



Liquid Drain Traps Selection and Sizing

The discharge rate depends on the differential pressure across the trap (that is, the pressure at the trap inlet minus the pressure at the outlet). The capacity charts show the maximum cold water discharge rate versus the differential pressure.

Note: Although the differential pressure is used for sizing, the trap body must be designed for the full maximum system pressure.

Operation against return

Line back-pressure

If the pressure in the return line (the "back-pressure") is above atmospheric at all times, the maximum operating pressure (PMO) of the trap is increased by the amount of the back-pressure. (But the increased PMO must never be higher than the PMA — the maximum allowable pressure.)

Example:

If the nameplate PMO is 100 psi g (6.9 bar g), and the back-pressure is always at least 25 psi g (1.7 bar g), the drain trap may be used at a working pressure of up to 125 psi g (8.6 bar g), provided that the nameplate PMA is at least 125 psi g (8.6 bar g) at the operating temperature.

The excess pressure will not hold the valve closed because the differential pressure is not greater than the nameplate PMO.

Safety factors

Both the amount of liquid to be discharged and the differential pressure may fluctuate. To ensure continuous drainage during periods of high load and/or low pressure, the liquid drain trap should be selected to handle the estimated load times a safety factor of 1.5 at the lowest expected differential pressure. If the capacity requirements or operating conditions cannot be predicted accurately, the safety factor should be increased accordingly. If the maximum peak load and minimum differential pressure are accurately known, the safety factor may be reduced or eliminated.

Liquids other than cold water

For liquids higher than cold water (that is, liquids with a specific gravity less than 1.0), both the discharge capacity and the maximum operating pressure will be reduced. The required capacity of the light liquid (including the safety factor) must be multiplied by the appropriate conversion factor from figure 1. The resulting equivalent cold water capacity is used to select a trap using the cold water capacity charts. Table 1 must be consulted to ensure that the reduced PMO of the selected trap is higher than the expected maximum system pressure. If there is a back-pressure in the return line, the PMO of the trap may be increased (see above).

Flashing liquids

The capacity charts are based on single-phase (liquid only) flow. If the pressure/temperature conditions upstream and downstream of the trap are such that a portion of the liquid will re-evaporate, or "flash" as it passes through the valve, the resulting two-phase (liquid and gas) flow will reduce the capacity of the trap. If two-phase flow is expected, the safety factor should be increased by 1-1/2 to 2 times.

Table 1: Maximum operating pressure with light liquids

Model(s)*	Size(s)	Maximum operating pressure, psi g (bar g)											
		s.g.1.00		.99 to .95		.94 to .90		.89 to .85		.84 to .80		.79 to .75	
		psi g	(bar g)	psi g	(bar g)	psi g	(bar g)	psi g	(bar g)	psi g	(bar g)	psi g	(bar g)
FA/FAI-30	½", ¾", 1"	35	(2.4)	31	(2.1)	28	(1.9)	24	(1.6)	21	(1.4)	17	(1.2)
	1½", 2"	34	(2.3)					25	(1.7)	22	(1.5)	20	(1.4)
FA/FAI-75	½", ¾", 1"	90	(6.2)	81	(5.6)	73	(5)	65	(4.5)	57	(3.9)	49	(3.4)
	1½"	88	(6.1)					66	(4.6)	58	(4)	51	(3.5)
	2"	75	(5.2)	60	(4.1)	54	(3.7)	49	(3.4)	44	(3)	38	(2.6)
FA/FAI-150	½", ¾", 1"	150	(10.3)	142	(9.8)	128	(8.8)	114	(7.8)	100	(6.9)	86	(5.9)
	1½"			140	(9.65)	127	(8.7)	115	(7.9)	103	(7.1)	90	(6.2)
	2"			139	(9.6)							91	(6.3)
FAI-200	½", ¾", 1"	200	(13.8)	184	(12.7)	168	(11.6)	152	(10.5)	135	(9.3)	119	(8.2)
FA-200	1"			200	(13.8)	200	(13.8)	190	(13.1)	164	(11.3)	139	(9.6)
	1½"							191	(13.2)	168	(11.6)	145	(10)
FAB-10	2"	10	(0.69)	9	(0.62)	8	(0.55)	7.5	(0.52)	7	(0.48)	6	(0.41)
FAB150	1½"	150	(10.3)	138	(9.5)	126	(8.7)	114	(7.8)	100	(6.9)	88	(6.1)
FAB-75	2½"	75	(5.2)	69	(4.8)	63	(4.3)	57	(3.9)	50	(3.4)	44	(3)
FAB-175	2"	175	(12.1)	163	(11.2)	150	(10.3)	137	(9.5)	124	(8.5)	111	(7.7)
CA-14	½", ¾"	200	(13.8)	198	(13.7)	195	(13.4)	173	(11.9)	152	(10.5)	130	(9)
CAS14	½", ¾", 1"	250	(17.2)	200	(13.8)	200	(13.8)	200	(13.8)	200	(13.8)	160	(11)
-4.5	½", ¾"	65	(4.5)	65	(4.5)	65	(4.5)	65	(4.5)	65	(4.5)	55	(3.8)
	1"											57	(3.9)
	1½", 2"											36	(2.5)
-10**	½", ¾"	145	(10)	145	(10)	145	(10)	125	(8.6)	108	(7.4)	94	(6.5)
	1"									107	(7.4)	93	(6.4)
	1½", 2"									92	(6.3)	79	(5.4)
FA450 CA46S	½", ¾"	203	(14)	198	(13.7)	195	(13.4)	173	(11.9)	152	(10.5)	130	(9)
	1"			203	(14)	203	(14)	180	(12.4)	160	(11)	135	(9.3)
	1½", 2"							203	(14)	203	(14)	203	(14)
-21	½", ¾"	304	(21)	304	(21)	304	(21)	280	(19.3)	261	(18)	225	(15.5)
	1"			290	(20)	275	(19)	245	(16.9)	217	(15)	187	(12.9)
	1½", 2"			304	(21)	304	(21)	304	(21)	295	(20.3)	253	(17.4)
-32	¾"	465	(32.1)	464	(32)	464	(32)	440	(30.3)	420	(29)	350	(24.1)
	1"			450	(31)	435	(30)	385	(26.5)	340	(23.4)	290	(20)
	1½", 2"			422	(29.1)	380	(26.2)	337	(23.2)	295	(20.3)	253	(17.4)
FA450	3" (DN80), 4" (DN100)	450	(31)	450	(31)	450	(31)	450	(31)	450	(31)	450	(31)
FA-150	¼"	150	(10.3)	135	(9.3)	119	(8.2)	104	(7.2)	89	(6.1)	73	(5)
F-150V	½"			150	(10.3)	150	(10.3)	150	(10.3)	138	(9.5)	119	(8.2)
F-300V	½"	300	(20.7)	300	(20.7)	300	(20.7)	300	(20.7)	282	(19.4)	243	(16.8)

*Some models are not available in all of the listed sizes. For liquids with a specific gravity less than 0.5, please consult factory.

** FA450 Only

Table 1: Maximum operating pressure with light liquids, continued on next page

Table 1: Maximum operating pressure with light liquids (continued)

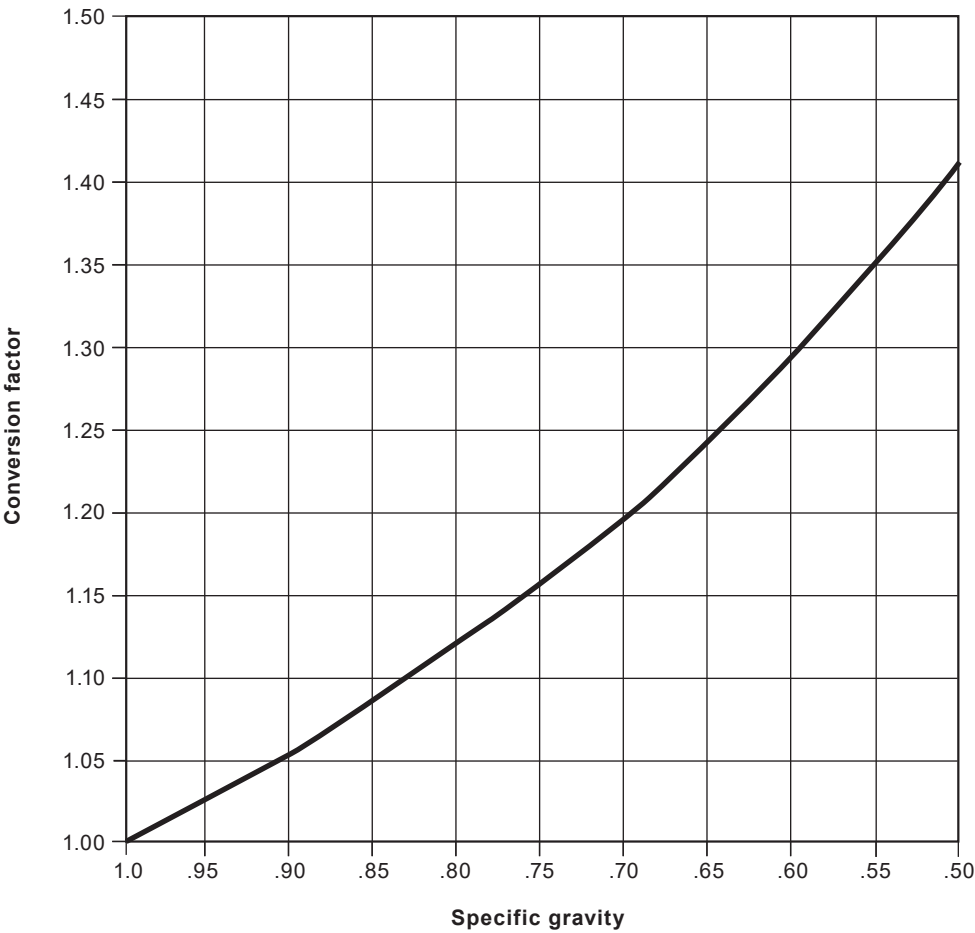
Model(s)*	Size(s)	Maximum operating pressure, psi g (bar g)									
		.74 to .70		.69 to .65		.64 to .60		.59 to .55		.54 to .50	
		psi g	(bar g)	psi g	(bar g)	psi g	(bar g)	psi g	(bar g)	psi g	(bar g)
FA/FAI-30	½", ¾", 1"	14	(0.97)	10	(0.69)	7	(0.48)	3	(0.21)		
	1½", 2"	17	(1.2)	14	(0.97)	11	(0.76)	8	(0.55)	6	(0.41)
FA/FAI-75	½", ¾", 1"	41	(2.8)	33	(2.3)	25	(1.7)	16	(1.1)	8	(0.55)
	1½"	43	(3)	36	(2.5)	28	(1.9)	21	(1.4)	13	(0.90)
	2"	33	(2.3)	28	(1.9)	23	(1.6)	17	(1.2)	12	(0.83)
FA/FAI-150	½", ¾", 1"	71	(4.9)	57	(3.9)	43	(3)	29	(2)	15	(1)
	1½"	78	(5.3)	65	(4.5)	53	(3.7)	40	(2.8)	28	(1.9)
	2"	79	(5.4)	67	(4.6)	55	(3.8)	43	(3)	31	(2.1)
FAI-200	½", ¾", 1"	103	(7.1)	87	(6)	71	(4.9)	54	(3.7)	38	(2.6)
FA-200	1"	113	(7.8)	88	(6.1)	62	(4.3)	37	(2.6)	11	(0.76)
	1½"	122	(8.4)	99	(6.8)	76	(5.2)	53	(3.7)	30	(2.1)
FAB-10	2"	5.5	(0.38)	5	(0.34)	4	(0.28)	3.5	(0.24)	3	(0.21)
FAB150	1½"	74	(5.1)	62	(4.3)	50	(3.4)	38	(2.6)	26	(1.8)
FAB-75	2½"	37	(2.6)	31	(2.1)	25	(1.7)	19	(1.3)	13	(0.90)
FAB-175	2"	98	(6.8)	85	(5.9)	72	(5)	59	(4.1)	46	(3.2)
CA-14	½", ¾"	110	(7.6)	87	(6)	65	(4.5)	45	(3.1)	26	(1.8)
CAS14	½", ¾", 1"	130	(9)	97	(6.7)	72	(5)				
-4.5	½", ¾"	50	(3.4)	38	(2.6)	26	(1.8)	16	(1.1)	7	(0.48)
	1"			39	(2.7)	29	(2)	20	(1.4)	11	(0.76)
	1½", 2"	30	(2.1)	24	(1.7)	18	(1.2)	12	(0.83)	6	(0.41)
-10**	½", ¾"	80	(5.5)	60	(4.1)	43	(3)	30	(2.1)	19	(1.3)
	1"			65	(4.5)	50	(3.4)	35	(2.4)	21	(1.4)
	1½", 2"	66	(4.6)	53	(3.7)	40	(2.8)	26	(1.8)	13	(0.90)
FA450 CA46S	½", ¾"	110	(7.6)	87	(6)	65	(4.5)	45	(3.1)	26	(1.8)
	1"	113	(7.8)	92	(6.3)	72	(5)	50	(3.4)	29	(2)
	1½", 2"	203	(14)	165	(11.4)	99	(6.8)	54	(3.7)	27	(1.9)
-21	½", ¾"	165	(11.4)	155	(10.7)	116	(8)	75	(5.2)	36	(2.5)
	1"	159	(11)	130	(9)	100	(6.9)	66	(4.6)	36	(2.5)
	1½", 2"	211	(14.5)	165	(11.4)	99	(6.8)	54	(3.7)	27	(1.9)
-32	¾"	300	(20.7)	240	(16.5)	185	(12.8)	125	(8.6)	65	(4.5)
	1"	246	(17)	195	(13.4)	145	(10)	100	(6.9)	55	(3.8)
	1½", 2"	211	(14.5)	165	(11.4)	99	(6.8)	54	(3.7)	27	(1.9)
FA450	3" (DN80), 4" (DN100)	390	(26.9)	275	(19)	158	(10.9)	40	(2.8)		
FA-150	¼"	58	(4)	43	(3)	25	(1.7)	12	(0.83)		
F-150V	½"	100	(6.9)	80	(5.5)	61	(4.2)	42	(2.9)	23	(1.6)
F-300V	½"	203	(14)	164	(11.3)	125	(8.6)	86	(5.9)	46	(3.2)

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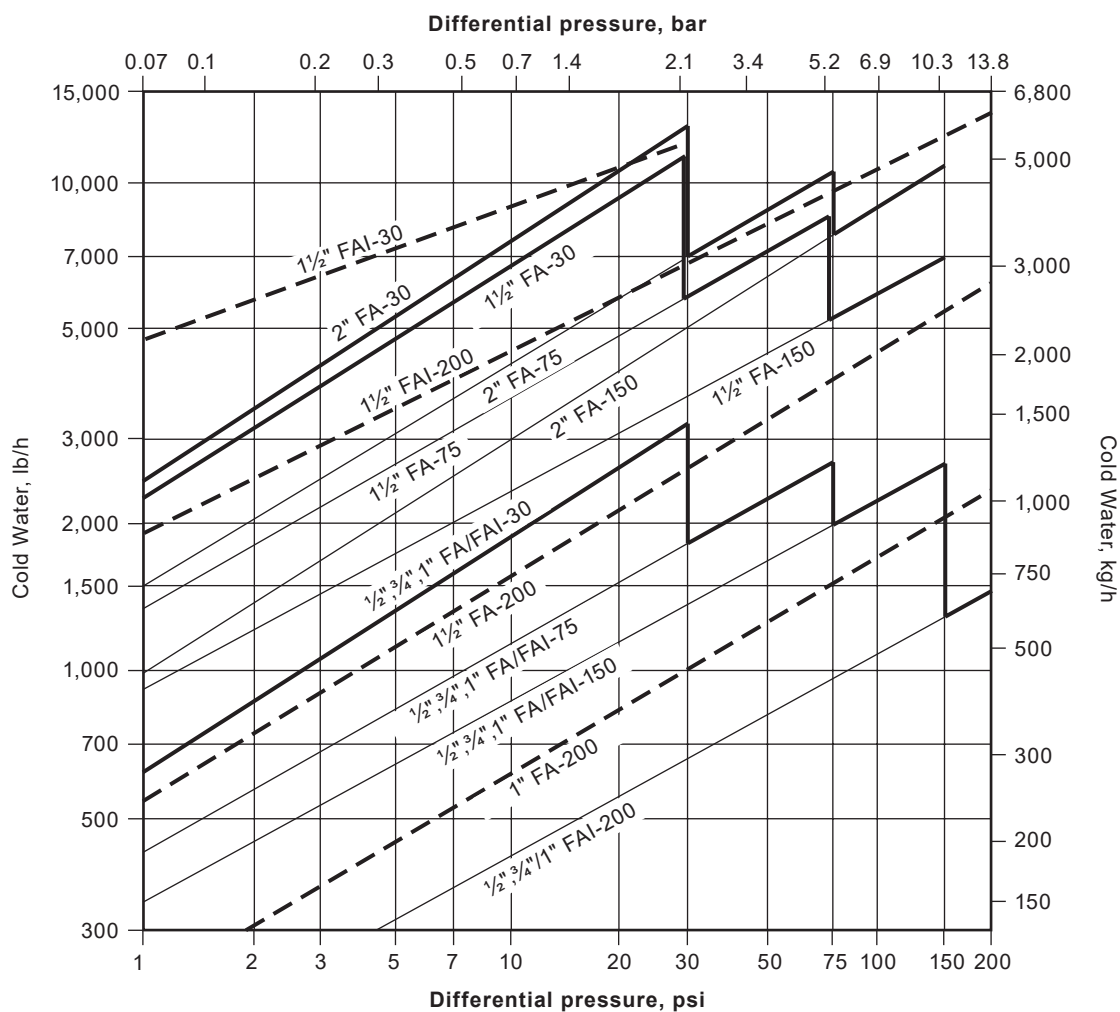
** FA450 Only

Capacity conversion factors

Conversion factor = $\frac{1}{\sqrt{\text{S.G.}}}$



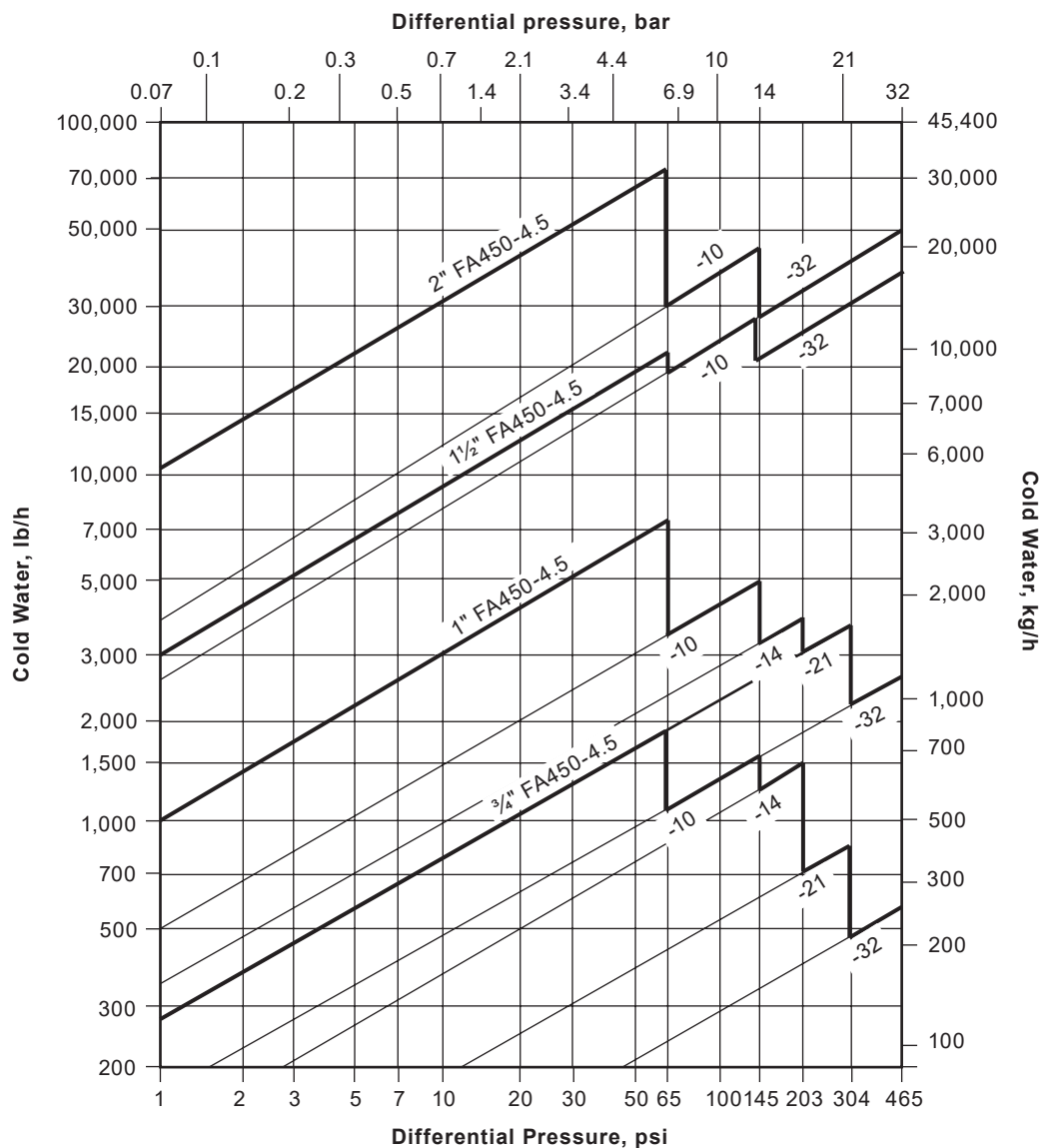
½" to 2" FA/FAI Capacities



Trap	Orifice	
	inches	mm
½", ¾", 1" FA/FA 130	.218	5.5
1½" FA30	.390	9.9
2" FA30	.500	12.7
½", ¾", 1" FA/FA 175	.166	4.2
1½" FA 75	.312	7.9
2" FA 75	.421	10.7
½", ¾", 1" FA/FAI 150	.125	3.2
1½" FA 150	.246	6.2
2" FA 150	.332	8.4
½", ¾", 1" FAI 200	.100	2.5
1" FA 200	.128	3.3
1½" FA 200	.203	5.2
1½" FAI 30	.500	12.7
1½" FAI 200	.332	8.4

Cold water capacity for single-phase flow of liquids with a specific gravity of 1.0

3/4" to 2" FA450 Capacities



Trap	Orifice	
	inches	mm
3/4", FA 450-4.5	.157	3.9
3/4" FA 450-10	.126	3.2
3/4", FA 450-14	.106	2.6
3/4" FA 450-21	.079	2
3/4" FA 450-32	.063	1.6
1", FA 450-4.5	.276	7
1", FA 450-10	.205	5.2

Trap	Orifice	
	inches	mm
1", FA 450-14	.185	4.6
1", FA 450-21	.157	3.9
1", FA 450-32	.126	3.2
1 1/2", FA 450-4.5	.689*	17.5
1 1/2", FA 450-10	.591*	15
1 1/2", FA 450-14	.531*	13.4

Trap	Orifice	
	inches	mm
1 1/2", FA 450-21	.531*	13.4
1 1/2", FA 450-32	.531*	13.4
2", FA 450-4.5	1.112*	28.2
2", FA 450-10	.807*	20.4
2", FA 450-14	.657*	16.6
2", FA 450-21	.657*	16.6
2", FA 450-32	.657*	16.6

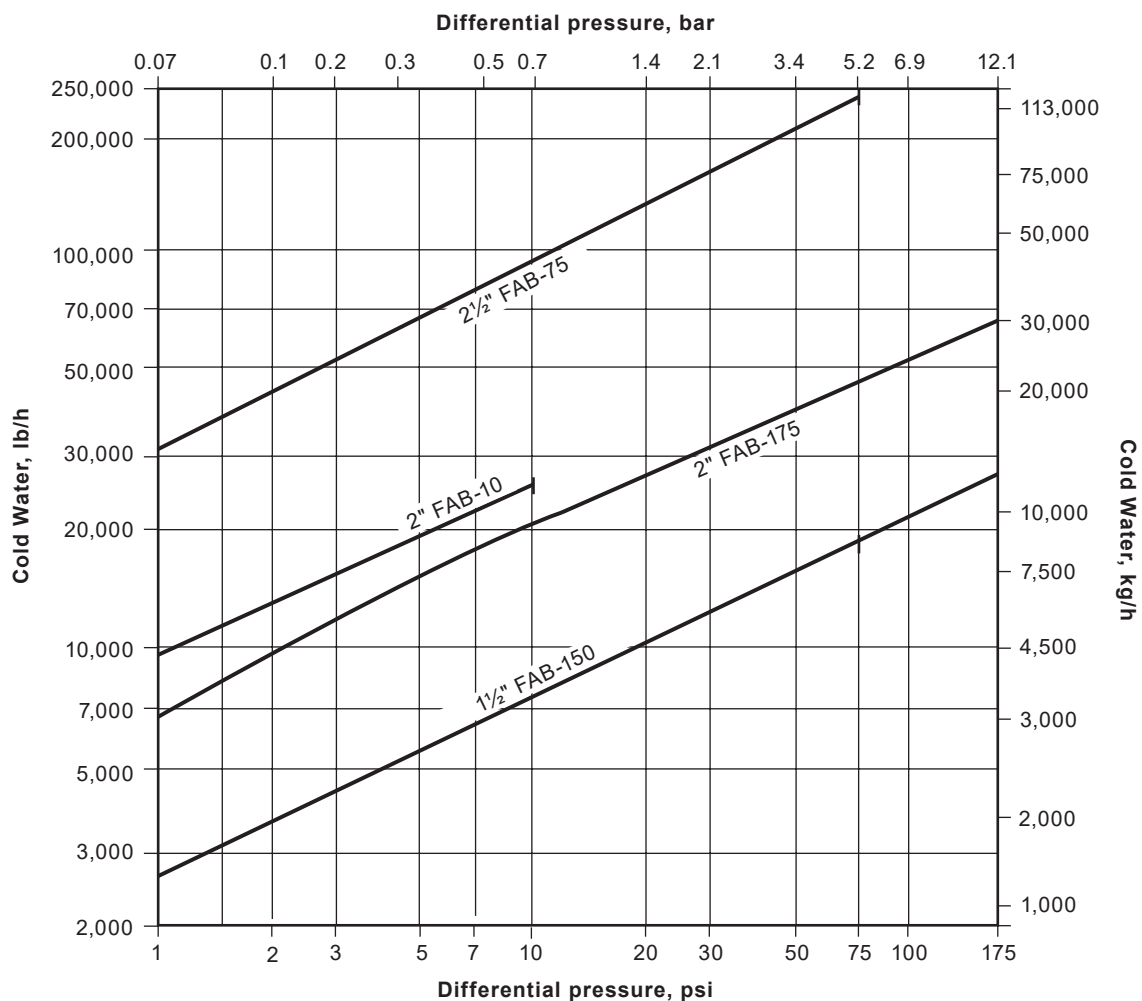
* Double Seated (2 valve orifices)

Cold water capacity for single-phase flow of liquids with a specific gravity of 1.0

Note:

1 1/2" and 2" FA450 traps have double-seated valves which may not close tight under no-load conditions. Normally, the liquid load will always be greater than the small residual leakage.

1½" to 2½" FAB Capacities



Trap	Orifice	
	inches	mm
2½", FAB-75	1.500*	38.1
2", FAB-10	.937	23.8
2", FAB-175	.750*	19.1
1½", FAB-150	.375*	9.5

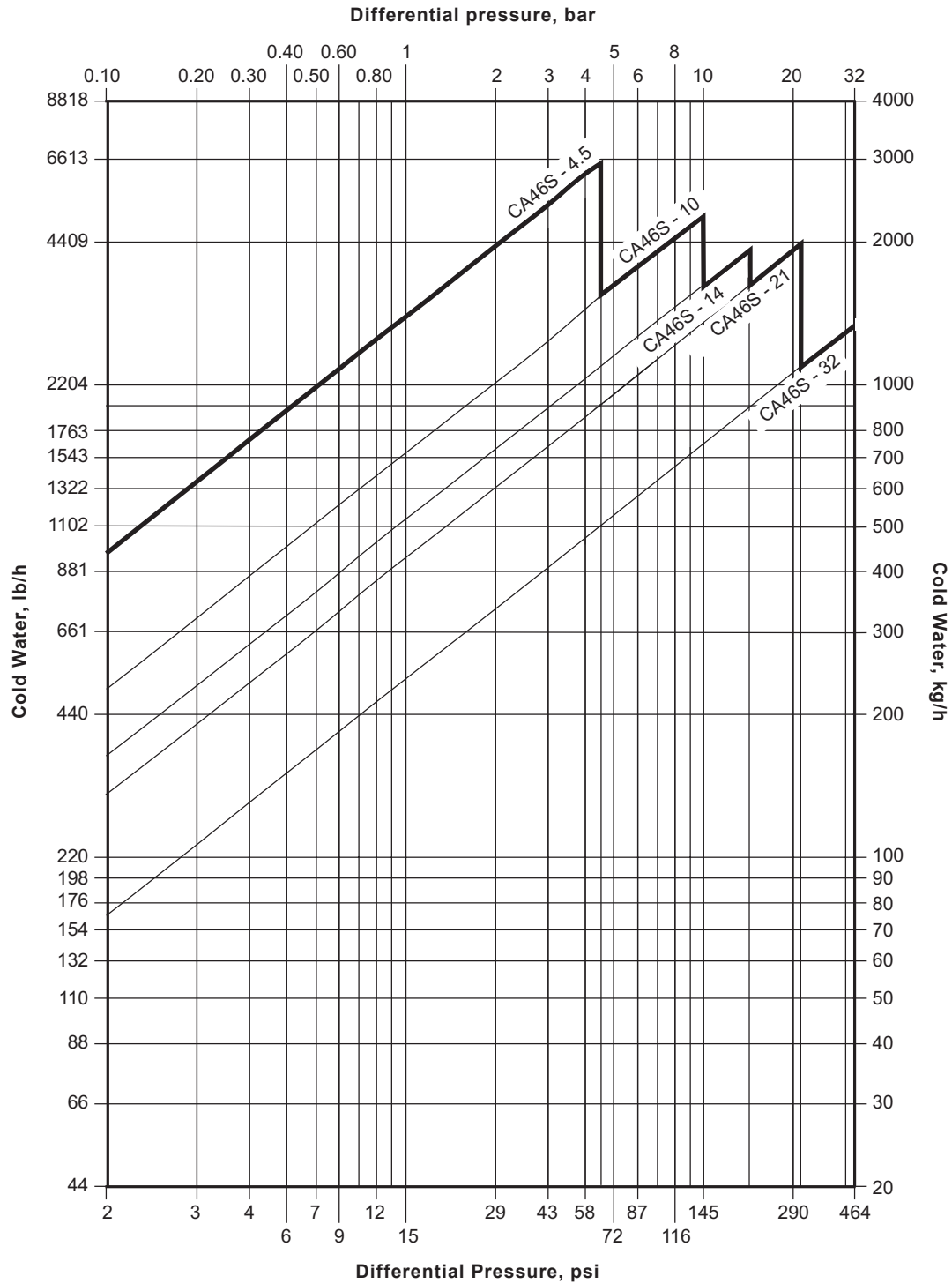
* Double Seated (2 valve orifices)

Cold water capacity for single-phase flow of liquids with a specific gravity of 1.0

Note:

FAB-75, FAB-150 and FAB-175 traps have double-seated valves which may not close tight under no-load conditions. Normally, the liquid load will always be greater than the small residual leakage.

CA46S Capacities



Liquid drainer	Size	Orifice diameter	
		inches	mm
CA14	All	0.079	2
CAS14	½", ¾"		
CA46S-4.5	½", ¾"	0.157	3.9
CA46S-10	½", ¾"	0.126	3.2
CA46S-14	½", ¾"	0.106	2.7
CA46S-21	½", ¾"	0.079	2
CA46S-4.5	1"	0.276	7
CA46S-10	1"	0.205	5.2
CA46S-14	1"	0.185	4.6
CA46S-21	1"	0.157	3.9
CA46S-4.5	1½" **	0.689	17.5
CA46S-21	1½" **	0.531	13.4
CA46S-4.5	2" **	1.122	28.4
CA46S-21	2" **	0.657	6.6
FA-150	¼"	0.100	2.5

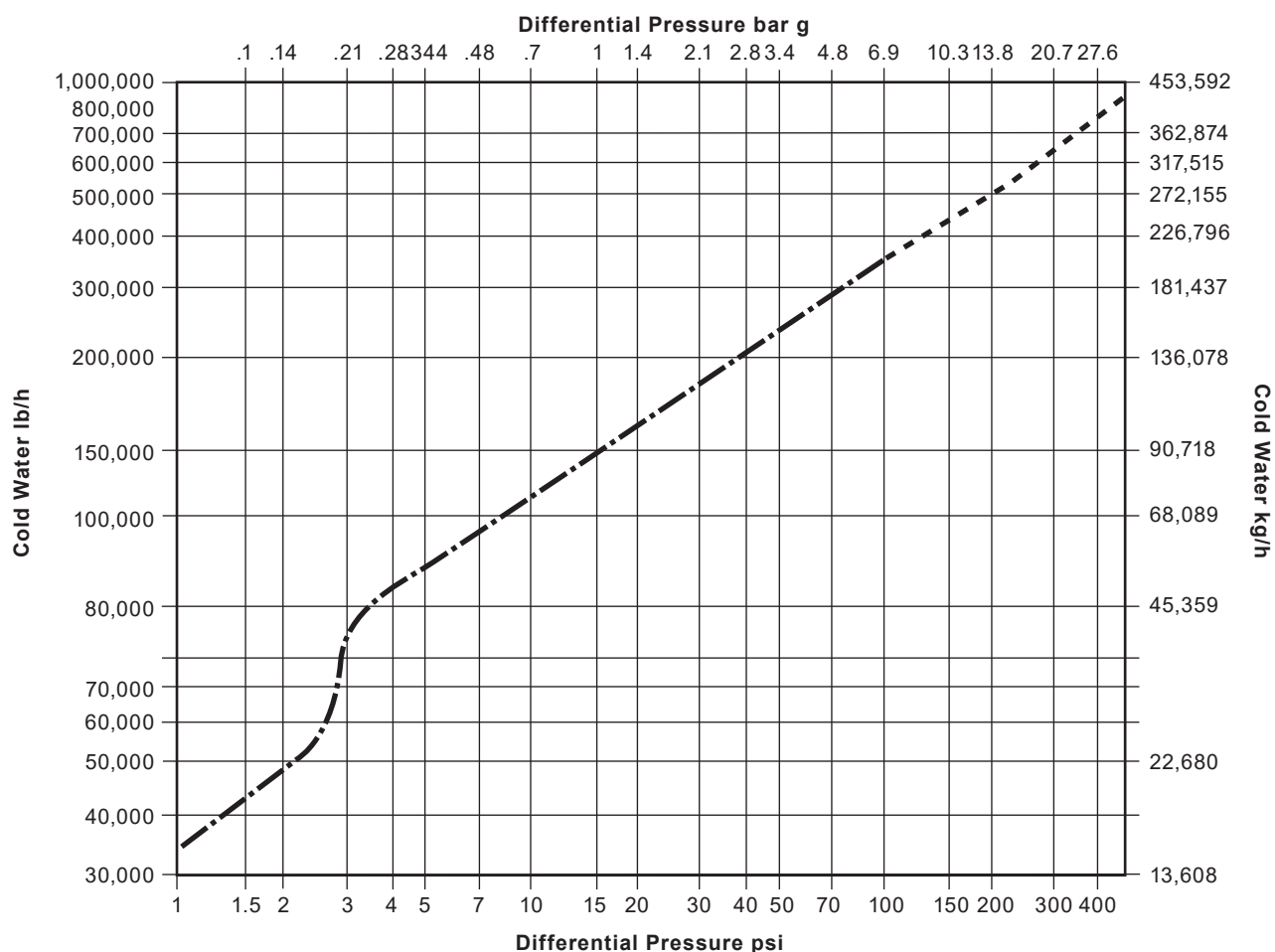
** Double seated (2 valve orifices)

Cold water capacity for single-phase flow of liquids with a specific gravity of 1.0

Note:

1½" and 2" traps have double-seated valves which may not close tight under no-load conditions. Normally, the liquid load will always be greater than the small residual leakage.

3", (DN80) 4" (DN100) FA450 Capacities



* In this region the trap capacity may exceed the flow capacity of the connection piping.

Trap	Orifice	
	inches	mm
3" (DN80) & 4" (DN100) FA450	2.063	52.4

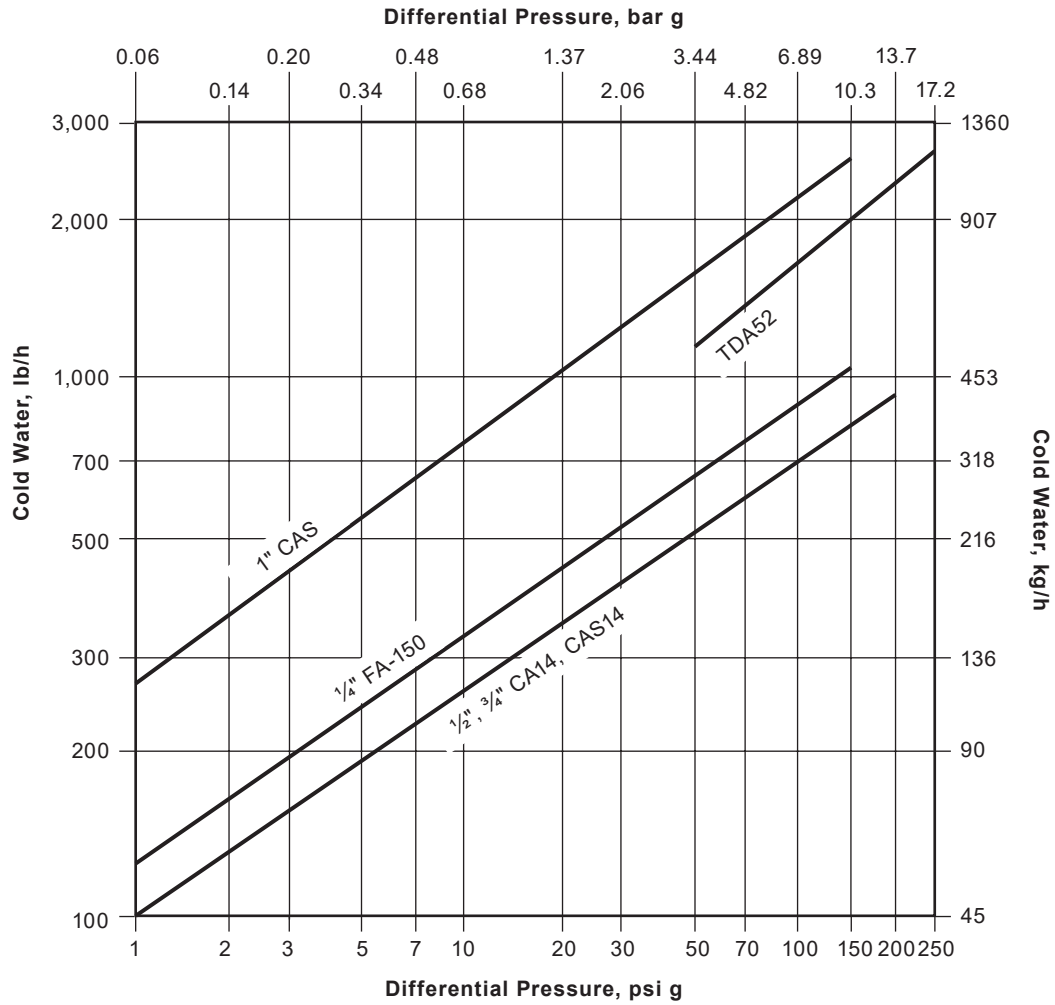
** Double Seated (2 Valve Orifices)

Cold water capacity for single-phase flow of liquids with a specific gravity of 1.0

Note:

This trap has a double-seated valve which may not close tight under no-load conditions. Normally, the liquid load will always be greater than the small residual leakage.

CA14, CAS14 1/4" FA-150, TDA52 Capacities



Cold water capacity for single-phase flow of liquids with a specific gravity of 1.0