

# Masoneilan™ 10900 Series

Spring Diaphragm and  
Differential Pressure Actuators  
for use with 500 Series  
Regulators



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## Features

The 10900 Series actuators are designed for use with the 500 Series regulators for reducing, back pressure and differential pressure applications.

The following chart indicates the combinations available to provide the desired function.

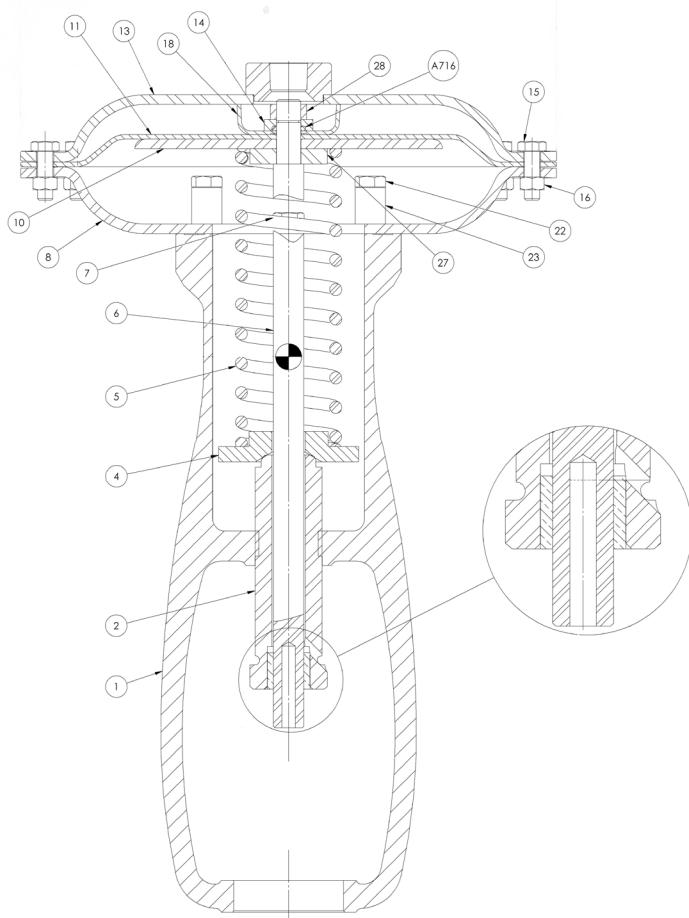
Function	Actuator	Regulator
Reducing	Spring Diaphragm	525, 535H, 535V
Back Pressure	Spring Diaphragm	526, 536H
Differential, Reducing	Differential	525-50, 535H-50, 535V-50
Differential, Back Pressure	Differential	526-50, 536H-50

For temperatures over the rating of the diaphragm material, the regulator must be mounted with the actuator below the centerline of the regulator body. The diaphragm will be protected from the high temperature by a condensate barrier in the sensing line and actuator diaphragm case. If installed otherwise, an adequate condensate barrier must be incorporated. Consult factory for more information.

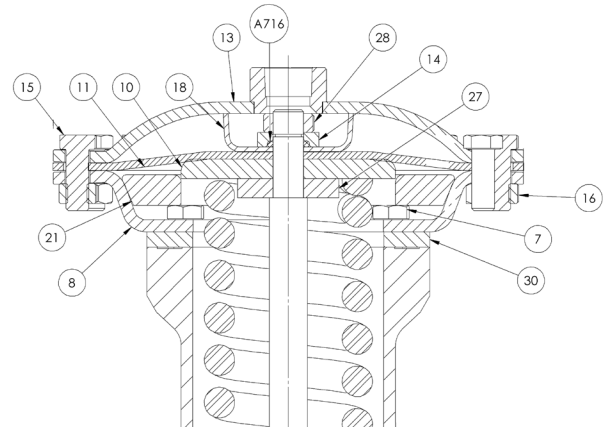
PTFE diaphragm protectors are available for applications where the process fluid and standard diaphragm are not compatible.

# Materials of Construction

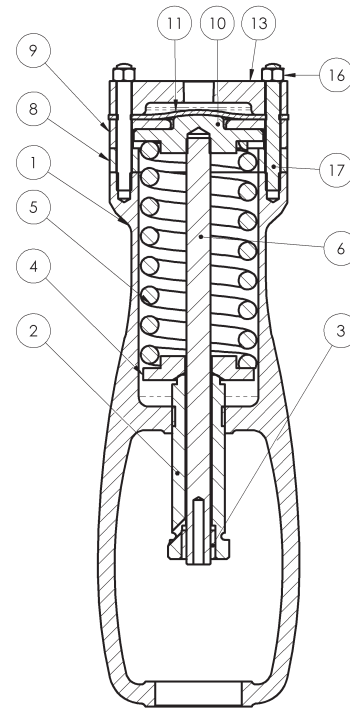
## Actuator 10900 Standard Construction Spring Diaphragm Actuators



Design for the 0.5-3, 2-10, 6-20 and 15-40 psi  
(0.03-0.21, 0.14-0.69, 0.41-1.38 and 1.03-2.76 bar) ranges



Design for the 30-75, 60-125 and 80-250 psi  
(2.07-5.17, 4.14-8.62 and 5.52-17.24 bar) ranges



Design for the 150-300, 150-450 & 400-750 psi  
(10.34-20.68, 10.34-31.03 & 27.58-51.71 bar) ranges

Figure 1 – Spring-Diaphragm Actuators for  
500, 500H and 535V Model Regulators

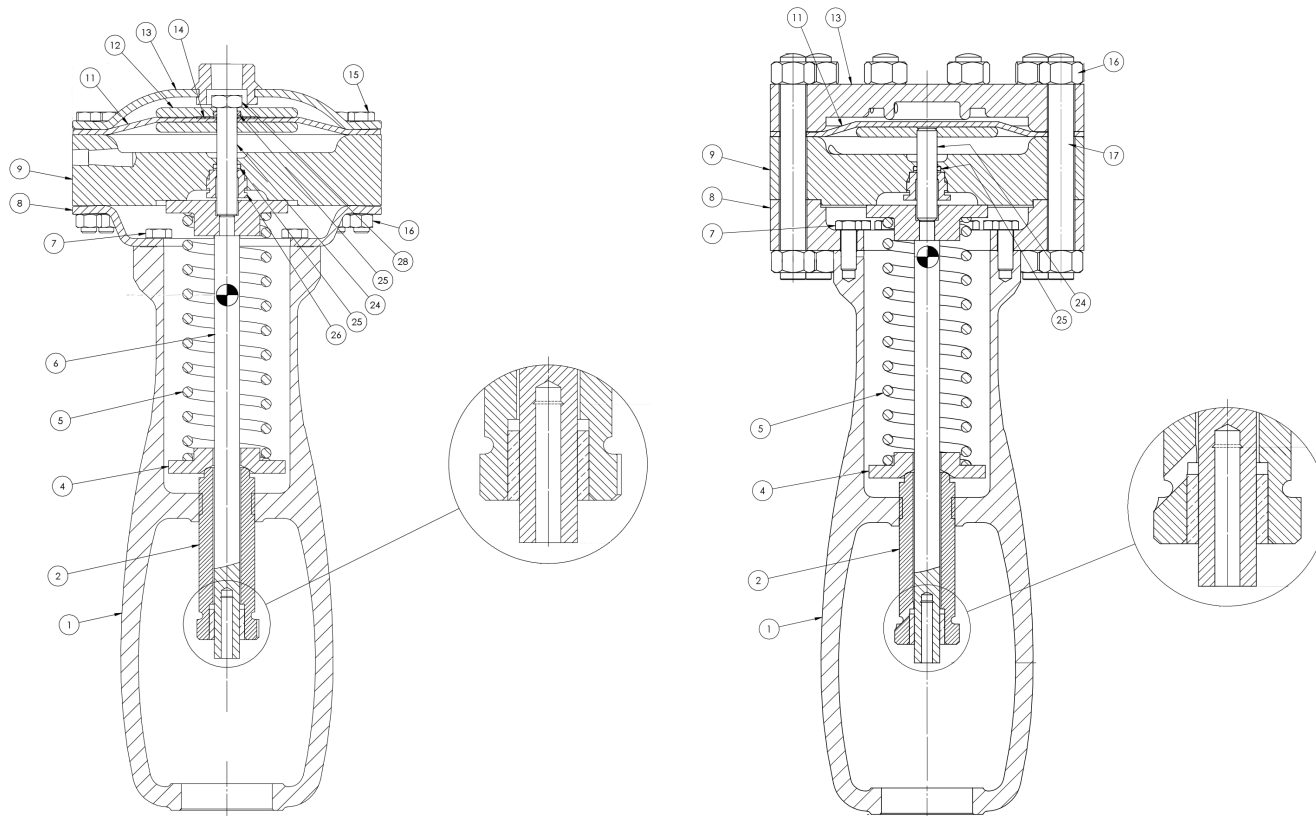
### Parts Reference

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
1	Yoke	9	Diaphragm Chamber	18 <sup>1</sup>	Stop Cup
2	Spring Adjuster	10	Diaphragm Plate	21 <sup>3</sup>	Reducing Ring
3	Bushing (incl. Ref. 2)	11	Diaphragm •	22 <sup>4</sup>	Stop Screw
4	Lower Spring Seat	13	Diaphragm Case (Upper)	23 <sup>4</sup>	Stop Spacer
5	Actuator Spring	14 <sup>1</sup>	Diaphragm Washer	27 <sup>1</sup>	Upper Spring Washer
6	Actuator Stem	15 <sup>1</sup>	Cap Screw (Diaph. case)	28 <sup>1</sup>	Nut (Actuator stem)
7	Cap Screw (L. case to yoke)	16	Nut (Diaph. case)	30	Spacer Ring (only on 80-250 psi range)
8	Diaphragm Case (Lower)	17 <sup>2</sup>	Stud (Diaph. case)	A716 <sup>1</sup>	O-Ring •

- Recommended spare parts
- 1. On 0.5-3, 2-10, 6-20, 15-40, 30-75, 60-125, 80-250 psi ranges
- 2. Only on 150-300, 150-450 and 400-750 psi ranges
- 3. Only on 60-125 and 80-250 psi ranges
- 4. Only on 0.5-3, 2-10, 6-20 and 15-40 psi ranges

# Materials of Construction

## Actuator 10900 Standard Construction Differential Pressure Actuators



**Low Pressure Case Design for 3-12, 10-30, 30-75, 60-125 psi  
(0.21-0.83, 0.69-2.07, 2.07-5.17,  
4.14-8.62 bar) ranges**

**High Pressure Case Design for 3-15, 30-85, 5-30, 10-60,  
10-30, 75-185, 100-330 psi (0.21-1.03, 2.07-5.86, 0.34-2.07,  
0.69-4.14, 0.69-2.07, 5.17-12.76, 6.89-22-75 bar) ranges**

**Figure 2 - Differential Pressure Actuators for 500-50, 500H-50 and 535V-50 Models Regulators**

### Parts Reference

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
1	Yoke	10	Diaphragm Plate (Incl. w. Ref. 24)	25 <sup>3,4</sup>	O-Ring •
2	Spring Adjuster	11	Diaphragm •	26	O-Ring Retainer
3	Bushing (Incl. Ref. 2)	12 <sup>1</sup>	Upper Diaphragm Plate	27	Upper Spring Seat (Incl. w. Ref. 6)
4	Lower Spring Seat	13	Diaphragm Case (Upper)	28 <sup>1</sup>	Nut
5	Actuator Spring	14 <sup>1</sup>	Diaphragm Washer		
6	Actuator Stem	15 <sup>1</sup>	Cap Screw (Diaph. case)		
7	Cap Screw (L. case to yoke)	16	Nut (Diaph. case)		
8	Diaphragm Case (Lower)	17 <sup>2</sup>	Stud (Diaph. case)		
9	Diaphragm Chamber	24	Plunger Sub-Assembly		

- Recommended spare parts
- 1. Only on Low Pressure Case Design
- 2. Only on High Pressure Case Design
- 3. Qty: 2 on Low Pressure Case Design
- 4. Qty: 1 on High Pressure Case Design

# Materials of Construction

## Actuator Material 10900 Series

Ref. No.	Description	Materials				
		-20°F	180°F	300°F	400°F	650°F
1	Yoke	ASTM A126 Class B, Gray Cast Iron				
2	Spring Adjuster	Carbon Steel				
3	Bushing (Inc. in Ref 2)	ASTM B438 Grade I Type II, Sintered Copper Alloy				
4	Lower Spring Seat	ASTM A668 Class BH, Low Carbon Steel				
5	Actuator Spring	ASTM A229				
6	Actuator Stem <sup>1</sup>	Carbon Steel, Zinc Dichromate Plated				
7	Cap Screw (L. case to yoke)	ASTM A449, Carbon Steel				
8	Diaphragm Case (Lower)	ASTM A36, Low Carbon Steel				
9	Diaphragm Chamber <sup>2</sup>	ASTM A36, Low Carbon Steel				
10	Diaphragm Plate	ASTM A668, Cl. BH, Low Carbon Steel				
11	Diaphragm	Neoprene Reinforced with Nylon Fabric <sup>2</sup>	Silicone Reinforced with Dacron Fabric <sup>2</sup>	Viton Reinforced with Dacron Fabric <sup>2</sup>	Consult Factory	
12	Upper Diaphragm Plate (Sizes 4 and 5 LP Differential)	ASTM A108, Carbon Steel				
13	Upper Diaphragm Case	ASTM A36, Low Carbon Steel				
14	Diaphragm Washer	SAE J429h Grade 5				
A716	O-Ring	Nitrile	Silicone	Viton	Consult Factory	
15	Cap Screw (L. case to yoke)	SAE J429h Grade 5				
16	Nut	SAE J995h Grade 2				
17	Stud (3 ½, 4 & 5 High Pressure Differential)	ASTM A193 Grade B7, Chrome-Moly Alloy Steel				
18	Stop Cup (3 ½, 4 & 5)	ASTM A36, Low Carbon Steel				
19	Diaphragm Screw <sup>3</sup>	SAE J429h Grade 5				
21	Reducing Ring	ASTM A36, Low Carbon Steel				
22	Stop Screw (9 Spring Diaphragm)	ASTM A449 Carbon Steel				
23	Stop Spacer (9 Spring Diaphragm)	Carbon Steel				
24	Plunger Subassembly <sup>4</sup>	316 Stainless Steel Stem Welded to Carbon Steel Plate				
25	O-ring <sup>4</sup>	Nitrile	Silicone	Viton	Consult Factory	
26	O-Ring Retainer	Bronze				
27	Spring Seat (Upper) <sup>5</sup>	Carbon Steel				
28	Locknut (4 & 5 LP Differential)	SAE J995h Grade 2				
29	Adapter (4 & 5 HP differential)	Carbon Steel				
30	Spacer Ring	ASTM A36, Low Carbon Steel				
Ref. No.	Temperature Range	-29°C	82°C	149°C	204°C	343°C

1. For Differential Pressure cases Free Cutting Steel Stem & Plate, Welded Stem Zinc Dichromate Plated

2. Precaution for the regulator installation is necessary from 212°F (100°C) to 650°F (343°C) to avoid reaching usable temperature limits of diaphragm.

Diaphragm limits:

Neoprene reinforced with Nylon Fabric -32°C to 82°C (-25°F to 180°F)  
 Silicone reinforced with Dacron Fabric -73°C to 177°C (-100°F to 350°F)  
 Viton Reinforced with Dacron Fabric -29°C to 204°C (-20°F to 400°F)

3. Spring Diaphragm Cases

4. Differential Pressure Cases

5. Included in Ref.6 Differential Pressure Cases.

# Pressure Ranges

## Spring Diaphragm Actuators for Models 500 Series Regulators

Actuator Size (inches)	Travel		Range		Maximum Static Allowable Pressure for Actuator	
	(inches)	(mm)	(psi)	(bar)	(psi)	(bar)
9	0.375	9.5	0.5-3	0.03-0.21	60	4.1
9	0.375	9.5	2-10	0.14-0.69	60	4.1
9	0.375	9.5	6-20	0.41-1.38	60	4.1
9	0.375	9.5	15-40	1.03-2.76	60	4.1
5	0.375	9.5	30-75	2.07-5.17	250	17.2
4	0.375	9.5	60-125	4.14-8.62	250	17.2
3.5	0.375	9.5	80-250	5.51-17.24	250	17.2
3.5	0.125	3.18	150-300	10.34-20.68	750	52.0
			150-450	10.34-31.02		
			400-750	27.58-51.71		

## Differential Pressure Actuator for Models 525-50, 535H-50, 526-50 and 536H-50 Differential Pressure Regulators

### Low Pressure Application

Actuator Size (inches)	Range		Maximum Static Allowable Pressure for Actuator	
	(psi)	(bar)	(psi)	(bar)
9	15-40	1.03-2.76	60	4.1
5	3-12	0.21-0.83	250	17.2
5	10-30	0.69-2.07	250	17.2
5	30-75	2.07-5.17	250	17.2
4	60-125	4.14-8.62	250	17.2

### High Pressure Application

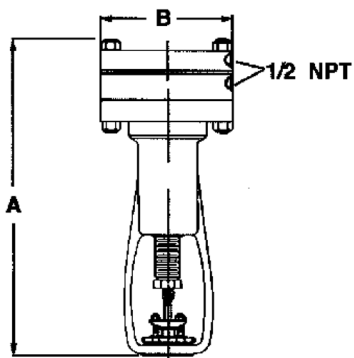
Actuator Size (inches)	Range		Maximum Static Allowable Pressure for Actuator	
	(psi)	(bar)	(psi)	(bar)
5	3-15	0.21-1.03	600	41.4
5	30-85	2.07-5.86	600	41.4
4	5-30	0.34-2.07	1000	69
4	10-60	0.69-4.14	1000	69
3.5	10-30	0.69-2.07	1500	103.4
3.5	75-185	5.17-12.76	1500	103.4
3.5	100-330	6.89-22.75	1500	103.4

### Diaphragms Options

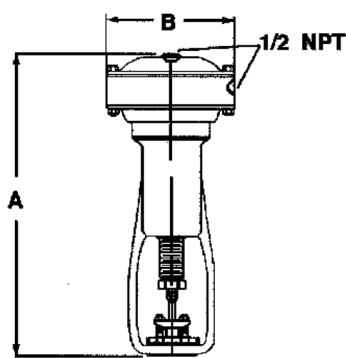
Material	Temperature Range
Neoprene Reinforced with Nylon Fabric (Standard)	-25°F to +180°F (-32°C to +82°C)
Silicone Reinforced with Dacron Fabric (Optional)	-100°F to +350°F (-73°C to +177°C)
Viton Reinforced with Dacron Fabric (Optional)	+300°F to +400°F (+149°C to +240°C)

# Dimensions and Weight

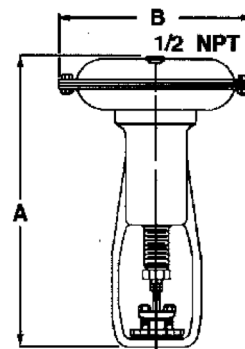
## Actuator 10900 Standard Construction



High Pressure Differential



Low Pressure Differential



Spring Diaphragm

Case	A		B	
	(in)	(mm)	(in)	(mm)
3 ½ Spring Diaphragm	16.3	413	7.6	194
4 Spring Diaphragm	16.3	413	7.6	194
5 Spring Diaphragm	16.3	413	7.6	194
9 Spring Diaphragm	16.9	430	11.0	279
Low Pressure Differential	18.0	457	7.6	194
High Pressure Differential	18.8	476	7.8	197

Spring Diaphragm				Low Pressure Differential				High Pressure Differential			
Range (psi)	Case	Weight		Range (psi)	Case	Weight		Range (psi)	Case	Weight	
		(lb)	(kg)			(lb)	(kg)			(lb)	(kg)
150-300	3 ½	31	14	60-125	4	46	21	10-30	3 ½	68	31
150-450	3 ½	31	14	3-12	5	44	20	75-185	3 ½	66	30
400-750	3 ½	31	14	10-30	5	44	20	100-330	3 ½	68	31
80-250	3 ½	29	13	30-75	5	46	21	10-60	4	64	29
60-125	4	27	12	15-40	9	40	18	5-30	4	64	29
30-75	5	27	12	-	-	-	-	30-85	5	62	28
15-40	9	35	16	-	-	-	-	3-15	5	62	28
6-20	9	33	15	-	-	-	-	-	-	-	-
2-10	9	33	15	-	-	-	-	-	-	-	-
1/2-3	9	33	15.0	-	-	-	-	-	-	-	-

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