

# Threaded and Flanged Safety Relief Valves

## RV10 Series

The RV10 safety relief valve is well-suited for overpressure protection of production equipment, including compressors, scrubbers, separators, pipelines or anywhere overpressure protection may be required. The design incorporates a non-rising stem to give the disk full guidance while opening and closing. The non-rising stem coupled with the valve's soft-seat design ensures long-lasting set pressure repeatability and bubble-tight shutoff. The shorter stem also makes the valve more compact, making it ideal for requirements where space may be an issue.

The RV10 is ASME certified for gas and liquid service and is available in NPT and flanged connections. Flanged sizes meet API 526 dimensions. The RV10 series covers set pressure ranges from 15-3000 psi (103-20684 kPa) with orifice sizes ranging from D to Q. Orifice sizes exceed API minimum areas for increased flow rates.

The RV10 is manufactured in accordance with the ASME Boiler and Pressure Vessel Code, capacity tested and certified by the National Board and meets the requirements of Section VIII, Division 1 of the ASME Code.

### Specifications

- Set Pressure Range:** 15 - 3000 psi (varies by model)
- Temperature Range:** -50° F to 400° F (-45° C to 204° C)
- Seat Tightness:** Meets or exceeds API 527
- Materials:**

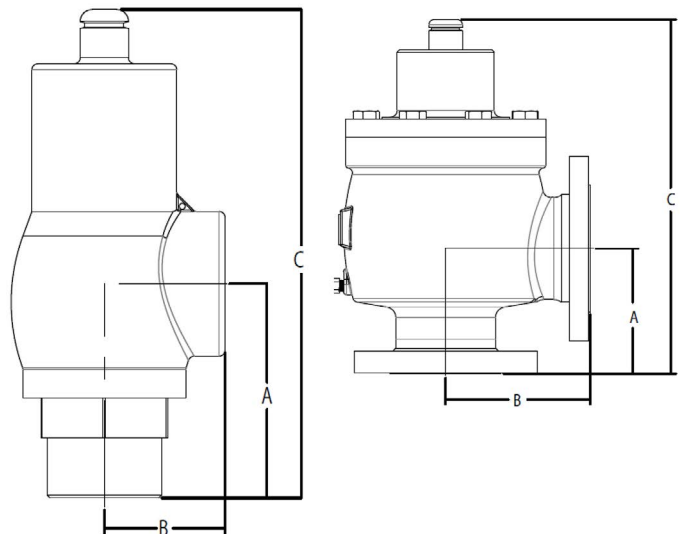
- Base:** ASME SA105, SA479 316, A350 LF2 (low-temp option)
- Body:** ASME SA216 WCB, SA352 LCB (low-temp option)
- Bonnet:** ASME SA216 WCB, SA352 LCB (low-temp option)
- Bolts:** ASME SA193 Gr B7
- Spring:** 17-7 Stainless (standard), Inconel® X-750 (NACE)
- Trim:** ASTM 304/316 stainless
- Soft Seat:** Viton®, carbon-filled PTFE®



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### Dimensions

See Tables 2 and 3 for Dimensions.



**Table 1 - Air Capacities in SCFM (14.7 psia & 60° F)**

Set Pressure	Orifice Letter Designation									
	Orifice Area (in <sup>2</sup> )									
	D	E	F	G	H	J	K	L	M	Q
	0.130	0.220	0.357	0.478	0.913	1.440	2.100	3.300	4.100	12.700
15	59	100	162	217	414	653	952	1496	1859	5758
20	68	115	187	250	477	753	1098	1725	2143	6638
25	77	130	211	283	541	853	1243	1954	2427	7519
30	86	145	236	316	604	952	1389	2182	2712	8399
40	106	179	291	389	743	1172	1709	2686	3337	10336
50	126	213	345	462	882	1392	2029	3189	3962	12273
60	145	246	399	535	1022	1611	2350	3692	4588	14210
75	175	296	481	644	1230	1941	2830	4447	5525	17116
100	225	380	617	826	1579	2490	3631	5706	7089	21958
125	274	464	753	1009	1927	3039	4432	6964	8652	26800
150	324	548	889	1191	2275	3588	5232	8222	10215	31643
175	373	632	1026	1373	2623	4137	6033	9480	11779	36485
200	423	716	1162	1555	2971	4686	6834	10739	13342	41327
250	522	884	1434	1920	3667	5784	8435	13255	16468	51012
300	621	1051	1706	2284	4363	6882	10036	15772	19595	60697
350	720	1219	1978	2649	5060	7980	11638	18288	22722	70382
400	820	1387	2251	3014	5756	9078	13239	20805	25848	80066
450	919	1555	2523	3378	6452	10176	14841	23321	28975	89751
500	1018	1723	2795	3743	7148	11275	16442	25838	32101	99436
550	1117	1890	3067	4107	7845	12373	18044	28354	35228	109120
600	1216	2058	3340	4472	8541	13471	19645	30871	38354	118805
650	1315	2226	3612	4836	9237	14569	21246	33387	41481	128490
700	1414	2394	3884	5201	9933	15667	22848	35904	44608	138175
750	1514	2561	4156	5565	10630	16765	24449	38420	47734	147859
800	1613	2729	4429	5930	11326	17863	26051	40937	50861	157544
850	1712	2897	4701	6294	12022	18961	27652	43453	53987	167229
900	1811	3065	4973	6659	12718	20059	29253	45970	57114	176914
950	1910	3232	5245	7023	13415	21158	30855	48486	60240	186598
1000	2009	3400	5518	7388	14111	22256	32456	51003	63367	196283
1200	2406	4071	6607	8846	16896	26648	38862	61069	75873	235022
1300	2604	4407	7151	9575	18288	28844	42065	66102	82126	254391
1440	2882	4877	7913	10595	20238	31919	46549	73148	90881	281509
1500	3001	5078	8240	11033	21073	33237	48470	76168	94633	293130
2000	3992	6756	10962	14678	28035	44218	64484	101333	125898	389978
2250	4488	7594	12324	16500	31517	49708	72492	113915	141531	438401
2500	4983	8433	13685	18323	34998	55199	80499	126498	157164	486825
2750	5479	9272	15046	20146	38479	60690	88506	139080	172797	535249
3000	5975	10111	16407	21968	41960	66180	96513	151663	188430	583672

kd = .756

To convert capacities to another gas, divide by the square root of the specific gravity of the desired gas.

To convert SCFM to m<sup>3</sup> /hr multiply by 1.699.

**Table 1 - Water Capacities in GPM (60° F)**

Set Pressure	Orifice Letter Designation									
	Orifice Area (in <sup>2</sup> )									
	D	E	F	G	H	J	K	L	M	Q
	0.130	0.220	0.357	0.478	0.913	1.440	2.100	3.300	4.100	12.700
15	14	23	38	51	97	153	223	350	435	1347
20	16	26	43	57	109	173	252	396	492	1523
25	17	29	47	63	121	191	278	437	542	1680
30	19	32	51	69	131	207	302	474	589	1824
40	22	36	59	79	151	239	348	547	680	2106
50	24	41	66	89	169	267	389	612	760	2355
60	26	45	73	97	185	293	427	670	833	2580
75	30	50	81	109	207	327	477	749	931	2884
100	34	58	94	125	239	378	551	865	1075	3331
125	38	65	105	140	268	422	616	968	1202	3724
150	42	71	115	154	293	463	674	1060	1317	4079
175	45	76	124	166	317	500	729	1145	1422	4406
200	48	82	132	177	339	534	779	1224	1521	4710
250	54	91	148	198	379	597	871	1368	1700	5266
300	59	100	162	217	415	654	954	1499	1862	5769
350	64	108	175	235	448	706	1030	1619	2012	6231
400	68	115	187	251	479	755	1101	1731	2150	6661
450	72	122	199	266	508	801	1168	1836	2281	7065
500	76	129	209	280	535	844	1231	1935	2404	7447
550	80	135	220	294	562	886	1292	2030	2522	7811
600	84	141	229	307	586	925	1349	2120	2634	8158
650	87	147	239	320	610	963	1404	2206	2741	8491
700	90	153	248	332	633	999	1457	2290	2845	8812
750	93	158	256	343	656	1034	1508	2370	2945	9121
800	96	163	265	355	677	1068	1558	2448	3041	9420
850	99	168	273	365	698	1101	1606	2523	3135	9710
900	102	173	281	376	718	1133	1652	2596	3226	9992
950	105	178	289	386	738	1164	1697	2667	3314	10265
1000	108	182	296	396	757	1194	1742	2737	3400	10532
1200	118	200	324	434	829	1308	1908	2998	3725	11537
1300	123	208	338	452	863	1362	1986	3120	3877	12008
1440	129	219	355	476	909	1433	2090	3284	4080	12638
1500	132	223	363	485	927	1463	2133	3352	4164	12899
2000	152	258	419	561	1071	1689	2463	3870	4808	14894
2250	162	274	444	595	1136	1791	2612	4105	5100	15798
2500	170	288	468	627	1197	1888	2754	4327	5376	16653
2750	179	303	491	657	1256	1980	2888	4538	5638	17465
3000	187	316	513	687	1311	2068	3016	4740	5889	18242

Kd = .658

To convert capacities to another liquid, divide by the square root of the specific gravity of the desired liquid.

**Table 2 - Inlet/Outlet Codes, Dimensions & Weights (NPT)**

Inlet/Outlet Code	Inlet/Outlet	A, B, C Dims (inches)	Orifice Sizes	Pressure Range (psi)	Approximate Weight (lbs)
N01	3/4" MNPT X 3/4" FNPT	3.25 X 1.88 X 8.13	D	15-3000	5
			E	15-2400	5
N02	3/4" MNPT X 1" FNPT	3.25 X 1.88 X 8.13	D	15-3000	5
			E	15-2400	5
N03	3/4" FNPT X 3/4" FNPT	2.25 X 1.88 X 7.25	D	15-3000	5
			E	15-2400	5
N04	3/4" FNPT X 1" FNPT	2.25 X 1.88 X 7.25	D	15-3000	5
			E	15-2400	5
N05	1" MNPT X 1" FNPT	3.25 X 1.88 X 8.13	D	15-3000	5.5
			E	15-2400	5.5
N06	1" FNPT X 1" FNPT	3.25 X 1.88 X 8.13	D	15-3000	5.5
			E	15-2400	5.5
N07	1" MNPT X 1 1/2" FNPT	4.50 X 2.38 X 10.12	D	15-3000	13
			E	15-2400	13
N08	1" FNPT X 1 1/2" FNPT	3.38 X 2.38 X 9.00	D	15-3000	13
			E	15-2400	13
N09	1" MNPT X 2" FNPT	4.50 X 2.38 X 10.12	D	15-3000	13
			E	15-2400	13
N10	1" FNPT X 2" FNPT	3.38 X 2.38 X 9.00	D	15-3000	13
			E	15-2400	13
N11	1 1/2" MNPT X 2" FNPT	4.50 X 2.38 X 10.12	D	15-3000	14
			E	15-2400	14
N12	2" MNPT x 2" FNPT	4.50 X 2.38 X 10.12	D	15-3000	14
			E	15-2400	14
N13	1 1/2" MNPT X 2" FNPT	4.44 X 2.38 X 10.13	F	15-2400	14
			G	15-2000	14
N14	1 1/2" FNPT X 2" FNPT	4.63 X 2.38 X 10.38	F	15-2400	14
			G	15-2000	14
N15	2" MNPT X 2" FNPT	4.44 X 2.38 X 10.13	F	15-2400	14
			G	15-2000	14
N16	2" FNPT X 2" FNPT	4.63 X 2.38 X 10.38	F	15-2400	14
			G	15-2000	14
N17	1 1/2" MNPT X 2" FNPT	4.25 X 3.00 X 12.31	H	15-850	26
N18	1 1/2" FNPT X 2" FNPT	3.00 X 3.00 X 11.06	H	15-850	25
N19	2" MNPT X 2" FNPT	4.25 X 3.00 X 12.31	H	15-850	26
N20	2" MNPT X 2" FNPT	4.25 X 3.00 X 14.38 (Tall Bonnet)	H	851-2000	31
N21	2" FNPT X 2" FNPT	3.00 X 3.00 X 11.06	H	15-850	24
N22	2" FNPT X 2" FNPT	3.00 X 3.00 X 13.13 (Tall Bonnet)	H	851-2000	30
N23	2" MNPT X 2 1/2" FNPT	4.25 X 3.00 X 12.31	H	15-850	25
N24	2" MNPT X 2 1/2" FNPT	4.25 X 3.00 X 14.38 (Tall Bonnet)	H	851-2000	30
N25	2" FNPT X 2 1/2" FNPT	3.00 X 3.00 X 11.06	H	15-850	24
N26	2" FNPT X 2 1/2" FNPT	3.00 X 3.00 X 13.13 (Tall Bonnet)	H	851-2000	29
N27	2 " MNPT X 3" FNPT	5.50 X 4.25 X 13.75	J	15-450	48
N28	2 " MNPT X 3" FNPT	5.50 X 4.25 X 16.95 (Tall Bonnet)	J	451-800	54
N29	2 " FNPT X 3" FNPT	3.75 X 4.25 X 12.00	J	15-450	46
N30	2 " FNPT X 3" FNPT	3.75 X 4.25 X 15.20 (Tall Bonnet)	J	451-800	52

**Table 2 - (NPT) Continued**

Inlet/Outlet Code	Inlet/Outlet	A, B, C Dims (inches)	Orifice Sizes	Pressure Range (psi)	Approximate Weight (lbs)
N31	3" MNPT X 3" FNPT	5.50 X 4.25 X 13.75	J	15-450	50
			K	15-285	50
N32	3" MNPT X 3" FNPT	5.50 X 4.25 X 16.95 (Tall Bonnet)	J	451-800	56
			K	286-750	56

**Table 3 - Inlet/Outlet Codes, Dimensions & Weights (Flanged)**

Inlet/Outlet Code	Inlet/Outlet	A, B, C Dims (inches)	Orifice Sizes	Pressure Range (psi)	Approximate Weight (lbs)
F01	3/4" 150 X 1" 150	4.13 X 4.50 X 9.00	D	15-285	9
F02	3/4" 300 X 1" 150	4.13 X 4.50 X 9.00	D	15-740	10
F03	3/4" X 600 X 1" 150	4.13 X 4.50 X 9.00	D	15-1480	11
F04	3/4" 900/1500 X 1" 300	4.13 X 4.50 X 9.00	D	15-3000	14
F05	1" 150 X 1" 150	4.13 X 4.50 X 9.00	D, E	15-285	12
F06	1" 300 X 1" 150	4.13 X 4.50 X 9.00	D, E	15-740	13
F07	1" 600 X 1" 150	4.13 X 4.50 X 9.00	D, E	15-1480	14
F08	1" 900/1500 X 1" 300	4.13 X 4.50 X 9.00	D	15-3000	18
			E	15-2400	18
F09	1" 150 X 1-1/2" 150	4.13 X 4.50 X 9.00	D, E	15-285	13
F10	1" 300 X 1-1/2" 150	4.13 X 4.50 X 9.00	D, E	15-740	14
F11	1" 600 X 1-1/2" 150	4.88 X 4.50 X 10.50	D, E	15-1480	15
F12	1" 900/1500 X 1-1/2" 300	4.88 X 4.50 X 10.50	D	15-3000	19
			E	15-2400	19
F13	1" 150 X 2" 150	4.13 X 4.50 X 9.00	D, E	15-285	14
F14	1" 300 X 2" 150	4.13 X 4.50 X 9.00	D, E	15-740	15
F15	1" 600 X 2" 150	4.75 X 4.50 X 9.00	D, E	15-1480	16
F16	1" 900/1500 X 2" 300	5.25 X 5.50 X 10.88	D	15-3000	24
			E	15-2400	24
F17	1 1/2" 150 X 2" 150	4.88 X 4.75 X 9.75	D, E	15-285	22
F18	1 1/2" 300 X 2" 150	4.88 X 4.75 X 9.75	D, E	15-740	23
F19	1 1/2" 600 X 2" 150	4.88 X 4.75 X 9.75	D, E	15-1480	24
F20	1 1/2" 900/1500 X 2" 300	4.13 X 5.50 X 9.00	D	15-3000	32
			E	15-2400	32
F21	1 1/2" 150 X 2" 150	4.88 X 4.75 X 10.50	F, G	15-285	22
F22	1 1/2" 300 X 2" 150	4.88 X 6.00 X 10.50	F, G	15-740	25
F23	1 1/2" 600 X 2" 150	4.88 X 6.00 X 10.50	F, G	15-1480	25
F24	1 1/2" 900/1500 X 2" 300	5.88 X 6.00 X 11.50	F	15-2400	33
			G	15-2000	33
F25	1 1/2" 150 X 3" 150	4.88 X 4.75 X 10.50	F, G	15-285	35
F26	1 1/2" 300 X 3" 150	4.88 X 6.00 X 10.50	F, G	15-740	38
F27	1 1/2" 600 X 3" 150	4.88 X 6.00 X 10.50	F, G	15-1480	38
F28	1 1/2" 900/1500 X 3" 300	4.88 X 6.50 X 10.50	F	15-2400	50
			G	15-2000	50
F29	1 1/2" 150 X 2" 150	4.88 X 4.75 X 12.63	H	15-285	34
F30	1 1/2" 300 X 2" 150	4.88 X 4.75 X 12.63	H	15-740	38
F31	1 1/2" 600 X 2" 150	4.88 X 4.75 X 12.63	H	15-850	38
F85	1 1/2" 900/1500 x 2" 300	5.88 X 6.00 X 16.19	H	851-2000	51

**Table 3 - (Flanged) Continued**

Inlet/Outlet Code	Inlet/Outlet	A, B, C Dims (inches)	Orifice Sizes	Pressure Range (psi)	Approximate Weight (lbs)
F32	1 1/2" 150 X 3" 150	5.13 X 4.88 X 12.88	H	15-285	38
F33	1 1/2" 300 X 3" 150	5.13 X 4.88 X 12.88	H	15-740	42
F34	2" 150 X 2" 150	4.88 X 4.75 X 10.50	F, G	15-285	34
F35	2" 300 X 2" 150	4.88 X 4.75 X 10.50	F, G	15-740	36
F36	2" 600 X 2" 150	5.38 X 6.00 X 11.00	F, G	15-1480	38
F37	2" 900/1500 X 2" 300	6.06 X 6.00 X 11.69	F	15-2400	55
			G	15-2000	55
F38	2" 150 X 2" 150	4.88 X 4.75 X 12.63	H	15-285	36
F39	2" 300 X 2" 150	4.88 X 4.75 X 12.63	H	15-740	38
F40	2" 600 X 2" 150	4.88 X 6.00 X 12.63	H	15-850	40
F41	2" 150 X 2 1/2" 150	4.88 X 4.75 X 12.63	H	15-285	39
F42	2" 300 X 2 1/2" 150	4.88 X 4.75 X 12.63	H	15-740	40
F43	2" 600 X 2 1/2" 150	4.88 X 6.00 X 12.63	H	15-850	42
F44	2" 600 X 2 1/2" 150	4.88 X 6.00 X 15.19 (Tall Bonnet)	H	851-1480	47
F45	2" 900 X 2 1/2" 150	6.06 X 6.00 X 16.38 (Tall Bonnet)	H	851-2000	65
F46	2" 150 X 3" 150	4.88 X 5.38 X 10.50	F, G	15-285	38
F47	2" 300 X 3" 150	4.88 X 5.38 X 10.50	F, G	15-740	40
F48	2" 600 X 3" 150	6.06 X 6.38 X 11.69	F, G	15-1480	42
F49	2" 900/1500 X 3" 300	6.06 X 6.38 X 11.69	F	15-2400	60
			G	15-2000	60
F71	2" 150 X 3" 150	6.06 X 4.75 X 13.75	H	15-285	40
F72	2" 300 X 3" 150	5.13 X 4.88 X 12.88	H	15-740	42
F73	2" 600 X 3" 150	6.06 X 6.38 X 13.69	H	15-850	44
F74	2" 600 X 3" 150	6.06 X 6.38 X 16.38 (Tall Bonnet)	H	851-1480	48
F75	2" 900 X 3" 150	6.06 X 6.38 X 16.38 (Tall Bonnet)	H	851-2000	66
F50	2" 150 X 3" 150	5.38 X 4.88 X 13.75	J	15-285	61
F51	2" 300 X 3" 150	5.38 X 4.88 X 13.75	J	15-450	62
F52	2" 300 X 3" 150	5.38 X 4.88 X 16.88 (Tall Bonnet)	J	451-740	69
F53	2" 600 X 3" 150	5.38 X 4.88 X 16.88 (Tall Bonnet)	J	451-1480	69
F68	3" 150 X 4" 150	7.25 X 7.13 X 15.50	J	15-285	77
F54	3" 300 X 4" 150	7.25 X 7.13 X 15.50	J	15-450	78
F55	3" 300 X 4" 150	7.25 X 7.13 X 18.69 (Tall Bonnet)	J	451-740	85
F56	3" 150 X 4" 150	6.13 X 6.38 X 17.38	K	15-285	117
F57	3" 300 X 4" 150	6.13 X 6.38 X 17.38	K	15-450	121
F86	3" 300 X 4" 150	6.16 x 6.38 x 23.00 (Tall Bonnet)	K	451-740	147
F58	3" 600 X 4" 150	7.25 X 7.13 X 18.69 (Tall Bonnet)	J, K	740-1480	88
F59	3" 900 X 4" 150	7.25 X 7.13 X 18.69 (Tall Bonnet)	J	1481-1800	97
F60	3" 150 X 4" 150	6.13 X 6.50 X 17.38	L	15-285	124
F61	3" 300 X 4" 150	6.13 X 6.50 X 17.38	L	15-300	128
F62	4" 300 X 6" 150	7.06 X 7.13 X 17.38	L	15-300	144
F64	4" 300 X 6" 150	7.06 X 7.13 X 23.06 (Tall Bonnet)	L	301-740	174
F65	4" 600 X 6" 150	7.06 X 8.00 X 23.06 (Tall Bonnet)	L	601-1250	185
F66	4" 150 X 6" 150	7.00 X 7.00 X 17.25	M	15-250	92
F67	4" 150 X 6" 150	7.00 X 7.00 X 23.00 (Tall Bonnet)	M	251-285	166
F69	4" 300 X 6" 150	7.00 X 7.00 X 23.00 (Tall Bonnet)	M	251-740	174

**Table 3 - (Flanged) Continued**

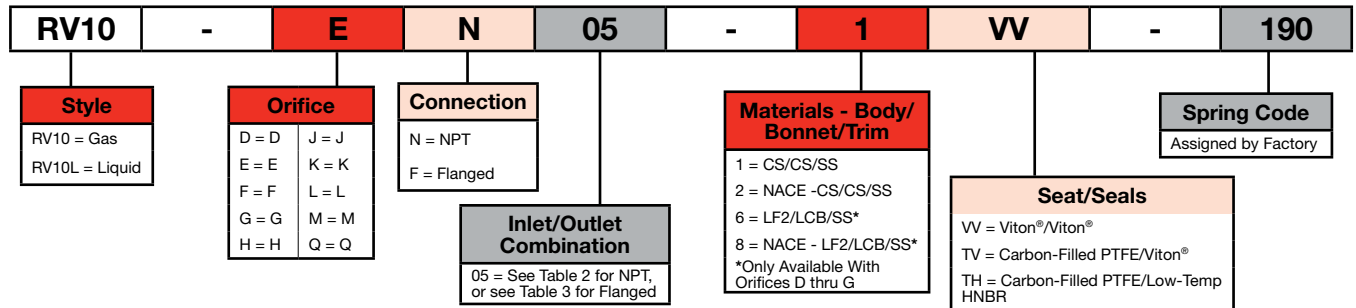
Inlet/Outlet Code	Inlet/Outlet	A, B, C Dims (inches)	Orifice Sizes	Pressure Range (psi)	Approximate Weight (lbs)
F70	4" 600 X 6" 150	7.00 X 8.00 X 23.00 (Tall Bonnet)	M	251-1000	184
F80	6" 150 X 8" 150	9.44 X 9.50 X 26.39	Q	15-100	296
F81	6" 150 X 8" 150	9.44 X 9.50 X 34.87(Tall Bonnet)	Q	101-165	352
F82	6" 300 X 8" 150	9.44 X 9.50 X 34.87(Tall Bonnet)	Q	101-300	367
F83	6" 600 X 8" 150	9.44 X 9.50 X 34.87(Tall Bonnet)	Q	101-600	395

**How to Order**

Options are listed below. All configurations may not be available. Call your sales representative or FW Murphy for more information. Repair kits are available.

Example Model No. **RV10-EN05-1VV-190**

RV10 Series Relief Valve, E Orifice, 1" Male NPT Inlet X 1" Female NPT Outlet, Carbon Steel Body/Bonnet with Stainless Trim, Viton® Seat and Viton® Seals with a 86-190 PSI Spring



FW Murphy is the exclusive BMD distributor for new equipment packages.

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