

Protectoseal Series 20 Pilot Operated Blanketing Valve Options & Part Numbering Worksheet

Version Code 07/2020



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Date: _____ Issued by: _____
 Company Name: _____
 Address: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Country: _____ Phone: _____ Fax: _____
 Email: _____

Project: _____
 Tag No: _____
 Tank No: _____
 Notes: _____

Note 1 - When properly completed, this column will indicate your part number.
 Please make sure that an option code is filled in for each of the 17 categories.

PART NO:

2	0	T															
DIGIT #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

DIGIT	DESIGNATION	OPTION CODE	SPECIFICATION	OPTION CODE		
1	Material, Metal Type	F	316 Stainless Steel			
		K	Cleaned to PURE-TECH Specs			
2 & 3	Series Number	20		20		
4	Series Revision Level	T		T		
5	Connections <i>Pipe Size-Inlet / Outlet Type</i>	A	1" - FNPT / FNPT			
		B	1" - FNPT / 150# Flange			
		C	1" - FNPT / 300# Flange			
		D	1" - 150# Flange / 150# Flange			
		E	1" - 300# Flange / 300# Flange			
		F	3/4" - FNPT / FNPT			
		G	3/4" - FNPT / 150# Flange			
		H	3/4" - FNPT / 300# Flange			
		I	3/4" - 150# Flange / 150# Flange			
		J	3/4" - 300# Flange / 300# Flange			
6	Setting Range (in. W.C.) <i>Refer to Table 4 on Tab 2</i>	A	0.0" and including 2.0"			
		B	Above 2.0" and including 5.0"			
		C	Above 5.0" and including 15.0"			
		D	Above 15.0" and including 50.0"			
		E	Above 50.0" and including 69.2"			
		F	-0.5" up to but not including 0.1"			
		7	Material, Seals & Gaskets*	A	Buna-N	
				B	Neoprene	
				C	Viton	
				D	EPDM	
E	Kalrez® *					
F	Chemraz® *					
8	Flow Capacity (Flow Plug) <i>Refer to Valve Sizing Specs on Tab 2</i>	A	100% (no plug)			
		B	80%			
		C	60%			
		D	40%			
		E	20%			
		F	10%			
9	Filter Type**	A	Aluminum / Zinc			
		B	316 Stainless Steel			
10	Check Valve Option	0	Not included			
		1	Included			
11	Pressure Gauge Option***	0	No gauges			
		1	Supply line gauge only			
		2	Sense line gauge only			
		3	Sense line & supply line gauges			

DIGIT	DESIGNATION	OPTION CODE	SPECIFICATION	OPTION CODE
12	Integral Purge Option	0	No purge	
		1	Outlet line purge only	
		2	Sense line purge only	
		3	Outline and sense line purge	
13	Field Test Option	0	Not included	
		1	Included	
		2	Incl. w/ 3-way valve for outline line	
		3	Incl. w/ shut-off valve for sense line	
		4	Incl. w/ 3-way valve for outline line & shut-off valve for sense line	
		5	Fittings incl. (no field test kit)	
		6	Fittings incl. w/ outlet line 3-way valve (no field test kit)	
		7	Fittings incl. w/ sense line shut-off valve (no field test kit)	
14	Status Port	X	No included	
		S	Included	
15	Single Port Sensing	X	Not included	
		A	Incl. w/ 1" 150# flange outlet connection	
		B	Incl. w/ 2" 150# flange outlet connection	
16 - 17	Single Port Sensing Sensing Outlet Tube Length See below on how to determine "A" Consult factory for dimensions outside of this range Note: If dimension "A" is less than 4.5" consult factory	00	Single port sensing not required	
		01	Dimension "A" is 1"	
		02	Dimension "A" is 2"	
		03	Dimension "A" is 3"	
		04	Dimension "A" is 4"	
		05	Dimension "A" is 5"	
		06	Dimension "A" is 6"	
		07	Dimension "A" is 7"	
		08	Dimension "A" is 8"	
		09	Dimension "A" is 9"	
		10	Dimension "A" is 10"	
		11	Dimension "A" is 11"	
		12	Dimension "A" is 12"	
		13	Dimension "A" is 13"	
		14	Dimension "A" is 14"	
		15	Dimension "A" is 15"	
		16	Dimension "A" is 16"	
		17	Dimension "A" is 17"	
18	Dimension "A" is 18"			

* For units specified with Kalrez® or Chemraz® seals and gaskets, the diaphragm case gasket will be Buna-N.

** Supply line filters sold separately - consult factory

*** Sense line & supply line gage included. Digit #11 should be Option Code 3.

To determine "A":

* Round up to the nearest whole number

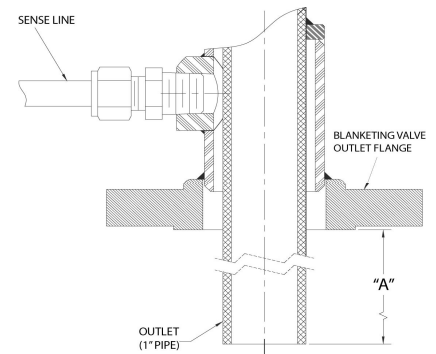
D = The distance from the valve's flange face to the tank roof.

L = The distance from the valve's flange face to the maximum liquid level.

When $4.5 \leq L-D \leq 8$, then $A = D^* + 2$

When $8 < L-D$, then $A = D^* + 5$

If $L-D < 4.5$, Consult Factory



VALVE SIZING TO MEET FLOW REQUIREMENTS - Series 20 Pilot Operated Blanketing Valve



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Blanketing valve flow requirements are based upon two factors:

- 1) The maximum possible emptying rate out of the tank, Table 1.
- 2) The possible effects of cooling during atmospheric changes, Table 2.

Using the total required flow determined from these two factors, the necessary specifications for the blanketing valve can be determined. Follow the three steps below. Steps 1 and 2 are based upon API 2000 recommendations.

STEP 1:

Use Table 1 below to determine the flow required to accommodate the maximum possible emptying rate.

Table 1
Flow Required to Accommodate Pumping Out Rate

For Maximum Liquid Emptying Rate in:	To obtain SCFH Air Required Multiply by:	To Obtain N m ³ /h Air Required Multiply By:
US gpm	8.000	0.22700
US gph	0.133	0.00379
barrels/hour	5.600	0.15900
barrels/day	0.233	0.00662
m ³ /h	35.220	1.00000

SCFH is at 60°F and 14.7 psia. Nm³/h is at 0°C and 101.3 kPa (absolute).

STEP 2:

Use Table 2 below to determine the flow required to accommodate the possible effects of atmospheric cooling.

Table 2
Flow Required to Accommodate Thermal Effects

Tank Capacity			Inbreathing Required	
Barrels	Gallons	m ³	SCFH	N m ³ /h
60	2,500	10	60	1.7
100	4,200	16	100	2.8
500	21,000	79	500	14
1,000	42,000	159	1,000	28
2,000	84,000	318	2,000	55
3,000	126,000	477	3,000	83
4,000	168,000	636	4,000	110
5,000	210,000	795	5,000	138
10,000	420,000	1,590	10,000	276
15,000	630,000	2,385	15,000	413
20,000	840,000	3,180	20,000	551
25,000	1,050,000	3,975	24,000	661
30,000	1,260,000	4,770	28,000	772
35,000	1,470,000	5,565	31,000	854
40,000	1,680,000	6,360	34,000	937
45,000	1,890,000	7,155	37,000	1,020
50,000	2,100,000	7,950	40,000	1,102
60,000	2,520,000	9,540	44,000	1,212
70,000	2,940,000	11,130	48,000	1,323
80,000	3,360,000	12,720	52,000	1,433
90,000	3,780,000	14,310	56,000	1,542
100,000	4,200,000	15,900	60,000	1,653
120,000	5,040,000	19,080	68,000	1,874
140,000	5,880,000	22,260	75,000	2,067
160,000	6,720,000	25,440	82,000	2,260
180,000	7,560,000	28,620	90,000	2,580

Interpolate between values as necessary.

STEP 3:

Add the values from Step 1 and Step 2 to determine the total flow requirement. Check Table 3 to locate the required flow. Optional plugs can be used to restrict flow to 80%, 60%, 40%, 20% or 10% of the maximum flows listed in Table 3.

Table 3 - Maximum Flow through Protectoseal Blanketing Valve

Supply Pressure			Air		Nitrogen		0.6g Natural gas	
psig	kPa (g)	kg/cm ² (g)	SCFH	N m ³ /h	SCFH	N m ³ /h	SCFH	N m ³ /h
20	138	1.4	13,209	364	13,432	370	17,053	470
30	207	2.1	17,016	469	17,303	477	21,967	605
40	276	2.8	20,822	574	21,174	584	26,881	741
50	345	3.5	24,629	679	25,045	690	31,796	876
60	414	4.2	28,436	784	28,916	797	36,710	1,012
70	483	4.9	32,242	889	32,786	904	41,624	1,147
80	552	5.6	36,049	993	36,657	1,010	46,539	1,283
90	621	6.3	39,855	1,098	40,528	1,117	51,453	1,418
100	690	7.0	43,662	1,203	44,399	1,224	56,367	1,553
110	758	7.7	47,469	1,308	48,270	1,330	61,281	1,689
120	827	8.4	51,275	1,413	52,141	1,337	66,196	1,824
130	896	9.1	55,082	1,518	56,012	1,544	71,110	1,960
140	965	9.8	58,889	1,623	59,883	1,650	76,024	2,095
150	1,034	10.5	62,695	1,728	63,753	1,757	80,939	2,231
160	1,103	11.2	66,502	1,833	67,624	1,864	85,853	2,366
170	1,172	12.0	70,308	1,938	71,495	1,970	90,767	2,502
180	1,241	12.7	74,115	2,043	75,366	2,077	95,682	2,637
190	1,310	13.4	77,922	2,148	79,237	2,184	100,596	2,772
200	1,379	14.1	81,728	2,252	83,108	2,290	105,510	2,908

Interpolate between values as necessary. SCFH is at 60°F and 14.7 psia. Nm³/h is at 0°C and 101.3 kPa (absolute).

Supply pressure limits are 20 PSIG (138 kPa) minimum / 200 PSIG (1,379 kPa) maximum. Production testing will be done at the given supply pressure.

Table 4 - Guidelines for Blanketing Valve and Conservation Vent Set Points

The blanketing valve is set to OPEN at the set point pressure. If used in conjunction with pressure / vacuum vents or other relieving devices, the following guidelines should be adhered to (all values in inches W.C.).

Blanketing Valve Set Point	MINIMUM Pressure Vent Set Point	MINIMUM Vacuum Vent Set Point (gauge)
-0.5 to 10.0	2.0 ABOVE Valve Set Point	0.5 BELOW Valve Set Point
10.1 to 20.0	4.0 ABOVE Valve Set Point	For Blanketing Valve Set Points BELOW 0.5 gauge, set Vacuum Vent at least 0.5 gauge BELOW Valve Set Point
20.1 to 30.0	6.0 ABOVE Valve Set Point	
Above 30.0	8.0 ABOVE Valve Set Point	

Note: Set point ranges may vary. Contact factory for specific applications outside the stated guidelines.