

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

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

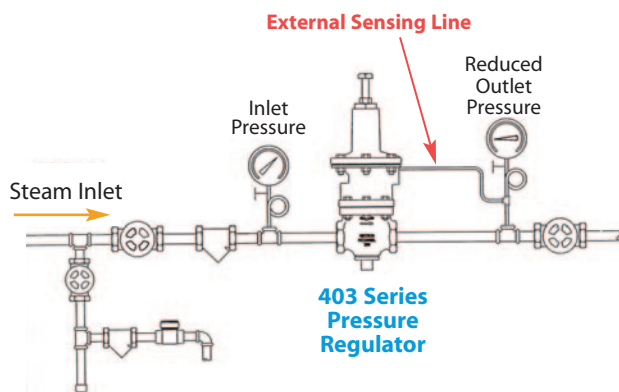
The **403 Series** pilot-operated (piston-actuated) pressure regulating valves are used for pressure reduction on steam mains and other process equipment. Pilot-operated regulators will maintain a constant and accurate downstream pressure regardless of fluctuations in supply pressure or usage. These regulators can be supplied with an optional internal sensing line which simplifies installation. Piston-actuated regulators are more compact than Diaphragm-actuated regulators. The 403 Series contains all stainless steel internals for high-pressure applications up to 450 PSIG. The Double-Spring option is available for a wider range of reduced pressures.

Features & Options

- Pilot-operated regulators minimize outlet pressure fluctuations 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)

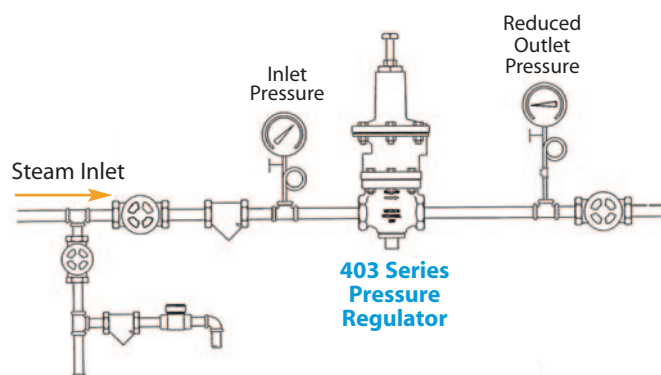
Pressure Reducing Station with External Sensing Line

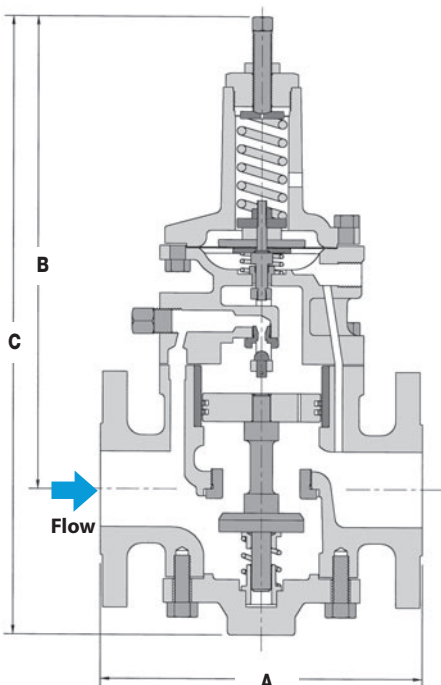
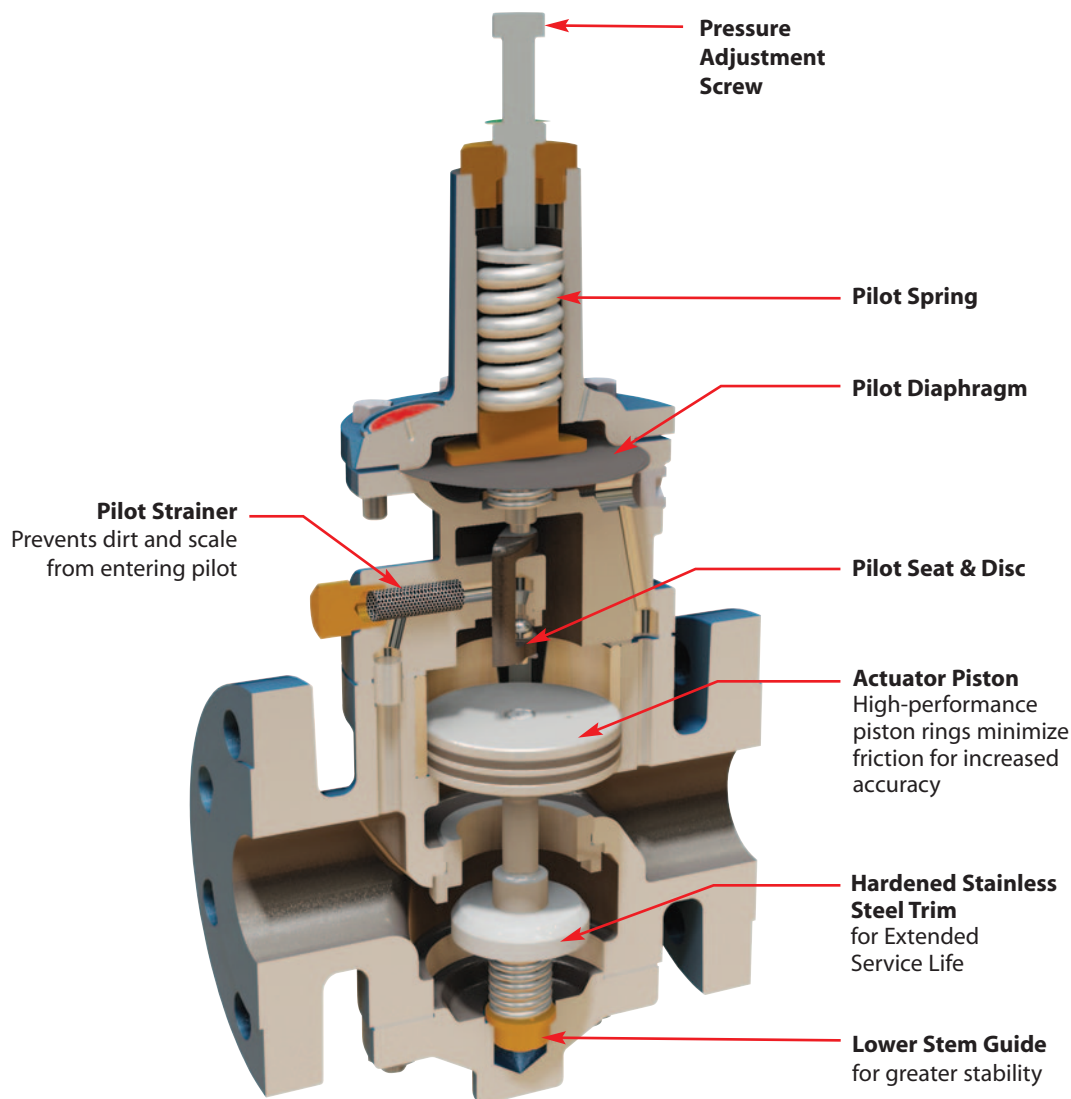
External Sensing (standard)
(requires sensing line)



Pressure Reducing Station with Internal Sensing Line

Internal Sensing Option
(Specially drilled internal sensing path eliminates the need for an external sensing line)





DIMENSIONS — inches

Size	Face-to-Face A			Centerline to Top B		Overall Height C	
	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
3/4"	4 1/2			12	14 3/8	14 3/8	16 3/4
1"	4 1/2			12	14 3/8	14 3/8	16 3/4
1 1/4"	8 3/16			12 3/4	15 1/8	16 1/8	18 1/2
1 1/2"	8 3/16			12 3/4	15 1/8	16 1/8	18 1/2
2"	8 3/4	8 1/4	8 3/4	13	15 3/8	17 1/8	19 1/2
2 1/2"		9 1/8	9 3/4	13 3/4	16 1/8	18 1/4	20 5/8
3"		9 3/4	10 1/2	14 3/4	16 1/8	19 3/4	22 1/8
4"		13 1/2	14	16	18 3/8	24	26 3/8

Regulators

Pressure Regulating Valve

403 Series
Pilot-Operated

How to Size/Order

From the Capacity chart, find the inlet pressure and required regulator outlet pressure. Follow across chart to nearest capacity (steam, air) that meets or slightly exceeds demand requirements. Follow vertically up to determine appropriate size. When exact application values are not shown, interpolate between values. From the spring range chart, select the spring range that accommodates the required outlet set pressure. Specify Internal or External (remote) Pressure sensing.

Example:

Application: 12,500 lbs/hr of 300 PSIG Steam reduced to 125 PSIG
Model Code: **403-17-N-0010-R** (2" 403 Series Valve, 100-200 PSIG spring range, with external sensing)

Note: Flange selection may reduce pressure/temperature ratings.

Size/Connection	Model Code *	Weight lbs
REMOTE Pressure Sensing - Requires External Sensing Line		
1/2" NPT	403-12-N-X-R	20
3/4" NPT	403-13-N-X-R	20
1" NPT	403-14-N-X-R	20
1 1/4" NPT	403-15-N-X-R	37
1 1/2" NPT	403-16-N-X-R	38
NPT	403-17-N-X-R	54
2" 150# FLG	403-17-F150-X-R	54
300# FLG	403-17-F300-X-R	56
2 1/2" 150# FLG	403-18-F150-X-R	66
300# FLG	403-18-F300-X-R	69
3" 150# FLG	403-19-F150-X-R	88
300# FLG	403-19-F300-X-R	96
4" 150# FLG	403-20-F150-X-R	174
300# FLG	403-20-F300-X-R	182
INTERNAL Pressure Sensing - No Sensing Line Required		
1/2" NPT	403-12-N-X-I	20
3/4" NPT	403-13-N-X-I	20
1" NPT	403-14-N-X-I	20
1 1/4" NPT	403-15-N-X-I	37
1 1/2" NPT	403-16-N-X-I	38
NPT	403-17-N-X-I	54
2" 150# FLG	403-17-F150-X-I	54
300# FLG	403-17-F300-X-I	56
2 1/2" 150# FLG	403-18-F150-X-I	66
300# FLG	403-18-F300-X-I	69
3" 150# FLG	403-19-F150-X-I	88
300# FLG	403-19-F300-X-I	96
4" 150# FLG	403-20-F150-X-I	174
300# FLG	403-20-F300-X-I	182

X = Spring Code (reference Spring Selection Table).



403 Spring Selection Table

Reduced Outlet Pressure PSI	Spring #	Code = X	Color
SINGLE Spring Ranges			
0 to 10	#13	0013	Blue & yellow
10 to 50	#14	0014	Black & yellow
40 to 100	#9	0009	Red & yellow
100 to 200	#10	0010	Green & blue
DOUBLE Spring Ranges			
30 to 125	#14 & #9	1409	Red & yellow Black & yellow
50 to 200	#9 & #10	0910	Red & yellow Green & blue

Note: For 200 - 280 PSI use Bellville washers (Code = **0015**)

Notes:

Must Specify Spring Code when Ordering:

Use the 403 Spring Selection Table to specify the proper spring(s) based on reduced pressure range by replacing the "X" with Spring Code from chart.

Internal Sensing (not available with 0-10 PSI range)

Pressure Sensing Codes:

Code R - Remote Pressure Sensing
Code I - Internal Pressure Sensing

Example Model Code:

1) **403-15-N-0014-R**
(403 Series, 1 1/4" NPT, 10-50 PSI, Remote Pressure Sensing)

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
Cv Factors		3.5		8.5		12		17		26		55		77		98	
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
	0-60	865	287	2100	697	2964	984	4199	1394	6422	2132	13585	4510	19019	6314	24206	8036
125	70	805	270	1955	655	2760	924	3910	1309	5980	2002	12650	4235	17710	5929	22540	7546
	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
150	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
	0-100	1337	445	3247	1080	4584	1524	6494	2159	9932	3302	21010	6985	29414	9779	37436	12446
200	150	1001	333	2431	808	3432	1140	4862	1615	7436	2470	15730	5225	22022	7315	28028	9310
	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
250	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
	0-150	2016	665	4896	1615	6912	2280	9792	3230	14976	4940	31680	10450	44352	14630	56448	18620
300	200	2016	665	4896	1615	6912	2280	9792	3230	14976	4940	31680	10450	44352	14630	56448	18620
	250	1250	417	3035	1012	4284	1428	6069	2023	9282	3094	19635	6545	27489	9163	34986	11662
400	0-200	2657	875	6452	2125	9108	3000	12903	4250	19734	6500	41745	13750	58443	19250	74382	24500
	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
450	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