



LARSEN & TOUBRO LIMITED

Engineering Design Research Centre (B&F)

EDRC-STD-H-PD-001

Chilled water pipe sizing

Discipline: HVAC

Selection Based on Frictional Loss of 4 ft of Water / 100 ft (Pipe dia ≤ 4 inches)

Pipe Size		Max Flow	Ton of Refrigeration		Velocity	
inches	mm		2.4 gpm / TR, ΔT=10°F	2.67 gpm / TR, ΔT=9°F	fps	m/s
1/2	12	2	0.7	0.7	1.9	0.6
3/4	20	4	1.6	1.4	2.3	0.7
1	25	7	3.1	2.7	2.7	0.8
1 1/4	32	15	6.4	5.7	3.3	1
1 1/2	40	23	9.7	8.6	3.7	1.1
2	50	45	19	17	4.4	1.3
2 1/2	65	73	30	27	4.9	1.5
3	80	130	54	48	5.7	1.7
4	100	268	112	99	6.8	2.1

Selection Based on Frictional Loss of 5 ft of Water / 100 ft (Pipe dia ≤ 4 inches)

1/2	12	2	0.8	0.7	2.1	0.6
3/4	20	4	1.8	1.6	2.6	0.8
1	25	8	3.5	3.1	3.1	0.9
1 1/4	32	17	7	6	3.7	1.1
1 1/2	40	26	11	10	4.1	1.3
2	50	51	21	19	4.9	1.5
2 1/2	65	82	34	30	5.5	1.7
3	80	147	61	54	6.4	1.9
4	100	301	125	112	7.6	2.3

Selection Based on Water Velocity Restricted to 8 fps (2.4 m/s) (Pipe dia ≥ 5 inches)

Pipe Size		Max Flow	Ton of Refrigeration		Friction Loss ft of Water/100 ft
inches	mm		2.4 gpm/TR, ΔT=10°F	2.67 gpm/TR, ΔT=9°F	
5	125	499	208	185	4.2
6	150	721	300	267	3.3
8	200	1248	520	462	2.4
10	250	1967	820	729	1.8
12	300	2818	1174	1044	1.5
14	350	3436	1432	1273	1.3
16	400	4552	1897	1686	1.1
18	450	5824	2427	2157	1
20	500	7253	3022	2686	0.8
24	600	10593	4414	3923	0.7
28	700	14533	6056	5383	0.6
30	750	16745	6977	6202	0.5

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EDRC-STD-H-PD-002

Condenser water pipe sizing

Discipline: HVAC

Selection Based on Frictional Loss of 4 ft of Water / 100 ft (Pipe dia ≤ 6 inches)

Pipe Size		Max Flow	Ton of Refrigeration		Velocity	
inches	mm		3 gpm / TR, ΔT=10°F	3.5 gpm / TR, ΔT=8.6°F	fps	m/s
1/2	12	1	0.4	0.3	1.8	0.5
3/4	20	3	0.9	0.8	2.1	0.6
1	25	6	2	1.7	2.4	0.7
1 1/4	32	11	3.7	3.2	2.8	0.9
1 1/2	40	17	5.8	5	3	0.9
2	50	34	11	9.7	3.5	1.1
2 1/2	65	63	21	18	4.2	1.3
3	80	97	32	28	4.6	1.4
4	100	200	67	57	5.4	1.6
5	125	365	122	104	6.2	1.9
6	150	580	193	166	6.9	2.1

Selection Based on Frictional Loss of 5 ft of Water / 100 ft (Pipe dia ≤ 6 inches)

1/2	12	1	0.4	0.3	1.9	0.6
3/4	20	3	1.1	0.9	2.3	0.7
1	25	7	2.3	1.9	2.8	0.9
1 1/4	32	12	4.2	3.6	2.9	0.9
1 1/2	40	19	6.3	5.4	3.5	1.1
2	50	38	13	11	4	1.2
2 1/2	65	70	23	20	4.7	1.4
3	80	115	38	33	5	1.5
4	100	225	75	64	5.9	1.8
5	125	400	133	114	7.2	2.2
6	150	650	217	186	7.8	2.4

Selection Based on Water Velocity Restricted to 8 fps (2.4 m/s) (Pipe dia ≥ 8 inches)

Pipe Size		Max Flow	Ton of Refrigeration		Friction Loss ft of Water/100 ft
inches	mm		3 gpm/TR, ΔT=10°F	3.5 gpm/TR, ΔT=8.6°F	
8	200	1275	425	364	4.1
10	250	1950	650	557	3.35
12	300	2800	933	800	2.61
14	350	3450	1150	986	2.35
16	400	4400	1467	1257	2.05
18	450	5700	1900	1629	1.7
20	500	7000	2333	2000	1.56
24	600	10000	3333	2857	1.35

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