

WellMark Series

W2601 and W2602 Safety Relief Valves

Application

2600 Series Safety Relief Valves are for general purpose gas, air and liquid services. They are recommended for over-pressure protection on separators, compressors, pressure vessels, heater-treaters, gathering and transmission lines, meter runs and other systems where the rated capacities of the valve are commensurate with the requirements of the system. The 2600 Series is manufactured in accordance with the ASME Boiler and Pressure Vessel Code and has been capacity tested and certified by the National Board to meet the requirements of Section VIII of the ASME Code, as signified accordingly by the symbols "UV" and "NB" on their nameplates.

NOTE: Standard threaded relief valves are designed for atmospheric relief only, and are not intended to relieve into pressurized systems. Threaded relief valves that relieve into pressurized systems require an additional Barkhausen Pressure test identified by a "B" code in the model number.

Features

- Choice Of Multiple Orifice Sizes
- ASME Coded: "UV" Section VIII Air/Gas and Liquid
- Enhanced Guided Lift System: Optimum Performance
- Trim Option: Soft Seat
- High Volume Applications
- Low Pressure Applications
- Stainless Steel Internals
- NACE Option Available

Specifications

Type W2601—1" Size

Type W2602—2" Size

Soft Resilient Seat

Multiple Orifices Available:

- C—.295" Diameter (1" gas valve only)
- D—.400" Diameter (1" valve only)
- E—.534" Diameter (1" or 2" valve)
- F—.672" Diameter (2" valve only)
- G—.857" Diameter (2" valve only)



Threaded Safety
Relief Valves

Contact Norriseal-WellMark today for more information about products and services

NRS_INFO@APERGY.COM • NORRISEALWELLMARK.COM

HOUSTON: 713.466.3552 • MIDLAND: 432.238.3919 • OKLAHOMA CITY: 405.672.6660 • BROUSSARD: 337.837.3223 • KENEDY: 830.583.8112

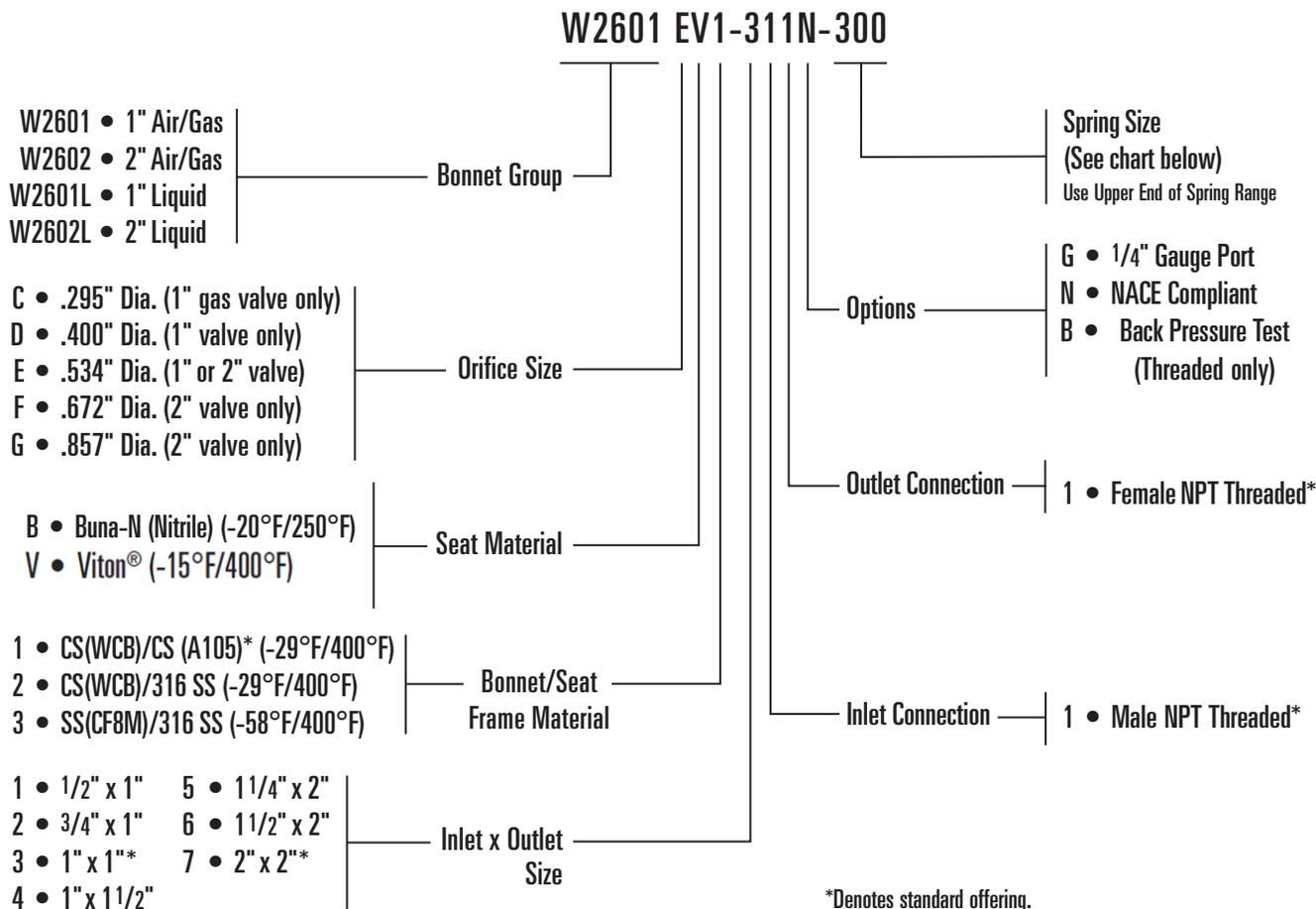
WellMark Series

2600

W2601 and W2602 Safety Relief Valves

Determining the Model Number

Example given: Model 2601 EV1-311N-300 – Series 2601 1" Safety Relief Valve with .534" Orifice Diameter, Viton® Seats, WCB Carbon Steel Bonnet, A105 Carbon Steel Frame, 1" Male NPT Threaded Inlets and 1" Female NPT Threaded Outlets, NACE Compliance and 300 psig Spring.



Specification	Orifice Designation				
	C	D	E	F	G
ORIFICE DIAMETER (IN.)	0.295	0.400	0.534	0.672	0.857
ORIFICE AREA (A) (SQ. IN.)	0.068	0.126	0.224	0.355	0.577
INLET SIZE AVAILABLE (IN.)	1/2, 3/4, 1	1/2, 3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2, 2	1 1/4, 1 1/2, 2	1 1/2, 2
OUTLET SIZE AVAILABLE (IN.)	1, 1 1/2	1, 1 1/2	1, 1 1/2, 2	2	2
PRESSURE RANGES (PSIG)	15-2500	15-2500	15-2500	15-1600	75-1000
FLOW COEFFICIENT (K) AIR/GAS	0.859	0.859	0.859	0.859	0.859
FLOW COEFFICIENT (K) LIQUID	N/A	0.628	0.628	0.628	0.628

Orifice	Service	Orifice Diameter	Orifice Area (A)	Spring Ranges (psig)- Use Upper End of Spring Range						
				15-80	80-250	250-400	400-800	800-1600	1600-2500	—
1"	C AIR/GAS	0.295	0.068	15-80	80-250	250-400	400-800	800-1600	1600-2500	—
	D AIR/GAS & LIQUID	0.400	0.126							
	E AIR/GAS & LIQUID	0.534	0.224							
2"	E AIR/GAS & LIQUID	0.534	0.224	15-75	75-250	250-500	500-1200	1200-2500	—	—
	F AIR/GAS	0.672	0.355	15-40	40-200	200-400	400-800	800-1600	—	—
	G AIR/GAS	0.857	0.577	—	75-100	100-200	200-600	600-1000	1000-1500	—
	F LIQUID	0.672	0.355	15-40	40-70	70-200	200-400	400-530	530-800	800-1600
	G LIQUID	0.857	0.577	—	75-125	125-250	250-400	400-600	600-1000	1000-1500

Contact Norriseal-WellMark today for more information about products and services

NRS_INFO@APERGY.COM • NORRISEALWELLMARK.COM

HOUSTON: 713.466.3552 • MIDLAND: 432.238.3919 • OKLAHOMA CITY: 405.672.6660 • BROUSSARD: 337.837.3223 • KENEDY: 830.583.8112



WellMark Series

W2601 and W2602 Safety Relief Valves

Relieving Capacity for Air • (10% Overpressure) Capacities in standard cubic feet per minute at 60° F

Set Pressure	Orifice Diameter (in.)/Area (sq. in.)					
	C 0.295/0.068	D 0.400/0.126	E 0.534/0.224	F 0.672/0.355	G 0.857/0.577	
15	33	61	110	174	NOT AVAILABLE	
20	39	72	129	205		
25	45	83	148	235		
30	51	94	168	266		
40	62	116	207	328		
50	74	138	245	389		
60	86	160	284	451		
70	98	181	323	512		
75	104	192	342	543		882
80	109	203	362	573		932
90	121	225	400	635	1032	
100	133	247	439	696	1132	
125	162	301	536	850	1382	
150	192	356	633	1004	1632	
175	221	411	730	1158	1882	
200	251	465	827	1311	2132	
250	310	574	1021	1619	2631	
275	339	629	1118	1773	2881	
300	369	683	1215	1926	3131	
350	427	792	1409	2233	3630	
400	486	901	1603	2541	4130	
450	545	1011	1797	2848	4630	
500	604	1120	1991	3156	5129	
550	663	1229	2185	3463	5629	
600	722	1338	2379	3770	6129	
650	781	1447	2573	4078	6628	
700	840	1556	2767	4385	7128	
720	863	1600	2845	4509	7329	
750	898	1665	2961	4693	7627	
800	957	1774	3155	5000	8127	
850	1016	1883	3349	5307	8627	
900	1075	1993	3543	5615	9126	
950	1134	2102	3737	5922	9626	

Set Pressure	Orifice Diameter (in.)/Area (sq. in.)				
	C 0.295/0.068	D 0.400/0.126	E 0.534/0.224	F 0.672/0.355	G 0.857/0.577
1000	1193	2211	3931	6230	10,126
1050	1252	2320	4125	6537	10627
1100	1311	2429	4319	6844	11126
1150	1370	2538	4513	7152	11626
1200	1428	2647	4706	7459	12126
1250	1487	2756	4900	7767	12626
1300	1546	2865	5094	8074	13125
1350	1605	2974	5288	8381	13625
1400	1664	3084	5482	8689	14125
1440	1711	3171	5638	8936	14524
1450	1723	3193	5676	8996	14624
1500	1782	3302	5870	9304	15124
1550	1841	3411	6064	9611	NOT AVAILABLE
1600	1899	3520	6258	9918	
1650	1958	3629	6452		
1700	2017	3738	6646		
1750	2076	3847	6840		
1800	2135	3956	7034		
1850	2194	4066	7228		
1900	2253	4175	7422		
1950	2312	4284	7616		
2000	2371	4393	7810		
2050	2429	4502	8004		
2100	2488	4611	8198		
2150	2547	4720	8392		
2160	2559	4743	8432		
2200	2606	4829	8586		
2250	2665	4938	8780		
2300	2724	5047	8974		
2350	2783	5157	9168		
2400	2842	5266	9362		
2450	2900	5375	9556		
2500	2959	5484	9750		

Sizing of Safety Relief Valves

Given certain information as follows, Safety Relief Valves may be sized by use of various formulas prescribed by Appendix 11, Section VIII, Division I of the ASME Boiler and Pressure Vessel Code for capacities of orifices. The information as shown below allows sizing using the coefficient method.

Table I – Molecular Weight and Values of C for Gases

Gas	M	C
AIR	28.97	356
ACETYLENE	26.04	345
AMMONIA	17.03	351
BUTANE	58.12	324
CARBON DIOXIDE	44.01	345
CHLORINE	70.91	352
ETHANE	30.07	339
ETHYLENE	28.05	337
FREON 22	86.48	355
HYDROGEN	2.02	356
HYDROGEN SULFIDE	34.08	348
METHANE	16.04	346
METHYL CHLORIDE	50.48	337
NATURAL GAS (0.6)	17.40	344
NITROGEN	28.02	356
OXYGEN	32.00	356
PROPANE	44.09	331
SULFUR DIOXIDE	64.06	342

Relieving Capacity Formula Coefficient Method

$$Q \text{ (SCFM)} = \frac{KACP}{w \times 60} \sqrt{\frac{M}{T}}$$

- A = Effective Flow Area (Orifice Area in sq. in.)
- C = Gas Constant
- K = Flow Coefficient
- M = Molecular Weight
- P = Flowing pressure (set pressure x 1.1 + 14.7 psia)
- Q = Flow Rate in SCFM for gases
- T = Absolute temperature in degrees Rankin (°F + 460)
- w = Density of the gas in lb./ft.³ (Air = .0764 @ 14.7 psia)

Contact Norriseal-WellMark today for more information about products and services

NRS_INFO@APERGY.COM • NORRISEALWELLMARK.COM

HOUSTON: 713.466.3552 • MIDLAND: 432.238.3919 • OKLAHOMA CITY: 405.672.6660 • BROUSSARD: 337.837.3223 • KENEDY: 830.583.8112



WellMark Series

W2601L and W2602L Safety Relief Valves

Relieving Capacity for Water • (10% Overpressure) Capacities in gallons per minute.

Set Pressure	Orifice Diameter (in.) / Area (sq. in.)				
	D 0.400/0.126	E 0.534/0.224	F 0.672/0.355	G 0.857/0.577	
15	13	23	36	NOT AVAILABLE	
20	14	26	41		
25	16	28	45		
30	17	31	49		
40	20	35	56		
50	22	40	63		
60	24	43	69		
70	26	47	74		
75	27	49	77		125
80	28	50	79		129
90	30	53	84		137
100	32	56	89		144
125	35	63	99		161
150	39	69	109		177
175	42	74	118	191	
200	45	79	126	204	
250	50	89	140	228	
275	52	93	147	239	
300	55	97	154	250	
350	59	105	166	270	
400	63	112	178	289	
450	67	119	188	306	
500	71	125	199	323	
550	74	131	208	339	
600	77	137	218	354	
650	80	143	227	368	
700	83	148	235	382	
720	85	150	238	388	
750	86	154	243	395	
800	89	159	251	408	
850	92	163	259	421	
900	95	168	267	433	
950	97	173	274	445	

Set Pressure	Orifice Diameter (in.) / Area (sq. in.)			
	D 0.400/0.126	E 0.534/0.224	F 0.672/0.355	G 0.857/0.577
1000	100	177	281	457
1050	102	182	288	468
1100	105	186	295	479
1150	107	190	301	490
1200	109	194	308	500
1250	111	198	314	511
1300	114	202	320	521
1350	116	206	326	531
1400	118	210	332	540
1440	120	213	337	548
1450	120	213	338	550
1500	122	217	344	559
1550	124	221	350	NOT AVAILABLE
1600	126	224	355	
1650	128	228		
1700	130	231		
1750	132	235		
1800	134	238		
1850	136	241		
1900	137	244		
1950	139	248		
2000	141	251		
2050	143	254		
2100	145	257		
2150	146	260		
2160	147	261		
2200	148	263		
2250	150	266		
2300	151	269		
2350	153	272		
2400	154	275		
2450	156	278		
2500	158	280		

Sizing of Safety Relief Valves

Given certain information as follows, Safety Relief Valves may be sized by use of various formulas prescribed by Appendix 11, Section VIII, Division I of the ASME Boiler and Pressure Vessel Code for capacities of orifices. The information as shown below allows sizing using the coefficient method.

Specific Gravity of Common Liquids

Liquid	Specific Gravity	Liquid	Specific Gravity
AMMONIA	0.606	KEROSENE	0.818
BENZENE	0.883	METHANOL	0.789
BUTANE	0.558	N-OCTANE	0.695
CO2	0.683	PROPANE	0.511
ENGINE OIL	0.887	R-12	1.315
ETHANOL	0.786	R-22	1.195
GASOLINE	0.752	R-134A	1.211
GLYCERINE	1.265	WATER	1.000

Relieving Capacity Formula Coefficient Method

$$Q \text{ (GPM)} = 38KA \sqrt{\frac{P - P_d}{G}}$$

Q (GPM) = Flow Rate in GPM

A = Effective Flow Area (Orifice Area in sq. in.)

K = Flow Coefficient for Liquid (.628)

P = Flowing Pressure (Set pressure x 1.1 + 14.7)

P_d = Discharge pressure (Pressure psia)

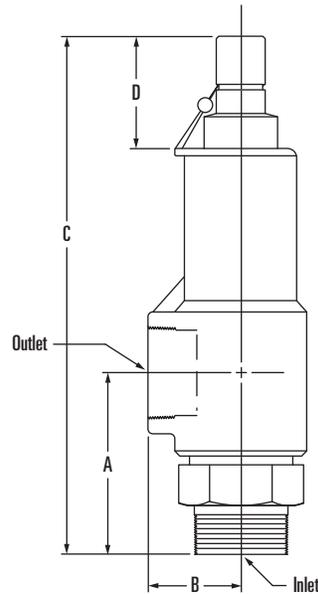
G = Specific Gravity of fluid (Water = 1)

Contact Norriseal-WellMark today for more information about products and services

NRS_INFO@APERGY.COM • NORRISEALWELLMARK.COM

HOUSTON: 713.466.3552 • MIDLAND: 432.238.3919 • OKLAHOMA CITY: 405.672.6660 • BROUSSARD: 337.837.3223 • KENEDY: 830.583.8112

Apergy

WellMark Series**W2601 and W2602 Safety Relief Valves****Threaded Dimensional Data**

Valve Configuration	Dimension (in.)				Weight (lbs.)
	A	B	C	D	
1/2" x 1"	3.25	1.88	10.5	2.375	7
3/4" x 1"					
1" x 1 ^{**} *					
1" x 1 1/2"					
1 1/4" x 2"	4.62	2.38	13.25	2.875	14
1 1/2" x 2"					
2" x 2 ^{***}					

*Standard configuration for Series 2601. **Standard configuration for Series 2602.

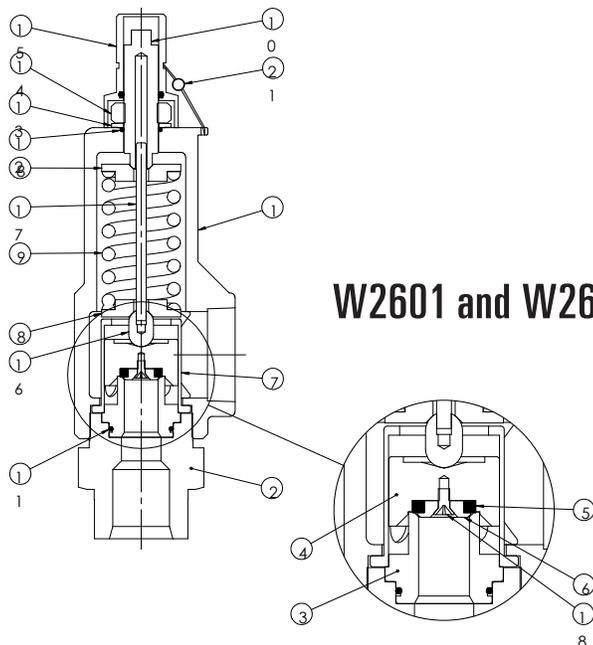
Contact Norriseal-WellMark today for more information about products and services

NRS_INFO@APERGY.COM • NORRISEALWELLMARK.COM

HOUSTON: 713.466.3552 • MIDLAND: 432.238.3919 • OKLAHOMA CITY: 405.672.6660 • BROUSSARD: 337.837.3223 • KENEDY: 830.583.8112

Apergy

WellMark Series



W2601 and W2602 Safety Relief Valves

Parts List, W2601

Item	Description	Material	Qty.	Part No.
1	BONNET	SA-216 GR.WCB CS	1	1118928
2	SEAT FRAME 1/2"	SA-105 FS	1	1125964
	SEAT FRAME 3/4"	SA-105 FS	1	1126320
	SEAT FRAME 1"	SA-105 FS	1	1122293
3	SEAT "C" ORIFICE	SA-276 TY. 316 SS	1	1122294
	SEAT "D" ORIFICE	SA-276 TY. 316 SS	1	1122295
	SEAT "E" OFIFICE	SA-276 TY. 316 SS	1	1120643
4	PLUG "C" AND "D" ORIFICE	SA-276 TY. 316 SS	1	1123680
	PLUG "E" ORIFICE	SA-276 TY. 316 SS	1	1122297
5	SQ. O-RING "C" AND "D"	VITON	1	1145692
	SQ. O-RING "E"	VITON	1	1145693
6	O-RING HOLDER "C" AND "D"	SA-276 TY. 316 SS	1	1145518
	O-RING HOLDER "E" ORIFICE	SA-276 TY. 316 SS	1	1145108
7	PLUG GUIDE "C" AND "D"	SA-351 SS	1	1123729
	PLUG GUIDE "E" ORIFICE	SA-351 SS	1	1125161
8	SPRING GUIDE	SA-29 CS	2	1124203
9	SPRING "C" AND "D" 15-80#	302 SS	1	1122138
	SPRING "C" AND "D" 80-250#	302 SS	1	1121795
	SPRING "C" AND "D" 250-400#	302 SS	1	1120228
	SPRING "C" AND "D" 400-800#	302 SS	1	1120127
	SPRING "C" AND "D" 800-1600#	17-7 SS	1	1122741
	SPRING "C" AND "D" 1600-2500#	17-7 SS	1	1123670
	SPRING "E" 15-50#	302 SS	1	1122138
	SPRING "E" 50-150#	302 SS	1	1121795
	SPRING "E" 150-300#	302 SS	1	1120228
	SPRING "E" 300-500#	302 SS	1	1120127
	SPRING "E" 500-1000#	17-7 SS	1	1122741
	SPRING "E" 1000-2500#	17-7 SS	1	1123670
10	ADJUSTING SCREW	307 CS	1	1121900
11	O-RING	VITON	1	1032515
12	O-RING	VITON	1	1122133
13	SEAL WASHER	SS/BUNA-N	1	1124855
14	JAM NUT	STEEL	1	1123641
15	CAP WITH O-RING	ALUMINUM / BUNA	1	1126810
16	GUIDE	SA-29 CS	1	1122296
17	GUIDE STEM	SA-29 CS	1	1121682
18	SCREW "C" AND "D" ORIFICE	18-8 SS	1	1120223
	SCREW "E" ORIFICE	18-8 SS	1	1120637
* 19	NAMEPLATE	304 SS	1	1150439
* 20	DRIVE SCREW	18-8 SS	4	1032590
21	SEAL WIRE AND LEAD	STEEL AND LEAD	1	1125115

* NOT SHOWN

Parts List, W2602

Item	Description	Material	Qty.	Part No.
1	BONNET	SA-216 GR.WCB CS	1	1119673
2	SEAT FRAME 1 1/4"	SA-105 FS	1	1126846
	SEAT FRAME 1 1/2"	SA-105 FS	1	1124721
	SEAT FRAME 2"	SA-105 FS	1	1119647
3	SEAT "E" ORIFICE	SA-276 TY. 316 SS	1	1125290
	SEAT "F" ORIFICE	SA-276 TY. 316 SS	1	1123681
	SEAT "G" OFIFICE	SA-276 TY. 316 SS	1	1122691
4	PLUG "E" ORIFICE	SA-276 TY. 316 SS	1	1120250
	PLUG "F" ORIFICE	SA-276 TY. 316 SS	1	1125244
	PLUG "G" ORIFICE	SA-276 TY. 316 SS	1	1123252
5	SQ. O-RING "E" ORIFICE	VITON	1	1145693
	SQ. O-RING "F" ORIFICE	VITON	1	1145696
	SQ. O-RING "G" ORIFICE	VITON	1	1145697
6	O-RING HOLDER "E" ORIFICE	SA-276 TY. 316 SS	1	1145108
	O-RING HOLDER "F" ORIFICE	SA-276 TY. 316 SS	1	1145473
	O-RING HOLDER "G" ORIFICE	SA-276 TY. 316 SS	1	1145474
7	PLUG GUIDE "E" ORIFICE	SA-351 SS	1	1125790
	PLUG GUIDE "F" ORIFICE	SA-351 SS	1	1126370
	PLUG GUIDE " G" ORIFICE	SA-351 / 316 SS	1	1120897
8	SPRING GUIDE	SA-29 CS	2	1123682
9	SPRING "E" 15-75#	302 SS	1	1121639
	SPRING "E" 75-250#	302 SS	1	1119617
	SPRING "E" 250-500#	302 SS	1	1121640
	SPRING "E" 500-1200#	302 SS	1	1124356
	SPRING "E" 1200-2500#	17-7 SS	1	1122251
	SPRING "F" 15-40#	302 SS	1	1121639
	SPRING "F" 40-200#	302 SS	1	1119617
	SPRING "F" 200-400#	302 SS	1	1121640
	SPRING "F" 400-800#	302 SS	1	1124356
	SPRING "F" 800-1600#	17-7 SS	1	1122251
	SPRING "G" 75-100#	302 SS	1	1119617
	SPRING "G" 100-200#	302 SS	1	1121640
	SPRING "G" 200-600#	302 SS	1	1124356
	SPRING "G" 600-1000#	17-7 SS	1	1122251
	SPRING "G" 1000-1500#	17-7 SS	1	1119093
10	ADJUSTING SCREW	307 CS	1	1125245
11	O-RING	VITON	1	1022452
12	O-RING	VITON	1	1035982
13	SEAL WASHER	SS/BUNA-N	1	1122682
14	JAM NUT	STEEL	1	1122669
15	CAP WITH O-RING	ALUMINUM / BUNA	1	1126251
16	GUIDE	SA-29 CS	1	1122296
17	GUIDE STEM	SA-29 CS	1	1122235
18	SCREW "E" ORIFICE	18-8 SS	1	1120637
	SCREW "F" AND "G" ORIFICE	18-8 SS	1	1121893
* 19	NAMEPLATE	304 SS	1	1150439
* 20	DRIVE SCREW	18-8 SS	4	1032590
21	SEAL WIRE AND LEAD	STEEL AND LEAD	1	1125115

* NOT SHOWN

Contact Norriseal-WellMark today for more information about products and services

NRS_INFO@APERGY.COM • NORRISEALWELLMARK.COM

HOUSTON: 713.466.3552 • MIDLAND: 432.238.3919 • OKLAHOMA CITY: 405.672.6660 • BROUSSARD: 337.837.3223 • KENEDY: 830.583.8112

