Masoneilan® 41005 Series Control Valves

Specification Data

CH3000

03/02



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Features

High Performance Design

Masoneilan's 41005 Series heavy-duty globe control valves are engineered to handle the most demanding process conditions and exceeds the capabilities of comparable designs. The balanced cage-guided construction of the 41005 Series provides some key advantages versus typical unbalanced and/or contoured plug type designs:

- Higher Flow Capacities
- Higher Pressure Drop Capabilities
- Tighter Shut-Off Ratings
- Reduced Actuator Size and Thrust Requirements
- Improved Stability with Larger Guide Areas
- Increased Low Noise and Anti-Cavitation Trim Options

Wide Application Range

Masoneilan's 41005 Series control valves provide high flow capacities combined with low pressure recoveries as reflected by the high F_L factors. This product line also provides efficient and dependable performance over a wide range of pressures and temperatures typical in critical service applications.

Maximum Reliability

Specification and selection of the best solution for any application is simplified with the standard design options and materials available in the 41005 Series. Standard product construction and material combinations are based on over 30 years of successful field experience in various process industries.

Various Seal Options

The 41005 Series is available with a variety of seal designs and materials to meet a wide combination of temperature and shut-off requirements.

Versatile Trim Solutions

Various noise attenuation, anti-cavitation, and tight shut-off solutions are available within the standard 41005 product envelope. This includes the following trim options:

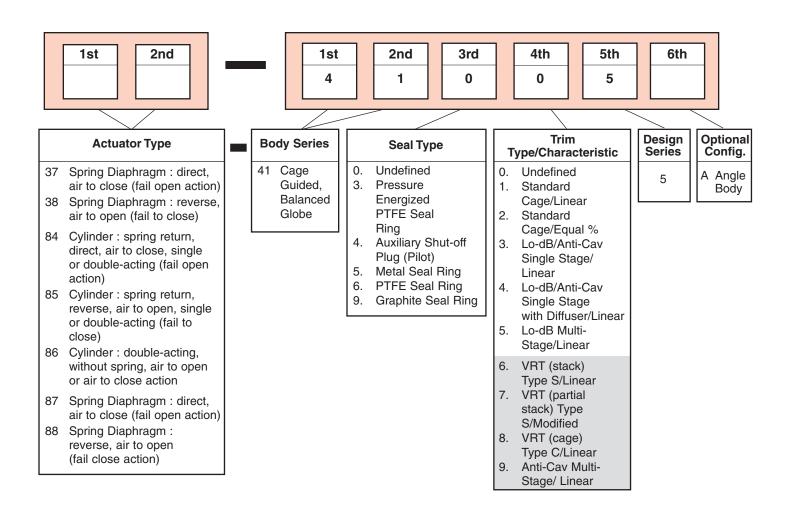
- Single Stage Trim Provides excellent low noise performance on either gas or steam applications. Also provides an effective anti-cavitation solution for liquid services.
- Multi-Stage Trim Provides highly effective low noise and anti-cavitation solutions for high-pressure ratio applications.
- Pilot Balanced Trim Provides unmatched tight shut-off performance for high temperature applications.
- Internal Diffuser Provides additional low noise and anti-cavitation benefits in flow-to-close (FTC) applications.
- Engineered Solutions Special trim designs can also be provided for applications not covered by the standard trim noted above.

NACE Compliance

The 41005 Series is available for sour service applications using design and construction methods in accordance with NACE Standard MR0175.

Trade names noted throughout are for reference only. Masoneilan reserves the right to supply trade named material or its equivalent.

Numbering System



General Data

Standard Valve (41305, 41405, 41505, 41605 and 41905)

Body

type: high-capacity globe or angle flow direction: see Flow Direction Table
Lo-dB trim: flow to open for gas or steam

Lo-dB trim

with diffuser: flow to close for gas or steam

anti-cavitation trim: flow to close

C_V ratio: 100:1 standard capacity trim

50:1 Lo-dB and reduced capacity

trim

• Bonnet

type: stud bolted extension

• Trim

cage: cylindrical ported or Lo-dB
plug: pressure balanced cage guided
with various seal ring options;
pressure balanced cage guided.

pressure balanced cage guided, with spring loaded internal auxiliary

tight shut-off plug

• Standard Flow Characteristics

standard trim: linear, equal percentage

Lo-dB trim: linear

Lo-dB trim

with diffuser: linear anti-cavitation trim: linear

O Threaded

14,18,20,24

Lo-dB[®] Multi-Stage Valve (41355, 41555, 41655, 41955)

flow direction: flow to open

gas or steam only

C_v ratio: 50:1

• Trim

cage: multi-stage Lo-dB

plug: pressure balanced cage guided

with various seal ring options

RF & RTJ

· Standard Flow Characteristic

Butt Weld

standard trim: linear

Actuator

type: spring diaphragm spring-return cylinder double-acting cylinder

handwheel: optional

Ratings/Connections

		_	
Valve	e Size	ANSI Class 150 to 1500	ANSI Class 2500
inch	mm	and equivalent PN	and equivalent PN
2	50	• □ 0	• 🗆
3 to 8	80 to 200		
10 to 16	250 to 400		
3x2	80x50		
4x2	100x50		
4x3	100x80		
6x3	150x80		
6x4	150x100		
8x4	200x100		
8x6	200x150		
10x6	250x150		
10x8	250x200		
12x8	300x200		
16x12	400x300		

Socket Weld

Notes: 1. Angle Body Version is available in valve sizes 2" - 6" with ANSI ratings from Class 150 to Class 1500 and standard raised face end connections.

- 2. Ex. 3x2 size = valve with 3" body x standard 2" trim.
- 3. Consult Masoneilan for AFNOR and DIN connections.

350,450,500,600

= ANSI Class 2500 Ratings and 14", 18", 20" and 24" sizes are available. Engineered trim options are also available for high temperature and high pressure drop applications, including Multi-Stage Anti-Cavitation Trim. Please consult factory for details.

Seal Type versus Temperature Range/Seat Leakage

Valve	Seal Type	Valve	Size	Temperatu	re Range ⁽¹⁾	Seat Leakage per IEC 534-4 and
Model	7,	inches	mm	Minimum	Maximum	ANSI / FCI 70.2 Class
41305	Pressure Energized PTFE Seal Ring	2 - 16	50 - 400	-50°F (-46°C)	+450°F (+232°C)	IV (standard) V (optional)
41405	Auxiliary Pilot Plug with Metal	2 - 4	50 - 100	-320°F (-196°C)	+850°F (+454°C) (2)	IV (standard)
41403	Seal Ring	6 - 16	150 - 400	-320°F (-196°C)	+1050°F (+566°C)	V (optional)
41505	Metal Seal Ring	2 - 4	50 - 100	-320°F (-196°C)	+850°F (+454°C) (2)	II
41303	Wetai Seai Hilly	6 - 16	150 - 400	-320°F (-196°C)	+1050°F (+566°C)	III
41605	PTFE Seal Ring	2 - 16	50 - 400	-20°F (-29°C)	+300°F (+149°C)	IV
41905	Graphite Seal Ring	2 - 4	50 - 100	-320°F (-196°C)	+850°F (+454°C)	III
41905	Graprine Sear hing	6 - 16	150 - 400	-320°F (-196°C)	+850°F (+454°C)	IV

Notes: 1. See Materials of Construction Tables for other temperature limitations

Flow Direction

Model Number	41305	41405 (1)	41505	41605	41905
Seal Type	Pressure Energized PTFE Seal Ring	Auxiliary Pilot Plug with Metal Seal Ring	Metal Seal Ring	PTFE Seal Ring	Graphite Seal Ring
Standard Trim 41015/41025	41315/41325 FTO or FTC ⁽²⁾	41415/41425 FTC	41515/41525 FTO or FTC	41615/41625 FTO or FTC	41915/41925 FTO or FTC
Lo-dB Single Stage 41035	41335 FTO	41435 FTC	41535 FTO	41635 FTO	41935 FTO
Anti-Cavitation Single Stage 41035	41335 FTC	41435 FTC	41535 FTC	41635 FTC	41935 FTC
Lo-dB & Anti-Cavitation Single Stage with Internal Diffuser ⁽³⁾ 41045	41345 FTC	41445 FTC	41545 FTC	41645 FTC	41945 FTC
Lo-dB Multi-Stage 41055	41355 FTO	N/A	41555 FTO	41655 FTO	41955 FTO

Notes: 1. Flow direction for Pilot Plug Seal configuration is always FTC.

^{2.} Maximum temperature limit for the 2" (50mm) size is +1050°F (+566°C).

^{2.} Seal ring must be installed in correct orientation relative to high pressure direction.

^{3.} Flow direction with Internal Diffuser is always FTC.

$\mathbf{C}_{\mathbf{v}}$ and $\mathbf{F}_{\mathbf{L}}$ versus Travel

Standard Trim Models 41315, 41415, 41515, 41615 and 41915

		Percent of]			10	20	30	40	50	60	70	80	90	100
		F,	L				0.94	0.94	0.93	0.93	0.92	0.92	0.91	0.91	0.90	0.90
Valve	Size	ANSI Class and		Diameter	Trav	rel .		Rated C _v								
inches	mm	equivalent PN	inches	mm	inches	mm							ı	ı		
2	50	900 - 1500	1.84	46.7	0.8	20.3	1.4	2.7	4.2	6	8	10	12.5	14	15.5	16
	50	900 - 1500	1.04	40.7	0.0	20.3	2	4.9	8.3	13	19	25	30	35	38	40
2	50	150 - 600					2.7	5.1	7.9	11	15	19	23	26	29	30
3x2 4x2	80x50 100x50	150-1500	2.50	63.5	1.5	38.1	4	9	15	24	35	47	57	65	71	75
3	80						5	10	16	22	30	38	46	52	58	60
4x3	100x80	150 - 1500	3.50	88.9	2.0	50.8	8	19	31	50	73	96	118	135	147	155
6x3 4	150x80 100						-									
6x4	150x100	150 - 1500	4.38	111.3	2.0	50.8	9	16	25	35	48	60	72	83	91	95
8x4	200x100	100 1000	4.00	111.0	2.0	00.0	12	29	48	77	113	149	182	209	228	240
6	150				0.8(1)	20.3(1)	7	15	28	41	58	74	94	117	144	165
8x6 10x6	200x150 250x150	150 - 1500	5.12	130.0	2.0	50.8	20	52	92	148	204	260	308	348	376	400
8	200 200						17	_	-							
10x8	250x200	150 - 1500	6.50	165.1	1.5	38.1	17	37	71	104	145	187	237	295	361	415
12x8	300x200				2.5	63.5	32	83	147	237	326	416	493	557	602	640
10	250	150 - 1500	8.00	203.2	1.5	38.1	20	46	87	128	179	230	291	362	444	510
'0	230	150 - 1500	0.00	200.2	3.0	76.2	50	130	230	370	510	650	770	870	940	1000
12	300	150 1500	9.75	247.7	2.0	50.8	31	69	131	193	270	347	439	547	670	770
16x12	400x300	150 - 1500	9.75	241.1	3.75	95.25	70	182	322	518	714	910	1078	1218	1316	1400
					2.5	63.5	51	128	211	320	448	576	730	922	1114	1280
16	400	150 - 1500	13.00	330.2	4.0	101.6	104	268	464	744	1024	1304	1544	1720	1880	2000
					5.0	127	130	335	580	930	1280	1630	1930	2150	2350	2500

Notes: 1. Travel of 1.5 inches (38.1mm) for 41405.

Flow Characteristic: LINEAR

^{2.} Ex. 3x2 size = valve with 3" body x standard 2" trim.

C_v and F_L versus Travel

Flow Characteristic: EQUAL PERCENTAGE

Standard Trim Models 41325, 41425, 41525, 41625 and 41925

10 20 70 100 **Percent of Travel** 30 40 50 60 80 90 0.94 0.94 0.94 0.94 0.94 0.93 0.90 0.94 0.92 0.92 **ANSI Class** Valve Size **Orifice Diameter** Rated C_v and Travel **Equivalent PN** inches inches inches mm mm mm 0.2 0.4 8.0 1.3 3.8 6.7 10.0 12.4 14 2 50 900 - 1500 1.84 46.7 0.8 20.3 0.5 1.1 2 3.2 5.2 9.5 16.7 25.0 31.1 35 2 50 150 - 600 0.3 8.0 1.5 2.3 3.8 7.1 12.4 18.5 23.1 26 3x2 80x50 2.50 63.5 1.5 38.1 150 - 1500 0.8 2.0 3.7 5.9 9.6 17.7 30.9 46.3 57.8 65 100x50 4x2 3 80 0.7 1.7 3.2 5 8.3 15.2 26.6 39.9 49.8 56 4x3 100x80 150 - 1500 3.50 88.9 2.0 50.8 1.8 4 8 13 21 38 67 100 124 140 150x80 6x3 4 100 3 1 5 8 13 24 43 64 80 90 6x4 150x100 150 - 1500 4.38 111.3 2.0 50.8 3 7 13 20 33 107 225 61 160 200 8x4 200x100 6 150 4 130 8 15 24 35 54 80 108 144 200x150 150 - 1500 5.12 130.0 2.0 50.8 8x6 9 21 39 60 135 269 360 10x6 250x150 200 8 6 14 56 86 172 230 10x8 250x200 150 - 1500 6.50 165.1 2.5 63.5 14 62 97 140 430 575 34 215 320 521 300x200 12x8 9 135 21 39 60 87 200 269 326 360 10 250 150 - 1500 8.00 203.2 3.0 76.2 23 53 97 337 900 151 219 500 672 815 12 300 13 30 54 84 122 187 278 374 453 500 150 - 1500 9.75 247.7 3.75 95.25 400x300 16x12 32 75 136 212 306 471 700 941 1142 1260

22

56

53

33

97

243

151

378

219

547

337

842

500

1251

672

1681

815

2038

900

2250

Note: 1. Ex. 3x2 size = valve with 3" body x standard 2" trim.

150 - 1500

16

400

330.2

13.00

5.0

127

C_{ν} and $F_{\scriptscriptstyle L}$ versus Travel

Single Stage Lo-dB[®]/Anti-Cavitation Models: 41335, 41435, 41535, 41635, 41935, 41X45 (with internal diffuser)

		Percent of	of Trave	l			10	20	30	40	50	60	70	80	90	100
		F,					0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
		ANSI Class												1		
Valve		and		Diameter	Trav						Ra	ted C _v				
inches	mm	Equivalent PN	inches	mm	inches	mm				ı	I	I	I	ı	ı	
							1	2	3	4	5	6	7	8	9	10
							1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7	13
2	50	900 - 1500	1.84	46.7	0.8	20.3	1.7	3.4	5.1	6.8	8.5	10.2	11.9	13.6	15.3	17
							2.3	4.6	6.9	9.2	11.5	13.8	16.1	18.4	20.7	23
							3	6	9	12	15	18	21	24	27	30
2	50	150 - 600					2.5	5	7.5	10	12.5	15	17.5	20	22.5	25
			0.50			00.4	3	6	10	13	16	19	22	26	29	32
3x2	80x50	150 1500	2.50	63.5	1.5	38.1	4	9	13	17	22	26	30	34	39	43
4x2	100x50	150 - 1500					6	12	17	23	29	35	41	46	52	58
							7	14	22	29	36	43	50	58	65	72
	00						4	8	12	16	20	24	28	32	36	40
3 4x3	80 100x80	150 - 1500	3.50	88.9	2.0	50.8	5 7	11 14	16 22	22 29	27 36	32 43	38 50	43 58	49 65	54 72
4x3 6x3	150x80	150 - 1500	3.50	00.9	2.0	50.6	10	19	22	38	48	57	67	76	86	95
0.53	150,000						13	25	38	50	63	75	88	100	113	125
							7	13	20	26	33	39	46	52	59	65
4	100						9	17	26	34	43	51	60	68	77	85
6x4	150x100	150 - 1500	4.38	111.3	20	50.8	11	22	33	44	55	66	77	88	99	110
8x4	200x100	130 - 1300	7.00	111.0	2.0		15	30	45	60	75	90	105	120	135	150
UA T	LOOKIOO						20	39	59	78	98	117	137	156	176	195
							10	20	30	40	50	60	70	80	90	100
6	150						13	26	39	52	65	78	91	104	117	130
8x6	200x150	150 - 1500	5.12	130.0	2.5	63.5	18	35	53	70	88	105	123	140	158	175
10x6	250x150						23	46	69	92	115	138	161	184	207	230
							30	60	90	120	150	180	210	240	270	300
							17	33	50	66	83	99	116	132	149	165
8	200				2.5	CO F	22	44	66	88	110	132	154	176	198	220
10x8	250x200	150 - 1500	6.50	165.1	2.5	63.5	29	58	87	116	145	174	203	232	261	290
12x8	300x200						38	76	114	152	190	228	266	304	342	380
					3.0	76.2	50	100	150	200	250	300	350	400	450	500
							23	45	68	90	113	135	158	180	203	225
					2.5	63.5	29	58	87	116	145	174	203	232	261	290
10	250	150 - 1500	8.00	203.2			39	78	117	156	195	234	273	312	351	390
					0.5	00.0	52	104	156	208	260	312	364	416	468	520
					3.5	88.9	65	130	195	260	325	390	455	520	585	650
					2.5	63.5	48	96	144	192	240	288	336	384	432	480
12	300	150 - 1500	9.75	247.7			63	126	189	252	315	378	441	504	567	630
16x12	400x300				4.0	101.6	84	168	252	336	420	504	588	672	756	840
					5.0	127	110	220	330	440	550	660	770	880	990	1100
					2.5	63.5	78	156	234	312	390	468	546	624	702	780
16	400	150 - 1500	13.00	330.2	4.0	101.6	103	206	309	412	515	618	721	824	927	1030
							136	272	408	544	680	816	952	1088	1224	1360
					6.0	152.4	180	360	540	720	900	1080	1260	1440	1620	1800

Notes: 1. Ex. 3x2 size = valve with 3" body x standard 2" trim.

Flow Characteristic: LINEAR

^{2.} Internal diffuser design only available for valve sizes 6" to 16" (150 to 400mm) and with capacities shaded above.

$\mathbf{C}_{\mathbf{v}}$ and $\mathbf{F}_{\mathbf{L}}$ versus Travel

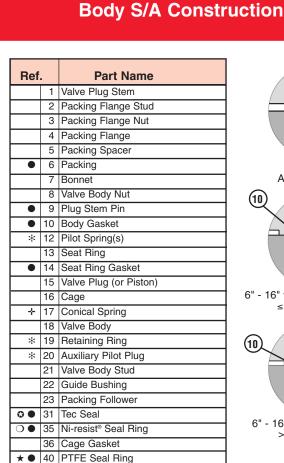
Flow Characteristic: LINEAR

Multi-Stage Lo-dB® Models 41355, 41555, 41655 and 41955

		Percent	of Trave	·I			10	20	30	40	50	60	70	80	90	100
		F					0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Valve	Size	ANSI Class and		Diameter	Trav	/el					Rate	d C _v				
inches	mm	Equivalent PN	inches	mm	inches	mm										
							1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12
2	50	900 - 1500	1.84	46.7	0.8	20.3	1.9	3.8	5.7	7.6	9.5	11.4	13.3	15.2	17.1	19
							2.4	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24
2	50	150 - 600					3	6	9	12	15	18	21	24	27	30
3x2	80x50	150 - 1500	2.50	63.5	1.5	38.1	4	9	13	17	22	26	30	34	39	43
4x2	100x50	150 - 1500					5	11	16	21	27	32	37	42	48	53
3	80						5	10	15	20	25	30	35	40	45	50
4x3	100x80	150 - 1500	3.50	88.9	2.0	50.8	8	15	23	30	38	45	53	60	68	75
6x3	150x80						10	19	29	38	48	57	67	76	86	95
4	100						7	14	22	29	36	43	50	58	65	72
6x4	150x100	150 - 1500	4.38	111.3	2.0	50.8	11	21	32	42	53	63	74	84	95	105
8x4	200x100						13	26	39	52	65	78	91	104	117	130
6	150						10	19	29	38	48	58	67	77	86	96
8x6	200x150	150 - 1500	5.12	130.0	2.5	63.5	15	30	45	60	75	90	105	120	135	150
10x6	250x150						19	38	57	76	95	114	133	152	171	190
8	200				2.5	63.5	16	31	47	62	78	93	109	124	140	155
10x8	250x200	150 - 1500	6.50	165.1	2.0	03.5	25	50	75	100	125	150	175	200	225	250
12x8	300x200				3.0	76.2	30	60	90	120	150	180	210	240	270	300
					2.5	63.5	23	46	69	92	115	138	161	184	207	230
10	250	150 - 1500	8.00	203.2	٥٠	88.9	35	70	105	140	175	210	245	280	315	350
					3.5	88.9	42	84	126	168	210	252	294	336	378	420
12	300				2.5	63.5	38	75	113	150	188	225	263	300	338	375
16x12	400x300	150 - 1500	9.75	247.7	4.0	101.6	60	120	180	240	300	360	420	480	540	600
10X12	4003300				5.0	127	73	145	218	290	363	435	508	580	653	725
					2.5	63.5	50	100	150	200	250	300	350	400	450	500
16	400	150 - 1500	13.00	330.2	4.0	101.6	80	160	240	320	400	480	560	640	720	800
					6.0	152.4	111	221	332	442	553	663	774	884	995	1105

Notes: 1. Ex. 3x2 size = valve with 3'' body x standard 2'' trim.

^{2.} Consult Masoneilan for multi-stage trim designs for anti-cavitation service.



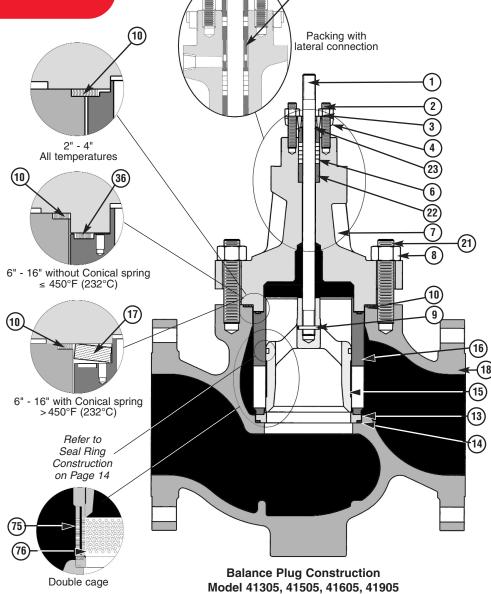
* For 41405 Series Valves Only

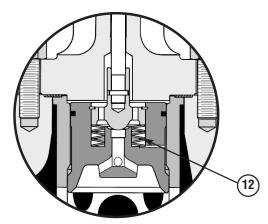
★ ● 41 Nordel® Backup Ring

46 Ni-resist® Backup Ring75 Double cage76 Pin

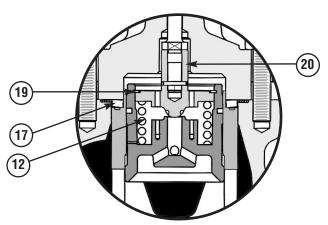
☐ ● 45 Graphite Seal Ring

- For 6" to 16" Valves Sizes Only above 450°F (232°C)
- ★ For 41605 Series Valves Only
- Recommended Spare PartsFor 41905 Series Valves Only
- O For 41405 / 41505 Series Valves Only
- For 41405 / 41505 Series valves Only
- ◆ For 41305 Series Valves Only





Pilot Balanced Construction Model 41405 Applications up to 850°F (454°C) Sizes 2" to 4" shown



Sizes 2" to 16"

Pilot Balanced Construction Model 41405 Applications above 450°F (232°C) to 1050°F (566°C) Sizes 6" to 16" shown

Materials of Construction

Standard Carbon Steel Version

Ref.	Temperature I	Range	-20°F 450°F (-29°C) (232°C)	(34	0°F 3°C) ∇	800°F (427°C)			
No	Description	n	Standard	d Materials					
1	Plug Stem		17-4 PH St. St. ASTM A564 GR 630						
2	Packing Flange Stu	d	304 St. St. A	STM A193 GR I	B8				
3	Packing Flange Nu	t	304 St. St. A	ASTM A194 GR	8				
4	Packing Flange		Carbon Steel AS	STM A105 Zinc I	Plated				
5	Packing Spacer		303 St. St. A	STM A582 TY 3	03				
6	Packing		Kevlar PTFE (Crane 285K)(1)						
7	Valve Bonnet		Carbon Steel AS	Carbon Steel ASTM A216 Grade WCC					
8	Valve Body Nut		Carbon Steel	ASTM A194 GR	2H				
9	Plug Stem Pin		316 St. St. A	STM A479 TY 3	16				
10	Valve Body Gasket		316L St. St. w/Flexible	Graphite Filler ((Spiral Wound)				
10	Pilot Spring(s)	2" to 4"	Inconel X-750 AMS	5598 (Stacked	Washers)				
12	(41405 Only)				1 688				
13	Seat Ring		400 Series Martensitic Stainless Steel - Harden	ed					
14	Seat Ring Gasket		316L St. St. w/Flexible	Graphite Filler ((Spiral Wound)				
15	Valve Plug		17-4 PH St. St. ASTM A747 GR CB7CU-1 Condition	H1075					
16	Cage		Martensitic St. St. ASTM A487 GR CA6NM CL B Hard Ch	rome Plated					
17	Conical Spring (6" t	o 16")	See Note 2	STM A564 GR lition H1075	Inconel X-750 ASTM B637	7 GR 688			
18	Valve Body		Carbon Steel AS	TM A216 Grade	WCC				
19	Retaining Ring (414	105 Only)	Inconel X	-750 AMS 5598					
00	Auxiliary Pilot Plug	2" to 4"	400 Series Martensition	Stainless Steel	- Hardened				
20	(41405 Only)	6" to 16"	Martensitic St. St. ASTM A487 GR CA6NM C	L B with Chrome	e Plated Guide and Hardfaced Se	at			
21	Valve Body Stud		Alloy Steel A	STM A193 GR I	B7				
22	Guide Bushing		440C St. St. A	STM A276 TY 4	40C				
23	Packing Follower		303 St. St. A	STM A582 TY 3	03				
_	Internal Diffuser (6" (See Note 4)	to 16")	316 St. St. ASTM A479	TY 316 with Ha	ardfaced Seat				
36	Cage Gasket (6" to	16")	316L St. St. w/Flexible Graphite Filler (Spiral Woo	und)	See Note 3				
31									
35									
40 Sool Bing Soo Bogo 14									
41	Seal Ring		See Page 14						
45									
46									

Notes: 1. PTFE/Carbon and graphite wipers rings required for ANSI Class 1500 and 2500.

- 2. Conical spring only required for valve sizes 6" to 16" for applications > 450°F (232°C).
- 3. Cage gasket only required for valve sizes 6" to 16" for applications $\leq 450^{\circ} F$ (232°C).
- 4. Internal Diffuser includes an internal 316SS Seat Ring with hardfaced seat. This part replaces the Seat Ring (Ref. No. 13) when this option is selected. See graphic on page 15.

Review use of optional materials and configurations for temperature ranges indicated. Standard materials listed may still be applicable depending on specific service conditions. Consult Masoneilan for appropriate material combinations.

Materials of Construction

Standard Stainless Steel Version(1)

Ref.	Temperature Range	-320°F (-196°C) -50°F	(46°C) 450°F	(232°C) ∇	650°F (; ∇	343°C)	1050°F (566°C)
No	Description		Standard I	Materials			
1	Plug Stem		316 St. St. AS7	ΓM A479 TY 316			
7 18	Valve Bonnet (2) Valve Body		316 St. St. ASTN	/I A351 GR CF8M			
13	Seat Ring		316 St. St. ASTM A479 T	Y 316 with Hardfaced S	eat		
15	Valve Plug		316 St. St. ASTM A479 T	Y 316 with Hardfaced S	eat		
16	Cage	316 St.	. St. ASTM A479 TY 316 Chrome	-Plated			
17	Conical Spring (6" to 16")	See	Note 3	Inconel X-75	0 ASTM E	3637 + Sh	ot Peening
20	Auxiliary Pilot Plug (41405 Only)	316 S	t. St. ASTM A479 TY 316 with Ch	nrome Plated Guide and	Hardface	ed Seat	
22	Guide Bushing		316 St. St. ASTM A479	TY 316 with Hardfacing	g		

Notes: 1. Materials for other components are same as listed for Standard Carbon Steel Version.

- 2. Extension bonnet required for temperatures below -100°F (-73°C).
- 3. Conical spring only required for valve sizes 6" to 16" for applications > 450°F (232°C).
- 4. See trim materials for Standard Carbon Steel Version for Martenistic Trim Option.

Optional Configurations and Materials

Ref.	Temperature	Range _v	-320°F (-196°C) -20°F	F (-29°C) ∇	650°F ((343°C) ⊽	1050°F (566°C)	
No	Description	on		Optional Materials				
	Plug Stem			A286 Super Alloy ASTM A638 GR 660				
_ '	Flug Stelli			Inconel X-750 ASTM B637 GR 688				
	Doolsing			LE® Packing (1)				
6	Packing			Flexible Graphite				
7	Valve Bonnet			Chrome-Moly Steel ASTM A217 Grade WC6 o				
18	Valve Body			Chilothe-Mory Steel ASTM A217	Grade WC	o or Grade	WC9	
13	Seat Ring	2" to 4"		316 St. St. ASTM A479 TY 316 with Hardfaced	Seat			
13	Seat hilly	6" to 16"	Marter	nsitic St. St. ASTM A487 GR CA6NM CL B with H	ardfaced S	Seat		
15	Valve Plug			Martensitic St. St. ASTM A487 GR CA6NM CL B	Nitrided			
10	0			Martensitic St. St. ASTM A487 GR CA6NM CL B Nitrided				
16	Cage			316 St. St. ASTM A479 TY 316 Nitrided				
20	Auxiliary Pilot Plug (41405 Only)	(2" to 4")	Martensitic St. St. A	STM A487 GR CA6NM CL B with Chrome Plated	Guide and	d Hardfaced	Seat	

Notes: 1. LE Packing for low emissions applications is limited to maximum operating pressure of 750 psig (52 bar).

- Recommended material for use along with solid Stellite bushing for applications above 650°F (343°C).
 Consult Masoneilan for material combinations for temperatures below –20°F (-29°C) or above 800°F (427°C).

Review use of optional materials and configurations for temperature ranges indicated. Standard materials listed may still be applicable depending on specific service conditions. Consult Masoneilan for appropriate material combinations.

Optional Bolting Materials

Ref.	Temperature Range	-320°F (-196°C) to -150°F (-101°C)	-150°F (101°C) to -20°F (-29°C)	850°F (454°C) to 950°F (510°C)	950°F (510°C) to 1050°F (566°C)				
No	Description	Optional Materials							
8	Valve Body Nut	316 SS ASTM A194 Grade 8M	Alloy Steel ASTM A194 Grade 4	Alloy Steel ASTM A194 Grade 4	304 SS ASTM A194 Grade 8				
21	Valve Body Stud	316 SS ASTM A193 Grade B8M Class 2	Alloy Steel ASTM A320 Grade L7	316 SS ASTM A193 Grade B16	Super Alloy ASTM A453 Grade 660				

Note: Use following materials for 2" and 3" sizes ANSI Class 300/600 at temperatures below -20°F (-29°C). Studs - 304 SS ASTM A193 Grade B8 Class 2 • Nuts - 304 SS ASTM A194 Grade 8.

Materials of Construction

NACE⁽¹⁾ Configuration and Material Options Valve Sizes: 2" to 16" • Body Ratings: ANSI Class 150 to 1500

Ref.	Temperature	Range	-20°F (-29°C)	650°F (343°C)						
No	Description	on	Standard and Optional Materials							
			316 St. St. ASTM A479 TY 316 (HRC 22 Max.)							
1	Plug Stem		Inconel X-750 ASTM B637 GR 688 (HRC 35 Max.							
_			304 St. St. ASTM A193 GR B8 ⁽²⁾							
2	Packing Flange Stud	d	Alloy Steel ASTM A193 Gr B7M (3)							
	Daaldaa Elaasa Nat		304 St. St. ASTM A194 GR 8 (2)							
3	Packing Flange Nut		Alloy Steel ASTM A194 Gr 2M (3)							
4	Packing Flange		Carbon Steel ASTM A668 CL B							
5	Packing Spacer		304 St. St. ASTM A479 TY 304							
6	Packing		Kevlar PTFE (Crane 285K)							
			Carbon Steel ASTM A216 Grade WCC (HRC 22 Max.)							
7	Valve Bonnet		Carbon Steel ASTM A105 (HRC 22 Max.)							
			316 St. St. ASTM A351 Gr CF8M (HRC 22 Max.)							
	Valve Body Nut		Alloy Steel ASTM A194 GR 2H (2)							
8	vaive Body Nut		Alloy Steel ASTM A194 Gr 2M (3)							
9	Plug Stem Pin		316 St. St. ASTM A479 TY 316 (HRC 22 Max.)							
10	Valve Body Gasket		316L St. St. w/Flexible Graphite Filler (Spiral Wound)							
12	Pilot Spring(s)	2" to 4"	Inconel X-750 AMS 5598 (HRC 50 Max.)							
	(41405 Only)	6" to 16" Inconel X-750 ASTM B637 GR 688 (HRC 50 Max.)								
40	Coat Dina	316 St. St. ASTM A479 TY 316 (HRC 22 Max.)								
13	Seat Ring		316 St. St. ASTM A479 TY 316 with Hardfaced Seat (HRC 22 Max.)							
14	Seat Ring Gasket		316L St. St. w/Flexible Graphite Filler (Spiral Wound)							
15	Valva Dlug	316 St. St. ASTM A479 TY 316 with Hardfaced Seat (HRC 22 Max.)								
15	Valve Plug		Martensitic St. St. ASTM A487 GR CA6NM CL B (HRC 22 Max.)							
16	Cage		316 St. St. ASTM A479 TY 316 Hard Chrome Plated (HRC 22 Max.)							
10	Caye		Martensitic St. St. ASTM A487 GR CA6NM CL B Hard Chrome Plated (HRC 23 Max.)							
18	Valve Body		Carbon Steel ASTM A216 Grade WCC (HRC 22 Max.)							
10	vaive body		316 St. St. ASTM A351 Gr CF8M (HRC 22 Max.)							
19	Retaining Ring (414)	05 Only)	Inconel X-750 AMS 5598 (HRC 50 Max.)							
20	Auxiliary Pilot Plug		316 St. St. ASTM A479 TY 316 with Hardfaced Seat (HRC 22 Max.)							
20	(41405 Only)		Martensitic St. St. ASTM A487 GR CA6NM CL B Chrome Plated Guide and Hardfaced Seat (HRC 23 Max.)							
21	Valve Body Stud		Alloy Steel ASTM A193 GR B7 (2)							
- 1	vaive body oldd		Alloy Steel ASTM A193 Gr B7M (3)							
22	Guide Bushing		Stellite 6 UNS 30006							
	Ů		316 St. St. ASTM A479 TY 316 with Hardfacing							
23	Packing Follower		316 St. St. ASTM A479 TY 316							
_	Internal Diffuser (6" (Not Shown)	to 16")	316 St. St. ASTM A479 TY 316 with Hardfaced Seat (HRC 22 Max.)							
36	Cage Gasket (6" to	16") ⁽⁴⁾	316L St. St. w/Flexible Graphite Filler (Spiral Wound)							
31										
35										
40	Seal Ring ⁽⁵⁾		See Page 14							
41	Jeal Hilly									
45										
46										
	Drive Nut (Not Show	(n)	Carbon Steel SAE 1117 (2)							
-	PING MAY (MOL 2000)	···)	Carbon Steel ASTM A105 or SAE 1010-1025 (3)							

Notes: 1. Materials and processes in accordance with the requirements of NACE specification MR0175.

- 2. Materials designated for these parts conform to NACE Class III bolting requirements.
- 3. Materials designated for these parts conform to NACE Class I or Class II bolting requirements.
- 4. Cage gasket only required for valve sizes 6" to 16" for applications \leq 450°F (232°C).
- 5. Seal ring materials for Model 41605 (PTFE Seal Ring) will be replaced with Glass-Reinforced PTFE External Seal Ring (Ref. No. 40) and Viton Internal Seal Ring (Ref. No. 41).
- 6. Maximum temperature for Models 41305 and 41605 limited to 450°F (232°C).

Seal Ring Construction

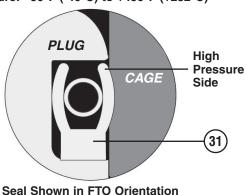
Model 41305

Seal Type: Pressure Energized Polymeric

Leakage: Class IV Standard

(Class V Optional)

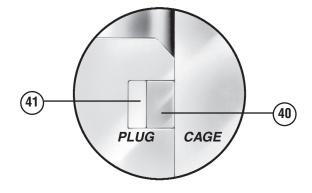
Temperature: -50°F (-46°C) to +450°F (+232°C)



Model 41605

Seal Type: TFE and Resilient Inner Leakage: Class IV Standard

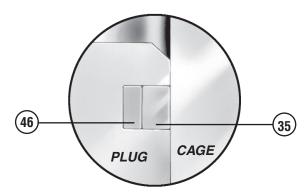
Temperature: -20°F (-29°C) to +300°F (+149°C)



Models 41405 and 41505

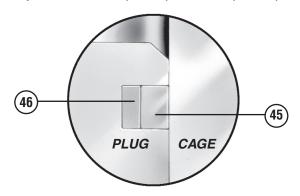
Seal Type: Metal

Leakage: From Class II to Class V (with pilot)
Temperature: -320°F (-196°C) to +1050°F (+566°C)



Model 41905

Seal Type: Graphite and Metal Inner Leakage: Class III and Class IV Standard Temperature: -320°F (-196°C) to +850°F (+454°C)



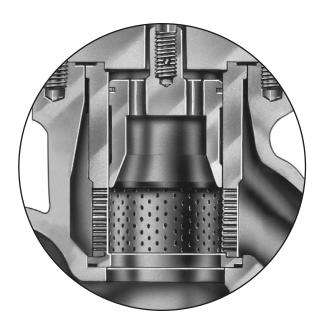
Materials of Construction

Temp)°F 1°C) 7	-20°F (-29°C) ∇	+30 (+14		+450°F (+232°C) ∇	+650°F (+343°C) ∇	+850°F (+454°C) ∇	+1050°F (+566°C)
Ref.	Description				eteriele.				
No.	Description			IVI	aterials				
31	Seal Ring	PΊ	ΓFE + 25%	Graphite and I	ELGILOY Spri	ing			
35	External Seal Ring	Ni-R	esist ASTI	M A439 Type	D3				Nitrided CA6NM
40	External Seal Ring		Br	onze PTFE					
40	External Seal Hilly		G	alass Reinford	ed PTFE (1)				
41	Internal Seal Ring			Nordel					
41	internal Sear hing			Viton	(1)(2)				
45	External Seal Ring				Graphite				
46	Internal Seal Ring	Ni-Resist ASTM A439 Type D3							

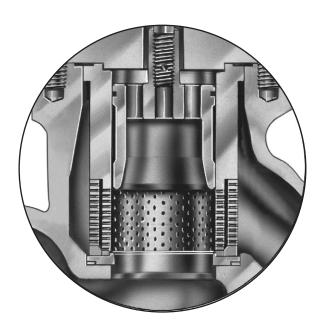
Note: 1. Optional materials for NACE Service. Viton not recommended for water or steam service.

2. Viton is recommended for oil and hydrocarbon service.

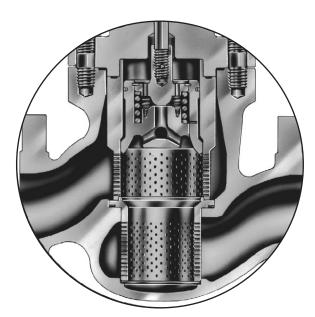
Trim Types



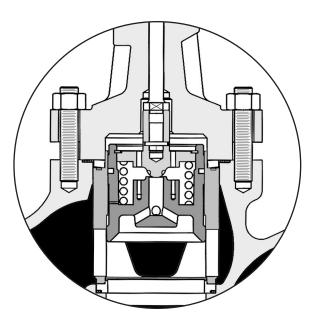
Models 41335 - 41535 - 41635 - 41935 Single Stage Low Noise Trim FTO Anti-Cavitation Trim FTC



Models 41355 - 41555 - 41655 - 41955 Multi-Stage Low Noise Trim FTO

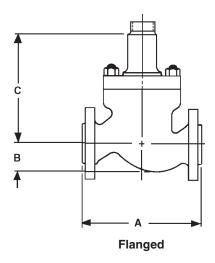


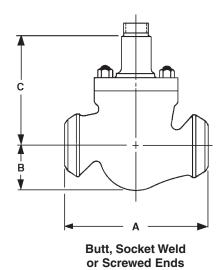
Model 41405
Pilot Balanced Construction FTC
Single Stage
Lo-dB with Internal Diffuser
Sizes 6" - 16"

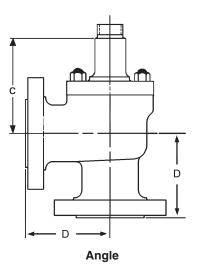


Model 41405
Pilot Balanced Construction FTC

Dimensions (inches)







Body S/A (inches)

					A								
Pressur	e Class		lass 150 valent PN	ANSI Class 300 and equivalent PN a				SI Class			ANSI Class 900 and equivalent PN		
Valve	Size	RF	RTJ	BW &	RF	RTJ	BW &	RF	RTJ	BW &	RF	RTJ	
inches	mm			SW			SW			SW			
2	50	10.00	10.51	11.26	10.51	11.14	11.26	11.26	11.38	14.76	14.76	14.88	
3	80	11.73	12.24	13.27	12.52	13.15	13.27	13.27	13.39	18.11	17.36	17.52	
3x2	80x50	"	66	44	"	"	"	"	"	(1)	(1)	(1)	
4	100	13.86	14.37	15.51	14.53	15.12	15.51	15.51	15.63	20.87	20.12	20.24	
4x2	100x50	"	66	"	"	"	"	"	"	(1)	(1)	(1)	
4x3	100x80	"	66	"	"	"	"	"	"	20.87	20.12	20.24	
6	150	17.76	18.27	20.00	18.62	19.25	20.00	20.00	20.12	30.24	28.11	28.23	
6x3	150x80	"	66	"	"	"	"	"	"	"	"	"	
6x4	150x100	"	66	"	"	"	"	"	"	"	"	"	
8	200	21.38	21.89	24.02	22.40	22.99	24.02	24.02	24.13	38.24	36.02	36.14	
8x4	200x100	"	66	"	"	"	"	"	"	"	"	"	
8x6	200x150	"	66	"	"	"	"	"	"	и	"	"	
10	250	26.50	27.01	29.61	27.87	28.50	29.61	29.61	29.72	46.00	42.99	43.11	
10x6	250x150	и	66	66	66	"	66	66	"	"	66	66	
10x8	250x200	"	и	66	66	"	66	66	"	"	66	66	
12	300	29.02	29.53	32.24	30.51	31.14	32.24	32.24	32.36	48.00	44.49	44.61	
12x8	300x200	"	44	44	66	"	44	44	"	"	66	66	
16	400	40.00	40.51	43.62	41.61	42.20	43.62	43.62	43.74	50.00	54.13	54.49	
16x12	400x300	"	u	"	66	"	(1)	"	44	(1)	(1)	(1)	

Notes: 1. Consult Masoneilan

^{2.} Ex. 3x2 size = valve with 3" body x standard 2" trim.

Body S/A (inches)

			Α		B max	C max
Pressu	ire Class	1	Class quivale		AII	AII
Val	ve Size	BW &	RF	RTJ	Classes	Classes
inches	mm	SW				
2	50	14.76	14.76	14.88	3.70	9.84
3	80	18.11	18.11	18.27	3.66	11.81
3x2	80x50	(1)	(1)	(1)	66	u
4	100	20.87	20.87	20.98	4.41	12.99
4x2	100x50	(1)	(1)	(1)	"	"
4x3	100x80	20.87	20.87	20.98	"	"
6	150	30.24	30.24	30.47	6.54	15.51
6x3	150x80	"	"	"	"	"
6x4	150x100	"	66	"	"	"
8	200	38.24	38.24	38.62	8.07	20.51
8x4	200x100	"	tt.	"	"	"
8x6	200x150	"	tt.	"	"	"
10	250	46.00	46.00	46.38	9.72	22.48
10x6	250x150	"	"	"	"	"
10x8	250x200	"	66	"	"	"
12	300	48.00	48.00	48.58	14.13	24.65
12x8	300x200	(1)	(1)	(1)	"	"
16	400	50.00	59.37	60.24	17.68	27.32
16x12	400x300	(1)	(1)	(1)	"	u

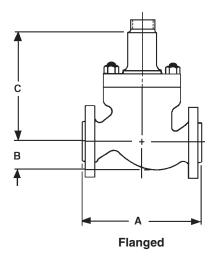
Notes: 1. Consult Masoneilan

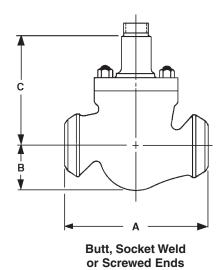
2. Ex. 3x2 size = valve with 3" body x standard 2" trim.

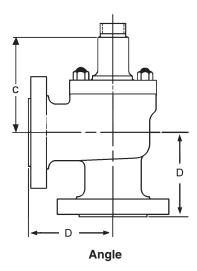
Angle Body S/A (inches)

)				
Pressur	Pressure Class		ass 150 /alent PN	ANSI Class 300 and equivalent PN		ANSI Class 600 and equivalent PN		ANSI Class 900 and equivalent PN		ANSI Class 1500 and equivalent PN	
Valve Size		RF	RTJ	RF	RTJ	RF	RTJ	RF	RTJ	RF	RTJ
inches	inches mm										
2	50	5.15	5.38	5.27	5.58	5.78	5.84	7.27	7.35	7.27	7.35
3	80	5.92	6.17	6.29	6.61	7.04	7.12	8.89	8.97	9.28	9.36
4	100	7.71	7.94	8.04	8.34	8.53	8.61	10.38	10.46	10.78	10.86
6	150	8.34	8.59	8.77	9.09	11.02	11.07	12.04	12.10	13.89	14.01

Dimensions (mm)







Body S/A (mm)

							Α					
Pressur	e Class		lass 150 valent PN	ANSI Class 300 ANSI Class 600 and equivalent PN and equivalent PN				ANSI Class 900 and equivalent PN				
Valve	e Size	RF	RTJ	BW &	RF	RTJ	BW &	RF	RTJ	BW &	RF	RTJ
inches	mm			SW			SW			SW		
2	50	254	267	286	267	283	286	286	289	375	375	378
3	80	298	311	337	318	334	337	337	340	460	441	445
3x2	80x50	"	"	"	"	"	"	"	"	(1)	(1)	(1)
4	100	352	365	394	369	384	394	394	397	530	511	514
4x2	100x50	"	"	"	"	"	"	"	"	(1)	(1)	(1)
4x3	100x80	"	"	"	"	"	"	"	"	530	511	514
6	150	451	464	508	473	489	508	508	511	768	714	717
6x3	150x80	"	"	"	"	"	"	"	"	"	"	"
6x4	150x100	"	"	"	"	"	"	"	"	"	"	"
8	200	543	556	610	569	584	610	610	613	972	915	918
8x4	200x100	"	"	"	"	"	"	"	"	"	"	"
8x6	200x150	"	66	"	66	"	"	66	"	"	44	66
10	250	673	686	752	708	724	752	752	755	1168	1092	1095
10x6	250x150	"	ш	"	"	"	и	"	"	"	"	"
10x8	250x200	"	"	44	66	"	u	66	"	66	66	66
12	300	737	750	819	775	791	812	819	822	1219	1130	1133
12x8	300x200	"	ш	"	"	"	и	"	"	"	"	"
16	400	1016	1029	1108	1057	1072	1108	1108	1111	1270	1375	1384
16x12	400x300	66	66	"	"	44	(1)	cc cc	44	(1)	(1)	(1)

Notes: 1. Consult Masoneilan

^{2.} Ex. 80x50 size = valve with 80mm body x standard 50mm trim.

Body S/A (mm)

			Α		B max	C max
Pressu	ire Class		Class quivale		AII	AII
Val	ve Size	BW &	RF	RTJ	Classes	Classes
inches	mm	SW				
2	50	375	375	378	94	250
3	80	460	460	464	93	300
3x2	80x50	(1)	(1)	(1)	"	66
4	100	530	530	533	112	330
4x2	100x50	(1)	(1)	(1)	"	"
4x3	100x80	530	531	533	"	"
6	150	768	768	774	166	394
6x3	150x80	"	"	"	"	"
6x4	150x100	"	"	"	"	"
8	200	972	972	981	205	521
8x4	200x100	"	"	"	"	u
8x6	200x150	"	"	"	"	u
10	250	1168	1168	1178	247	571
10x6	250x150	"	"	"	"	"
10x8	250x200	"	"	"	"	"
12	300	1219	1219	1234	359	626
12x8	300x200	(1)	(1)	(1)	"	"
16	400	1270	1508	1530	449	694
16x12	400x300	(1)	(1)	(1)	66	"

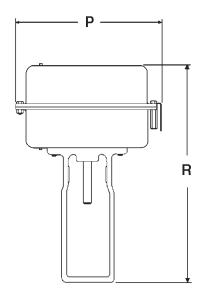
Notes: 1. Consult Masoneilan

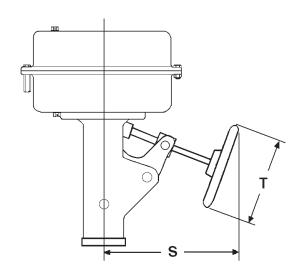
2. Ex. 80x50 size = valve with 80mm body x standard 50mm trim.

Angle Body S/A (mm)

						ı	ס				
Pressur	Pressure Class		ass 150 /alent PN	ANSI Class 300 and equivalent PN		ANSI Class 600 and equivalent PN		ANSI Class 900 and equivalent PN		ANSI Class 1500 and equivalent PN	
Valve Size		RF	RTJ	RF	RTJ	RF	RTJ	RF	RTJ	RF	RTJ
inches	mm										
2	50	131	137	134	142	147	148	185	187	185	187
3	80	150	157	160	168	179	181	226	228	236	238
4	100	196	202	204	212	217	219	264	266	274	276
6	150	212	218	223	231	280	281	306	307	353	356

Model 87/88 Multi-Spring Diaphragm Actuator





Shown with optional handwheel

Model 87/88 Actuator (inches)

Actuator Size	Р	R	S	Т
6	11.50	15.54	10.00	9.00
10	14.50	19.58	10.90	12.00
16	18.75	28.22	14.00	18.00
23	21.63	30.71	16.00	18.00

Actuator removal clearance = 6 inches

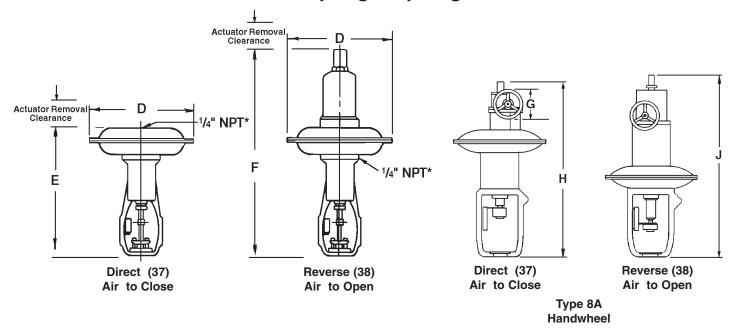
Model 87/88 Actuator (mm)

Actuator Size	Р	R	S	Т
6	292	395	254	229
10	368	497	277	305
16	476	717	356	457
23	549	780	406	457

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Actuator removal clearance = 150 mm

Mode 37/38 Spring Diaphragm Actuator



Model 37/38 Actuator (inches)

	Actuator				Side-Mounted Handwheel			
Size	Actuator Removal Clearance	D	E Dir.	F Rev.	Туре	G	H Dir.	J Rev.
18	5.6	20.75	33.4	53 max	8A	8	F0	00
24	5.0	27.5	34.7	59 max	8A	12	56 max	66 max

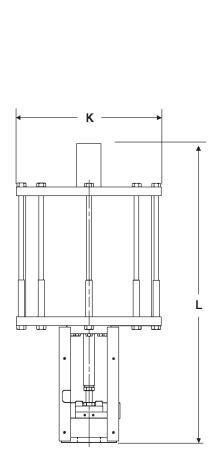
^{* 1/2&}quot; NPT for No. 24 Actuator

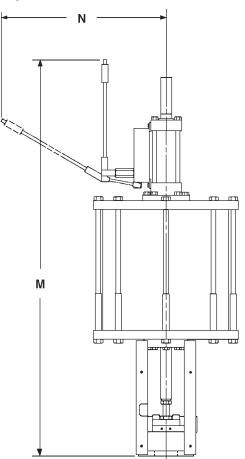
Model 37/38 Actuator (mm)

	Actuator				Sic	le-Mou	nted Hand	lwheel	
Size	Actuator Removal Clearance	D	E Dir.	F Rev.	Туре	G	H Dir.	J Rev.	
18	142	527	849	1353 max	8A	203	1405	1007	
24	127	699	881	1505 max	8A	305	1425 max	1667 max	

^{* 1/2&}quot; NPT for No. 24 Actuator

Model 84/85/86 Cylinder Actuator





Model 84/85/86 Actuator (inches)

Actuator Size	K	L	М	N
154	14.80	47.80	62.10	26.70
314	23.90	49.80	64.50	27.00

Actuator removal clearance = 6 inches

Actuator removal clearance with handjack = 7.2 inches

Model 84/85/86 Actuator (mm)

Actuator Size	K	L	M	N
154	376	1214	1577	678
314	607	1265	1638	686

Actuator removal clearance = 150 mm

Actuator removal clearance with handjack = 180 mm

Body S/A Weights (lbs)

Va	lve		Flanged C	Connection		Threaded / Welded Connection		
Si	ize	ANSI Class ANSI Class 150, 300 and 600 and				ANSI Class 600 and	ANSI Class 900 and	ANSI Class 1500 and
inches	mm	,		equivalent PN		equivalent PN		equivalent PN
2	50	88	88	110	110	88	88	88
3	80	176	198	265	287	154	221	221
4	100	221	265	463	485	198	375	397
6	150	419	507	882	1036	397	750	816
8	200	772	926	1389	1698	772	1147	1323
10	250	1257	1367	2227	2646	1125	1852	2007
12	300	1632	2117	2933	4278	1808	2448	3330
16	400	3462	3837	-	-	3330	-	-

Body S/A Weights (kg)

Va	lve		Flanged C	Connection		Threaded / Welded Connection		
Si	ize	ANSI Class 150, 300 and	ANSI Class 600 and	ANSI Class 900 and	ANSI Class 1500 and	ANSI Class 600 and	ANSI Class 900 and	ANSI Class 1500 and
inches	mm	,		equivalent PN				
2	50	40	40	50	50	40	40	40
3	80	80	90	120	130	70	100	100
4	100	100	120	210	220	90	170	180
6	150	190	230	400	470	180	340	370
8	200	350	420	630	770	350	520	600
10	250	570	620	1010	1200	510	840	910
12	300	740	960	1330	1940	820	1110	1510
16	400	1570	1740	-	-	1510	-	-

Model 87/88 Spring Diaphragm Actuator (lbs)

Size	Standard	With Handwheel
6	45	60
10	85	105
16	210	245
23	265	340

Model 87/88 Spring Diaphragm Actuator (kg)

Size	Standard	With Handwheel
6	20	27
10	38	48
16	95	111
23	120	154

Weights

Model 37/38 Spring Diaphragm Actuator (lbs)

Size	Stan	dard	With Ha	andwheel
0.20	Direct	Reverse	Direct	Reverse
18	190	450 max	234	494
24	375	540 max	419	584

Model 37/38 Spring Diaphragm Actuator (kg)

Size		With Handwheel		
0.20	Direct	Direct Reverse		Reverse
18	86	204 max	106	224
24	170	245 max	190	265

Model 84/85/86 Cylinder Actuator (lbs)

Actuator Size	Base Weight	Small Spring	Large Spring	Medium Spring	Handjack
154	266	60	82	_	100
314	709	60	142	84	100

Model 84/85/86 Cylinder Actuator (kg)

Actuator Size	Base Weight	Small Spring	Large Spring	Medium Spring	Handjack
154	120	27	37	_	45
314	321	27	64	38	45

Options

Extension Bonnets
Environmental Capabilities (LE Packing)
Lubricator & Isolation Valve
Other Flange Facings
Limit Stops
Body Drain Plug
Reducer and Nipple Connections
NACE Compliance
Custom Trim Materials
U.O.P. Trim Materials
Other Materials
Soft Seat (IEC 534-4 and ANSI Class VI)
Non-Destructive Examination
Oxygen Cleaning
Electric Actuators

For Accessories and additional Options, consult Masoneilan.

Notes

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Notes

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