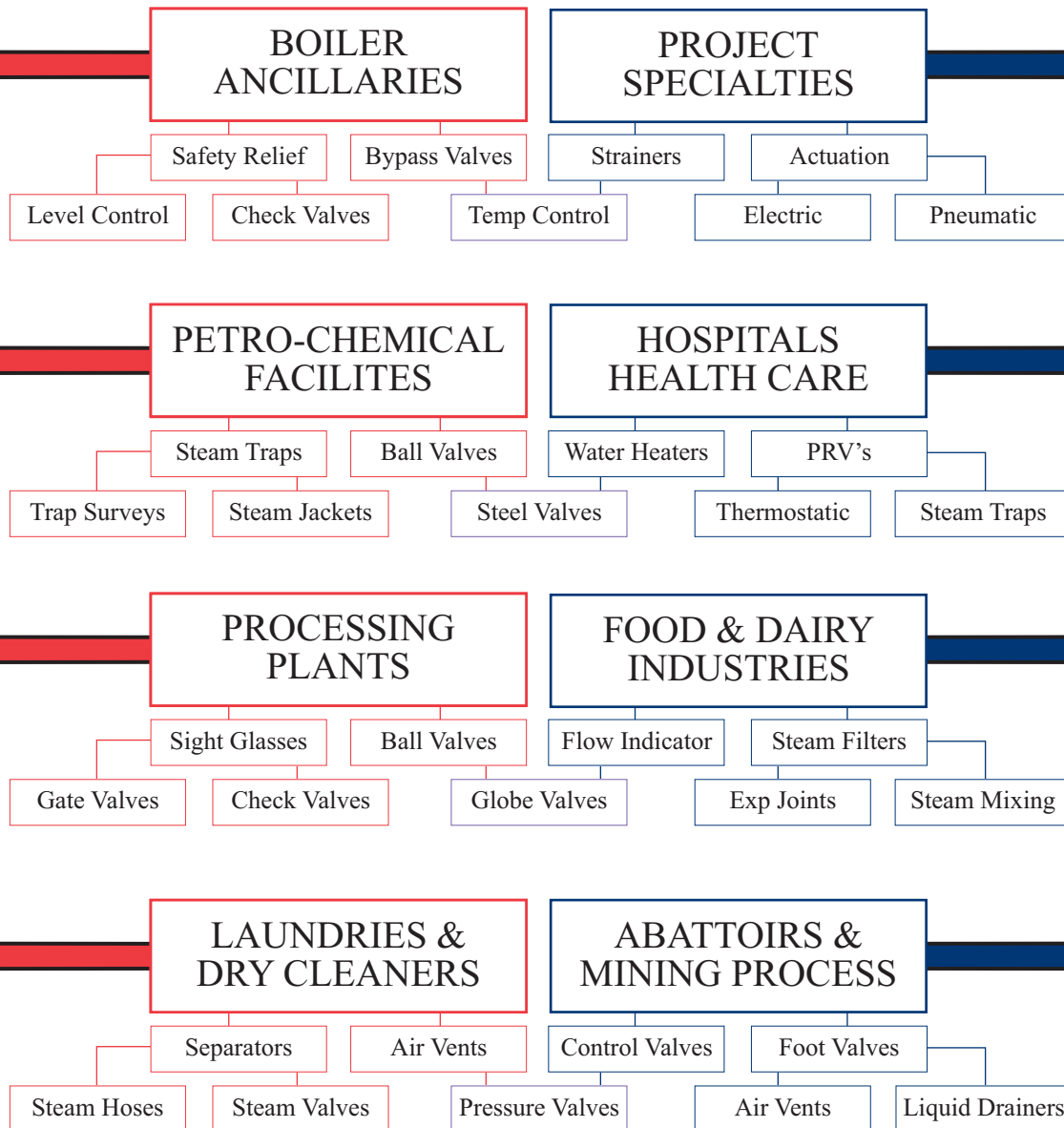


ARMSTRONG STEAM & ENGINEERING

Pty. Ltd.

Valves, Actuators & Pipeline Specialties



From Concept to Conclusion

Free Floating Guided Lever Drain Traps

For Loads to 42,000 lb/hr (19,050 kg/hr)...Pressures to 1,000 psig (69 bar)

Armstrong's forged steel, free-floating guided lever drain traps use the same bodies, caps, lever mechanisms, valves and seats of Armstrong inverted bucket steam traps that have been proven in years of service. Elliptical floats and high leverage make it possible to open large orifices to provide adequate capacity for drain trap size and weight.

The hemispherical valve, seat and leverage of the 32-LD, 33-LD and 36-LD stainless steel traps are identical in design, materials and workmanship to those for saturated steam service up to 1,000 psig with the exception of the addition of a guidepost to assure a positive, leaktight valve closing under all conditions.

List of Materials

Model No.	Valve & Seat	Leverage System	Float	Body & Cap	Gasket
32-LD 33-LD 36-LD	Stainless Steel			Forged Steel ASTM A105	Compressed Asbestos-free

For information on special materials, consult the Armstrong Application Engineering Department.

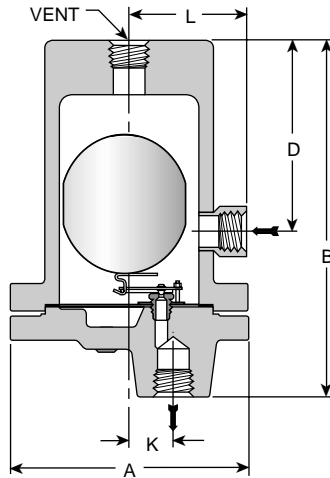


Figure LD-35.

No. 32-LD, 33-LD and 36-LD forged steel guided lever drain trap. Socketweld or flanged connections are also available.



Physical Data

Model No.	Forged Steel					
	32-LD†		33-LD†		36-LD†	
Pipe Connections	in	mm	in	mm	in	mm
	1/2, 3/4, 1	15, 20, 25	1/2, 3/4, 1	15, 20, 25	1-1/2, 2	40, 50
"A"	6-3/4	171	8	203	11-7/8	302
"B"	10-3/16	259	11-9/16	294	17-1/8	435
"D"	5-9/16	141	6-1/16	154	9	229
"K"	1-1/4	32	1-7/16	37	2-1/8	54
"L"	3-3/8	86	3-9/16	90	6-1/16	154
Approx. Wt. lbs (kg)	31 (14)		49 (22)		163 (74)	
Max. Allowable Pressure (Vessel Design)	600 psig @ 100°F (41 bar @ 38°C) 500 psig @ 750°F (35 bar @ 400°C)		1,000 psig @ 100°F (69 bar @ 38°C) 600 psig @ 750°F (41 bar @ 400°C)			

Note: Vessel design pressure may exceed float collapse pressure in some cases.

Pipe size of vent connection is same as that of inlet and outlet connections.

†Available in Type 316 stainless steel. Consult factory.

All dimensions and weights are approximate. Use certified print for exact dimensions. Design and materials are subject to change without notice.



Free Floating Lever Drain Traps

For Loads to 50,000 lb/hr (22,679 kg/hr)...Pressures to 1,000 psig (69 bar)

Table LD-14. Maximum Operating Pressures for Handling Different Specific Gravity Liquids With Orifices Available in Guided Free Floating Lever Drain Traps. (See pages LD-29 and LD-30.)

Model No.	Sp. Grav.	1.00		.95		.90		.85		.80		.75		.70		.65		.60		.55		.50		
		Maximum Operating Pressure psig (bar)																						
		Orifice		psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig
1-LD	1/8	121	8.3	109	7.6	98	6.8	87	6.0	75	5.2	64	4.4	52	3.6	41	2.8	29	2.0	18	1.2	6	0.4	
	7/64	143	9.9	130	9.0	116	8.0	103	7.1	89	6.1	75	5.2	62	4.3	48	3.3	35	2.4	21	1.4	7	0.5	
	#38	182	12.5	164	11	147	10.2	130	9.0	113	7.8	95	6.6	78	5.4	61	4.2	44	3.0	26	1.8	9	0.6	
	5/64	300	20.7	289	19.9	259	17.8	228	15.7	198	13.7	168	11.6	137	9.5	107	7.4	77	5.3	47	3.2	16	1.1	
11-LD	1/8	176	12.1	161	11.1	146	10.1	130	9.0	115	7.9	100	6.9	85	5.8	69	4.8	54	3.7	39	2.7	24	1.6	
	7/64	209	14	191	13	173	12	155	10.7	137	9.4	119	8.2	100	6.9	82	5.7	64	4.4	46	3.2	28	1.9	
	#38	264	18	242	17	219	15	196	14	173	12	150	10.4	127	8.8	104	7.2	81	5.6	59	4.0	36	2.5	
	5/64	400	28	400	28	384	27	344	24	304	21	264	18	224	15	183	13	143	9.9	103	7.1	63	4.3	
2-LD to 250 psi (17 bar)	5/16	22	1.5	20	1.4	18	1.3	17	1.1	15	1.0	13	0.9	11	0.8	10	0.7	8	0.5	6	0.4	4	0.3	
	1/4	36	2.5	33	2.3	30	2.1	27	1.9	24	1.7	22	1.5	19	1.3	16	1.1	13	0.9	10	0.7	7	0.5	
	3/16	79	5.5	73	5.0	67	4.6	60	4.2	54	3.7	47	3.3	41	2.8	35	2.4	28	2.0	22	1.5	16	1.1	
	5/32	137	9.4	126	8.7	115	7.9	104	7.2	93	6.4	82	5.6	71	4.9	60	4.1	49	3.4	38	2.6	27	1.8	
	1/8	234	16.1	215	14.8	196	13.5	178	12.2	159	10.9	140	9.6	121	8.4	102	7.1	83	5.8	65	4.5	46	3.2	
	7/64	299	20.6	275	19	251	17.3	227	15.7	203	14	179	12	155	10.7	131	9.0	107	7.4	83	5.7	59	4.0	
22-LD to 533 psi (475 bar)	#38	372	25.7	342	23.6	313	21.6	283	19.5	253	17.4	223	15	193	13	163	11.2	133	9.2	103	7.1	73	5.0	
	5/64	533	37	475	33	461	32	417	29	372	26	328	23	284	20	240	17	196	14	152	10.5	108	7.4	
	5/16	29	2.0	26	1.8	23	1.6	21	1.4	18	1.2	15	1.0	12	0.9	10	0.7	7	0.5	4	0.3	2	0.1	
	1/4	47	3.3	43	3.0	38	2.6	34	2.3	29	2.0	25	1.7	20	1.4	16	1.1	12	0.8	7	0.5	3	0.2	
	3/16	104	7.2	94	6.5	85	5.8	75	5.2	65	4.5	55	3.8	45	3.1	35	2.4	25	1.8	16	1.1	6	0.4	
	5/32	180	12	163	11	146	10	129	8.9	112	7.7	95	6.5	78	5.4	61	4.2	44	3.0	27	1.9	10	0.7	
32-LD	1/8	307	21	278	19	249	17	220	15	191	13	162	11	133	9	104	7.2	75	5.2	46	3.2	17	1.2	
	7/64	393	27	356	25	319	22	282	19	245	17	207	14	170	12	133	9	96	6.6	59	4.1	22	1.5	
	#38	489	34	443	31	397	27	351	24	304	21	258	18	212	15	166	11	120	8	73	5.1	27	1.9	
	5/64	600	41	600	41	585	40	517	36	449	31	381	26	313	22	244	17	176	12	108	7	40	2.8	
	1/2	16	1.1	14	1.0	13	0.9	12	0.8	10	0.7	9	0.6	7	0.5	6	0.4	5	0.3	3	0.2	2	0.1	
	3/8	33	2.3	31	2.1	28	1.9	25	1.7	22	1.5	19	1.3	16	1.1	13	0.9	10	0.7	7	0.5	4	0.3	
3-LD to 250 psi (17 bar) (Cast Iron)	5/16	54	3.7	49	3.4	44	3.0	39	2.7	35	2.4	30	2.1	25	1.7	20	1.4	16	1.1	11	0.8	6	0.4	
	9/32	71	4.9	65	4.5	59	4.0	52	3.6	46	3.2	40	2.7	34	2.3	27	1.9	21	1.4	15	1.0	8	0.6	
	1/4	107	7.4	97	6.7	88	6.1	79	5.4	69	4.8	60	4.1	50	3.5	41	2.8	32	2.2	22	1.5	13	0.9	
	7/32	153	10.5	139	9.6	126	8.7	112	7.7	99	6.8	85	5.9	72	5.0	59	4.0	45	3.1	32	2.2	18	1.2	
	3/16	230	16	209	14	189	13	169	12	149	10.3	129	8.9	108	7.5	88	6.1	68	4.7	48	3.3	27	1.9	
	5/32	359	25	327	23	296	20	264	18	233	16	201	14	169	12	138	9.5	106	7.3	74	5.1	43	2.9	
13-LD to 570 psi (39 bar) (Stainless)	1/8	726	50	662	46	598	41	534	37	470	32	406	28	342	24	278	19	214	15	150	10.3	86	5.9	
	7/64	900	62	847	58	765	53	683	47	601	41	519	36	437	30	356	25	274	19	192	13	110	7.6	
	1-1/16	21	1.4	19	1.3	18	1.2	16	1.1	15	1.0	13	0.9	12	0.8	10	0.7	9	0.6	7	0.5	6	0.4	
	7/8	32	2.2	30	2.1	28	1.9	26	1.8	23	1.6	21	1.4	19	1.3	16	1.1	14	1.0	12	0.8	9	0.6	
	3/4	47	3.2	44	3.0	40	2.8	37	2.5	34	2.3	30	2.1	27	1.9	24	1.6	20	1.4	17	1.2	14	0.9	
	5/8	72	4.9	67	4.6	61	4.2	56	3.9	51	3.5	46	3.2	41	2.8	36	2.5	31	2.1	26	1.8	21	1.4	
6-LD Cast Iron	9/16	95	6.5	88	6.1	81	5.6	75	5.2	68	4.7	61	4.2	55	3.8	48	3.3	41	2.8	34	2.4	28	1.9	
	1/2	138	9.5	128	8.8	118	8.1	108	7.5	99	6.8	89	6.1	79	5.4	69	4.8	59	4.1	50	3.4	40	2.8	
	7/16	196	13	182	13	168	12	154	11	140	10	126	8.7	112	7.7	98	6.8	85	5.8	71	4.9	57	3.9	
	3/8	250	17	250	17	250	17	243	17	221	15	199	14	177	12	155	11	133	9.0	111	7.7	90	6.2	
	11/32	250	17	250	17	250	17	250	17	250	17	250	17	236	16	207	14	178	12	148	10	119	8.2	
	5/16	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	228	16	191	13	153	11	
	9/32	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	201	14	
	1/4	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	
	7/32	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	
	3/16	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	250	17	
	36-LD Forged Steel	1-1/16	16	1.1	15	1.01	13	0.91	12	0.81	10	0.71	9	0.6	7	0.5	6	0.4	4	0.3	3	0.2	1	0.1
		7/8	25	1.7	23	1.6	21	1.4	18	1.3	16	1.1	14	0.95	11	0.79	9	0.63	7	0.47	5	0.31	2	0.16
3/4		36	2.5	33	2.3	30	2.1	27	1.8	23	1.6	20	1.4	17	1.1	13	0.91	10	0.68	7	0.45	3	0.22	
5/8		56	3.9	51	3.5	46	3.1	41	2.8	35	2.4	30	2.1	25	1.7	20	1.4	15	1.05	10	0.69	5	0.34	
9/16		74	5.1	67	4.6	60	4.2	54	3.7	47	3.2	40	2.8	34	2.3	27	1.8	20	1.4	13	0.92	7	0.46	
1/2		107	7.4	97	6.7	88	6.0	78	5.4	68	4.7	58	4.0	49	3.4	39	2.7	29	2.0	19	1.3	10	0.66	
7/16		152	10.5	138	9.6	125	8.6	111	7.6	97	6.7	83	5.7	69	4.8	55	3.8	41	2.9	27	1.9	14	0.94	
3/8		240	17	218	15	197	14	175	12	153	10.5	131	9.0	109	7.5	87	6.0	65	4.5	43	3.0	21	1.5	
11/32		320	22	291	20	262	18	233	16	203	14	174	12	145	10	116	8.0	87	6.0	58	4.0	29	2.0	
5/16		411	28	374	26	336	23	299	21	262	18	224	15	187	13	149	10.3	112	7.7	74	5.1	37	2.5	
9/32		539	37	490	34	441	30	392	27	343	24	293	20	244	17	195	13	146	10.1	97	6.7	48	3.3	
1/4		788	54	716	49	644	44	573	39	501	35	429	30	357	25	286	20	214	15	142	9.8	70	4.9	
7/32	1,000	69	1,000	69	910	63	808	56	707	49	606	42	505	35	403	28	302	21	201	14	99	6.9		
3/16	1,000	69	1,000	69	1,000	69	1,000	69	1,000	69	992	68	826	57	660	46	494	34	328	23	163	11.2		
Specific Gravity		1.00		.95		.90		.85		.80		.75		.70		.65		.						

How to Select and Size Armstrong Drain Traps

For Draining Water From a Light Liquid

Armstrong dual gravity drain traps for draining water from a light liquid are described on pages LD-45 and LD-46. All models shown are identical to corresponding models of traps used to drain liquid from a gas except that float weights are modified to make them suitable for draining water from a light liquid.

Dual gravity drain trap* selection requires that you know the peak heavy liquid load, maximum operating pressure, and specific gravity of the light liquid. With this information you can determine the orifice size required from Chart LD-12 and find the specific drain trap that will meet your conditions from the pressure tables on the dual gravity pages.

Selection Procedure for Draining Water from a Light Liquid

1. Assume a required safety factor of 2:1. Multiply the peak load in pounds per hour by 2. (See paragraph on "Safety Factors.")
2. From Capacity Chart LD-12, find the intersection of actual load times safety factor and the minimum operating pressure differential. Follow the pressure line immediately above this point to intersect the next higher orifice capacity curve. Then follow this curve downward and to the left to get the orifice size.
3. Inspect the tables on pages LD-45 and LD-46 to find the smallest trap that can open the predetermined orifice size at the maximum operating pressure differential. Do not oversize dual gravity drain traps. Oversizing will cause excessive fluctuation of the interface between the two liquids.

NOTE: While drain traps are sized on the basis of operating pressure differential, forged steel must be used when total pressure in the drain trap exceeds 250 psig.

* Floats for dual gravity drain traps are weighted with quenching oil which, in the unlikely possibility of float failure, may be dispersed through the system. If this is a hazard, consult the Armstrong Application Engineering Department.

How to Order Dual Gravity Drain Traps

Specify:

- Drain trap size by number
- Orifice size
- Pipe connections—size and type
- Specific gravity of light liquid
- Weight of water discharge per hour
- Maximum operating pressure

If you are not sure of the drain trap size to use, then specify:

- Specific gravity of light liquid
- Capacity in pounds of water per hour with safety factor included
- Working pressure—maximum and minimum

Chart LD-12.

Calculated Cold Water Capacity of Armstrong Drain Trap Orifices at Various Pressures

Actual capacity also depends on trap configuration, piping and flow to trap. It is important to allow for safety factors and fluid density variations due to temperature.

