

Type 87/88 Actuators

Specification Data

CR8788

10/98

Pneumatic
Spring Diaphragm
Actuators

Masoneilan

Valve & Controls

DRESSER

Table of Contents

Foreword	2
Numbering System	3
Handwheels	3
Materials	4, 5
Specifications	6
Travel Time	6
Standard Springs	6
Dimensions & Weights	7
Sales Offices and Distribution Centers	8

Foreword

Masoneilan Type 87 direct-acting and Type 88 reverse-acting pneumatic spring diaphragm actuators are designed to provide high performance. Their features include:

Field Reversible

Allows air action change with no additional parts.

Multiple Spring Design

Four standard spring types achievable by varying spring quantity and placement.

Heavy One-Piece Yoke

Provides maximum strength and rigidity.

Diaphragm Cases

Pressed steel upper and lower cases combine lightness, high mechanical strength, and protection in the event of overpressurization.

Thrust Capability

Two actuator types and four sizes provide a wide range of applications.

Diaphragm

Molded elastomer with fabric insert for strength, long life and high sensitivity.

Linearity

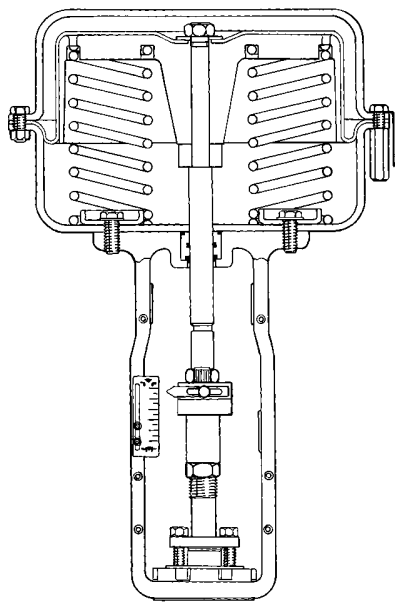
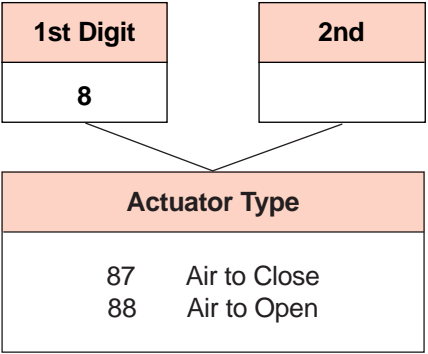
The molded rolling diaphragm and deep cases minimize area change and effects a linear relationship between travel and air pressure.

The following specifications have been inserted to provide technical information required to specify Masoneilan Type 87 and Type 88 spring diaphragm actuators.

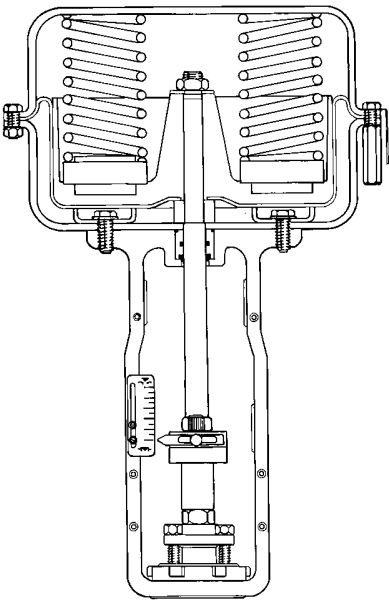
For additional information, consult your local Masoneilan Sales Representative.

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

Numbering System

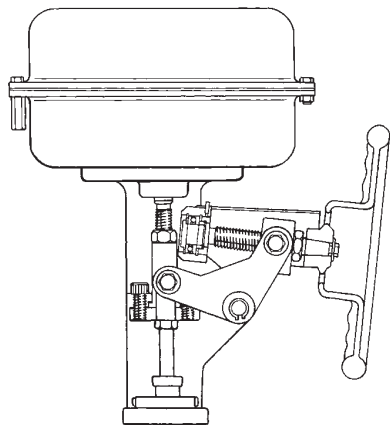


Direct : Air to Extend Stem
Type 87



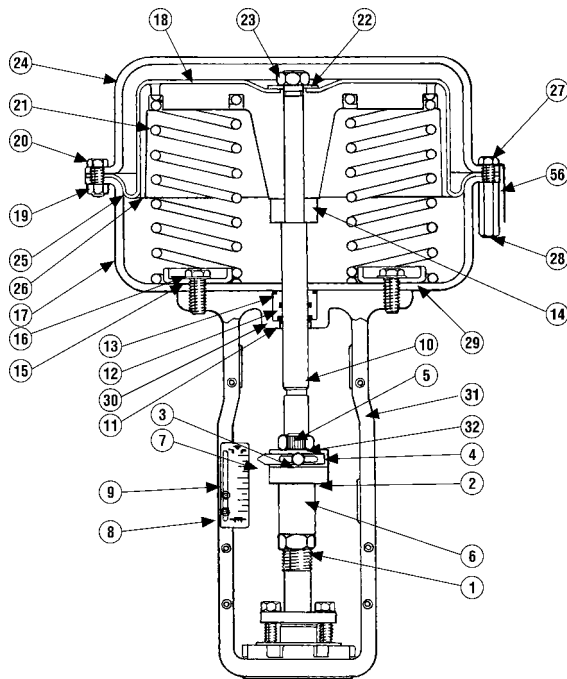
Reverse : Air to Retract Stem
Type 88

Handwheels

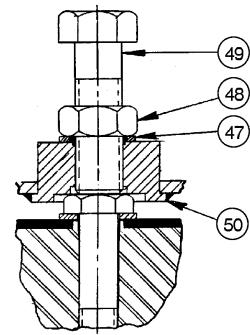


Actuator Size	Maximum Travel (inches)	Equivalent Air Supply (psi)	Number of Turns	Rim Force (lbs.)
6	0.8	60	5	80
10	1.5	60	9	100
16	2.5	60	17	100
23	2.5	60	25	100

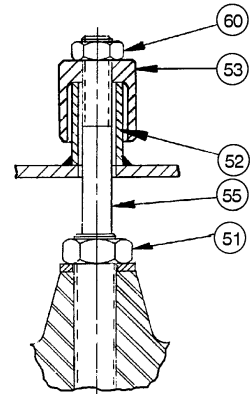
Materials



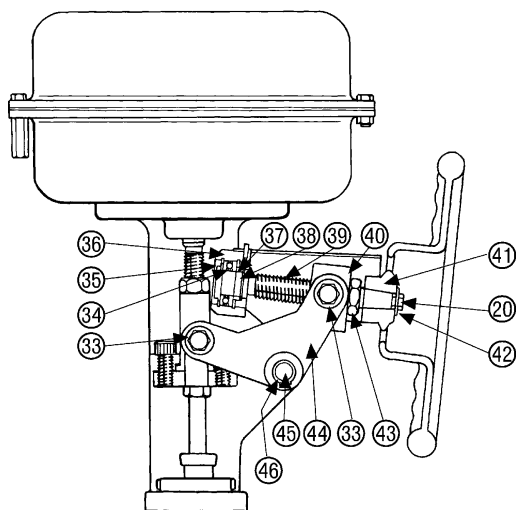
Size 16 Actuator



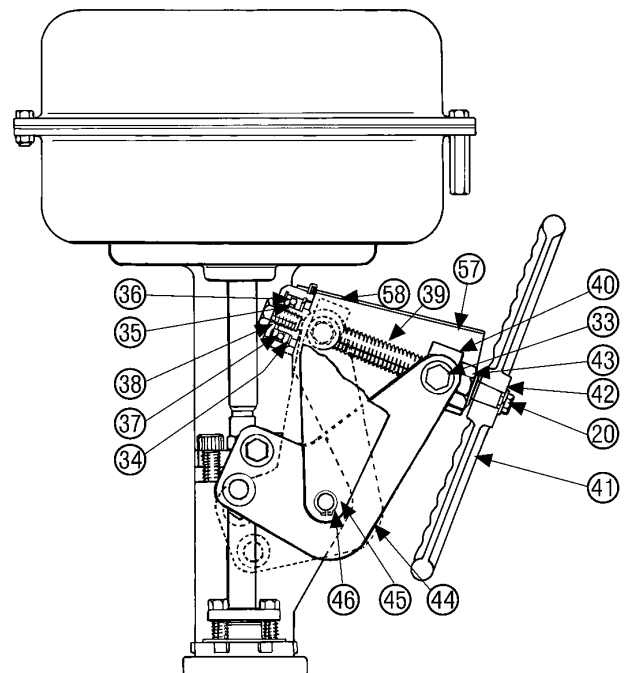
Model 87



**Model 88
Adjustable Limit Stop**



**Size 10 Actuator
with Optional Handwheel**



**Size 23 Actuator
with Optional Handwheel**

Materials

Ref No.	Description	Material
1	Hex Nut	Carbon Steel
2	Bottom Stem Connector	Carbon Steel, Zinc Plate
3	Hex Head Cap Screw	Carbon Steel
4	Top Stem Connector	Carbon Steel, Zinc Plate
5	Socket Head Cap Screw	Alloy Steel
6	Connector Insert	Carbon Steel, Zinc Plate
7	Pointer	Stainless Steel
8	Pan Head Screw	Carbon Steel
9	Scale - Travel	Stainless Steel
10	Actuator Stem	Stainless Steel
11	Stem Wiper	Polyurethane
12	O-ring	Buna-N
13	O-ring	Buna-N
14	Spacer	Carbon Steel
15	Seal Washer	Steel & Rubber
16	Hex Head Cap Screw	Carbon Steel
17	Lower Diaphragm Case	Carbon Steel
18	Spring Spacer	Cast Iron
19	Hex Nut	Carbon Steel
20	Hex Head Cap Screw	Carbon Steel
21	Spring	Carbon/Alloy Spring Steel
22	Washer	Carbon Steel
23	Jam Nut	Carbon Steel
24	Upper Diaphragm Case	Carbon Steel
25	Diaphragm	Buna-N w/Polyester
26	Diaphragm Plate	Aluminum ① Cast Iron ②
27	Hex Head Cap Screw	Carbon Steel
28	Compression Nut	Carbon Steel
29	Spring Guide	Carbon Steel
30	Stem Bushing	Tin/Lead Bronze
31	Machining Yoke	Gray Cast Iron
32	Lock Nut	Carbon Steel

Ref No.	Description	Material
33	Pivot Pin	Carbon Steel, Zinc Plate
34	Thrust Bearing	Alloy Steel
35	Retaining Ring	Carbon Steel
36	Handwheel Pivot	Carbon Steel
37	End Flange ①	Carbon Steel, Zinc Plate
	Bearing Ring ②	Carbon Steel
38	Hex Head Cap Screw ①	Carbon Steel
	Retaining Ring ②	Carbon Steel
39	Handwheel Stem	Carbon Steel, Zinc Plate
40	Traveling Nut	Leaded Steel
41	Handwheel	Gray Cast Iron
42	Washer, Flat	Carbon Steel
43	Lock Nut	Carbon Steel
44	Handwheel Lever Assy	Carbon Steel
45	Lever Pin	Carbon Steel
46	Retaining Ring	Carbon Steel
47	Seal Washer	Steel & Rubber
48	Jam Nut	Carbon Steel
49	Hex Head Cap Screw	Carbon Steel
50	Upper Case Assembly	Carbon Steel
51	Jam Nut	Carbon Steel
52	Upper Case Assembly	Carbon Steel
53	Limit Stop	Carbon Steel
55	Stem Extension	Stainless Steel
56	Warning Plate	Stainless Steel
57	Handwheel Cover	Carbon Steel
58	Groove Pin	Carbon Steel
60	Jam Nut	Carbon Steel

① Size 16 and 23 Actuators only

② Size 6 and 10 Actuators only

Specifications

Bench ranges available : 3-15, 6-30, 11-23, and 21-45 for all actuator sizes

Actuator Size	Diaphragm Effective Area (sq. in.)	Stem Travel (inches)	Max Supply (psi)
6	60	0.8	60
10	100	0.8 / 1.5	60
16	160	0.8 / 1.5 / 2.0 / 2.5	60
23	230	0.8 / 1.5 / 2.0 / 2.5	60

Travel Time - Typical Bench Values

Actuator Size	Travel (inches)	Time (seconds)*			
		4700 P		4700 E	
		Loading	Venting	Loading	Venting
6	0.8	2	2	2	2
10	0.8	4	4	9	3
	1.5	6	6	14	5
16	0.8	5	8	7	7
	1.5	7	10	11	9
	2.0	9	12	12	11
	2.5	10	13	13	13
23	0.8	11	11	20	8
	1.5	15	17	21	16
	2.0	22	20	35	17
	2.5	20	26	30	25

*Basis 88 Actuator, 3-15 spring, 1.4 bar supply, which is the most common type of actuator. 87 actuator travel time generally exceeds 88 type travel time by 5 % to 15 %.
For precise requirements, consult Masoneilan.

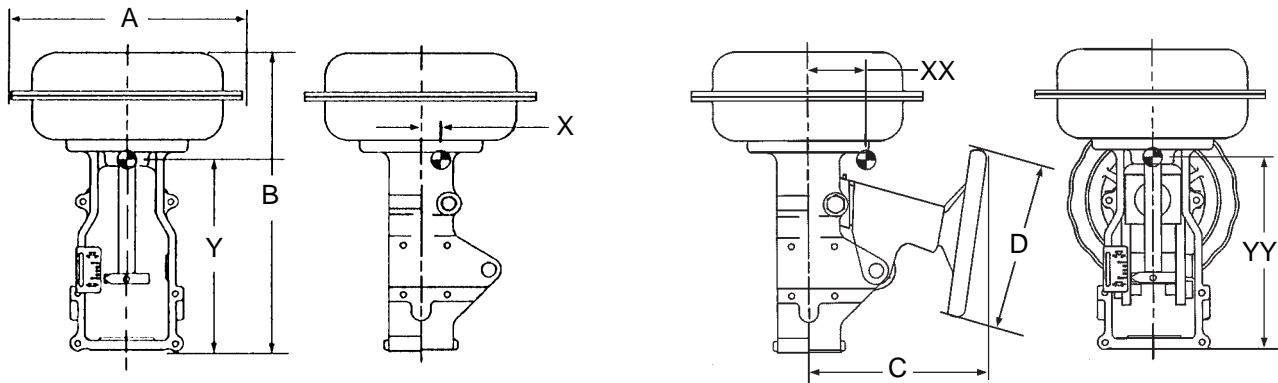
Standard Springs

Spring Type	Spring Qty	Placement
3-15	3	Lower Level
6-30	6	Lower Level
11-23	3	Upper Level
21-45	6	Upper Level

Air Connections

Standard : 1/4" NPT
Optional : 1/2" NPT

Dimensions (inches) and Weights (lbs.)



Shown with optional handwheel

Actuator Size	A	B	C	D	Weights (lbs.)	
					Standard	w/Handwheel
6	11.50	15.54	10.00	9.00	45	60
10	14.50	19.58	10.90	12.00	85	105
16	18.75	28.22	13.00	18.00	210	245
23	21.63	30.71	15.00	18.00	265	320

Actuator removal clearance = 6 inches

Center of Gravity

Size	X	Y
6	.19	9.75
10	0	12.88
16	.13	18.50
23	.06	21.13
With Handwheel		
Size	XX	YY
6	1.25	9.13
10	0.88	12.00
16	1.38	16.75
23	1.38	19.00

Limit Stops

Size	Model	Overall Dim
6	87	19.1
10	87	24.5
16	87	32.3
23	87	35.2
6	88	18.8
10	88	24.6
16	88	35.6
23	88	37.8

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