



# High Leverage Spring-Loaded Ball Float Type Drain Traps

For Low Flows at Pressures to 3,700 psi (255 bar) and Specific Gravity Down to 0.40

The Armstrong High Leverage Series of liquid drain traps was developed especially for draining low specific gravity fluids from gases at high pressures. They use standard Armstrong forged steel bodies with very high leverage systems and spring assist.

**NOTE:** Models 2313-HLS, 2316-HLS, 2413-HLS and 2415-HLS are also available with cast T-316 stainless steel body and all-stainless steel internals. Consult factory.

Because of design considerations in this drain trap, it is essential that a safety factor of at least 2 be applied to the peak liquid load for sizing purposes.

Do not use HLS drain traps on steam service.

### Sour Gas Service

Forged steel and stainless steel traps can be modified to resist hydrogen sulfide stress corrosion. These modifications involve annealing the float, which will reduce the maximum working pressure of the float to about half its normal value. Consult Armstrong Application Engineering for allowable working pressures.

**Table LD-26. Reference Data**

Model No.	Float Diameter	Unbalanced Float Weight
2313-HLS 2413-HLS 25133G-HLS	3-1/2" (89 mm)	4 oz (113 g)
2315-HLS 2415-HLS 25155G-HLS 26155G-HLS	4" (102 mm)	4-1/2 oz (128 g)
2316-HLS 2416-HLS	5" (127 mm)	6 oz (170 g)

**Table LD-27. Maximum Operating Pressures for Handling Different Specific Gravity Liquids With Orifices Available in High Leverage Drain Traps**  
(See pages LD-29 and LD-30.)

Model No.	Sp. Grav.	Maximum Operating Pressure psig (bar) at 100°F (38°C)																													
		1.00		.95		.90		.85		.80		.75		.70		.65		.60		.55		.50		.45		.40					
		in	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar			
2313-HLS	1/16	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	630	43		
	5/64	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	940	65	670	47	410	29				
	3/32	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	850	58	660	46	480	33	290	20		
	7/64	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	910	63	770	53	630	44	490	34	360	25	220	15		
1/8	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	920	63	810	56	700	48	600	41	490	34	380	26	280	19	170	11.7					
2315-HLS	3/32	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	960	66		
	1/8	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	550	38
	5/32	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	930	64	810	56	700	48	590	40	470	33	360	25		
	3/16	1,000	69	1,000	69	1,000	69	1,000	69	970	67	890	61	810	56	730	50	650	45	570	39	490	34	410	28	330	23	250	17		
2316-HLS	3/32	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69		
	1/8	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69
	5/32	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69
	3/16	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	830	57
7/32	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	820	43	
2413-HLS	1/16	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,420	98	1,020	71	630	43		
	5/64	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,460	101	1,200	83	940	65	670	47	410	29		
	3/32	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,500	103	1,400	97	1,220	84	1,030	71	850	58	660	46	480	33	290	20				
	7/64	1,500	103	1,500	103	1,500	103	1,460	101	1,320	91	1,180	82	1,050	72	910	63	770	53	630	44	490	34	360	25	220	15				
2415-HLS	3/32	1,800	124	1,800	124	1,800	124	1,800	124	1,800	124	1,800	124	1,800	124	1,800	124	1,800	124	1,800	124	1,800	124	1,560	108	1,260	87	960	66		
	1/8	1,800	124	1,800	124	1,800	124	1,800	124	1,800	124	1,780	122	1,600	110	1,430	98	1,250	86	1,080	74	900	62	730	50	550	38				
	5/32	1,720	119	1,610	111	1,490	103	1,380	95	1,270	87	1,150	80	1,040	72	930	64	810	56	700	48	590	40	470	33	360	25				
	3/16	1,210	83	1,130	78	1,050	72	970	67	890	61	810	56	730	50	650	45	570	39	490	34	410	28	330	23	250	17				
2416-HLS	3/32	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110		
	1/8	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110
	5/32	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,480	102	1,220	84		
	3/16	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,580	109	1,400	97	1,220	84	1,040	72	860	59				
7/32	1,600	110	1,600	110	1,600	110	1,600	110	1,600	110	1,570	108	1,440	99	1,300	90	1,170	81	1,040	71	900	62	770	53	640	44					
25133G-HLS	1/16	2,120	146	2,120	146	2,120	146	2,120	146	2,120	146	2,120	146	2,120	146	2,120	146	2,120	146	1,820	125	1,420	98	1,020	71	630	43				
	5/64	2,120	146	2,120	146	2,120	146	2,120	146	2,120	146	2,120	146	1,980	137	1,720	119	1,460	101	1,200	83	940	65	670	47	410	29				
	3/32	2,120	146	2,120	146	2,120	146	1,960	135	1,770	122	1,590	110	1,400	97	1,220	84	1,030	71	850	58	660	46	480	33	290	20				
	7/64	1,870	129	1,740	120	1,600	110	1,460	101	1,320	91	1,180	82	1,050	72	910	63	770	53	630	44	490	34	360	25	220	15				
25155G-HLS	5/64	2,520	174	2,520	174	2,520	174	2,520	174	2,520	174	2,520	174	2,520	174	2,520	174	2,520	174	2,520	174	2,210	152	1,780	123	1,350	93				
	3/32	2,520	174	2,520	174	2,520	174	2,520	174	2,520	174	2,520	174	2,520	174	2,470	170	2,170	150	1,870	129	1,560	108	1,260	87	960	66				
	1/8	2,520	174	2,470	171	2,300	159	2,130	147	1,950	135	1,780	122	1,600	110	1,430	98	1,250	86	1,080	74	900	62	730	50	550	38				
	5/32	1,720	119	1,610	111	1,490	103	1,380	95	1,270	87	1,150	80	1,040	72	930	64	810	56	700	48	590	40	470	33	360	25				
3/16	1,210	83	1,130	78	1,050	72	970	67	890	61	810	56	730	50	650	45	570	39	490	34	410	28	330	23	250	17					
26155G-HLS	5/64	3,700	255	3,700	255	3,700	255	3,700	255	3,700	255	3,700	255	3,700	255	3,490	241	3,060	211	2,630	182	2,210	152	1,780	123	1,350	93				
	3/32	3,700	255	3,700	255	3,700	255	3,680	254	3,380	233	3,080	212	2,770	191	2,470	170	2,170	150	1,870	129	1,560	108	1,260	87	960	66				
	1/8	2,650	183	2,470	171	2,300	159	2,130	147	1,950	135	1,780	122																		

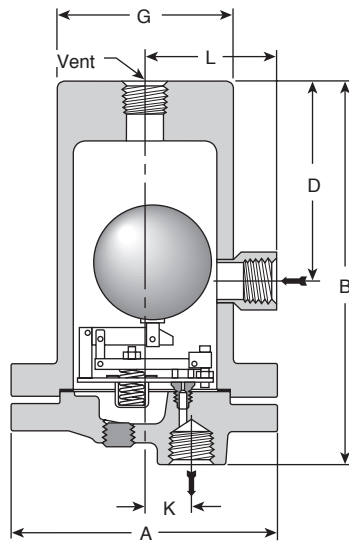
# High Leverage Spring-Loaded Ball Float Type Drain Traps

For Low Flows at Pressures to 3,700 psi (255 bar) and Specific Gravity Down to 0.40



## List of Materials

Table LD-28.					
Model No.	Valve & Seat	Leverage System	Float	Body & Cap	Gasket
2313-HLS 2315-HLS 2316-HLS	Stainless Steel			ASTM A105 Forged Steel	Compressed Asbestos-free
2413-HLS 2415-HLS 2416-HLS 25133G-HLS 25155G-HLS 26155G-HLS				ASTM A182 Grade F22 Forged Steel	



**Figure LD-42.**  
High leverage ball float drain trap.

For a fully detailed certified drawing, refer to CD #1074.

## Physical Data

Table LD-29. High Leverage Spring-Loaded Ball Float Type Drain Traps																		
Model No.	2313-HLS†		2315-HLS		2316-HLS		2413-HLS†		2415-HLS†		2416-HLS		25133G-HLS		25155G-HLS		26155G-HLS	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
Pipe Connections	1/2, 3/4, 1	15, 20, 25	1, 1-1/4, 1-1/2	25, 32, 40	1-1/2, 2	40, 50	1/2, 3/4, 1	15, 20, 25	1, 1-1/4, 1-1/2	25, 32, 40	1-1/2, 2	40, 50	1/2, 3/4, 1	15, 20, 25	3/4, 1, 1-1/4	20, 25, 32	1, 1-1/4, 1-1/2	25, 32, 40
"A"	8	203	9-3/4	248	11-7/8	302	8-5/8	219	10-3/4	273	12-1/2	318	8-1/2	216	10-3/8	263	11-3/4	298
"B"	11-9/16	294	15-1/16	383	17-1/8	435	11-7/8	3002	15	381	17-3/4	451	14-1/4	362	16-7/32	412	24-1/8	613
"D"	6-1/16	154	7-13/16	198	9	229	5-3/8	137	7-1/4	184	9	229	3	75	4	102	5	127
"G"	5-1/8	130	6-7/8	175	8-3/8	213	5-3/8	137	6-7/8	175	8-5/8	219	5-3/4	146	7-3/8	187	8-3/8	213
"K"	1-7/16	37	1-3/4	44	2-1/8	54	1-7/16	37	1-3/4	44	2-1/8	54	1-5/16	33	1-3/4	44	1-3/4	44
"L"	3-7/8	98	4-11/16	119	5-3/4	146	4	102	4-13/16	122	5-13/16	148	—	—	—	—	—	—
Weight, lbs (kg)	46 (21)		98 (44)		160 (73)		69 (31)		130 (59)		210 (95)		113 (51)		171 (78)		325 (147)	
Maximum Allowable Pressure (Vessel Design)	1,000 psig @ 100°F (69 bar @ 38°C) 600 psig @ 750°F (41 bar @ 400°C)						1,500 psig @ 100°F (103 bar @ 38°C) 900 psig @ 850°F (62 bar @ 454°C)		1,800 psig @ 100°F (125 bar @ 38°C) 900 psig @ 900°F (62 bar @ 482°C)		2,120 psig @ 100°F (146 bar @ 38°C) 1,700 psig @ 900°F (117 bar @ 482°C)		2,520 psig @ 100°F (174 bar @ 38°C) 2,000 psig @ 900°F (138 bar @ 482°C)		3,700 psig @ 100°F (255 bar @ 38°C) 3,000 psig @ 900°F (207 bar @ 482°C)			

**Note:** Available with screwed, socketweld or flanged connections.

† Available with cast 316 stainless steel body and all stainless steel internals. Consult factory.

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit [www.armstronginternational.com](http://www.armstronginternational.com) for up-to-date information.