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API -2000

Standard Information Tank Blanketing Regulator Selection

The tank blanketing valve is not a substitute for the vacuum relief device.

API Standard 2000 states, "The design of a gas repressuring system to eliminate the requirement for vacuum relief valves is beyond the scope of this standard and should be considered only when the induction of air represents a hazard equal to or greater than failure of the tank".

The tank blanketing valve failure must be taken into account when considering possible causes of overpressure in a tank.

API Standard 2000 states, "When the possible causes of overpressure or vacuum in a tank are being determined, other circumstances resulting from equipment failures and operating errors must be considered and evaluated by the designer." Failure of the tank blanketing valve can result in unrestricted gas flow into the tank, reduced gas flow or complete loss of the gas flow.

Tank blanketing valve set point definition is determined by manufacturers. Jordan Valve defines set point as the point where the tank blanketing valve is just beginning to open, and the valve requires a pressure above the set point in order to close completely. Others define set point somewhere in between opening and closing but still the pressure must go above the defined set point in order to close completely.

CAPACITY REQUIREMENTS

The capacity requirement of the tank blanketing valve is composed of two components. The first being inbreathing due to liquid or product movement out of the tank, and the second being inbreathing due to contraction of the vapors/product because of weather changes.

Inbreathing due to maximum liquid or product movement out of the tank equals 8.0 SCFH of air for each US gallon per minute of maximum emptying rate or 0.94 Nm³/h of air for each m³/h of maximum emptying rate.

The second component, inbreathing due to weather changes, is selected from Table 1 (Table 2 for metric). The tank capacity is found in column 1 and the corresponding inbreathing requirement is selected from column 2.

The two components are added together to give the total inbreathing requirement and the capacity requirement of the tank blanketing valve.

$$Q_{total} = Q_{displacement} + Q_{thermal}$$

$$Q_{displacement} (SCFH) = \text{Max. Pumpout Rate (gpm)} \times 8.0$$

or

$$Q_{displacement} (Nm^3/h) = \text{Max. Pumpout Rate (m}^3/h) \times 0.94$$

VALVE SELECTION

If the tank blanketing supply pressure varies, use the minimum supply pressure in selecting the tank blanketing valve and the maximum supply pressure to determine blanketing valve failure capacity. Using the minimum supply pressure, consult the flow chart to determine if the valve will meet the Total Inbreathing Requirement (Q total). Next determine if a specific range selection can be used to make the capacity of the tank blanketing valve more closely match the inbreathing requirement. This will also reduce the fail open flow of the blanketing valve.

NORMAL INSTALLATION

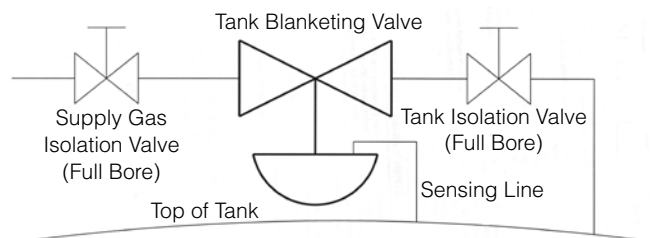


TABLE 1					
REQUIREMENTS FOR THERMAL INBREATHING - ENGLISH UNITS (AIR)					
(Column 1)		(Column 2)	(Column 1)		(Column 2)
TANK CAPACITY		INBREATHING	TANK CAPACITY		INBREATHING
Barrels	Gallons	SCFH	Barrels	Gallons	SCFH
60	2,500	60	35,000	1,470,000	31,000
100	4,200	100	40,000	1,680,000	34,000
500	21,000	500	45,000	1,890,000	37,000
1000	42,000	1000	50,000	2,100,000	40,000
2,000	84,000	2,000	60,000	2,520,000	44,000
3,000	126,000	3,000	70,000	2,940,000	48,000
4,000	168,000	4,000	80,000	3,360,000	52,000
5,000	210,000	5,000	90,000	3,780,000	56,000
10,000	420,000	10,000	100,000	4,200,000	60,000
15,000	630,000	15,000	120,000	5,040,000	68,000
20,000	840,000	20,000	140,000	5,880,000	75,000
25,000	1,050,000	24,000	160,000	6,720,000	82,000
30,000	1,260,000	28,000	180,000	7,560,000	90,000

NOTE: Table and sizing from API 2000 fifth edition, April 1998

TABLE 2			
REQUIREMENTS FOR THERMAL INBREATHING - METRIC UNITS (AIR)			
(Column 1)	(Column 2)	(Column 1)	(Column 2)
TANK CAPACITY	INBREATHING	TANK CAPACITY	INBREATHING
CUBIC METERS	Nm³/H	CUBIC METERS	Mn³/H
10	1.69	5000	787
20	3.37	6000	896
100	16.9	7000	1003
200	33.7	8000	1077
300	50.6	9000	1136
500	84.3	10000	1210
700	118	12000	1345
1000	169	14000	1480
1500	253	16000	1615
2000	337	18000	1745
3000	506	20000	1877
3180	536	25000	2179
4000	647	30000	2495

NOTE: Table and sizing from API 2000 fifth edition, April 1998

TABLE 6 TANK BLANKETING VALVE CAPACITIES 3/4" MARK 608IS

Set Pressure	Inlet (psi)	Orifice Size							
		1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"
2" H2O (1-2.5" H2O) 1" H2O Droop 2" H2O Boost	5	201	374	430	261	477	888	1043	1169
	10	213	402	456	580	506	784	943	
	20	222	392	475	619	361			
	40	299	465	639	764				
	60	665	897	1161					
	80	816	873	1139					
	100	598	640						
	150	770	825						
3" H2O (2-5" H2O) 1" H2O Droop 2" H2O Boost	5	239	373	503	560	613	886	1163	1195
	10	231	402	566	580	591	783	977	
	20	211	392	570	619	295			
	40	277	465	649	764				
	60	597	897	1194					
	80	753	873	976					
	100	675	776						
	150	880	825						
7" H2O (4-10" H2O) 1" H2O Droop 2" H2O Boost	5	220	295	372	409	441	619	799	661
	10	277	427	578	527	476	732	982	
	20	258	462	661	893	1118	1154		
	35	276	592	897	967	1035	1294		
	75	525	980	1426					
	90	727	1364						
	100	813	1503						
	150	1040	1926						
28" H2O (5-30" H2O) 5-1/2" H2O Droop	5	302	454	604	722	839	941	1040	1074
	10	337	533	723	981	1239	1378	1514	
	30	283	816	1335	1666	1982	2154		
	45	617	1373	2058	2487				
	60	817	1866	2906	2899				
	75	820	1812						
	100	840	1867						
	150	1089	2421						
1.25 psi (0.5 - 1.75 psi) 0.2 psi Droop	5	180	272	439	395	526	465	658	921
	10	235	333	522	535	783	665	913	848
	30	279	469	824	785	1014	1141		
	45	354	561	886	856	1033			
	60	418	669	1003	937	1087			
	75	427	762	1152					
	100	543	949	1402					
	150	715	1266	1816					
3 psi (1 - 3.5 psi) 0.3 psi Droop	5	145	217	289	315	338	371	402	675
	10	209	312	418	502	592	625	661	731
	30	226	468	701	783	859	1136		
	45	354	561	812	856	856			
	60	415	669	922	937	945			
	75	427	762	1059					
	100	503	949	1408					
	150	660	1266	1816					

TABLE 6 TANK BLANKETING VALVE CAPACITIES 1" MARK 608IS

Set Pressure	Inlet (psi)	Orifice Size							
		1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"
2" H2O (1-2.5" H2O) 1" H2O Droop 2" H2O Boost	5	226	420	483	630	536	998	1172	1313
	10	328	618	702	893	779	1206	1450	
	20	493	872	1055	1376	803			
	40	786	1224	1681	2010				
	60	1073	1447	1872					
	80	1360	1455	1898					
	100	1648	1763						
3" H2O (2-5" H2O) 1" H2O Droop 2" H2O Boost	5	268	419	565	629	689	996	1307	1342
	10	356	618	870	892	910	1205	1503	
	20	469	872	1266	1376	656			
	40	730	1224	1707	2010				
	60	963	1447	1926					
	80	1255	1455	1627					
	100	1534	1763						
7" H2O (4-10" H2O) 1" H2O Droop 2" H2O Boost	5	283	378	477	524	565	793	1024	848
	10	380	585	791	722	653	1003	1345	
	20	488	871	1247	1684	2110	2177		
	35	673	1444	2188	2358	2525	3155		
	75	1221	2278	3317					
	90	1399	2623						
	100	1534	2836						
28" H2O (5-30" H2O) 5-1/2" H2O Droop	5	318	478	636	760	883	991	1095	1130
	10	388	613	831	1128	1424	1584	1741	
	30	373	1074	1756	2192	2608	2834		
	45	718	1596	2393	2892				
	60	929	2121	3302	3294				
	75	1139	2517						
	100	1449	3219						
1.25 psi (0.5 - 1.75 psi) 0.2 psi Droop	5	198	299	482	434	578	511	723	1012
	10	267	378	593	608	890	756	1038	964
	30	328	552	969	924	1193	1342		
	45	479	758	1197	1157	1396			
	60	624	998	1497	1398	1622			
	75	689	1229	1858					
	100	920	1609	2376					
3 psi (1 - 3.5 psi) 0.3 psi Droop	5	159	238	318	346	371	408	442	742
	10	237	355	475	571	672	710	752	831
	30	266	550	825	921	1011	1337		
	45	479	758	1097	1157	1157			
	60	619	998	1376	1398	1410			
	75	689	1229	1708					
	100	852	1609	2387					
150	1100	2091	3081						

TABLE 6 TANK BLANKETING VALVE CAPACITIES 1-1/4" MARK 608IS

Set Pressure	Inlet (psi)	Orifice Size							
		1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"
2" H2O (1-2.5" H2O) 1" H2O Droop 2" H2O Boost	5	283	525	604	788	670	1248	1465	1641
	10	420	791	899	1143	997	1544	1856	
	20	838	1482	1794	2339	1365			
	40	1234	1922	2639	3156				
	60	1610	2171	2808					
	80	1904	2037	2567					
	100	2225	2380						
3" H2O (2-5" H2O) 1" H2O Droop 2" H2O Boost	5	336	524	707	786	861	1245	1634	1678
	10	456	791	1114	1142	1165	1542	1924	
	20	797	1482	2152	2339	1116			
	40	1146	1922	2680	3156				
	60	1445	2171	2889					
	80	1757	2037	2277					
	100	2071	2380						
7" H2O (4-10" H2O) 1" H2O Droop 2" H2O Boost	5	407	544	687	755	814	1142	1475	1221
	10	459	708	957	874	790	1214	1627	
	20	575	1028	1472	1987	2490	2569		
	35	1077	2310	3501	3773	4040	5048		
	75	1917	3576	5207					
	90	2099	3935						
	100	1918	3545						
28" H2O (5-30" H2O) 5-1/2" H2O Droop	5	404	607	808	965	1122	1259	1391	1436
	10	550	870	1180	1602	2022	2249	2472	
	30	574	1654	2704	3376	4016	4364		
	45	991	2202	3302	3991				
	60	1096	2503	3896	3887				
	75	1640	3624						
	100	1739	3863						
1.25 psi (0.5 - 1.75 psi) 0.2 psi Droop	5	216	326	525	473	630	557	788	1103
	10	283	401	629	644	943	801	1100	1022
	30	344	580	1017	970	1253	1409		
	45	493	781	1233	1192	1438			
	60	668	1068	1602	1496	1736			
	75	717	1278	1932					
	100	1003	1754	2590					
3 psi (1 - 3.5 psi) 0.3 psi Droop	5	173	259	347	377	404	445	481	809
	10	252	376	503	605	713	753	797	881
	30	279	578	866	967	1062	1404		
	45	493	781	1130	1192	1192			
	60	662	1068	1472	1496	1509			
	75	717	1278	1776					
	100	929	1754	2602					
150	1211	2256	3356						

TABLE 6 TANK BLANKETING VALVE CAPACITIES 1-1/2" MARK 608

Range	Set Point	Accuracy	Inlet Pressure										
			2.0 psi (0,14 bar)	3.0 psi (0,21 bar)	5.0 psi (0,34 bar)	10.0 psi (0,7 bar)	15.0 psi (1,0 bar)	20.0 psi (1,4 bar)	25.0 psi (1,7 bar)	30.0 psi (2,1 bar)	40.0 psi (2,8 bar)	50.0 psi (3,5 bar)	60.0 psi (4,1 bar)
2.0 - 5.0 WC	3.0" WC	0.75" WC	4853	5185	5999								
5,0 - 12,5 mbar	7,5 mbar	1,9 mbar	137	147	170								
4.0 - 8.0" WC	5.0" WC	1" WC	4675	5532	6748	8599							
	7.0" WC		4987	5747	6482	6984							
10,0 - 20,0 mbar	12,5 mbar	2,5 mbar	132	157	191	246							
	17,4 mbar		141	163	184	198							
8.0 - 28" WC	10.0" WC	1.5" WC	5601	5297	6622	7720	8468	7638					
	25.0" WC		4293	4672	4357	4858	6876	7220					
20,0 - 70,0 mbar	24,9 mbar	3,7 mbar	159	150	188	219	240	216					
	62,3 mbar		122	132	123	138	195	204					
10.0 - 17.0" WC	12.0" WC	2" WC	4582	5984	7169	10367	10228	10838					
	15.0" WC		4297	5200	7111	9778	10310	10748					
24,9 - 42,4 mbar	28,9 mbar	5,0 mbar	130	169	203	294	290	307					
	37,4 mbar		122	147	201	277	292	304					
14.0 - 28.0" WC	15.0" WC	2.5" WC	4070	5737	8261	10811	12068	13414	13120	14768	18382	22625	26656
	25.0" WC		3123	4487	6675	9057	10792	11608	12938	14614	18310	22315	26307
34,9 - 70,0 mbar	37,4 mbar	6,2 mbar	115	162	234	306	342	380	372	418	520	640	754
	62,3 mbar		88	127	189	256	306	329	366	414	518	632	744
0.75 - 1 psi	0.75 psi	0.25 psi	4843	7253	9628	11573	13833	15278	17038	19240	24148	29419	34672
	1 psi		4638	6286	9501	11557	13892	15253	17026	19234	24071	29344	34599
51,7 - 69,0 mbar	51,7 mbar	12,9 mbar	137	205	273	328	392	433	482	544	683	833	981
	68,8 mbar		131	178	269	327	393	432	482	544	681	830	979
1 - 2 psi	1.5 psi	0.3 psi		4352	8736	11529	13957	15514	17358	19667	24473	29873	35253
	2.0 psi			3505	7588	11281	13764	15351	17206	19499	24129	29494	34836
69,0 - 137,9 mbar	0,10 bar	20,7 mbar		123	247	326	395	439	492	557	693	845	998
	0,14 bar			99	215	319	390	435	487	552	683	835	986
1.5 - 3 psi	2.0 psi	0.4 psi		3929	8034	11339	13874	15466	17332	19499	24313	29719	35102
	3.0 psi				6057	10924	13626	15327	17252	19448	23925	29185	34535
0.10 - 0,21 bar	0,14 bar	27,5 mbar		111	228	321	393	438	491	552	688	841	993
	0,21 bar				172	309	386	434	489	550	677	826	977
3 - 5 psi	3.5 psi	0.5 psi			3507	10781	13598	15365	17332	19712	24286	29472	34908
	5.0 psi					9639	12792	14682	16688	19145	23706	28339	33665
0,21 - 0,34 mbar	0,24 bar	34,4 mbar			99	305	385	435	491	558	687	834	988
	0,34 bar					273	362	416	473	542	671	802	953

TABLE 6 TANK BLANKETING VALVE CAPACITIES 2" MARK 608

Range	Set Point	Accuracy	Inlet Pressure										
			2.0 psi (0,14 bar)	3.0 psi (0,21 bar)	5.0 psi (0,34 bar)	10.0 psi (0,7 bar)	15.0 psi (1,0 bar)	20.0 psi (1,4 bar)	25.0 psi (1,7 bar)	30.0 psi (2,1 bar)	40.0 psi (2,8 bar)	50.0 psi (3,5 bar)	60.0 psi (4,1 bar)
2.0 - 5.0 WC	3.0" WC	0.75" WC	5392	5761	6666								
5,0 - 12,5 mbar	7,5 mbar	1,9 mbar	153	163	189								
4.0 - 8.0" WC	5.0" WC	1" WC	5195	6147	7498	9554							
	7.0" WC		5541	6385	7202	7760							
10,0 - 20,0 mbar	12,5 mbar	2,5 mbar	147	174	212	271							
	17,4 mbar		157	181	204	220							
8.0 - 28" WC	10.0" WC	1.5" WC	6223	5885	7358	8578	9408	8486					
	25.0" WC		4770	5191	4841	5398	7640	8022					
20,0 - 70,0 mbar	24,9 mbar	3,7 mbar	176	167	208	243	266	240					
	62,3 mbar		135	147	137	153	216	227					
10.0 - 17.0" WC	12.0" WC	2" WC	5091	6649	7965	11519	11365	12042					
	15.0" WC		4775	5778	7901	10864	11456	11942					
24,9 - 42,4 mbar	28,9 mbar	5,0 mbar	144	188	226	326	322	341					
	37,4 mbar		135	164	224	308	324	338					
14.0 - 28.0" WC	15.0" WC	2.5" WC	4523	6374	9179	12013	13409	14904	14578	16409	20646	25140	29618
	25.0" WC		3470	4986	7416	10063	11991	12898	14376	16403	20552	25048	29528
34,9 - 70,0 mbar	37,4 mbar	6,2 mbar	128	180	260	340	380	422	413	464	584	711	838
	62,3 mbar		98	141	210	285	340	365	407	464	582	709	836
0.75 - 1 psi	0.75 psi	0.25 psi	5382	8059	10698	12859	15370	16976	18931	21328	26769	32612	38435
	1 psi		5153	6984	10556	12841	15436	16948	18918	21321	26684	32529	38354
51,7 - 69,0 mbar	51,7 mbar	12,9 mbar	152	228	303	364	435	481	536	604	758	923	1088
	68,8 mbar		146	198	299	364	437	480	536	603	755	921	1085
1 - 2 psi	1.5 psi	0.3 psi		4835	9706	12810	15508	17238	19286	21901	27254	33268	39260
	2.0 psi			3895	8431	12534	15293	17056	19118	21731	26892	32871	38825
69,0 - 137,9 mbar	0,10 bar	20,7 mbar		137	275	363	439	488	546	620	771	941	1111
	0,14 bar			110	239	355	433	483	541	615	761	930	1099
1.5 - 3 psi	2.0 psi	0.4 psi		4365	8927	12599	15412	17185	19258	21880	27076	33096	39091
	3.0 psi				6731	12138	15140	17030	19169	21823	26847	32750	38753
0.10 - 0,21 bar	0,14 bar	27,5 mbar		124	253	357	436	487	545	619	766	937	1106
	0,21 bar				191	344	429	482	543	618	760	927	1097
3 - 5 psi	3.5 psi	0.5 psi			3897	11979	15109	17072	19258	21436	27025	32796	34908
	5.0 psi					10710	14214	16314	18543	21207	26259	31391	37290
0,21 - 0,34 mbar	0,24 bar	34,4 mbar			110	339	428	483	545	607	765	928	988
	0,34 bar					303	402	462	525	600	743	888	1055

TABLE 6 TANK BLANKETING VALVE CAPACITIES 1-1/2" MARK 608DS (AIR AT 1.0 S.G. in SCFH)													
Range	Set Point	Accuracy	Inlet Pressure (PSI)										
			2 psi	3 psi	5 psi	10 psi	15 psi	20 psi	25 psi	50 psi	75 psi	100 psi	150 psi
1.0 - 5.0" WC*	1.0" WC	3/4" WC	2380	2311	2234	1940	1886	2323	3964	4926	5593	5835	5405
	3.0" WC		2670	3545	4018	4260	4271	3883	3964	4726	5593	5835	5405
4.0 - 8.0" WC	5.0" WC	1" WC	2566	3094	4049	5488	5409	5362	5239	6370	7360	7529	7135
	7.0" WC		2123	2443	3473	5112	6290	6637	6508	7963	9126	9411	8919
8.0 - 28.0" WC	10.0" WC	1-1/2" WC	1988	2304	2964	4433	5970	7548	7858	9725	11128	11482	10811
	25.0" WC		1290	1580	1885	2169	2136	2404	2669	3185	3532	3952	3567
10.0 - 17.0" WC	12.0" WC	2" WC	2232	2823	3969	6222	7990	8077	8174	10022	11481	11858	11352
	15.0" WC		2104	2560	3403	5821	7480	8732	8874	10824	12365	12799	11892
14.0 - 28.0" WC	15.0" WC	2-1/2" WC	2040	2692	3672	5678	7043	8444	8699	10617	12365	12611	11892
	25.0" WC		1604	2167	3102	5366	6493	8340	8655	10617	12365	12611	11892
0.75 - 1 psi	0.75 psi	0.25 psi	2766	3652	4654	7014	8670	9913	10761	13165	18014	15435	14595
	1 psi		2225	3151	4503	6739	8599	9913	11507	14227	16192	16564	15676
1 - 2 psi	1.5 psi	0.30 psi		2692	4168	6416	8344	9927	11493	14227	16192	16564	15676
	2.0 psi			2232	3203	5422	7067	8628	9860	12103	13837	14305	13514
1.5 - 3 psi	2.0 psi	0.40 psi		2363	4199	6468	8316	9927	11409	14227	16192	16514	15676
	3.0 psi				2778	6066	6993	8444	9626	12103	13837	13929	13514
3 - 5 psi	3.5 psi	0.50 psi			2764	5678	7297	9100	10917	13590	15603	15811	15136
	5.0 psi					5611	7079	8548	10412	13165	15014	15435	14595

* Must be inverted for proper operation

TABLE 6 TANK BLANKETING VALVE CAPACITIES 2" MARK 608DS (AIR AT 1.0 S.G. in SCFH)													
Range	Set Point	Accuracy	Inlet Pressure (PSI)										
			2 psi	3 psi	5 psi	10 psi	15 psi	20 psi	25 psi	50 psi	75 psi	100 psi	150 psi
1.0 - 5.0" WC*	1.0" WC	3/4" WC	4811	5810	8217	12235	15351	16340	17453	22297	25024	25600	23785
	3.0" WC		5513	6661	9431	14025	17608	18825	20009	25694	28852	29364	27569
4.0 - 8.0" WC	5.0" WC	1" WC	5628	6320	8335	12444	15121	16317	16758	22297	25025	25600	23785
	7.0" WC		5369	6067	8061	12032	14650	15882	16236	21660	24141	24847	23245
8.0 - 28.0" WC	10.0" WC	1-1/2" WC	3977	4740	6824	10090	12900	16340	17475	22297	25025	25600	23785
	25.0" WC		1771	2286	3484	5286	6844	8639	9336	11892	13248	13553	12433
10.0 - 17.0" WC	12.0" WC	2" WC	3837	5260	7154	12080	15121	16293	17671	22263	25025	25600	23785
	15.0" WC		3602	5013	6901	11653	14604	15859	17324	21660	24141	24847	23245
14.0 - 28.0" WC	15.0" WC	2-1/2" WC	4747	5348	7799	11255	15351	16293	17475	22297	25025	25600	23785
	25.0" WC		3926	4675	7039	10362	14257	15151	16339	20810	23258	23717	22164
0.75 - 1 psi	0.75 psi	0.25 psi	5131	6386	8565	12677	15070	16340	16743	22297	25025	25600	23785
	1 psi		4594	5930	9152	12221	14550	15830	16212	21660	24141	24847	23245
1 - 2 psi	1.5 psi	0.30 psi		5612	7799	12031	15095	16340	17475	22263	25025	25600	23785
	2.0 psi			4193	6402	10274	13049	14158	15124	19324	21786	22211	20542
1.5 - 3 psi	2.0 psi	0.40 psi		6404	8106	12469	15121	16317	17475	22297	25025	25600	23785
	3.0 psi			3061	6055	10390	12931	14042	15060	19324	21786	22211	20542
3 - 5 psi	3.5 psi	0.50 psi			6615	6378	11533	9693	11536	22297	25025	25600	23785
	5.0 psi				3476	5885	11235	9618	11569	22509	25319	25976	23785

* Must be inverted for proper operation

TABLE 6 TANK BLANKETING VALVE CAPACITIES 3/4" MARK 608BP WITH 1/4" ORIFICE

Range	Setpoint	Inlet Pressure	330Nitrogen @ 0.97sg		
			Deviation from Setpoint (in/water)		
			+/- 0.5	+/- 1.0	+/- 2.0
2 - 5.5" w.c.	2" w.c.	5	212	424	460
		20	516	1408	1595
		40	2003	2121	2239
		60	2891	3029	3167
		80	3876	4031	4031
		100	4948	5119	5119
		125	6402	6590	6590
2 - 5.5" w.c.	4" w.c.	5	247	354	566
		20	1126	1408	1408
		40	2121	2356	2356
		60	3029	3167	3167
		80	3876	4031	4031
		100	4948	5119	5119
		125	6025	6402	6402
4 - 10" w.c.	7" w.c.	5	141	283	354
		20	188	798	1126
		40	589	2121	2239
		60	1102	2891	3029
		80	1395	3876	3876
		100	4607	4948	5119
		125	5837	6214	6590
5 - 30" w.c.	20" w.c.	5	71	141	247
		20	141	235	422
		40	236	412	707
		60	138	413	964
		80	233	465	1240
		100	341	682	4265
		125	282	659	5272
0.5 - 1.75 psi	1 psi	5	71	141	354
		20	235	469	1126
		40	412	825	2121
		60	620	1239	3029
		80	775	3411	3876
		100	938	1791	4777
		125	1036	5084	5837
1 - 3.5 psi	3 psi	5	247	389	495
		20	704	1126	1408
		40	1119	2239	2356
		60	2754	2891	3029
		80	3566	3721	3876
		100	4436	4948	4948
		125	5461	5649	6025
		150	6439	6659	7099

TABLE 6 TANK BLANKETING VALVE CAPACITIES 3/4" MARK 608BP WITH 5/16" ORIFICE

Range	Setpoint	Inlet Pressure	330Nitrogen @ 0.97sg		
			Deviation from Setpoint (in/water)		
			+/- 0.5	+/- 1.0	+/- 2.0
2 - 5.5" w.c.	4" w.c.	5	318	849	919
		20	563	1408	2065
		40	825	3417	3535
		60	2341	4957	4957
4 - 10" w.c.	7" w.c.	5	247	495	849
		20	469	1126	1877
		40	707	2003	3535
		60	1239	3305	4957
		80	1860	6046	6511
5 - 30" w.c.	20" w.c.	5	71	283	212
		20	188	563	469
		40	118	943	825
		60	344	1377	1102
		80	310	1860	1473
		100	299	2218	1706
		125	188	2824	1789
		150	220	3301	2091
0.5 - 1.75 psi	1 psi	5	159	283	636
		20	282	563	1783
		40	471	943	2592
		60	551	1377	3442
		80	775	1860	6201
		100	1365	2218	7166
		125	1318	2824	8850
		150	1541	3301	10456
1 - 3.5 psi	3 psi	5	354	707	919
		20	845	1877	2158
		40	1296	2946	3535
		60	2065	4819	5095
		80	2636	6046	6511
		100	3242	7166	8019
		125	3766	8850	9415
		150	4458	10456	11117

TABLE 6 TANK BLANKETING VALVE CAPACITIES 3/4" MARK 608BP WITH 3/8" ORIFICE

Range	Setpoint	Inlet Pressure	330Nitrogen @ 0.97sg		
			Deviation from Setpoint (in/water)		
			+/- 0.5	+/- 1.0	+/- 2.0
2 - 5.5" w.c.	4" w.c.	5	424	601	1202
		20	375	1220	2158
		40	1414	3299	4359
		60	826	4406	6471
		80	6046	8062	8372
		100	8701	10237	10237
4 - 10" w.c.	7" w.c.	5	212	424	990
		20	938	1408	2346
		40	236	1296	3535
5 - 30" w.c.	20" w.c.	5	106	177	354
		20	188	282	610
		40	236	471	1296
		60	138	344	1239
		80	310	775	1783
		100	682	1365	3242
		125	565	1224	1695
		150	661	1431	1981
0.5 - 1.75 psi	1 psi	5	141	283	813
		20	375	704	2065
		40	530	1178	3181
		60	620	1515	4544
		80	698	1783	5891
		100	768	2218	7337
		125	1036	2448	8285
		150	1210	2862	9740
1 - 3.5 psi	3 psi	5	495	849	1131
		20	892	1971	3003
		40	1767	3417	4595
		60	2203	4681	6747
		80	2248	5581	7907
		100	2986	4948	10578
		125	3766	8097	11863
		150	4458	9520	13978

TABLE 6 TANK BLANKETING VALVE CAPACITIES 1" MARK 608BP WITH 1/4" ORIFICE					
Range	Setpoint	Inlet Pressure	330Nitrogen @ 0.97sg		
			Deviation from Setpoint (in/water)		
			+/- 0.5	+/- 1.0	+/- 2.0
2 - 5.5" w.c.	2" w.c.	5	71	389	495
		20	751	1220	1220
		40	2356	2356	2356
		60	3029	3167	3167
		80	4186	4186	4341
		100	5460	5460	5460
		125	6590	6779	6779
		150	7759	7979	7979
2 - 5.5" w.c.	4" w.c.	5	212	441	530
		20	516	1126	1501
		40	1296	2298	2356
		60	3167	3029	3098
		80	4108	4186	4186
		100	3412	5119	5119
		125	6025	6025	6025
		150	7099	7099	7099
4 - 10" w.c.	7" w.c.	5	247	354	495
		20	352	845	1408
		40	471	1650	2415
		60	757	3167	3167
		80	1240	4031	4263
		100	5119	5119	5289
		125	6214	6214	6214
		150	7319	7319	7319
5 - 30" w.c.	20" w.c.	5	53	141	247
		20	164	258	422
		40	236	530	943
		60	275	551	1239
		80	388	620	1860
		100	512	1024	2047
		125	753	1506	2260
		150	881	1761	2642
0.5 - 1.75 psi	1 psi	5	141	212	530
		20	282	1314	1408
		40	471	1060	2239
		60	551	1239	3167
		80	775	1550	2636
		100	1194	2218	4777
		125	1318	2260	6025
		150	1541	2642	7099
1 - 3.5 psi	3 psi	5	318	707	707
		20	657	1501	1501
		40	1296	2239	2356
		60	2891	3029	3167
		80	3876	4186	4341
		100	4777	5119	5289
		125	5649	5837	6026
		150	6659	6879	7099

TABLE 6 TANK BLANKETING VALVE CAPACITIES 1" MARK 608BP WITH 5/16" ORIFICE

Range	Setpoint	Inlet Pressure	330Nitrogen @ 0.97sg		
			Deviation from Setpoint (in/water)		
			+/- 0.5	+/- 1.0	+/- 2.0
2 - 5.5" w.c.	4" w.c.	5	247	424	601
		20	563	1408	2065
		40	1119	2592	3535
		60	2065	4957	5095
4 - 10" w.c.	7" w.c.	5	212	424	636
		20	375	938	1689
		40	589	1414	3535
		60	688	3029	5095
		80	1240	4341	6201
5 - 30" w.c.	20" w.c.	5	141	212	424
		20	188	375	563
		40	236	471	825
		60	207	413	964
		80	233	620	1860
		100	341	853	2730
		125	377	753	3013
		150	446	881	3577
0.5 - 1.75 psi	1 psi	5	71	212	530
		20	235	610	1689
		40	412	825	2710
		60	551	1033	4819
		80	620	1705	6046
		100	853	1877	6995
		125	753	2260	8473
		150	881	2642	10016
1 - 3.5 psi	3 psi	5	566	884	1273
		20	657	1689	2065
		40	1296	2592	3535
		60	1928	4819	5095
		80	2480	6201	6511
		100	3242	7166	8019
		125	4142	8662	9791
		150	4898	10236	11556

TABLE 6 TANK BLANKETING VALVE CAPACITIES 1" MARK 608BP WITH 3/8" ORIFICE

Range	Setpoint	Inlet Pressure	330Nitrogen @ 0.97sg		
			Deviation from Setpoint (in/water)		
			+/- 0.5	+/- 1.0	+/- 2.0
2 - 5.5" w.c.	4" w.c.	5	424	601	1202
		20	375	1220	2158
		40	1414	3299	4359
		60	826	4406	6471
		80	6046	8062	8372
		100	8701	10237	10237
4 - 10" w.c.	7" w.c.	5	212	424	990
		20	938	1408	2346
		40	236	1296	3535
5 - 30" w.c.	20" w.c.	5	106	177	354
		20	188	282	610
		40	236	471	1296
		60	138	344	1239
		80	310	775	1783
		100	682	1365	3242
		125	565	1224	1695
		150	661	1431	1981
0.5 - 1.75 psi	1 psi	5	141	283	813
		20	375	704	2065
		40	530	1178	3181
		60	620	1515	4544
		80	698	1783	5891
		100	768	2218	7337
		125	1036	2448	8285
		150	1210	2862	9740
1 - 3.5 psi	3 psi	5	495	849	1131
		20	892	1971	3003
		40	1767	3417	4595
		60	2203	4681	6747
		80	2248	5581	7907
		100	2986	4948	10578
		125	3766	8097	11863
		150	4458	9520	13978

TABLE 7 TANK BLANKETING VALVE CAPACITIES - MK688 Series

Inlet Pressure - psig	Capacity in SCFH - Nitrogen		
	Cv - 17	Cv - 30	Cv - 45
30	22,832	40,293	60,439
40	27,958	49,339	74,008
50	33,070	58,359	57,539
60	38,182	67,380	101,070
70	43,293	76,400	114,601
80	48,405	85,421	128,132
90	53,517	94,442	141,663
100	58,628	103,462	155,194
120	68,852	121,503	182,255
140	79,075	139,545	209,317
160	89,298	157,586	236,379
180	99,522	175,627	263,441
200	109,745	193,668	290,503

TABLE 7 TANK BLANKETING VALVE CAPACITIES - MK688 Series

Inlet Pressure - bar	Capacity in m3/h (n) - Nitrogen		
	Cv - 17	Cv - 30	Cv - 45
2.1	646	1,140	1,710
2.8	791	1,396	2,094
3.4	936	1,652	1,628
4.1	1,081	1,907	2,860
4.8	1,225	2,162	3,243
5.5	1,370	2,417	3,626
6.2	1,515	2,673	4,009
6.9	1,659	2,928	4,392
8.3	1,949	3,439	5,158
9.7	2,238	3,949	5,924
11.0	2,527	4,460	6,690
12.4	2,816	4,970	7,455
13.8	3,106	5,481	8,221