Frick®
BY JOHNSON CONTROLS

Form E120-100 SED (MAY 2008)
SPECIFICATIONS - ENGINEERING DATA - DIMENSIONS

File: EQUIPMENT MANUAL - Section 120
Replaces: E120-100 SED (JUL 2002)
Dist: 1, 1a, 1b, 1c, 4, 4b, 4c

PRESSURE VESSELS

TYPICAL VESSEL MATERIAL SPECIFICATIONS

All vessels are designed, constructed and "U" stamped in accordance with the latest edition of Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code.

Head Material:

SA-234-WPB	Weld Cap	6" thru 12"	
SA-516-70	Hot Formed 2:1 Elliptical Heads	14" thru 144"	

Shell Material:

SA-53-E/B	Pipe	6" thru 24"	Down to -55°F
SA-333-6	Pipe	6" thru 24"	-56°F to -60°F
SA-516-70	Plate	30" thru 144"	Down to -55°F
SA-516-70	Normalized Plate	30" thru 144"	-56°F to -60°F

Nozzle Material:

SA-105	Full Couplings	(where specified)	Down to -55°F
SA-350-LF2	Full Couplings	(where specified)	-56°F to -60°F
SA-106-B	Seamless Pipe	3/4" thru 12"	Down to -55°F
SA-53-E/B	Welded Pipe	14" thru 24"	Down to -55°F
SA-333-6	Pipe		-56°F to -60°F

Coil Material:

SA-106-B	Seamless Pipe	Down to -50°F
SA-333-6	Pipe	-51°F to -60°F

Support Material:

SA-516-70		Down to -50°F
SA-516-70	Normalized	-51°F to -60°F
SA-36		Down to -50°F

Paint:

Vessels:	One coat shop primer
Packages:	One coat shop primer One coat semi-gloss finish

O.D. (in)	TYPICAL SHELL and HEADS THICKNESS		ASME 2:1 ELLIPTICAL HEADS with 2 " STRAIGHT FLANGE		
	250 psig	300 psig	HEAD DEPTH (in)	HEAD VOL. (ft^3)	SHELL VOLUME (ft^3/linear ft)
6⅝*	.280 Schedule 40		3½	0.02	0.2
8⅝	.322 Schedule 40		4	0.04	0.3
10¾	.365 Schedule 40		5	0.07	0.5
12¾	3/8 Std Weight		6	0.10	0.8
14*	3/8 Std Weight		5 11/16	0.20	1.1
16	.250 Schedule 10		6 3/16	0.30	1.4
18*	.312 Schedule 20		6 11/16	0.40	1.8
20	3/8 Std Weight		7 3/16	0.60	2.2
24	3/8 Std Weight		8 3/16	1.00	3.1
30	3/8	3/8	9 11/16	2.00	4.9
36	3/8	1/2	11 3/16	3.50	7.1
42	3/8	1/2	12 11/16	5.60	9.6
48	1/2	1/2	14¼	8.40	12.6
54	1/2	5/8	15¾	11.90	15.9
60	1/2	5/8	17¼	16.30	19.6
66*	5/8	5/8	18¾	21.80	23.8
72	5/8	3/4	20 5/16	28.30	28.3
78*	3/4	3/4	21⅞	35.90	33.2
84	3/4	7/8	23⅜	44.90	38.5
96	3/4	7/8	26⅜	67.00	50.3
108	7/8	1	29 7/16	95.40	63.6
120	1	1⅛	32 9/16	130.90	78.5
132*	1	1¼	35⅝	174.20	95.0
144	1⅛	1⅜	38 11/16	226.20	113.1

* 6⅝, 14, 18, 66, 78, and 132 inch diameters are not available for ship loose vessels from Frick.

NOTES: Johnson Controls-Frick reserves the right to substitute thickness at any time.
Head depth and volume may change slightly depending on material thickness.

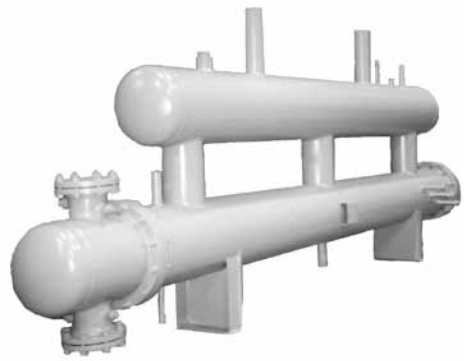
WEIGHT PER FOOT OF SHELL (lb/ft) - WEIGHT PER HEAD (lb)										
	1/4″		5/16″		3/8″		7/16″		1/2″	
O.D. (in)	SHELL	ELLIP. HEAD	SHELL	ELLIP. HEAD	SHELL	ELLIP. HEAD	SHELL	ELLIP. HEAD	SHELL	ELLIP. HEAD
6⅝	18	5	—	—	—	—	—	—	—	—
8⅝	22	10	—	—	—	—	—	—	—	—
10¾	28	15	—	—	—	—	—	—	—	—
12¾	31	22	39	28	47	33	54	41	61	47
14	36	28	46	35	55	42	63	49	72	56
16	42	33	52	41	63	50	73	61	82	70
18	49	41	59	51	71	61	82	71	93	81
20	52	47	66	58	79	70	91	85	104	97
24	63	62	79	78	95	94	110	109	125	125
30	79	89	99	114	119	137	138	160	157	182
36	95	128	119	160	143	192	166	224	189	256
42	111	165	139	214	167	257	194	300	221	343
48	127	215	159	285	191	331	222	386	253	442
54	145	270	182	351	218	415	254	483	291	553
60	161	330	202	434	242	508	282	592	323	677
66	177	398	222	520	266	610	310	711	355	813
72	193	453	243	598	290	718	338	842	387	962
84	225	624	283	806	338	965	394	1,136	451	1,298
96	257	820	324	1,050	386	1,260	450	1,473	515	1,683
108	289	1,031	364	1,320	434	1,582	506	1,854	579	2,119
120	321	1,255	405	1,622	482	1,950	562	2,249	647	2,571
132	353	1,590	446	1,990	530	2,490	619	2,790	708	3,340
144	385	1,880	486	2,350	579	2,820	675	3,300	777	3,760

WEIGHT PER FOOT OF SHELL (lb/ft) - WEIGHT PER HEAD (lb)								
	5/8″		3/4″		7/8″		1″	
O.D. (in)	SHELL	ELLIP. HEAD	SHELL	ELLIP. HEAD	SHELL	ELLIP. HEAD	SHELL	ELLIP. HEAD
6⅝	—	—	—	—	—	—	—	—
8⅝	—	—	—	—	—	—	—	—
10¾	—	—	—	—	—	—	—	—
12¾	76	58	—	—	—	—	—	—
14	89	70	—	—	—	—	—	—
16	103	87	—	—	—	—	—	—
18	116	101	—	—	—	—	—	—
20	129	121	—	—	—	—	—	—
24	156	161	186	193	216	225	245	257
30	196	228	234	274	272	327	308	374
36	236	326	282	393	328	458	372	523
42	276	428	330	514	384	611	436	698
48	316	552	378	662	440	789	500	897
54	364	691	438	829	512	982	587	1,121
60	404	846	486	1,015	568	1,200	651	1,371
66	444	1,017	534	1,220	624	1,440	715	1,646
72	484	1,203	582	1,443	680	1,702	779	1,945
84	564	1,622	678	1,947	792	2,293	908	2,620
96	644	2,104	775	2,525	905	2,970	1,036	3,394
108	725	2,648	871	3,178	1,017	3,735	1,164	4,268
120	805	3,213	967	3,856	1,129	4,528	1,292	5,175
132	885	3,980	1,063	4,655	1,241	5,463	1,420	6,243
144	965	4,720	1,159	5,650	1,353	6,485	1,549	7,411

WEIGHT PER FOOT OF SHELL (lb/ft) - WEIGHT PER HEAD (lb)								
	1-1/8″		1-1/4″		1-3/8″		1-1/2″	
O.D. (in)	SHELL	ELLIP. HEAD	SHELL	ELLIP. HEAD	SHELL	ELLIP. HEAD	SHELL	ELLIP. HEAD
6⅝	—	—	—	—	—	—	—	—
8⅝	—	—	—	—	—	—	—	—
10¾	—	—	—	—	—	—	—	—
12¾	—	—	—	—	—	—	—	—
14	—	—	—	—	—	—	—	—
16	—	—	—	—	—	—	—	—
18	—	—	—	—	—	—	—	—
20	—	—	—	—	—	—	—	—
24	275	298	304	331	332	364	360	409
30	347	421	384	467	421	527	456	589
36	419	601	464	667	508	734	552	817
42	491	785	545	872	597	977	649	1,084
48	563	1,009	625	1,121	685	1,253	745	1,388
54	663	1,261	738	1,401	813	1,563	889	1,729
60	735	1,543	818	1,714	901	1,910	985	2,111
66	807	1,852	898	2,057	989	2,289	1,082	2,526
72	879	2,189	979	2,432	1,078	2,703	1,178	2,980
84	1,023	2,947	1,139	3,275	1,254	3,635	1,370	4,003
96	1,167	3,818	1,299	4,242	1,430	4,704	1,562	5,173
108	1,312	4,802	1,459	5,336	1,606	5,911	1,754	6,496
120	1,456	5,822	1,619	6,469	1,783	7,162	1,947	7,864
132	1,600	7,024	1,780	7,804	1,959	8,636	2,139	9,590
144	1,744	8,338	1,940	9,264	2,135	10,246	2,331	11,239

WEIGHT OF CARBON STEEL PIPES AND FITTINGS (lb)									
NOM. PIPE SIZE	DESIGNATION STD = BOLD	NOMINAL WALL THICKNESS	PIPE 1 FT.	ELBOW			RETURN		TEE
				90° L.R.	90° S.R.	45° L.R.	180° L.R.	180° S.R.	
1/2	SCH-40	0.109	0.9	0.2	—	0.1	0.4	—	0.4
	SCH-80	**0.147**	**1.1**	**0.3**	**—**	**0.2**	**0.5**	**—**	**0.5**
	SCH-160	0.187	1.3	—	—	—	—	—	0.4
3/4	SCH-40	0.113	1.1	0.2	—	0.1	0.4	—	0.5
	SCH-80	**0.154**	**1.5**	**0.3**	**—**	**0.2**	**0.7**	**—**	**0.6**
	SCH-160	0.218	1.9	—	—	—	—	—	0.6
1	SCH-40	0.133	1.7	0.4	0.3	0.3	0.8	0.5	0.8
	SCH-80	**0.179**	**2.2**	**0.5**	**—**	**0.3**	**1.0**	**—**	**0.9**
	SCH-160	0.250	2.8	0.6	0.4	0.3	1.2	0.8	1.0
1¼	SCH-40	0.140	2.3	0.6	0.4	0.4	1.3	0.8	1.3
	SCH-80	**0.191**	**3.0**	**0.9**	**—**	**0.5**	**1.8**	**—**	**1.6**
	SCH-160	0.250	3.8	1.0	0.7	0.5	2.0	1.4	2.0
1½	SCH-40	0.145	2.7	0.9	0.6	0.4	1.9	1.1	2.0
	SCH-80	**0.200**	**3.6**	**1.2**	**0.8**	**0.7**	**2.4**	**1.5**	**2.3**
	SCH-160	0.281	4.9	1.4	1.2	1.0	3.3	2.4	3.0
2	**SCH-40**	**0.154**	**3.7**	**1.6**	**1.0**	**0.8**	**3.2**	**2.0**	**3.5**
	SCH-80	0.218	5.0	2.2	1.5	1.2	4.4	3.0	4.0
	SCH-160	0.343	7.5	3.3	2.2	1.6	6.0	4.0	5.0
2½	**SCH-40**	**0.203**	**5.8**	**3.3**	**2.1**	**1.8**	**6.5**	**4.3**	**6.0**
	SCH-80	0.276	7.7	4.0	2.8	2.1	8.0	5.6	7.0
	SCH-160	0.375	10.0	5.1	3.4	3.0	12.0	6.0	8.0
3	**SCH-40**	**0.216**	**7.6**	**5.0**	**3.0**	**2.6**	**10.2**	**6.0**	**7.0**
	SCH-80	0.300	10.3	6.5	4.3	3.5	13.0	8.5	8.5
	SCH-160	0.438	14.3	8.5	6.0	4.4	18.0	12.0	10.0
3½	**SCH-40**	**0.226**	**9.1**	**6.8**	**4.5**	**3.5**	**13.0**	**9.0**	**9.0**
	SCH-80	0.318	12.5	8.4	6.0	4.5	16.8	12.0	12.0
	XXSTG	0.636	22.9	16.0	11.0	8.5	32.0	22.0	18.0
4	**SCH-40**	**0.237**	**10.8**	**9.0**	**6.3**	**4.5**	**18.5**	**12.5**	**12.0**
	SCH-80	0.337	15.0	13.5	8.5	6.1	25.0	17.0	15.8
	SCH-160	0.531	22.5	18.0	12.0	8.8	40.0	24.0	25.0

WEIGHT OF CARBON STEEL PIPES AND FITTINGS (LB)									
NOM. PIPE SIZE	DESIGNATION STD = BOLD	NOMINAL WALL THICKNESS	PIPE 1 FT.	ELBOW			RETURN		TEE
				90° L.R.	90° S.R.	45° L.R.	180° L.R.	180° S.R.	
5	**SCH-40**	**0.258**	**14.60**	**15.50**	**9.60**	**7.50**	**30.00**	**19.00**	**21.00**
	SCH-80	0.375	20.80	22.00	14.00	10.80	44.00	28.00	26.00
	SCH-160	0.625	33.00	32.00	22.00	16.00	65.00	44.00	55.00
6	**SCH-40**	**0.280**	**19.00**	**24.50**	**18.00**	**12.00**	**50.00**	**35.00**	**34.00**
	SCH-80	0.432	28.60	35.00	23.00	17.50	70.00	46.00	40.00
	SCH-160	0.718	45.30	57.00	38.00	30.00	120.00	76.00	62.00
8	**SCH-40**	**0.322**	**28.60**	**50.00**	**34.00**	**23.00**	**95.00**	**68.00**	**55.00**
	SCH-80	0.500	43.40	71.00	47.50	35.00	142.00	100.00	75.00
	SCH-160	0.906	74.70	120.00	80.00	62.00	230.00	160.00	152.00
10	**SCH-40**	**0.365**	**40.50**	**88.00**	**58.00**	**43.00**	**177.00**	**115.00**	**85.00**
	SCH-80	0.592	64.40	133.00	88.00	67.00	267.00	177.00	161.00
	SCH-160	1.125	116.00	260.00	174.00	130.00	530.00	348.00	260.00
12	**STD**	**0.375**	**49.60**	**125.00**	**80.00**	**62.00**	**230.00**	**155.00**	**120.00**
	XSTG	0.500	65.40	160.00	104.00	84.00	320.00	218.00	160.00
	SCH-80	0.687	88.60	219.00	146.00	109.00	439.00	292.00	245.00
	SCH-160	1.312	161.00	450.00	300.00	225.00	910.00	600.00	480.00
14	**STD**	**0.375**	**55.00**	**160.00**	**105.00**	**80.00**	**325.00**	**210.00**	**165.00**
	XSTG	0.500	72.00	205.00	140.00	100.00	400.00	275.00	230.00
	SCH-80	0.750	107.00	310.00	205.00	154.00	619.00	410.00	369.00
16	**STD**	**0.375**	**63.00**	**206.00**	**132.00**	**100.00**	**412.00**	**260.00**	**195.00**
	XSTG	0.500	83.00	276.00	174.00	135.00	550.00	340.00	280.00
	SCH-80	0.843	137.00	450.00	300.00	225.00	900.00	600.00	548.00
18	**STD**	**0.375**	**71.00**	**260.00**	**167.00**	**126.00**	**510.00**	**330.00**	**249.00**
	XSTG	0.500	93.00	340.00	219.00	167.00	690.00	430.00	332.00
	SCH-80	0.937	171.00	634.00	422.00	317.00	1,268.00	844.00	710.00
20	**STD**	**0.375**	**79.00**	**320.00**	**210.00**	**160.00**	**640.00**	**410.00**	**342.00**
	XSTG	0.500	105.00	420.00	275.00	206.00	830.00	550.00	480.00
	SCH-80	1.031	209.00	861.00	573.00	431.00	1,722.00	1,146.00	1,021.00
24	**STD**	**0.375**	**95.00**	**460.00**	**298.00**	**238.00**	**890.00**	**590.00**	**528.00**
	XSTG	0.500	125.00	600.00	392.00	300.00	1,200.00	780.00	610.00
	SCH-80	1.218	297.00	1,470.00	977.00	735.00	2,940.00	1,954.00	1,673.00



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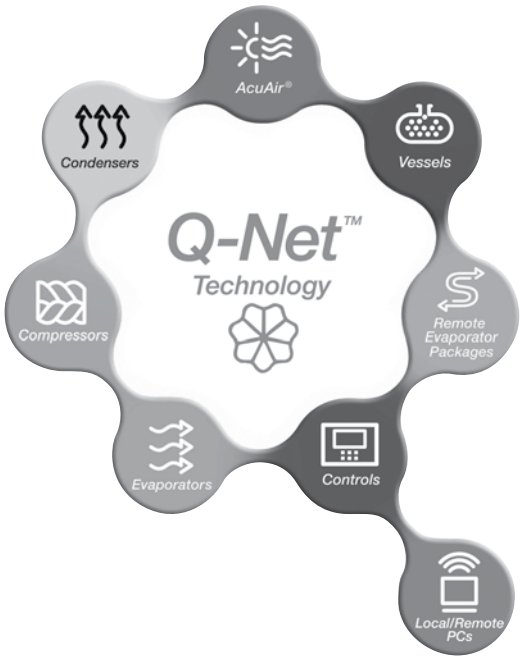
Take full advantage of Q-NET™ technology with all Frick products!



System integration is what we do...

- Q-NET™... supports open-protocols for SCADA systems (i.e. Allen-Bradley® DF1, Modbus RTU, Modbus ASCII, and Industrial Ethernet Protocols)
- Q-NET™... connects instantly for local or remote access; no software required
- Q-NET™... can be applied to both new and existing systems
- Q-NET™ means precise control 24 hours a day, seven days a week
- Q-NET™ distributed architecture mean faster, easier, economical installations
- Q-NET™ delivers increased operating efficiency and lowers energy costs

Available on Frick screw compressors, condensers, evaporators, AcuAir® hygienic air handlers, and refrigerant vessels.

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