

REGULATORS

402 & 403 Series

Pressure Regulating Valve

Watson McDaniel reserves the right to change the designs and/or materials of its products without notice.
©2010 Watson McDaniel Company

Model	402	403
Service	Steam & Air	
Sizes	1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 2 1/2", 3", 4"	
Connections	NPT, 150# & 300# Flanged	
Body Material	Ductile Iron	
Seat & Disc	Hardened 420 Stainless Steel (55 Rc)	
Max. Inlet Pressure	250 PSIG	450 PSIG
Min. Inlet Pressure	20 PSIG	20 PSIG
Max. Diff. Pressure	150 PSI	250 PSI
Min. Diff. Pressure	15% of Inlet Pressure (10 PSI min)	



402/403
Flanged

DESIGN PRESSURE/TEMPERATURE RATING – PMA/TMA

NPT	450 PSIG @ 650°F
150# FLG	150 PSIG @ 566°F
300# FLG	450 PSIG @ 650°F

TYPICAL APPLICATIONS

The **402** and **403** Series Internally Pilot-Operated Pressure Regulating Valves are used for pressure reduction on steam mains and other process equipment. Pilot-operated regulators will maintain a constant and accurate downstream pressure regardless of fluctuations in supply pressure or usage. These regulators can be supplied with an internal sensing option eliminating the external sensing line.

FEATURES & OPTIONS

- Internal pilot minimizes outlet pressure fluctuations. Outlet pressure remains constant even when load varies
- Internal Sensing option (If requested the regulator can be modified to internally sense pressure eliminating the need for an external sensing line)
- Ductile Iron body to handle increased pressure and temperature
- Hardened stainless steel seat and disc (55 Rc)
- 403 Series regulators use stainless steel wear parts for a higher operating pressure rating (PMO of 450 PSIG)

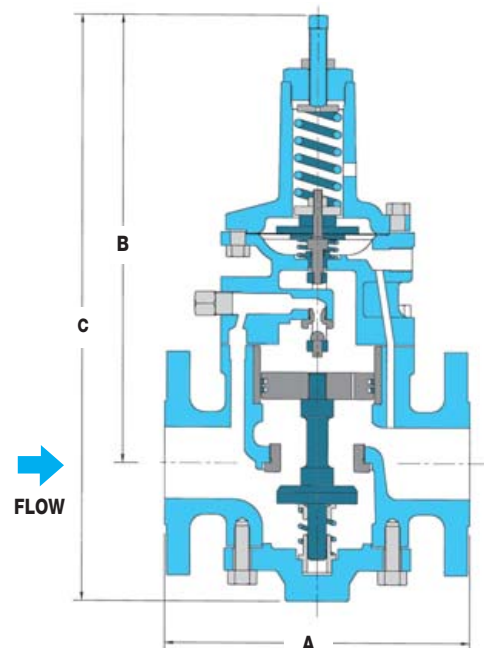
HOW TO SIZE/ORDER

From the Capacity chart, find the inlet pressure and required regulator outlet pressure. Follow across chart to nearest capacity of application service medium that meets or slightly exceeds demand requirements. Follow vertically up to determine appropriate size. When exact application values are not shown, interpolation between values is acceptable. From the Spring Ranges chart, select the ideal spring range that accommodates the required outlet set pressure. Select valve model suitable for system pressure requirements. Specify Internal or External (Remote) sensing. Example:

Application: 12,500 lbs/hr of 300 PSIG Steam reduced to 125 PSIG
Size/Model: 2" 403 Series Valve, 100-200 PSIG spring range,
Specify internal or external sensing

PRESSURE-ADJUSTING SPRING RANGES

Springs	Outlet Pressure (PSIG)	Spring No.	Identifying Colors
Single	0-10	13	blue/yellow
	10-50	14	black/yellow
	40-100	9	red/yellow
	100-200	10	green/blue
	200-280	special	bellville washers
Double	30-125	14	black/yellow
		9	red/yellow
	50-200	9	red/yellow
		10	green/blue



402 & 403 Series Pressure Regulating Valve

DIMENSIONS & WEIGHTS – inches/pounds

Size	Face-to-Face A			Centerline to Top B		Overall Height C		Weight (lbs)
	NPT Threaded	150# Flanged	300# Flanged	Single Spring	Double Spring	Single Spring	Double Spring	
1/2"	4 ¹ / ₂			12	14 ³ / ₈	14 ³ / ₈	16 ³ / ₄	19
3/4"	4 ¹ / ₂			12	14 ³ / ₈	14 ³ / ₈	16 ³ / ₄	19
1"	4 ¹ / ₂			12	14 ³ / ₈	14 ³ / ₈	16 ³ / ₄	19
1 1/4"	8 ³ / ₁₆			12 ³ / ₄	15 ¹ / ₈	16 ¹ / ₈	18 ¹ / ₂	36
1 1/2"	8 ³ / ₁₆			12 ³ / ₄	15 ¹ / ₈	16 ¹ / ₈	18 ¹ / ₂	36
2"	8 ³ / ₄	8 ¹ / ₄	8 ³ / ₄	13	15 ³ / ₈	17 ¹ / ₈	19 ¹ / ₂	50
2 1/2"		9 ¹ / ₈	9 ³ / ₄	13 ³ / ₄	16 ¹ / ₈	18 ¹ / ₄	20 ⁵ / ₈	70
3"		9 ³ / ₄	10 ¹ / ₂	14 ³ / ₄	16 ¹ / ₈	19 ³ / ₄	22 ¹ / ₈	82
4"		13 ¹ / ₂	14	16	18 ³ / ₈	24	26 ³ / ₈	170

DIRECT-OPERATED
REGULATING VALVES

CAPACITIES – Steam (lbs/hr); Air (SCFM)

Inlet/Outlet Pressures (PSIG)

Inlet Press.	Outlet Press.	1/2", 3/4"		1"		1 1/4"		1 1/2"		2"		2 1/2"		3"		4"	
		Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air
20	0-10	175	60	425	145	600	204	850	289	1300	442	2750	935	3850	1309	4900	1666
	0-10	270	88	655	213	924	300	1309	425	2002	650	4235	1375	5929	1925	7546	2450
30	20	203	67	493	162	696	228	986	323	1508	494	3190	1045	4466	1463	5684	1862
	0-20	385	130	935	315	1320	444	1870	629	2860	962	6050	2035	8470	2849	10780	3626
50	30	343	116	833	281	1176	396	1666	561	2548	858	5390	1815	7546	2541	9604	3234
	0-50	690	231	1675	561	2364	792	3349	1122	5122	1716	10835	3630	15169	5082	19306	6468
100	60	637	214	1547	519	2184	732	3094	1037	4732	1586	10010	3355	14014	4697	17836	5978
	80	455	151	1105	366	1560	516	2210	731	3380	1118	7150	2365	10010	3311	12740	4214
125	0-60	865	287	2100	697	2964	984	4199	1394	6422	2132	13585	4510	19019	6314	24206	8036
	70	805	270	1955	655	2760	924	3910	1309	5980	2002	12650	4235	17710	5929	22540	7546
150	100	588	196	1428	476	2016	672	2856	952	4368	1456	9240	3080	12936	4312	16464	5488
	0-70	1019	343	2474	833	3492	1176	4947	1666	7566	2548	16005	5390	22407	7546	28518	9604
200	100	858	287	2083	697	2940	984	4165	1394	6370	2132	13475	4510	18865	6314	24010	8036
	125	609	214	1479	519	2088	732	2958	1037	4524	1586	9570	3355	13398	4697	17052	5978
250	0-100	1337	445	3247	1080	4584	1524	6494	2159	9932	3302	21010	6985	29414	9779	37436	12446
	150	1001	333	2431	808	3432	1140	4862	1615	7436	2470	15730	5225	22022	7315	28028	9310
300	175	739	245	1794	595	2532	840	3587	1190	5486	1820	11605	3850	16247	5390	20678	6860
	0-125	1652	550	4012	1335	5664	1884	8024	2669	12272	4082	25960	8635	36344	12089	46256	15386
400	175	1358	452	3298	1097	4656	1548	6596	2193	10088	3354	21340	7095	29876	9933	38024	12642
	200	1138	378	2763	918	3900	1296	5525	1836	8450	2808	17875	5940	25025	8316	31850	10584
450	0-150	2016	665	4896	1615	6912	2280	9792	3230	14976	4940	31680	10450	44352	14630	56448	18620
	200	2016	665	4896	1615	6912	2280	9792	3230	14976	4940	31680	10450	44352	14630	56448	18620
500	250	1250	417	3035	1012	4284	1428	6069	2023	9282	3094	19635	6545	27489	9163	34986	11662
	0-200	2657	875	6452	2125	9108	3000	12903	4250	19734	6500	41745	13750	58443	19250	74382	24500
600	280	2146	711	5211	1726	7356	2436	10421	3451	15938	5278	33715	11165	47201	15631	60074	19894
	0-225	2975	984	7225	2389	10200	3372	14450	4777	22100	7306	46750	15455	65450	21637	83300	27538
700	280	2975	984	7225	2389	10200	3372	14450	4777	22100	7306	46750	15455	65450	21637	83300	27538

Note: For capacities of other gases multiply the air capacities by the following factors: Argon-0.85 CO₂-0.81 Helium-2.69 Nitrogen-1.02