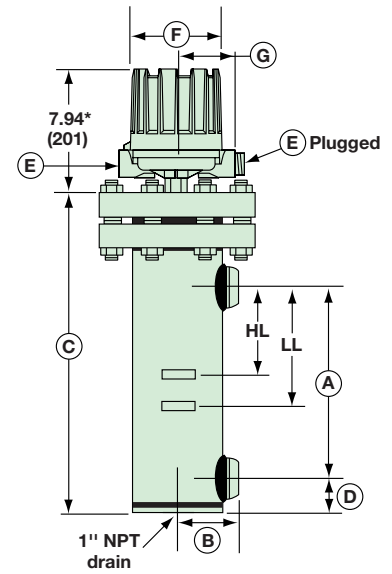
FLANGED TOP CAGE DESIGN



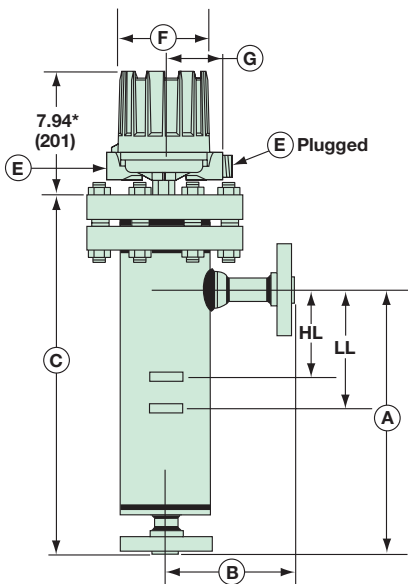
Flanged Top Chamber w/NPT or Socket weld Side/Bottom Connections (C74, H15, H32, H52)



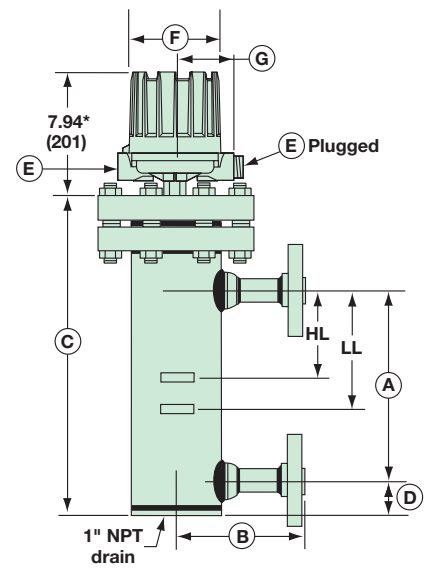
Flanged Top Chamber Side/Side Flange Connections (C74 only)



Flanged Top Chamber w/NPT or Socket weld Side/Side Connections (H15, H32, H52)



Flanged Top Chamber Side/Bottom Flange Connections (C74, H15, H32, H52)



Flanged Top Chamber Side/Side Flange Connections (H15, H32, H52)

Levels–Flanged Cage

Model Code	Process Temp.	Specific Gravity													
		0.40		0.50		0.60		0.70		0.80		0.90		1.00	
		HL	LL	HL	LL	HL	LL	HL	LL	HL	LL	HL	LL	HL	LL
C74	100° F	4.38	8.24	5.56	8.74	6.35	9.07	6.92	9.31	7.34	9.49	7.67	9.63	7.94	9.74
	200° F	4.01	7.83	5.27	8.41	6.11	8.80	6.71	9.08	7.16	9.28	7.51	9.44	7.79	9.57
	300° F	3.59	7.36	4.94	8.04	5.83	8.49	6.47	8.81	6.95	9.05	7.32	9.24	7.62	9.39
	400° F	3.13	6.84	4.56	7.62	5.52	8.14	6.20	8.51	6.72	8.79	7.12	9.00	7.44	9.18
	500° F	2.61	6.26	4.15	7.15	5.18	7.75	5.91	8.18	6.46	8.50	6.89	8.75	7.23	8.94
H15	100° F	2.47	5.93	3.90	6.74	4.86	7.29	5.54	7.67	6.05	7.96	6.44	8.19	6.76	8.37
	200° F	2.12	5.54	3.62	6.43	4.62	7.02	5.34	7.45	5.87	7.77	6.29	8.02	6.62	8.21
	300° F	1.72	5.09	3.30	6.07	4.36	6.73	5.11	7.19	5.67	7.55	6.11	7.82	6.46	8.04
H32	100° F	2.96	5.18	4.18	6.05	5.00	6.63	5.59	7.04	6.02	7.35	6.37	7.60	6.64	7.79
	200° F	2.71	4.91	3.98	5.83	4.84	6.45	5.44	6.89	5.90	7.22	6.25	7.48	6.54	7.68
	300° F	2.43	4.60	3.76	5.59	4.65	6.24	5.28	6.71	5.76	7.06	6.13	7.34	6.43	7.56
H52	100° F	1.65	4.16	3.13	5.22	4.11	5.93	4.81	6.43	5.34	6.81	5.75	7.11	6.08	7.34
	200° F	1.37	3.85	2.90	4.97	3.92	5.72	4.65	6.26	5.20	6.66	5.62	6.97	5.96	7.22
	300° F	1.04	3.50	2.64	4.69	3.71	5.49	4.47	6.05	5.04	6.48	5.48	6.81	5.83	7.08

Dimensions–Upper Side/Bottom

Model Code	Connection Size	NPT or SW			Flanges		
		A	B	C	A	B	C
C74 300#	1"	15.65	2.77	22.69		5.45	
	1-1/2"	15.77	3.19	22.81	18.33	6.19	25.38
	2"	15.90	3.31	22.94		6.25	
C74 600#	1"	15.65	2.77	23.06		5.45	
	1-1/2"	15.77	3.19	23.19	18.33	6.19	26.38
	2"	15.90	3.31	23.31		6.25	
H15	1"		3.62				
	1-1/2"	14.85	3.69	23.12	18.33	9.50	26.63
	2"		3.81				
H32	1"		4.40				
	1-1/2"	14.25	4.53	21.38	17.50	10.00	24.63
	2"		4.91				
H52	1"		4.50				
	1-1/2"	15.60	4.63	23.88	19.21	10.00	27.50
	2"		5.00				

Conduit Connections E
Electric Switches:
TYPE 4X/7/9: 1" NPT
GROUP B: 1" NPT
Pneumatic Switches:
NEMA 1: 1/4" NPT

Housing	F	G
NEMA 1	4.69	5.00
TYPE 4X/7/9*	5.93	3.78
TYPE 4X/7/9 Grp B*		

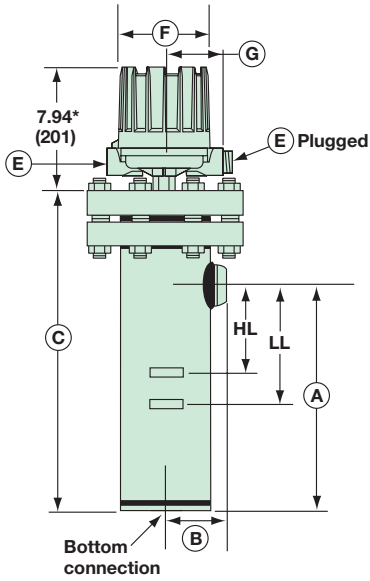
* These dimensions increase by 2.19 when used with Series HS switches with terminal blocks.

Dimensions–Side/Side

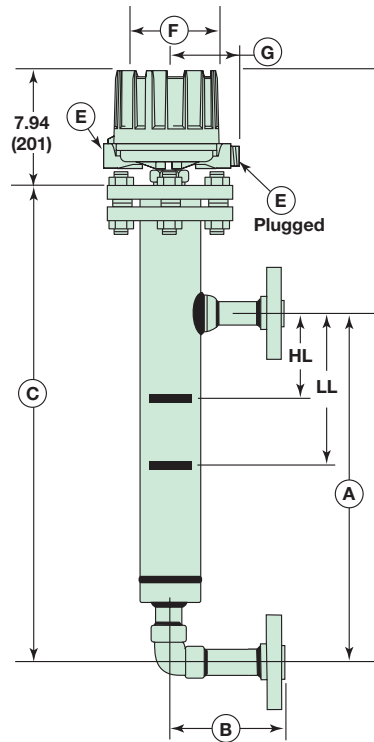
Model Code	Connection Size	NPT or SW						Flanges					
		A		B	C		D	A		B	C		D
		Std	14"		Std	14"		Std	14"		Std	14"	
C74 300#	1"									5.45			
	1-1/2"	n/a	n/a	n/a	n/a	n/a	n/a	18.97	n/a	6.19	26.00	n/a	n/a
	2"									6.25			
C74 600#	1"									5.45			
	1-1/2"	n/a	n/a	n/a	n/a	n/a	n/a	18.97	n/a	6.19	26.38	n/a	n/a
	2"									6.25			
H15	1"			3.62									
	1-1/2"	11.50	14.00	3.69	23.12	25.63	3.35	11.50	14.00	9.50	23.12	25.63	3.35
	2"			3.81									
H32	1"			4.40									
	1-1/2"	11.50	14.00	4.53	21.38	23.88	2.75	11.50	14.00	10.00	21.38	23.88	2.75
	2"			4.91									
H52	1"			4.50									
	1-1/2"	11.64	14.00	4.63	23.88	26.25	3.96	11.64	14.00	10.00	23.88	26.25	3.96
	2"			5.00									

DIMENSIONAL SPECIFICATIONS MILLIMETERS

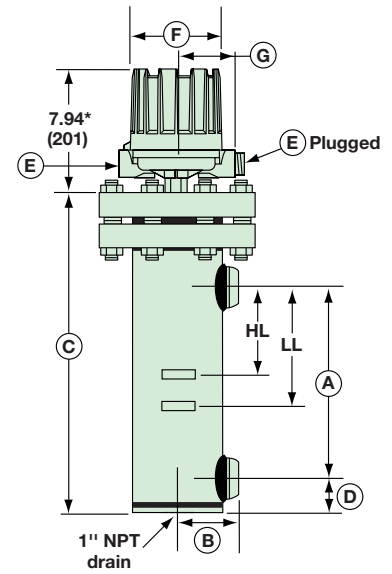
FLANGED TOP CAGE DESIGN



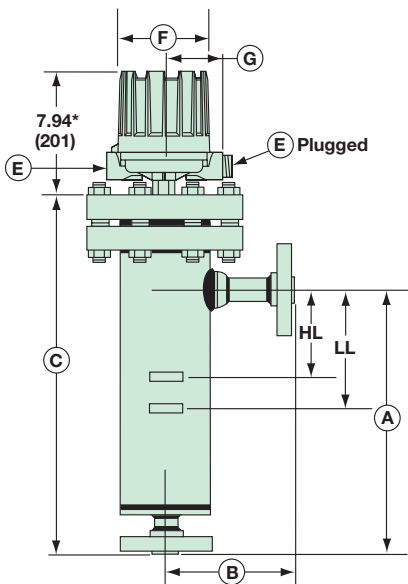
Flanged Top Chamber w/NPT or Socket weld Side/Bottom Connections (C74, H15, H32, H52)



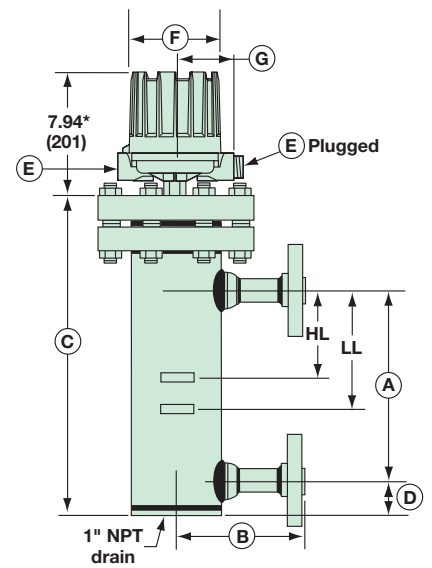
Flanged Top Chamber Side/Side Flange Connections (C74 only)



Flanged Top Chamber w/NPT or Socket weld Side/Side Connections (H15, H32, H52)



Flanged Top Chamber Side/Bottom Flange Connections (C74, H15, H32, H52)



Flanged Top Chamber Side/Side Flange Connections (H15, H32, H52)

Levels–Flanged Cage

Model Code	Process Temp.	Specific Gravity													
		0.40		0.50		0.60		0.70		0.80		0.90		1.00	
		HL	LL	HL	LL	HL	LL	HL	LL	HL	LL	HL	LL	HL	LL
C74	38° C	111	209	141	222	161	230	176	236	186	241	195	245	202	247
	93° C	102	199	134	214	155	224	170	231	182	236	191	240	198	243
	149° C	91	187	125	204	148	216	164	224	177	230	186	235	194	239
	204° C	80	174	116	194	140	207	157	216	171	223	181	229	189	233
	260° C	66	159	105	182	132	197	150	208	164	216	175	222	184	227
H15	38° C	63	151	99	171	123	185	141	195	154	202	164	208	172	213
	93° C	54	141	92	163	117	178	136	189	149	197	160	204	168	209
	149° C	44	129	84	154	111	171	130	183	144	192	155	199	164	204
H32	38° C	75	132	106	154	127	168	142	179	153	187	162	193	169	198
	93° C	69	125	101	148	123	164	138	175	150	183	159	190	166	195
	149° C	62	117	96	142	118	158	134	170	146	179	156	186	163	192
H52	38° C	42	106	80	133	104	151	122	163	136	173	146	181	154	186
	93° C	35	98	74	126	100	145	118	159	132	169	143	177	151	183
	149° C	26	89	67	119	94	139	114	154	128	165	139	173	148	180

Dimensions–Upper Side/Bottom

Model Code	Connection Size	NPT or SW			Flanges		
		A	B	C	A	B	C
C74	1"	398	70	576		138	
300#	1-1/2"	401	81	579	466	157	645
	2"	404	84	583		159	
C74	1"	398	70	586		138	
600#	1-1/2"	401	81	589	466	157	670
	2"	404	84	592		159	
H15	1"		89				
	1-1/2"	377	91	587	466	241	676
	2"		97				
H32	1"		112				
	1-1/2"	362	115	543	444	254	626
	2"		125				
H52	1"		114				
	1-1/2"	396	118	607	488	254	698
	2"		127				

Conduit Connections E
Electric Switches:
TYPE 4X/7/9: 1" NPT
GROUP B: 1" NPT
Pneumatic Switches:
NEMA 1: 1/4" NPT

Housing	F	G
NEMA 1	119	127
TYPE 4X/7/9*	5.93	96
TYPE 4X/7/9 Grp B*		

* These dimensions increase by 56 when used with Series HS switches with terminal blocks.

Dimensions–Side/Side

Model Code	Connection Size	NPT or SW						Flanges					
		A		B	C		D	A		B	C		D
		Std	14"		Std	14"		Std	14"		Std	14"	
C74	1"									138			
300#	1-1/2"	n/a	n/a	n/a	n/a	n/a	n/a	482	n/a	157	660	n/a	n/a
	2"									159			
C74	1"									138			
600#	1-1/2"	n/a	n/a	n/a	n/a	n/a	n/a	482	n/a	157	670	n/a	n/a
	2"									159			
H15	1"			92									
	1-1/2"	292	356	94	587	651	85	292	356	241	587	651	85
	2"			97									
H32	1"			112									
	1-1/2"	292	356	115	543	607	70	292	356	254	543	607	70
	2"			125									
H52	1"			114									
	1-1/2"	296	356	115	607	667	101	296	356	254	607	667	101
	2"			127									

MODEL NUMBER

STANDARD PRESSURE

Models available for quick shipment, usually within one week after factory receipt of a purchase order, through the Expedite Ship Plan (ESP)

SPECIFIC GRAVITY AND PRESSURE RATING CODE

Code	Cage Type	Cage Material	Maximum Pressure Rating at given Temperature – psi (bar)					Minimum S.G.
			+100 ° F (+38 ° C)	+200 ° F (+93 ° C)	+300 ° F (+149 ° C)	+400 ° F (+204 ° C)	+500 ° F (+260 ° C)	
B74	Sealed	Carbon steel	1480 (102)	1350 (93)	1315 (91)	n/a	n/a	0.4
		304 Stainless steel	1440 (99)	1200 (83)	1055 (73)			
		316 Stainless steel	1440 (99)	1240 (85)	1120 (77)			
H13		Carbon steel	1500 (103)	1500 (103)	1500 (103)	1440 (99)	1350 (93)	
C74	Flanged	300# Carbon steel	740 (51)	740 (51)	740 (51)	740 (51)	740 (51)	
			600# Carbon steel	1480 (102)	1480 (102)	1400 (97)	1280 (88)	1190 (82)
H15		Carbon steel	1500 (103)	1500 (103)	1500 (103)	1440 (99)	1350 (93)	

MATERIALS OF CONSTRUCTION

Code	Applicable Models	Cage	Sleeve	Spring Trim
1	B74, C74, H13, H15	Carbon Steel	400 SS	Inconel & 316 SS
2 ①	H13, H15	Carbon Steel	400 SS	316 SS
2	B74, C74	Carbon Steel	316 SS	Inconel & 316 SS
3	B74	304 Stainless Steel	316 SS	Inconel & 316 SS
4	B74	316 Stainless Steel	316 SS	Inconel & 316 SS

TANK CONNECTION TYPE AND SIZE

B74			C74 300 lb			C74 600 lb			H13 & H15			Connection Type	C/C	Location
1"	1½"	2"	1"	1½"	2"	1"	1½"	2"	1"	1½"	2"			
B20	C20	D20	B70	C70	D70	B90	C90	D90	B20	C20	D20	NPT	Std	side/bottom
B30	C30	D30	B80	C80	D80	B01	C01	D01	B30	C30	D30	Socketweld		
N30	P30	Q30	—	—	—	—	—	—	N30	P30	Q30	150 lb ANSI flanges		
N40	P40	Q40	N40	P40	Q40	—	—	—	N40	P40	Q40	300 lb ANSI flanges		
N50	P50	Q50	—	—	—	N50	P50	Q50	N50	P50	Q50	600 lb ANSI flanges		
—	—	—	—	—	—	—	—	—	B40	C40	D40	NPT	Std	side/side
—	—	—	—	—	—	—	—	—	B44	C44	D44	NPT	14"	
—	—	—	—	—	—	—	—	—	B50	C50	D50	Socketweld	Std	
—	—	—	—	—	—	—	—	—	B54	C54	D54	Socketweld	14"	
S30	T30	V30	—	—	—	—	—	—	S30	T30	V30	150 lb ANSI flanges	Std	
—	—	—	—	—	—	—	—	—	S34	T34	V34	150 lb ANSI flanges	14"	
S40	T40	V40	S40	T40	V40	—	—	—	S40	T40	V40	300 lb ANSI flanges	Std	
—	—	—	—	—	—	—	—	—	S44	T44	V44	300 lb ANSI flanges	14"	
S50	T50	V50	—	—	—	S50	T50	V50	S50	T50	V50	600 lb ANSI flanges	Std	
—	—	—	—	—	—	—	—	—	S54	T54	V54	600 lb ANSI flanges	14"	



MODEL NUMBER CONTINUED

STANDARD PRESSURE

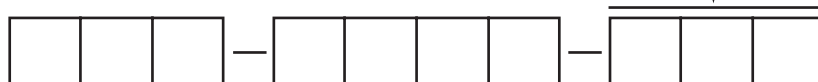
ELECTRIC SWITCH MECHANISM AND ENCLOSURE ②

Switch Description ③	Maximum Process ④ Temperature ° F (° C)	One Set Point	TYPE 4X/7/9 Aluminum Enclosure		
			Class I, Div. 1, Groups C & D	Class I, Div. 1, Group B	ATEX Ex II 2G EEx d IIC T6
Series B Snap Switch	250 (121)	SPDT DPDT	BKQ BNQ	BKS BNS	BA9 BB9
Series C Snap Switch	450 (232)	SPDT DPDT	CKQ CNQ	CKS CNS	CA9 CB9
Series D Snap Switch for DC Current Application	250 (121)	SPDT DPDT	DKQ DNQ	DKS DNS	DA9 DB9
Series F Hermetically Sealed Snap Switch	500 (260)	SPDT DPDT	FKQ FNQ	FKS FNS	FA9 FB9
Series HS 5 Amp Hermetically ⑤ Sealed Snap Switch w/Wiring Leads	500 ⑥ (260)	SPDT DPDT	HMC HMF	HEK ⑦ HET ⑦	N/A
Series HS 5 Amp Hermetically ⑤ Sealed Snap Switch w/Terminal Block	500 ⑥ (260)	SPDT DPDT	HM3 HM7	HM4 HM8	HA9 HB9

PNEUMATIC SWITCH MECHANISM AND ENCLOSURE

Switch Description	Maximum Supply Pressure	Maximum Process Temperature	Bleed Orifice Diameter	NEMA 1		
				B74, C74-1, 300# C74-2	H13, H15	600# C74-2
Series J Bleed Type	100 psig (7 bar)	+400° F (+204° C)	.063 (1.6 mm)	JDE	JKE	JKE
	60 psig (4 bar)		.094 (2.4 mm)	JEE	JLE	JLE
Series k Non-Bleed	100 psig (7 bar)	+400° F (+204° C)	—	KOE	KOE	KPE

- ① Maximum temperature rating +200° F (+93° C) with type 316 SS spring
- ② Consult factory for TYPE 4X/7/9 cast iron housings.
- ③ Uncontrolled housing heater or drain available in TYPE 4X/7/9 enclosures. Consult factory for switch codes.
- ④ Process temperature based on +100° F (+38° C) ambient.
- ⑤ HS switch not available on 600# C74 model with materials of construction code -2.
- ⑥ On condensing applications, temperature down-rated to +400° F (204° C) process at +100° F (+38° C) ambient.
- ⑦ CSA approval does not apply to Series HE switches.



MODEL NUMBER

HIGH PRESSURE

SPECIFIC GRAVITY AND PRESSURE RATING CODE

No.	Cage Style	Maximum Pressure	Maximum Temp.	Min. Specific Gravity
H31	Sealed	3000 psi (207 bar) @ +450° F (+232° C)	+450° F (+232° C)	0.4
H51		5000 psi (345 bar) @ +450° F (+232° C)		
H32	Flanged	3000 psi (207 bar) @ +450° F (+232° C)		
H52		5000 psi (345 bar) @ +450° F (+232° C)		

MATERIALS OF CONSTRUCTION

No.	Cage	Sleeve	Spring Trim
1	Carbon Steel	400 SS	Inconel & 316 SS
2 ①			316 SS

TANK CONNECTION TYPE AND SIZE

H31 & H32			H51 & H52			Connection Type	C/C	Location
1"	1½"	2"	1"	1½"	2"			
B20	C20	D20	B20	C20	D20	NPT	Std	side/bottom
B30	C30	D30	B30	C30	D30	Socketweld		
N50	P50	Q50	—	—	—	600 lb ANSI flanges		
N60	P60	Q60	N60	P60	Q60	900 lb ANSI flanges		
N70	P70	Q70	N70	P70	Q70	1500 lb ANSI flanges		
—	—	—	N80	P80	Q80	2500 lb ANSI flanges		
B40	C40	D40	B40	C40	D40	NPT	Std	side/side
B44	C44	D44	B44	C44	D44		14"	
B50	C50	D50	B50	C50	D50	Socketweld	Std	
B54	C54	D54	B54	C54	D54		14"	
S50	T50	V50	—	—	—	600 lb ANSI flanges	Std	
S54	T54	V54	—	—	—		14"	
S60	T60	V60	S60	T60	V60	900 lb ANSI flanges	Std	
S64	T64	V64	S64	T64	V64		14"	
S70	T70	V70	S70	T70	V70	1500 lb ANSI flanges	Std	
S74	T74	V74	S74	T74	V74		14"	
—	—	—	S80	T80	V80	2500 lb ANSI flanges	Std	
—	—	—	S84	T84	V84		14"	



MODEL NUMBER CONTINUED

HIGH PRESSURE

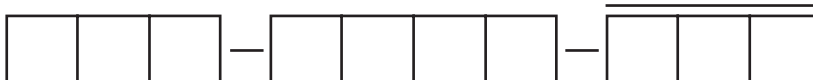
ELECTRIC SWITCH MECHANISM AND ENCLOSURE ②

Switch Description ③	Maximum Process ④ Temperature ° F (° C)	One Set Point	Type 4X/7/9 Aluminum Enclosure		
			Class I, Div. 1, Groups C & D	Class I, Div. 1, Group B	ATEX Ex II 2G EEx d IIC T6
Series B Snap Switch	250 (121)	SPDT DPDT	BKQ BNQ	BKS BNS	BA9 BB9
Series C Snap Switch	300 (149)	SPDT DPDT	CKQ CNQ	CKS CNS	CA9 CB9
Series D Snap Switch for DC Current Application	250 (121)	SPDT DPDT	DKQ DNQ	DKS DNS	DA9 DB9
Series F Hermetically Sealed Snap Switch	300 (149)	SPDT DPDT	FKQ FNQ	FKS FNS	FA9 FB9
Series HS 5 Amp Hermetically ⑤ Sealed Snap Switch w/Wiring Leads	300 (149)	SPDT DPDT	HMC HMF	HEK ⑥ HET ⑥	N/A
Series HS 5 Amp Hermetically ⑤ Sealed Snap Switch w/Terminal Block	300 (149)	SPDT DPDT	HM3 HM7	HM4 HM8	HA9 HB9

PNEUMATIC SWITCH MECHANISM AND ENCLOSURE

Switch Description	Maximum Supply Pressure	Maximum Process Temperature	Bleed Orifice Diameter	NEMA 1	
				H31, H32	H51, H52
Series J Bleed Type	100 psig (7 bar)	+400° F (+204° C)	.063 (1.6 mm)	JKE	JKE
	60 psig (4 bar)		.094 (2.4 mm)	JLE	JLE
Series k Non-Bleed	100 psig (7 bar)	+400° F (+204° C)	—	KOE	KPE

- ① Maximum temperature rating +200° F (+93° C) with type 316 SS spring
- ② Consult factory for TYPE 4X/7/9 cast iron housings.
- ③ Uncontrolled housing heater or drain available in TYPE 4X/7/9 enclosures. Consult factory for switch codes.
- ④ Process temperature based on +100° F (+38° C) ambient
- ⑤ HS switch not available on models H51 or H52.
- ⑥ CSA approval does not apply to Series HE switches.



QUALITY



The quality assurance system in place at Magnetrol guarantees the highest level of quality throughout the company. Magnetrol is committed to providing full customer satisfaction both in quality products and quality service.

Magnetrol's quality assurance system is registered to ISO 9001 affirming its commitment to known international quality standards providing the strongest assurance of product/service quality available.

ESP

Expedite Ship Plan

Several External Cage Switches are available for quick shipment, usually within one week after factory receipt of a purchase order, through the Expedite Ship Plan (ESP).

To take advantage of ESP, match the color coded model number codes in the selection charts (standard dimensions apply).

ESP service may not apply to orders of ten units or more. Contact your local representative for lead times on larger volume orders, as well as other products and options.

WARRANTY



All Magnetrol mechanical level and flow controls are warranted free of defects in materials or workmanship for five full years from the date of original factory shipment.

If returned within the warranty period; and, upon factory inspection of the control, the cause of the claim is determined to be covered under the warranty; then, Magnetrol will repair or

replace the control at no cost to the purchaser (or owner) other than transportation.

Magnetrol shall not be liable for misapplication, labor claims, direct or consequential damage or expense arising from the installation or use of equipment. There are no other warranties expressed or implied, except special written warranties covering some Magnetrol products.



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