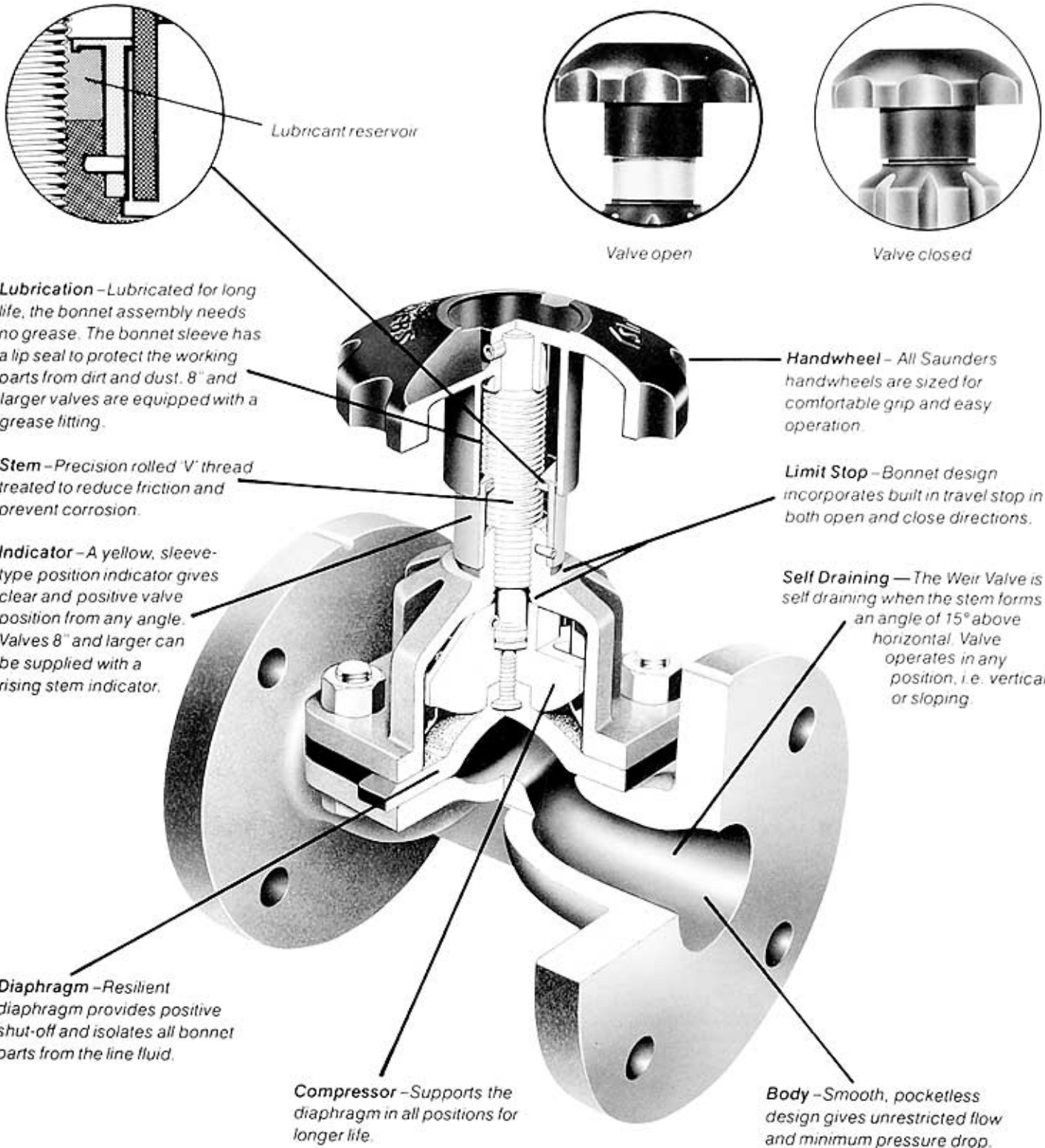


WEIR TYPE GENERAL INFORMATION

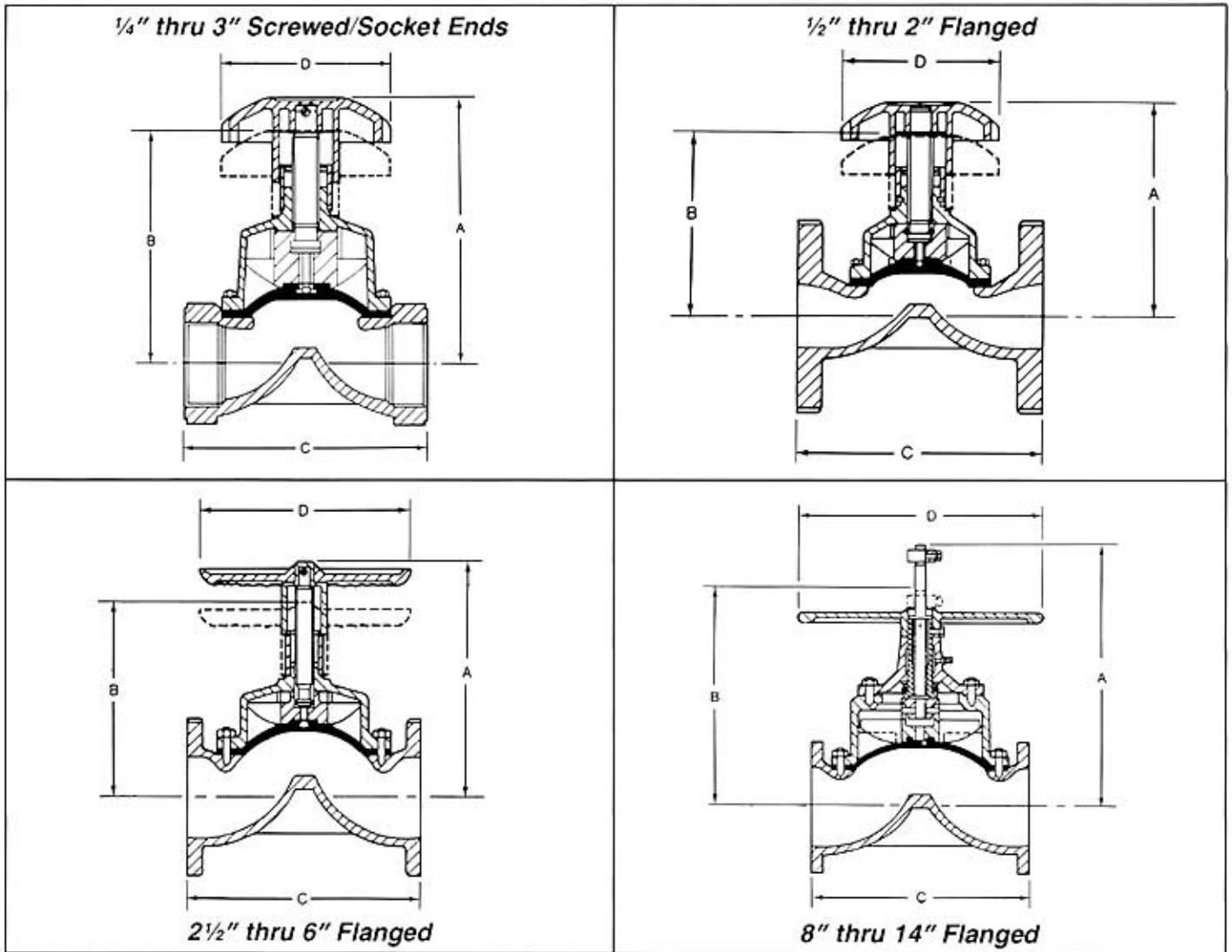
The Weir is a versatile valve with a wide range of body and diaphragm materials for chemical and abrasive service. Saunders body linings often replace the need for more expensive alloy bodies. Saunders also offers a wide

variety of Weir Valve bonnets designed to meet specific applications. These are the quick-acting lever operated, sealed, padlocked, extended stem, sliding stem, and chainwheel operated.



WEIR TYPE DIMENSIONAL DATA

OVERALL DIMENSIONS



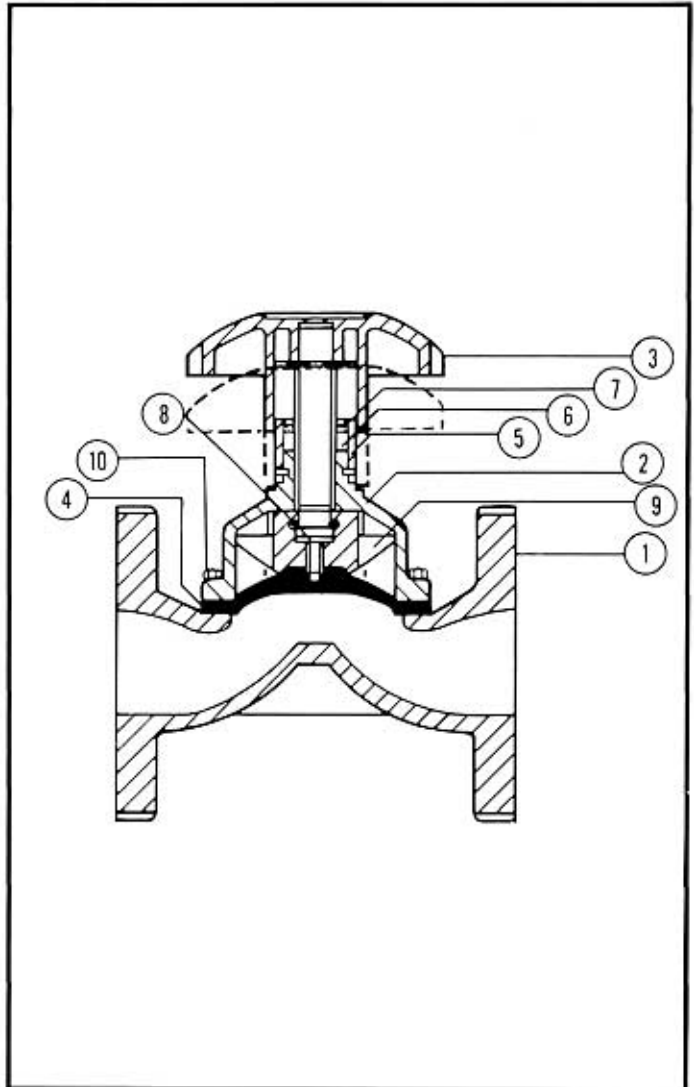
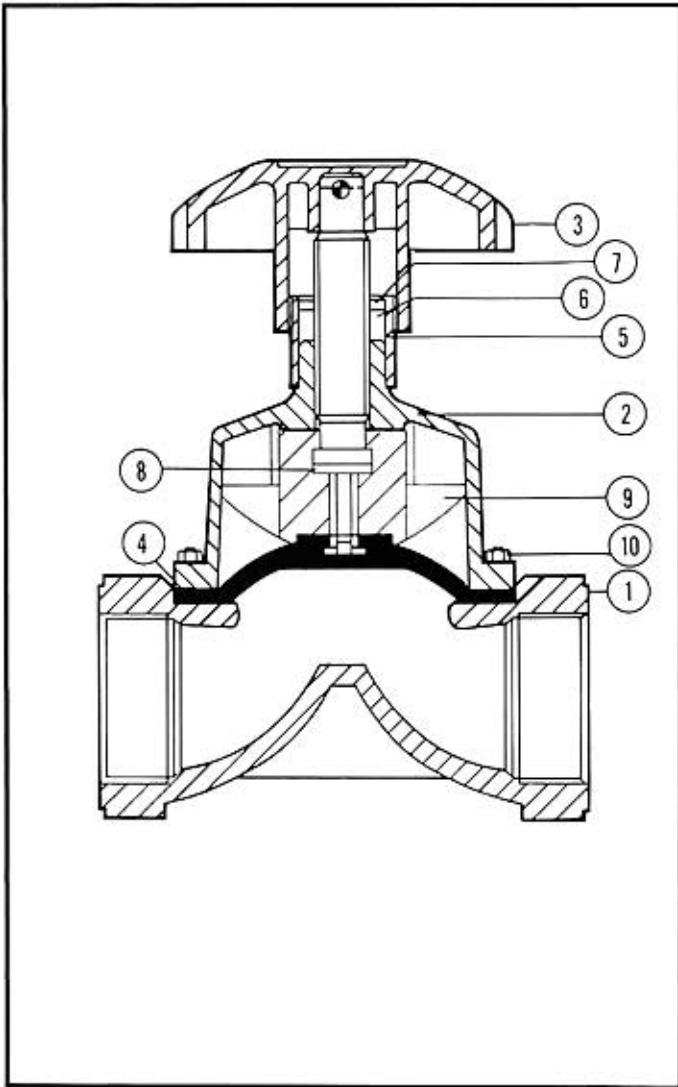
Body Type	Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14
Screwed/Socket Ends	A	2 ⁵ / ₈	2 ⁵ / ₈	3 ¹ / ₂	3 ⁵ / ₈	3 ⁵ / ₈	6	6 ¹ / ₄	7 ¹ / ₈	10 ³ / ₂	11 ³ / ₈	—	—	—	—	—	—
	B	2 ¹ / ₄	2 ¹ / ₁₆	3 ¹ / ₄	2 ¹¹ / ₁₆	2 ³ / ₁₆	5 ⁷ / ₁₆	5 ¹ / ₂	6	9 ⁷ / ₁₆	9 ³ / ₈	—	—	—	—	—	—
	C	2 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂	3 ¹ / ₄	4 ¹ / ₄	4 ⁷ / ₈	5 ³ / ₄	6 ¹ / ₂	8 ³ / ₈	10 ¹ / ₈	—	—	—	—	—	—
	Weight lbs.	1/4	1/3	1	2	2 ¹ / ₂	4	6	11	22	33	—	—	—	—	—	—
Flanged Unlined	A	—	—	3 ⁷ / ₈	3 ¹ / ₂	4 ¹ / ₂	5 ⁵ / ₈	6	6 ³ / ₄	10	10 ³ / ₄	13 ⁵ / ₈	16 ³ / ₄	26	30 ³ / ₄	35	36 ³ / ₄
	B	—	—	3 ⁵ / ₈	3 ³ / ₁₆	3 ¹¹ / ₁₆	5 ¹ / ₁₆	5 ¹ / ₄	5 ⁵ / ₈	8 ⁷ / ₁₆	9 ¹ / ₈	11 ¹ / ₂	13 ³ / ₁₆	21 ¹ / ₁₆	25	28 ⁷ / ₁₆	27 ³ / ₄
	C	—	—	4	4 ⁵ / ₈	5	5 ³ / ₄	6 ¹ / ₄	7 ¹ / ₂	10	12 ¹ / ₂	12 ¹ / ₂	16	20 ¹ / ₂	26	29 ¹ / ₂	36 ¹ / ₄
	Weight lbs.	—	—	4	4	6	9	11	17	31	42	70	137	310	508	778	890
Flanged Rubber Lined	A	—	—	—	3 ¹ / ₂	4 ¹ / ₄	5 ⁵ / ₈	6	6 ³ / ₄	10	10 ³ / ₄	13 ⁵ / ₈	16 ³ / ₄	26	30 ³ / ₄	35	36 ³ / ₄
	B	—	—	—	3 ³ / ₁₆	3 ³ / ₁₆	5 ¹ / ₁₆	5 ¹ / ₄	5 ⁵ / ₈	8 ⁷ / ₁₆	9 ¹ / ₈	11 ¹ / ₂	13 ³ / ₁₆	21 ¹ / ₁₆	25	28 ⁷ / ₁₆	27 ³ / ₄
	C	—	—	—	4 ⁷ / ₈	5 ¹ / ₄	6	6 ¹ / ₂	7 ³ / ₄	10 ¹ / ₄	12 ¹ / ₂	12 ¹ / ₂	16 ¹ / ₄	20 ³ / ₈	25 ³ / ₈	29 ⁷ / ₈	36 ⁵ / ₈
	Weight lbs.	—	—	—	5	7	10	12	18	33	45	73	139	313	512	782	894
Flanged Glass Lined	A	—	—	3 ⁷ / ₈	3 ¹ / ₂	4 ¹ / ₂	5 ⁵ / ₈	6	6 ³ / ₄	10	10 ³ / ₄	13 ⁵ / ₈	16 ³ / ₄	26	30 ³ / ₄	—	—
	B	—	—	3 ⁵ / ₈	3 ³ / ₁₆	3 ¹¹ / ₁₆	5 ¹ / ₁₆	5 ¹ / ₄	5 ⁵ / ₈	8 ⁷ / ₁₆	9 ¹ / ₈	11 ¹ / ₂	13 ³ / ₁₆	21 ¹ / ₁₆	25	—	—
	C	—	—	4 ¹ / ₈	4 ⁵ / ₈	5 ¹ / ₈	5 ⁵ / ₈	6 ¹ / ₄	7 ³ / ₄	10 ¹ / ₄	12 ¹ / ₂	12 ¹ / ₂	16 ¹ / ₄	20 ³ / ₈	25 ³ / ₈	—	—
	Weight lbs.	—	—	—	4	7	10	12	18	32	43	71	138	312	510	—	—
Flanged	A	—	—	—	3 ¹ / ₂	4 ¹ / ₄	5 ⁵ / ₈	6	6 ³ / ₄	10	10 ³ / ₄	13 ⁵ / ₈	16 ³ / ₄	26	—	—	—
	B	—	—	—	3 ³ / ₁₆	3 ³ / ₁₆	5 ¹ / ₁₆	5 ¹ / ₄	5 ⁵ / ₈	8 ⁷ / ₁₆	9 ¹ / ₈	11 ¹ / ₂	13 ³ / ₁₆	21 ¹ / ₁₆	—	—	—
	C	—	—	—	5 ³ / ₄	5 ³ / ₄	6 ¹ / ₄	6 ¹ / ₄	7 ³ / ₄	8 ³ / ₄	10 ¹ / ₄	12 ¹ / ₄	16 ¹ / ₄	20 ³ / ₄	—	—	—
	Weight lbs.	—	—	—	5	7	10	12	18	33	45	73	139	313	—	—	—
Handwheel Dimension	D	1 ¹ / ₂	1 ³ / ₄	2 ¹ / ₂	2 ¹ / ₂	3 ¹ / ₈	4	4	4 ³ / ₄	6 ³ / ₈	9 ⁷ / ₈	12 ¹ / ₂	14 ¹ / ₂	23	27 ¹ / ₂	27 ¹ / ₂	27 ¹ / ₂

All Dimensions + or - 1/16"

All Dimensions given in inches

Subject to change without notice.

WEIR TYPE MATERIALS OF CONSTRUCTION

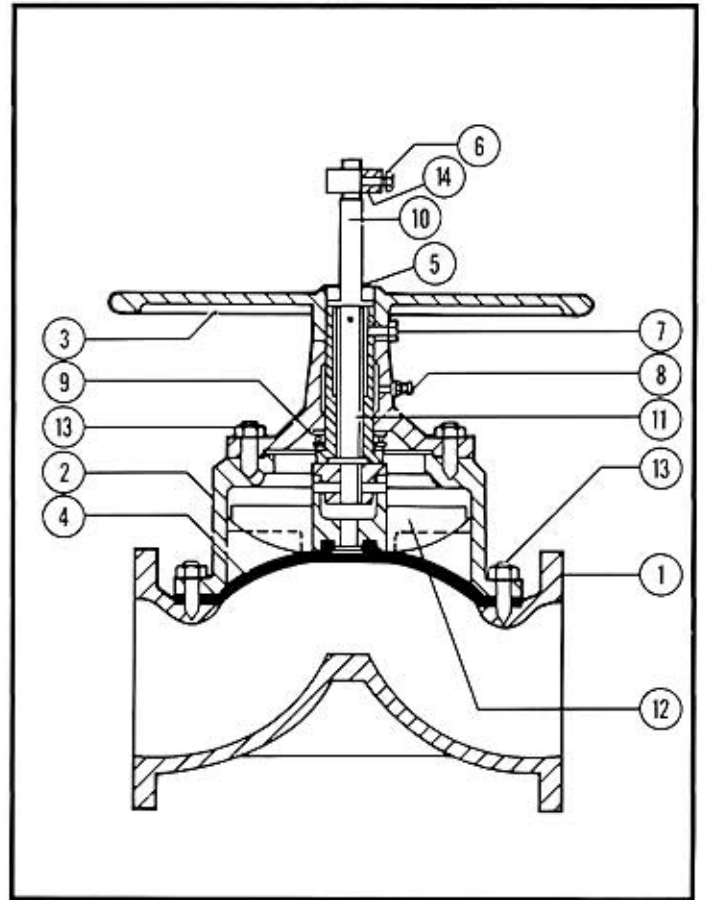
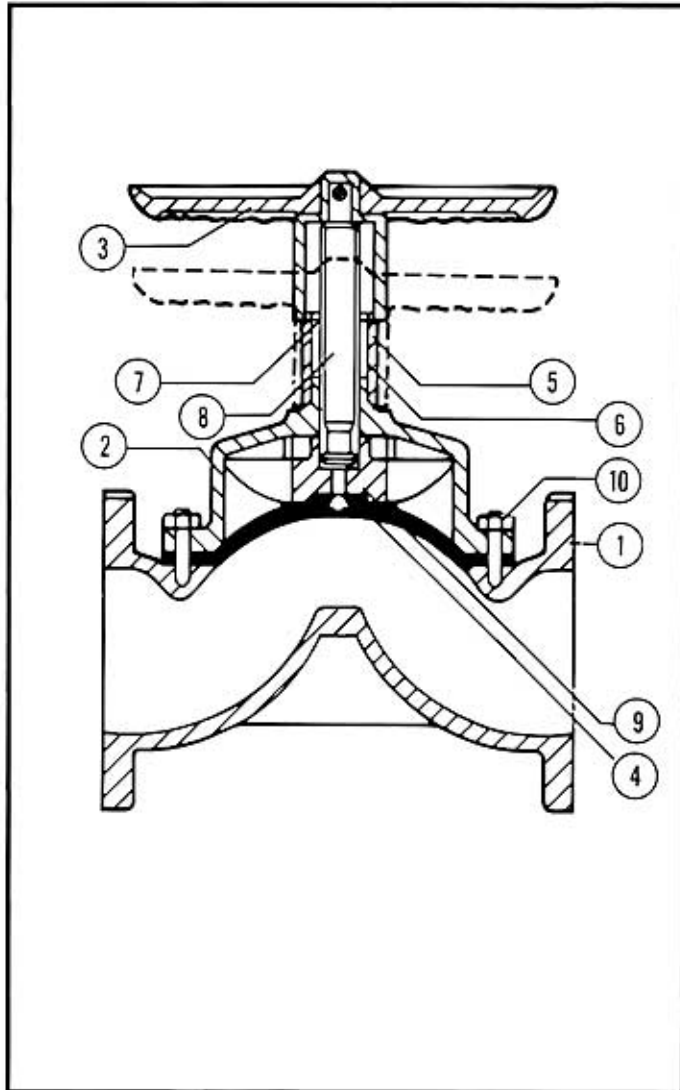


1/4" THRU 3" SCREWED/SOCKET ENDS		
Item	Part	Material
1	Body	as Specified
2	Bonnet	Cast Iron or as Specified
3	Handwheel	ABS Plastic or as Specified
4	Diaphragm	as Specified
5	Indicator Sleeve	Yellow Polypropylene
6	Reservoir	Lubricant (Cosmolube)
7	Retainer	Fiber Washer
8	Stem	Carbon Steel
9	Compressor	Cast Iron
10	Body/Bonnet Studs & Nuts	Carbon Steel

1/2" THRU 2" FLANGED		
Item	Part	Material
1	Body	as Specified
2	Bonnet	Cast Iron or as Specified
3	Handwheel	ABS Plastic or as Specified
4	Diaphragm	as Specified
5	Indicator Sleeve	Yellow Polypropylene
6	Reservoir	Lubricant (Cosmolube)
7	Retainer	Fiber Washer
8	Stem	Carbon Steel
9	Compressor	Cast Iron
10	Body/Bonnet Studs & Nuts	Carbon Steel

Subject to change without notice.

WEIR TYPE MATERIALS OF CONSTRUCTION



2 1/2" THRU 6" FLANGED		
Item	Part	Material
1	Body	as Specified
2	Bonnet	Cast Iron
3	Handwheel	Carbon Steel
4	Diaphragm	as Specified
5	Indicator Sleeve	Yellow Polypropylene
6	Reservoir	Lubricant (Cosmolube)
7	Retainer	Fiber Washer
8	Stem	Carbon Steel
9	Compressor	Cast Iron
10	Body/Bonnet Studs & Nuts	Carbon Steel

8" THRU 14" FLANGED		
Item	Part	Material
1	Body	as Specified
2	Bonnet	Cast Iron
3	Handwheel	Cast Iron
4	Diaphragm	as Specified
5	Handwheel Cap	Carbon Steel
6	Closure Stop Screw	Carbon Steel
7	Handwheel Screw	Carbon Steel
8	Grease Nipple	Carbon Steel
9	Thrust Race	Carbon Steel
10	Indicator Stem	Brass
11	Stem	Carbon Steel
12	Compressor	Cast Iron
13	Body/Bonnet Studs & Nuts	Carbon Steel
14	Closure Stop	Carbon Steel

Subject to change without notice.

WEIR TYPE BODY, LININGS AND DIAPHRAGM MATERIALS

DIAPHRAGM MATERIALS

Saunders diaphragms other than TFE diaphragms have positive attachment to compressor by screw or button.

All Saunders Diaphragms are suitable for vacuum service to the highest vacuum. For sizes over 3" specify 'vacuum reinforced diaphragms'.

Vacuum reinforced diaphragms (other than C(V)) have steel studs—can be used with ammonia or acetylene.

TFE Diaphragms

If operating line conditions demand a high temperature and chemical resistance, Saunders TFE diaphragm should be specified. When used with glass lined valves assembly torque should be controlled.

Diaphragm Features:

- TFE face on resilient rubber backing.
- Diaphragm is attached to compressor positively but not rigidly by 90° turn on a bayonet pin. Lack of rigidity allows uniform diaphragm pressure on weir without any load on diaphragm pin.
- Superior performance under vacuum conditions —balancing connection is not required.
- The rubber backing corrects for any creep in the TFE.
- 5 backings are available:
Butyl P1 — Normal general purpose. Supplied as standard.
Hypalon P2 — General Chlorine service.
Viton P3 — High temperature or severe Chlorine service.
Ethylene Propylene P4 — For general purpose high temperature services.
Kynar Membrane/Viton P5 — High temperature and severe services where permeation is a concern.

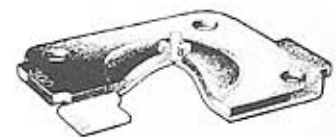
Grade	Material	Size	Temperature
AA	Natural Rubber	1/2" to 14"	-50°F to 212°F
B	Butyl Rubber	1/2" to 14"	-40°F to 212°F
C	Nitrile Rubber	1/4" to 14"	-5°F to 212°F
D (300)	Butyl Rubber (Hi Temp)	1/4" to 14"	-20°F to 265°F
E (325)	Ethylene Propylene	1/2" to 8"	-40°F to 302°F
HT	Neoprene	1/4" to 14"	-20°F to 212°F
P1 (214/300)	TFE/Butyl Backed	1/4" to 10"	-5°F to 350°F
P2 (214/237)	TFE/Hypalon Backed	1/4" to 10"	0°F to 250°F
P3 (214/226)	TFE/Viton Backed	1/4" to 10"	0°F to 350°F
P4 (214/325)	TFE/Ethylene Propylene	1/4" to 10"	-5°F to 350°F
P5 (214/K)	TFE/PVDF Viton Backed	3/4" to 6"	0°F to 350°F
Q	Natural/Synthetic Rubber	1/4" to 14"	-50°F to 212°F
U (237)	Hypalon	1/2" to 14"	0°F to 212°F
V (226)	Viton	1/4" to 14"	0°F to 300°F
W	White Natural Rubber	3/4" to 6"	-50°F to 212°F
W1 (215)	White Butyl	1/2" to 6"	-15°F to 230°F

In sizes larger than 3". Weir Type Diaphragms are specifically reinforced for vacuum service and are identified by suffix (V), e.g., Q(V). All (V) diaphragms have ferrous studs (except C(V) grade) and are specified for applications requiring all iron and steel construction. C(V) diaphragms have special bronze studs for shipboard use and are available in sizes 1" - 14". Vacuum reinforcement does not affect temperature range. B(V) diaphragms are available in sizes 1" to 14" to complete a full range of diaphragms with ferrous studs.

Weir Type Diaphragms



Rubber



TFE/Rubber Backed

BODY MATERIALS AND LININGS

Material	Screwed	Flanged
Ductile Iron	1/4" - 2"	3/4" - 8"
Cast Iron Unlined	2 1/2" - 3"	1/2" - 14"
Aluminum	1/4" - 2"	1/2" - 4"
Bronze	1/4" - 3"	1/2" - 6"
Stainless Steel ATSM A296 CF8M (Cast equivalent of AISI 316)	1/4" - 2"	1/2" - 10"
Alloy 20	1/2" - 2"	—

Butt weld and socket weld ends are available in ST, ST, and Alloy 20 body materials.

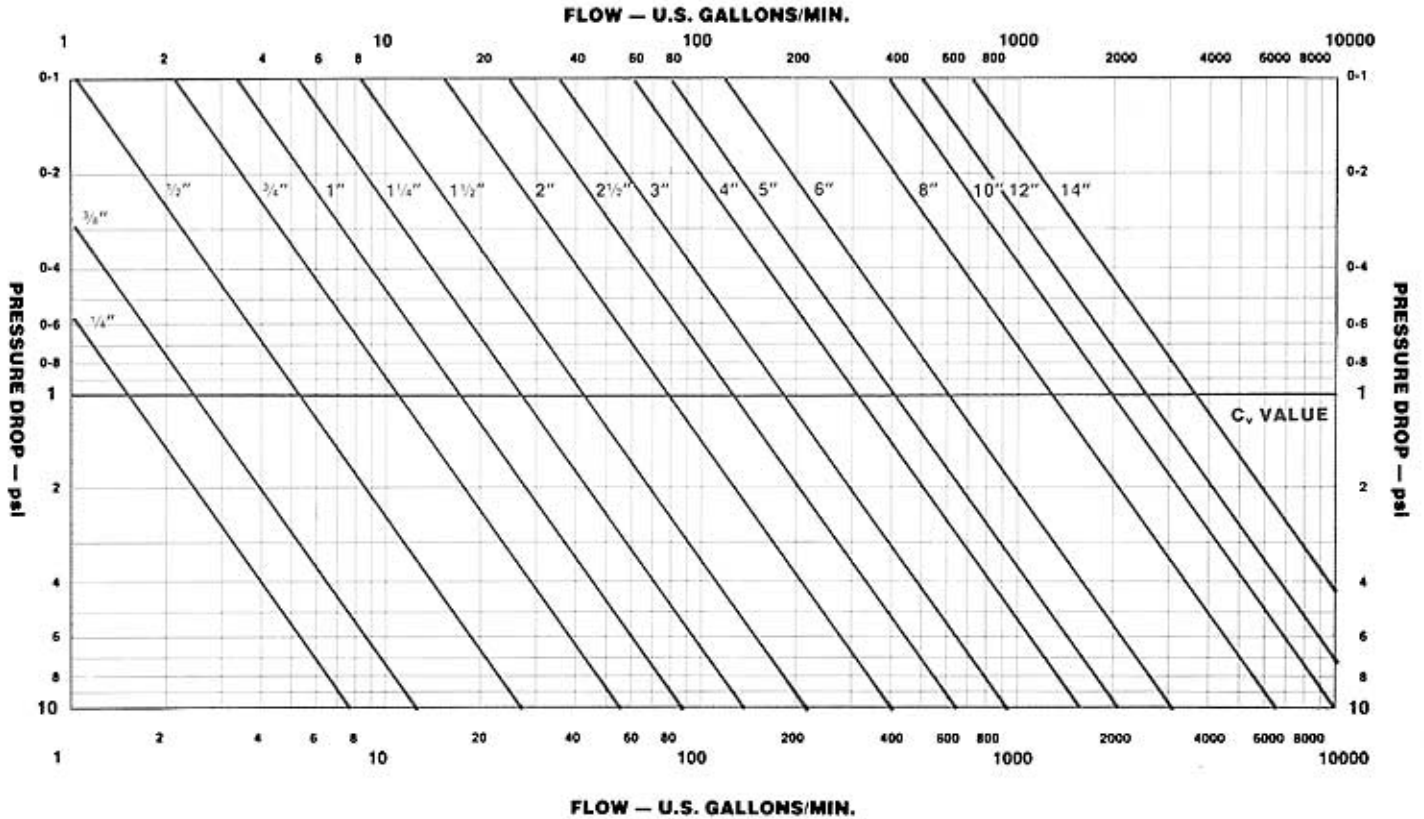
Material	Flanged
Cast Iron or Ductile Lined with:	
Hard Rubber	3/4" - 14"
Soft Rubber	3/4" - 14"
Neoprene	3/4" - 14"
Butyl	3/4" - 14"
Hypalon	3/4" - 14"
Glass	1/2" - 10"
Halar (ECTFE)	1/2" - 12"
ETFE	3/4" - 8"
PFA	3/4" - 4"
Polypropylene	3/4" - 8"
PVDF	3/4" - 8"

All screwed and flanged end connections conform to U.S. standards (API/NPT and ANSI 125 & 150). Valves with other national and international standards can be supplied.

WEIR TYPE PERFORMANCE DATA

FLOW COEFFICIENT — C_v — OF WEIR TYPE DIAPHRAGM VALVE

By definition the valve flow coefficient C_v is "the number of gallons per minute of water which will pass through a given flow restriction with a pressure drop of 1 psi".



This graph applies to water and to unlined valves. Liquid Flow Formula $Q = C_v \sqrt{\frac{\Delta P}{G}}$

Where Q = Flow (US gallons/minute)
 C_v = Flow coefficient from graph.

ΔP = Pressure drop.
G = Specific Gravity

Gas Flow Formula $Q = 1360 C_v \sqrt{\frac{\Delta P}{GT} \frac{P_1 + P_2}{2}}$

$\Delta P = (P_1 - P_2)$ Pressure Drop — psi.
 C_v = Flow in GPM (water) at 1 psi Pressure Drop.
Q = Volumetric Flow (SCFH).

G = Specific Gravity of Gas (Air @ 14.7 and 60°F = 1.0)
T = Absolute Temperature of Flowing Medium (°F + 460).

P_1 = Inlet pressure — psia.
 P_2 = Outlet pressure — psia.

Screwed/Socket Metal/PVC											
% Open	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"
10	0.1	0.3	0.5	1.1	1.7	2.8	4	8.8	10	18	
20	0.3	0.6	1.2	2.7	4.1	6.8	10	22	26	45	
30	0.5	1	2	4.5	6.8	11.3	17	36	43	75	
40	0.7	1.4	2.6	6.0	9	15	22	48	57	100	
50	0.8	1.7	3.2	7.3	11	18.3	27	58	69	122	
60	0.9	1.9	3.7	8.3	12.5	20.8	31	66	79	139	
70	1	2.1	4	9.1	13.7	22.8	34	73	86	152	
80	1.1	2.2	4.2	9.6	14.4	24	35.5	77	91	160	
90	1.1	2.3	4.3	9.8	14.7	24.5	36.3	78	93	164	
100	1.1	2.3	4.4	10	15	25	37	80	95	167	

Flanged End—Rubber Lined											
% Open	1/2"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"
10	1	1.5	2.4	3.9	7	11	16	28	53	114	225
20	2.5	3.8	5.9	9.5	17	26	40	68	131	281	428
30	4.1	6.3	9.9	16	29	46	67	113	218	468	713
40	5.5	8.4	13.2	21	38	61	89	151	290	624	950
50	6.7	10.2	16.1	26	47	74	108	184	353	759	1156
60	7.7	11.6	18.3	29	53	85	123	209	402	863	1315
70	8.4	12.7	20	32	58	93	135	229	440	946	1441
80	8.8	13.4	21	33.6	61	98	142	242	465	998	1521
90	9	13.7	21.6	34	63	100	145	247	474	1019	1552
100	9.2	14	22	35	64	102	148	252	484	1040	1584

Flanged End—Plastic Lined											
% Open	1/2"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"
10	0.9	1.4	2.4	4.2	7.8	11	19.8	34	78	112	
20	2.1	3.5	5.9	10.3	19.2	27	49	82	193	275	
30	3.5	5.8	9.9	17.1	32	45	81	137	321	459	
40	4.7	7.8	13.2	22.8	43	60	106	183	428	612	
50	5.7	9.5	16.1	27.7	52	73	131	223	520	745	
60	6.5	10.8	18.3	31.5	59	83	149	253	592	847	
70	7.1	11.8	20	34.6	65	91	164	275	649	928	
80	7.5	12.5	21.1	36.5	68	96	173	293	684	979	
90	7.6	12.7	21.6	37	70	98	176	299	699	1000	
100	7.8	13	22	38	71	100	180	305	713	1020	

Flanged End—Unlined											
% Open	1/2"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"
10	0.6	1.3	1.9	3	4.8	9	14	20	35	67	143
20	1.5	3.1	4.7	7.4	12	22	34	50	85	163	351
30	2.5	5.2	7.9	12.4	19	36	57	83	142	272	585
40	3.3	6.9	10.5	16.5	26	48	76	111	189	363	780
50	4	8.4	12.8	20	32	58	93	135	230	442	949
60	4.6	9.5	14.5	22.8	36	66	105	154	261	502	1079
70	5	10.5	16	25	39	73	116	168	287	551	1183
80	5.3	11	16.9	26.4	41	77	122	178	302	581	1248
90	5.4	11.3	17.2	26.9	42	78	124	181	309	593	1274
100	5.5	11.5	17.5	27.5	43.2	80	127	185	315	605	1300

Flanged End—Glass/Halar-Lined											
% Open	1/2"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"
10	0.6	1.3	2	3.2	5	9.2	14.6	21	36	70	150
20	1.6	3.2	5	7.8	12.3	22.7	36	52	89	171	367
30	2.6	5.4	8.3	13.1	20.4	38	60	87	149	286	612
40	3.5	7.2	11.1	17.4	27.2	50	80	116	199	381	816
50	4.2	8.8	13.5	21.2	33.1	61	97	142	242	454	993
60	4.8	10	15.4	24.1	37.7	70	110	161	275	527	1129
70	5.3	10.9	16.8	26.4	41.3	76	121	177	301	578	1238
80	5.6	11.5	17.8	27.8	43.6	81	128	186	318	610	1306
90	5.7	11.8	18.1	28.4	44.5	82	130	190	324	622	1333
100	5.8	12	18.5	29	45.4	84	133	194	331	635	1360

WEIR TYPE PERFORMANCE DATA

OPERATING LIMITS

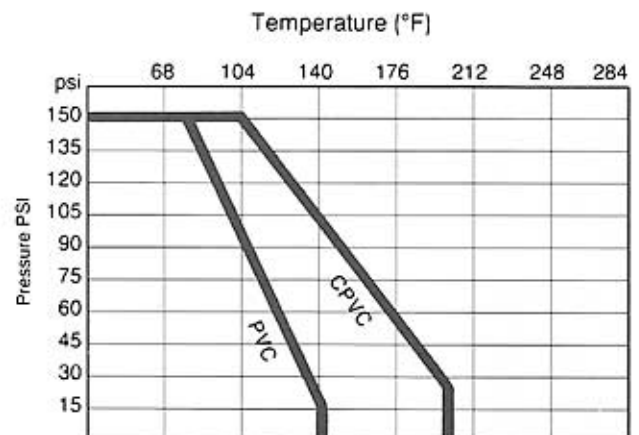
1. The table below shows the maximum permissible working pressure, within a temperature range of -50°F and +120°F, for the entire size range of Saunders Weir Diaphragm Valves.
2. For operating temperatures above 120°F, the permissible working pressure decreases as shown by the chart on the facing page. To find the maximum working pressure at the higher temperatures, select the pressure from the table below for the desired size and valve material. Then, find the corresponding

pressure line on the chart and plot that line until it intersects with the anticipated temperature. From the point of intersection, proceed horizontally to the edge of the chart and read the allowable working pressure at the anticipated temperature.

3. Refer to the diaphragm temperature limitation bar graphs to determine if the anticipated temperature is within the recommended operating range of the desired diaphragm and body material.

VALVE MAXIMUM WORKING PRESSURE, psi (at temperatures up to 120°F)															
Body Material	Valve Size/Maximum Pressure														
	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"
Metallic Screwed	230	230	230	230	230	230	230	150	150						
Metals other than Cast Iron			230	230	230	230	230	150	150	150	150	100	70	60	50
Cast Iron Flanged			175	175	175	175	175	150	150	150	150	100	70	60	50
Rubber Lined				175	175	175	175	150	150	150	150	100	70	60	50
Plastic Lined				175	175	175	175	150	150	150	150	100	70	60	50
Glass and Halar Lined			150	150	150	125	100	100	100	75	75	75	70	60	50

VALVE MAXIMUM WORKING PRESSURE, psi (at temperatures up to 68°F)					
Body Material	Valve Size/Maximum Pressure				
	1/2"	3/4"	1"	1 1/2"	2"
PVC	150	150	150	150	150
CPVC	150	150	150	150	150



PVC 140°F

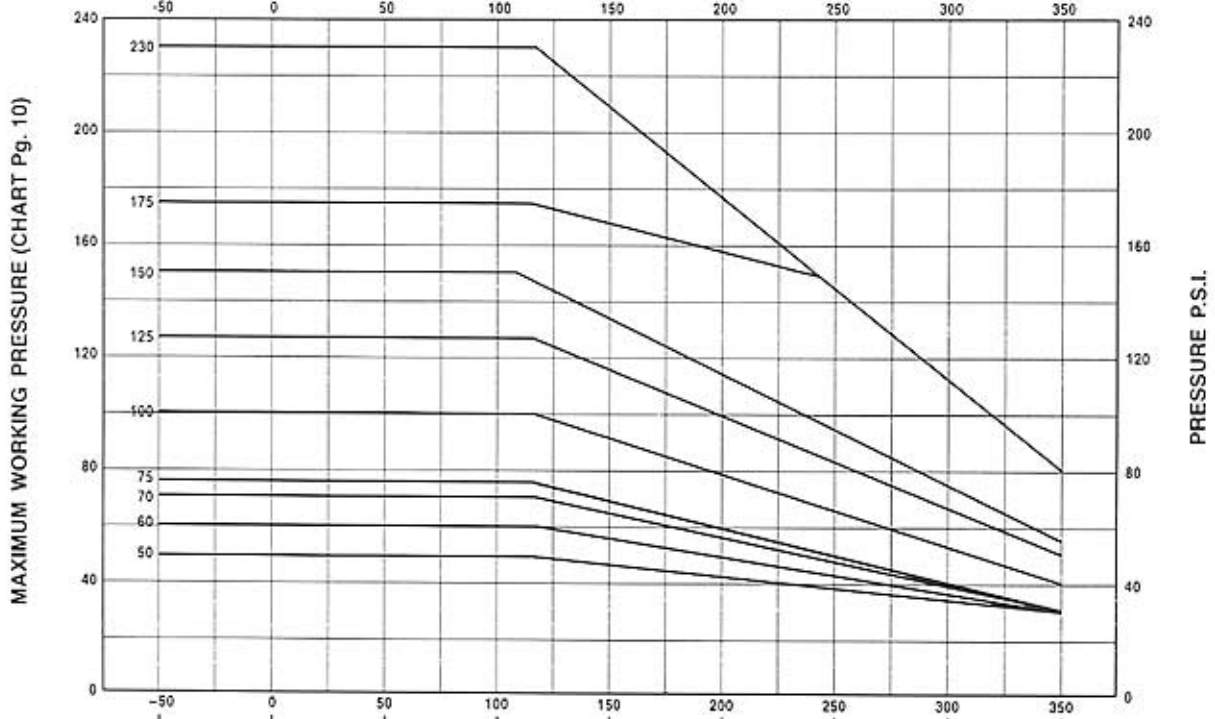
CPVC 200°F

WEIR TYPE PERFORMANCE DATA

DIAPHRAGM TEMPERATURE LIMITATIONS

GRADE P5	TFE/PVDF/VITON	350°F
GRADE P3	TFE/VITON	350°F
GRADE P1	TFE/BUTYL	350°F
GRADE V	VITON	300°F
GRADE E	ETHYLENE PROPYLENE	300°F
GRADE D	BUTYL	265°F
GRADE P2	TFE/HYPALON	250°F
GRADE W1	WHITE BUTYL	230°F
GRADE U	HYPALON	212°F
GRADE Q	NATURAL	212°F
GRADE HT	NEOPRENE	212°F
GRADE W	WHITE NATURAL	212°F
GRADE C	NITRILE	212°F
GRADE B	BUTYL	212°F
GRADE AA	NATURAL	212°F

TEMPERATURE °F



TEMPERATURE °F

CAST IRON	350°F
METALLIC OTHER THAN CAST IRON	350°F
GLASS LINED	350°F
PFA	350°F
ETFE (TEFZEL) LINED	300°F
PVDF LINED	275°F
HALAR LINED	250°F
POLYPROPYLENE LINED	200°F
BUTYL LINED	250°F
NEOPRENE LINED	220°F
HYPALON LINED	200°F
HARD RUBBER LINED	185°F
SOFT RUBBER LINED	185°F

BODY TEMPERATURE LIMITATIONS