

The BelGAS<sup>CP</sup> P7100 series is a pneumatically operated control valve. Offering a NACE compliant construction as standard, the P7100 is designed to withstand severely corrosive mediums associated with the oil and gas industry. Trim options of precipitation hardened stainless steel and tungsten carbide allow the P7100 to handle most destructive process conditions. An LCC steel body makes the P7100 well-suited for applications in a wide temperature range.

## Applications

- Separators
- Liquid Level Controls
- Scrubbers
- Plunger Lift
- Dehydrators
- Process Equipment

## Features

- **Simple Maintenance:** The actuator assembly and valve trim can be quickly changed without removing the valve from the line. Simply loosen the hammer nut and lift the actuator assembly free of the body. No special tools are required.
- **Safety Pressure Relief:** As a warning, the hammer nut is designed to leak a small amount of process fluid if an attempt to remove the actuator is made while the valve body is still pressurized.
- **Hardened Trim:** Precipitation hardened stainless steel and tungsten carbide trim options will handle the most damaging process conditions.
- **Sour Gas Service:** All control valves come standard with NACE MR0175 compliant parts to ensure functionality in sour gas applications.



## Specifications

<b>Inlet Pressure Rating</b>	4000 PSIG (Max)
<b>Assembled Valve Temperature Range</b>	-40° to 200°F (-40° to 93°C)
<b>Shutoff Classification</b>	ANSI Class IV
<b>Recommended Air Pressure to Actuator</b>	3-15 Spring: 0 to 20 PSIG 6-30 Spring: 0 to 35 PSIG

## P7100 Series Actuator

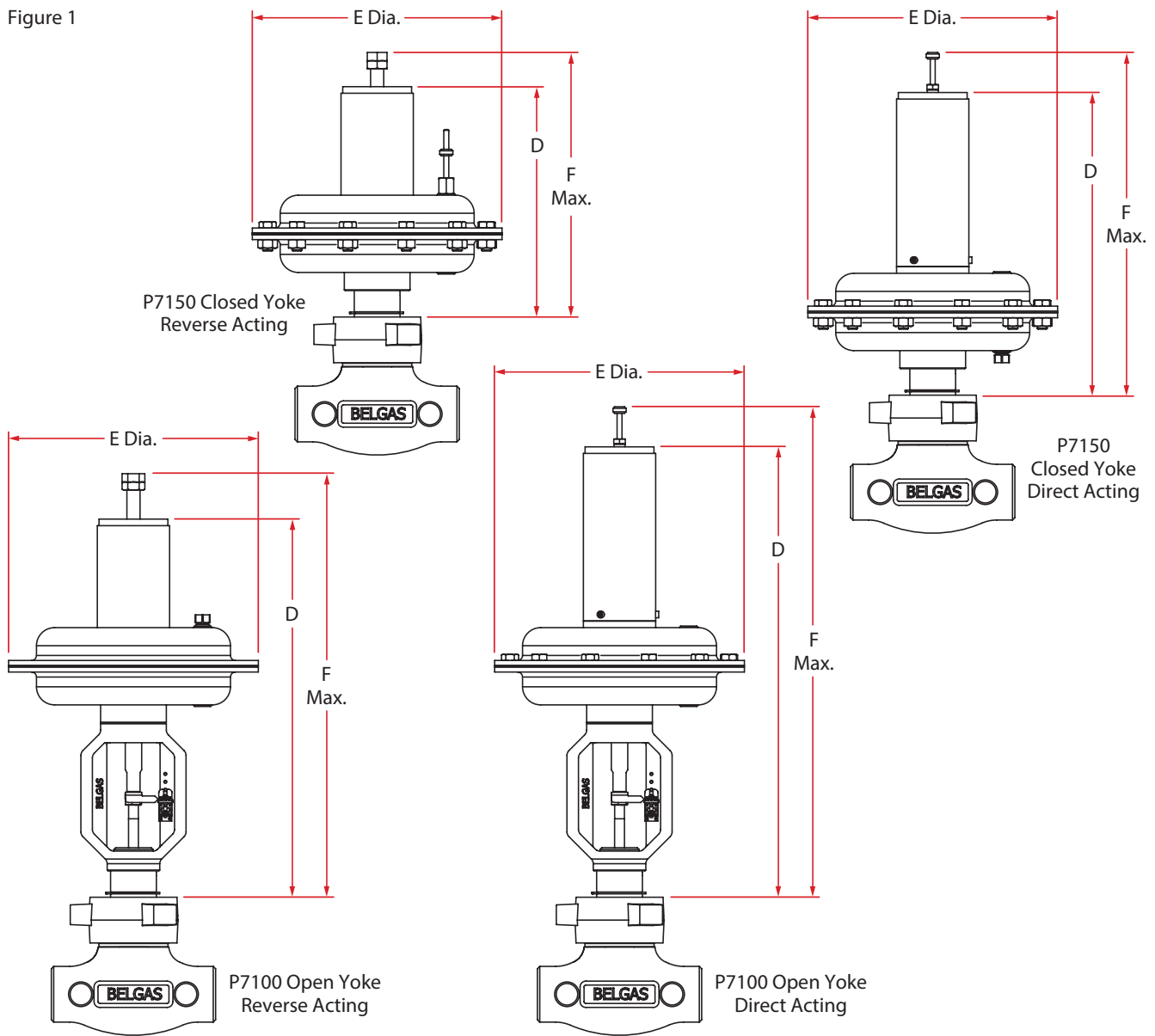
Actuator Size	Diaphragm Effective Area	Housing Max Pressure	Approximate Weight
No. 35	35 in. <sup>2</sup>	50 PSIG	25 lbs. (11.3 kg)
No. 70	70 in. <sup>2</sup>	35 PSIG	50 lbs. (22.7 kg)

## Materials of Construction

Part	Material
Upper and Lower Housing	Steel
Main Spring	Steel
Diaphragm	Neoprene with Nylon
Diaphragm Plate	Steel
Packing Plug	Stainless Steel
Hammer Nut	Steel
Body	LCC Steel
Trim/Orifice	17-4PH Stainless Steel or Tungsten Carbide
V-Packing	Virgin PTFE

# P7100/P7150 Actuator Dimensional Data (in., mm)

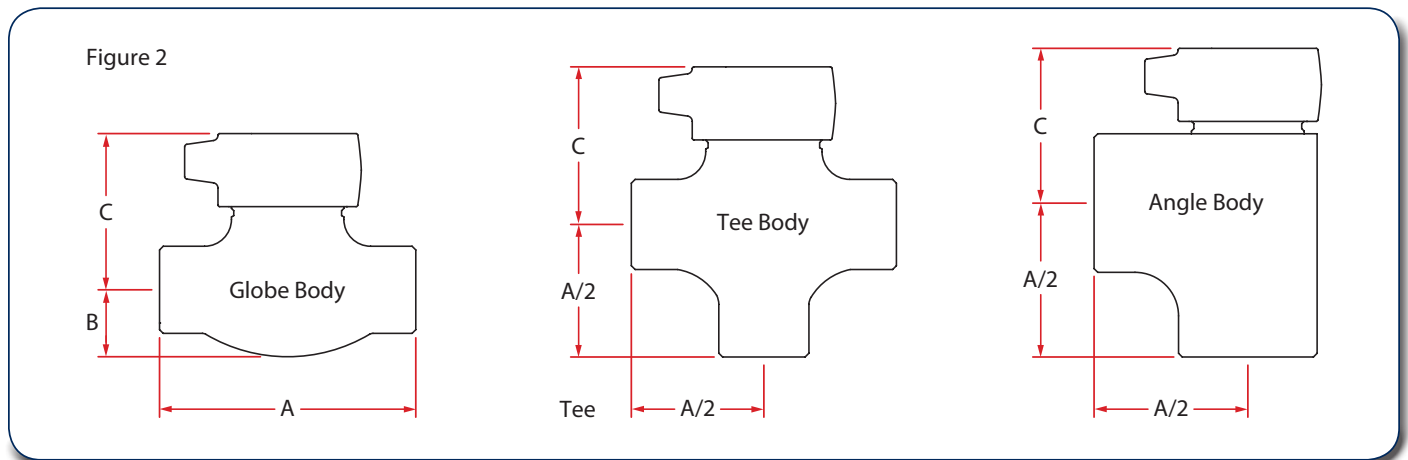
Figure 1



Actuator Size	Spring Range	Dimensions									
		Diaphragm		P7150 Closed Yoke Reverse Acting				P7150 Closed Yoke Direct Acting			
		E		D		F		D		F	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
No. 35	3-15	9.50	241.30	8.77	222.68	10.77	273.48	11.52	292.53	13.52	343.33
	6-30	9.50	241.30	10.64	270.18	12.64	320.98	13.01	330.42	15.01	381.22
No. 70	3-15	12.50	317.50	10.64	270.18	12.64	320.98	13.12	333.14	15.12	383.94
	6-30	12.50	317.50	12.39	314.63	14.39	365.43	16.44	417.46	18.44	468.26

Actuator Size	Spring Range	Dimensions									
		Diaphragm		P7100 Open Yoke Reverse Acting				P7100 Open Yoke Direct Acting			
		E		D		F		D		F	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
No. 35	3-15	9.50	241.30	14.39	365.56	16.39	416.36	17.14	435.41	19.14	486.21
	6-30	9.50	241.30	16.26	413.05	18.26	463.85	18.63	473.29	20.63	524.09
No. 70	3-15	12.50	317.50	16.26	413.05	18.26	463.85	18.74	476.01	20.74	526.81
	6-30	12.50	317.50	18.01	457.50	20.01	508.30	22.06	560.34	24.06	611.14

## P7100 Body Dimensional Data (in., mm)



Body Size (in.)	End Connection	A (Face to Face)								B		C	
		ANSI 150		ANSI 300		ANSI 600		ANSI 900 / 1500		in.	mm	in.	mm
		in.	mm	in.	mm	in.	mm	in.	mm				
1	NPT	—	—	—	—	—	—	6.25	159	1.56	39.6	3.69	93.7
	RF	7.25	184	7.75	197	8.25	210	9.38	238				
	RTJ	7.75	197	8.25	210	8.25	210	9.38	238				
2	NPT	—	—	—	—	—	—	7.50	191	3.69	93.7	3.69	93.7
	RF	10.00	254	10.50	267	11.25	286	12.88	327				
	RTJ	10.50	267	11.13	283	11.38	289	13.00	330				

## Flow Coefficients (C<sub>v</sub>)

Body Size (in.)	Orifice Size (in.)	Trim Characteristic													
		Modified Percent											Quick Open		
		Globe Body											Angle Body	Globe Body	Angle Body
		Valve Opening (% Travel)													
		10	20	30	40	50	60	70	80	90	100	100	100	100	
1	1/4	.284	.506	.657	.767	.875	.989	1.10	1.20	1.32	1.40	1.64	1.68	1.92	
	3/8	.311	.621	.942	1.28	1.64	2.07	2.51	2.93	3.35	3.70	4.23	3.82	4.34	
	1/2	.502	1.05	1.59	2.09	2.61	3.14	3.72	4.27	4.96	5.62	6.61	5.70	6.72	
	3/4	.882	1.76	2.76	3.82	4.93	6.17	7.49	8.85	10.00	11.00	15.10	11.60	15.20	
	1	1.01	2.02	3.44	5.07	6.78	8.42	10.30	12.40	14.30	15.40	20.80	15.50	20.90	
2	1/4	.284	.506	.657	.767	.875	.989	1.10	1.20	1.32	1.40	1.66	1.68	1.98	
	3/8	.311	.621	.942	1.28	1.64	2.07	2.51	2.93	3.35	3.70	4.35	3.82	4.47	
	1/2	.592	1.17	1.76	2.34	2.95	3.70	4.57	5.50	5.95	6.08	6.90	6.19	7.00	
	3/4	.882	1.81	2.98	4.11	5.74	7.03	8.49	10.10	11.50	12.90	15.20	13.00	15.80	
	1	1.08	2.12	3.58	5.43	7.46	9.27	11.40	13.70	15.80	17.10	21.10	18.00	22.00	

## P7100 Part Number Matrix

<b>P71</b>					<b>S</b>								
<b>Style</b>													
Closed Coupled	<b>50</b>												
Open Yoke	<b>00</b>												
<b>Body Size</b>													
1"		<b>08</b>											
2"		<b>16</b>											
<b>End Connections</b>													
Female NPT			<b>S</b>										
Raised Face Flange (RF)			<b>F</b>										
Ring Type Joint Flange (RTJ)			<b>J</b>										
<b>ANSI Class</b>													
ANSI 150				<b>1</b>									
ANSI 300				<b>3</b>									
ANSI 600				<b>6</b>									
ANSI 900				<b>9</b>									
ANSI 1500				<b>5</b>									
<b>Materials of Construction</b>													
LCC, NACE					<b>S</b>								
<b>Body Style</b>													
Globe						<b>G</b>							
Tee (1") or Angle (2")						<b>T</b>							
Tapped Globe						<b>P</b>							
<b>Actuator Selection</b>													
No. 35 Actuator w/3-15 Spring								<b>33</b>					
No. 35 Actuator w/6-30 Spring								<b>36</b>					
No. 70 Actuator w/3-15 Spring								<b>73</b>					
No. 70 Actuator w/6-30 Spring								<b>76</b>					
<b>Actuator Type</b>													
Reverse Acting (Spring Closes/ Air Opens)									<b>R</b>				
Direct Acting (Spring Opens/ Air Closes)									<b>D</b>				
<b>Seal Material</b>													
Nitrile										<b>0</b>			
Viton®										<b>2</b>			
Aflas®										<b>A</b>			
Kalrez®										<b>K</b>			
HNBR										<b>R</b>			
<b>Trim Material</b>													
17-4PH SST											<b>1</b>		
Tungsten Carbide											<b>2</b>		
<b>Trim Size</b>													
3/16"												<b>2</b>	
1/4"												<b>4</b>	
3/8"												<b>6</b>	
1/2"												<b>8</b>	
3/4"												<b>B</b>	
1"												<b>D</b>	
<b>Trim Characteristic</b>													
Modified Percent (Throttling)													<b>T</b>
Quick Opening (On/Off)													<b>S</b>
Equal Percentage													<b>E</b>

## P7100 Repair Kits

Trim Repair Kit (Plug, Cage w/O-ring, Pin)			
971P71			
<b>Trim Material</b>			
17-4PH SST w/Nitrile O-ring	<b>1</b>		
Tungsten Carbide w/Nitrile O-ring	<b>2</b>		
<b>Trim Size</b>			
3/16"			
1/4"		<b>4</b>	
3/8"		<b>6</b>	
1/2"		<b>8</b>	
3/4"		<b>B</b>	
1"		<b>D</b>	
<b>Trim Characteristic</b>			
Modified Percent (Throttling)			<b>T</b>
Quick Opening (On/Off)			<b>S</b>
Equal Percentage			<b>E</b>

O-ring Repair Kit			
971P71		5	0
<b>Type</b>			
Elastomer Kit	<b>5</b>		
<b>Material</b>			
Nitrile		<b>0</b>	
Fluorocarbon		<b>2</b>	
TFE/P		<b>A</b>	
FFKM		<b>K</b>	
HNBR		<b>R</b>	

Top Works			
P71			
<b>Style</b>			
Closed	<b>50</b>		
Open	<b>00</b>		
<b>Actuator Selection</b>			
No. 35 Actuator w/3-15 Spring		<b>33</b>	
No. 35 Actuator w/6-30 Spring		<b>36</b>	
No. 70 Actuator w/3-15 Spring		<b>73</b>	
No. 70 Actuator w/6-30 Spring		<b>76</b>	
<b>Actuator Type</b>			
Reverse Acting (Spring Closes/ Air Opens)			<b>R</b>
Direct Acting (Spring Opens/ Air Closes)			<b>D</b>
<b>Seal Material</b>			
Buna-N			<b>0</b>
Viton®			<b>2</b>
Aflas®			<b>A</b>
Kalrez®			<b>K</b>
HNBR			<b>R</b>

Packing Plug Kit	Material	Qty.	Part Number
Packing Plug, Packing Plug	Nitrile	1	819-011-000K
	Fluorocarbon		819-011-001K
O-ring and Lower Housing	TFE/P		819-011-002K
O-ring	FFKM		819-011-003K
	HNBR		819-011-004K

## P7100 Parts (Flange Bodies)

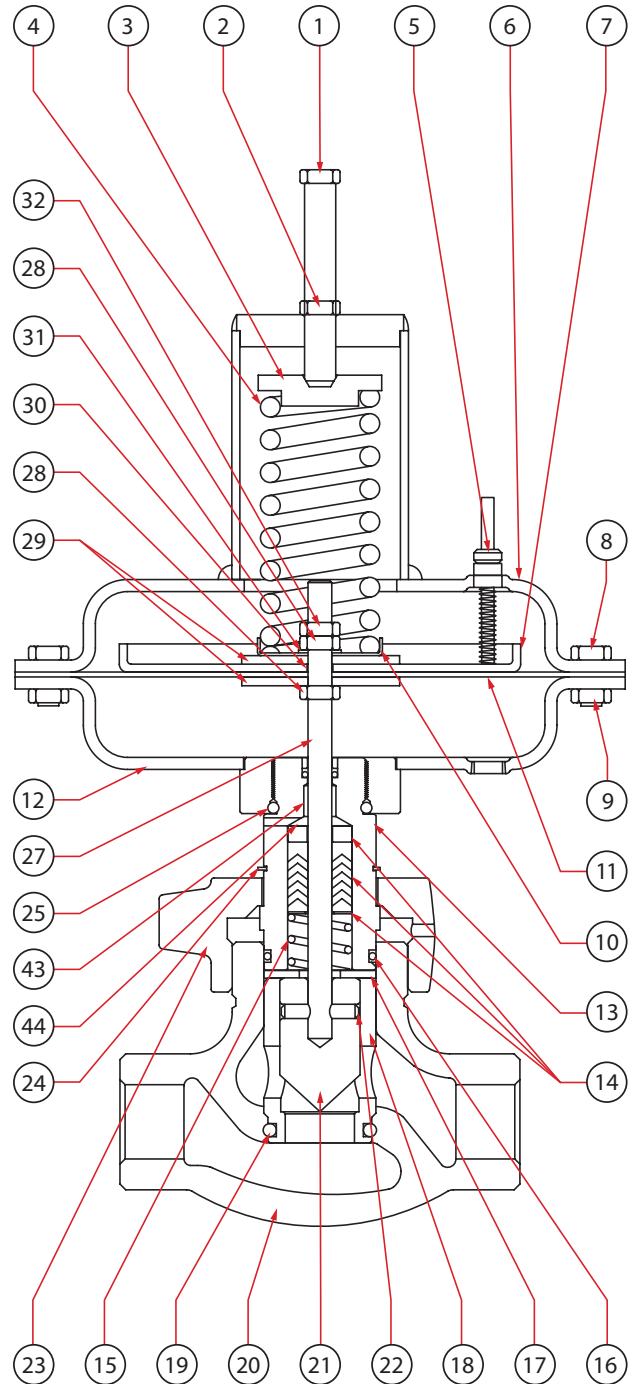
Item	Description	Qty.	Part Number	
20	1" Globe Body	1	150 RF	
			300 RF	
			600 RF	
			900 RF	
			1500 RF	
			150 RTJ	
			300 RTJ	
			600 RTJ	
			900 RTJ	
			1500 RTJ	
			2" Globe Body	150 RF
				300 RF
	600 RF			
	900 RF			
	1500 RF			

Item	Description	Qty.	Part Number
20	2" Angle Body	1	150 RF
			300 RF
			600 RF
			900 RF
			1500 RF
	2" Globe Body		150 RTJ
			300 RTJ
			600 RTJ
			900 RTJ
			1500 RTJ

## P7100 Parts List (Reverse Acting)

Item	Description	Qty.	Part Number
1	Adjustment Screw	1	#35 648-559-000
			#70 648-559-001
2	Jam Nut	1	#35 634-000-056
			#70 634-181-000
3	Upper Spring Retainer	1	#35, 3-15 Spring 643-214-000
			#35, 6-30 Spring 643-213-000
			#70, 3-15 Spring 643-230-000
			#70, 6-30 Spring 643-230-000
4	Spring	1	#35, 3-15 Spring 655-757-000
			#35, 6-30 Spring 655-756-000
			#70, 3-15 Spring 655-755-000
			#70, 6-30 Spring 655-755-000
5	Position Indicator Assembly	1	819-014-000K
6	Upper Diaphragm Housing	1	#35, 3-15 Spring 802-132-000
			#35, 6-30 Spring 802-135-000
			#70, 3-15 Spring 802-134-000
			#70, 6-30 Spring 802-133-000
7	Diaphragm Plate	1	#35 638-083-000
			#70 638-082-000
8	Diaphragm Housing Screw	12	648-560-000
9	Diaphragm Housing Nut	12	634-184-000
10	Lower Spring Retainer	1	#35, 3-15 Spring 643-215-000
			#35, 6-30 Spring 662-425-000
			#70, 3-15 Spring 662-424-000
			#70, 6-30 Spring 662-424-000
11	Diaphragm	1	#35 618-105-000K
			#70 618-104-000K
12	Lower Diaphragm Housing	1	#35 802-131-000
			#70 802-130-000
13	Packing Plug	1	See Repair Kits
14	Packing Kit	1	824-001-000
15	Packing Spring	1	655-759-000
16	Packing Plug O-ring	1	See Repair Kits
17	Packing Washer	1	662-427-000
18	Cage/Seat	1	See Repair Kits
19	Seat O-ring	1	See Repair Kits
20	Body	1	1" NPT, Globe 664-417-000
			1" NPT, Tee 664-421-000
			2" NPT, Globe 664-419-000
			2" NPT, Angle 664-426-000
Flange Bodies Part Numbers			See Table/Pg. 5
21	Valve Plug	1	See Repair Kits
22	Pin	1	635-078-000
23	Hammer Nut	1	634-207-000
24	Ring Retainer	1	693-029-000
25	Lower Housing O-ring	1	See Repair Kits
27	Stem	1	689-014-000
28	Hex Nut	2	634-151-000
29	Bearing Washer	1	662-423-000
30	Diaphragm O-ring	1	See Repair Kits
31	Lock Washer	1	662-429-000
32	Hex Jam Nut	1	634-000-010
Not Shown	NPT Plug (1" Tee Body Only)	1	639-140-000
	Nameplate	1	632-571-000

Figure 3



1" Globe Body with No. 35 Actuator and 3-15 Spring Range

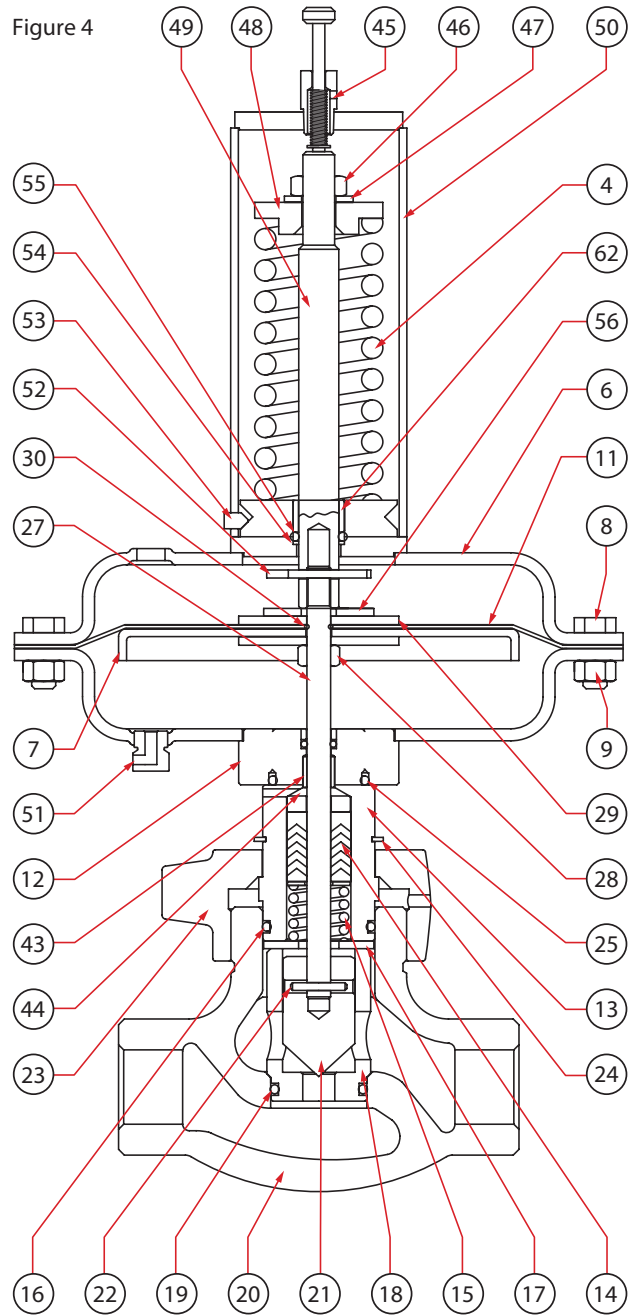
Item	Description	Qty.	Part Number
Not Shown	NACE Tag	1	675-015-000
	Drive Screw (Nameplate)	1	648-573-000
	Cable Tie (NACE Tag)	1	010-267-000
43	Packing Plug Bushing	1	602-138-000
44	Felt Wiper	1	662-257-000



## P7100 Parts List (Direct Acting)

Item	Description	Qty.	Part Number	
4	Spring	1	#35, 3-15 Spring	655-757-000
			#35, 6-30 Spring	655-756-000
			#70, 3-15 Spring	655-755-000
			#70, 6-30 Spring	
6	Upper Diaphragm Housing	1	#35, 3-15 Spring	802-132-000
			#35, 6-30 Spring	802-135-000
			#70, 3-15 Spring	802-134-000
			#70, 6-30 Spring	802-133-000
7	Diaphragm Plate	1	#35	638-083-000
			#70	638-082-000
8	Diaphragm Housing Screw	12	648-560-000	
9	Diaphragm Housing Nut	12	634-184-000	
11	Diaphragm	1	#35	618-105-000K
			#70	618-104-000K
12	Lower Diaphragm Housing	1	#35	802-131-000
			#70	802-130-000
13	Packing Plug	1	See Repair Kits	
14	Packing Kit	1	824-001-000	
15	Packing Spring	1	655-759-000	
16	Packing Plug O-ring	1	See Repair Kits	
17	Packing Washer	1	662-427-000	
18	Cage/Seat	1	See Repair Kits	
19	Seat O-ring	1	See Repair Kits	
20	Body	1	1" NPT, Globe	664-417-000
			1" NPT, Tee	664-421-000
			2" NPT, Globe	664-419-000
			2" NPT, Angle	664-426-000
	Flange Bodies Part Numbers		See Table/Pg. 5	
21	Valve Plug	1	See Repair Kits	
22	Pin	1	635-078-000	
23	Hammer Nut	1	634-207-000	
24	Ring Retainer	1	693-029-000	
25	Lower Housing O-ring	1	See Repair Kits	
27	Stem	1	689-014-000	
28	Hex Nut	2	634-151-000	
29	Diaphragm Retainer	1	643-237-000	
30	Diaphragm O-ring	1	See Repair Kits	
Not Shown	NPT Plug (1" Tee Body Only)	1	639-140-000	
	Nameplate	1	632-571-000	
	NACE Tag	1	675-015-000	
	Drive Screw (Nameplate)	1	648-573-000	
	Cable Tie (NACE Tag)	1	010-267-000	
43	Packing Plug Bushing	1	602-138-000	
44	Felt Wiper	1	662-257-000	
45	Position Indicator Assembly	1	819-015-000K	
46	Adjustment Nut	1	634-185-000	
47	Washer	1	662-236-003	
48	Upper Spring Retainer	1	#35, 3-15 Spring	643-231-000
			#35, 6-30 Spring	643-232-000
			#70, 3-15 Spring	
			#70, 6-30 Spring	
49	Upper Stem	1	#35, 3-15 Spring	689-029-000
			#35, 6-30 Spring	689-012-000
			#70, 3-15 Spring	
			#70, 6-30 Spring	

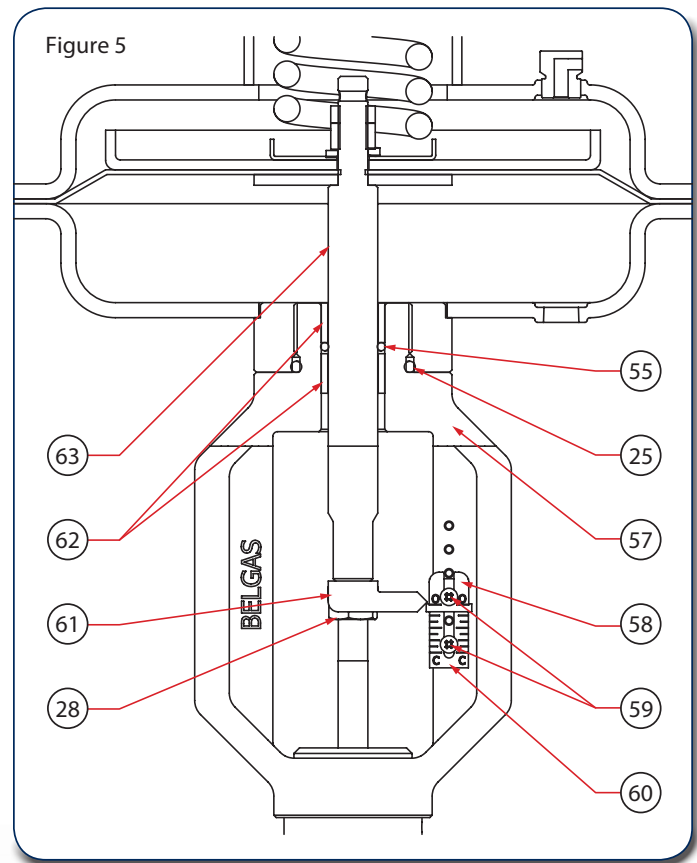
Figure 4



Item	Description	Qty.	Part Number	
50	Spring Cover	1	#35, 3-15 Spring	812-034-000
			#35, 6-30 Spring	812-033-000
			#70, 3-15 Spring	812-032-000
			#70, 6-30 Spring	
51	1/4" NPT Breather Plug	1	639-144-000	
52	Cotter Pin	1	635-000-042	
53	Spring Cap Set Screw	2	648-591-000	
54	Split Back-Up Ring	1	644-068-000	
55	Stem O-ring	1	See Repair Kits	
56	Washer (#35 Only)	1	662-424-000	
62	Bronze Bushing	1	602-129-000	

## P7100 Parts List (Open Yoke)

Item	Description	Qty.	Part Number
25	Lower Housing O-ring	1	See Repair Kits
28	Hex Nut	2	634-151-000
55	Stem O-ring	1	See Repair Kits
57	Open Yoke	1	629-282-000
58	Open Indicator Scale	1	711-006-000
59	Indicator Scale Screws	2	648-000-394
60	Closed Indicator Scale	1	711-007-000
61	Indicator Pointer	1	711-008-000
62	Bronze Bushing	2	602-129-000
63	Open Yoke Stem	1	689-040-000



Contact your BelGAS<sup>CP</sup> representative or go to [www.BelGASCP.com](http://www.BelGASCP.com) to learn more about our products.



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Better.**

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