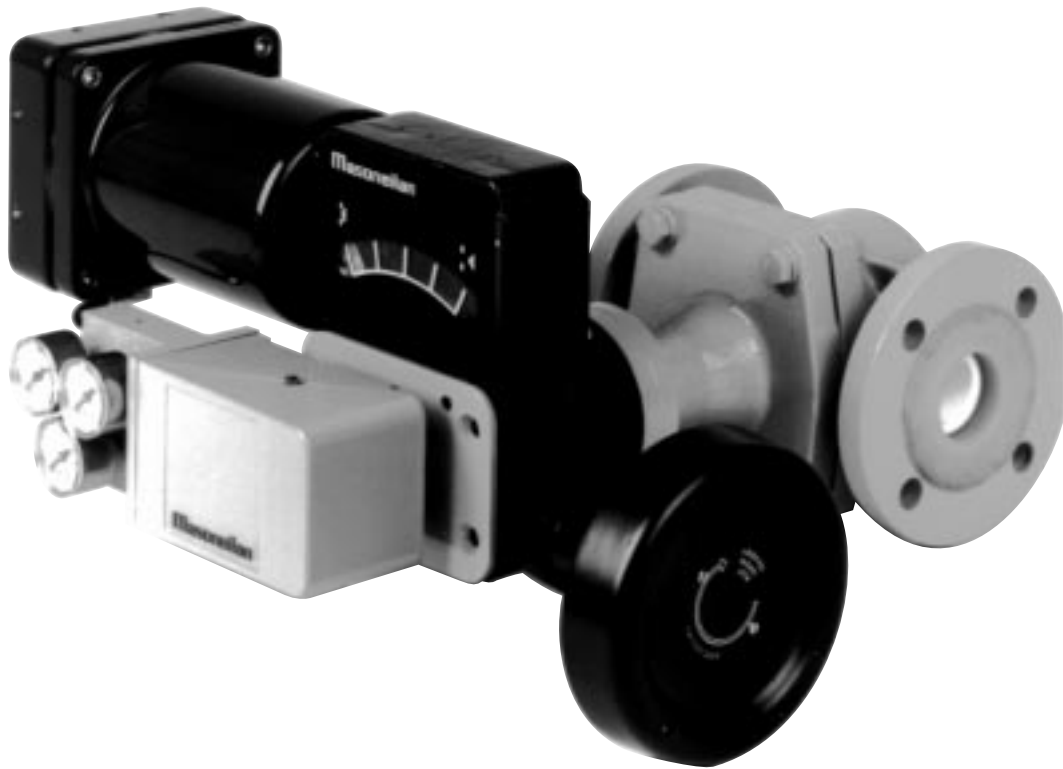


# 31000 Series Eccentric Rotary Control Valves with PFA Liner



**Masoneilan**

**DRESSER**

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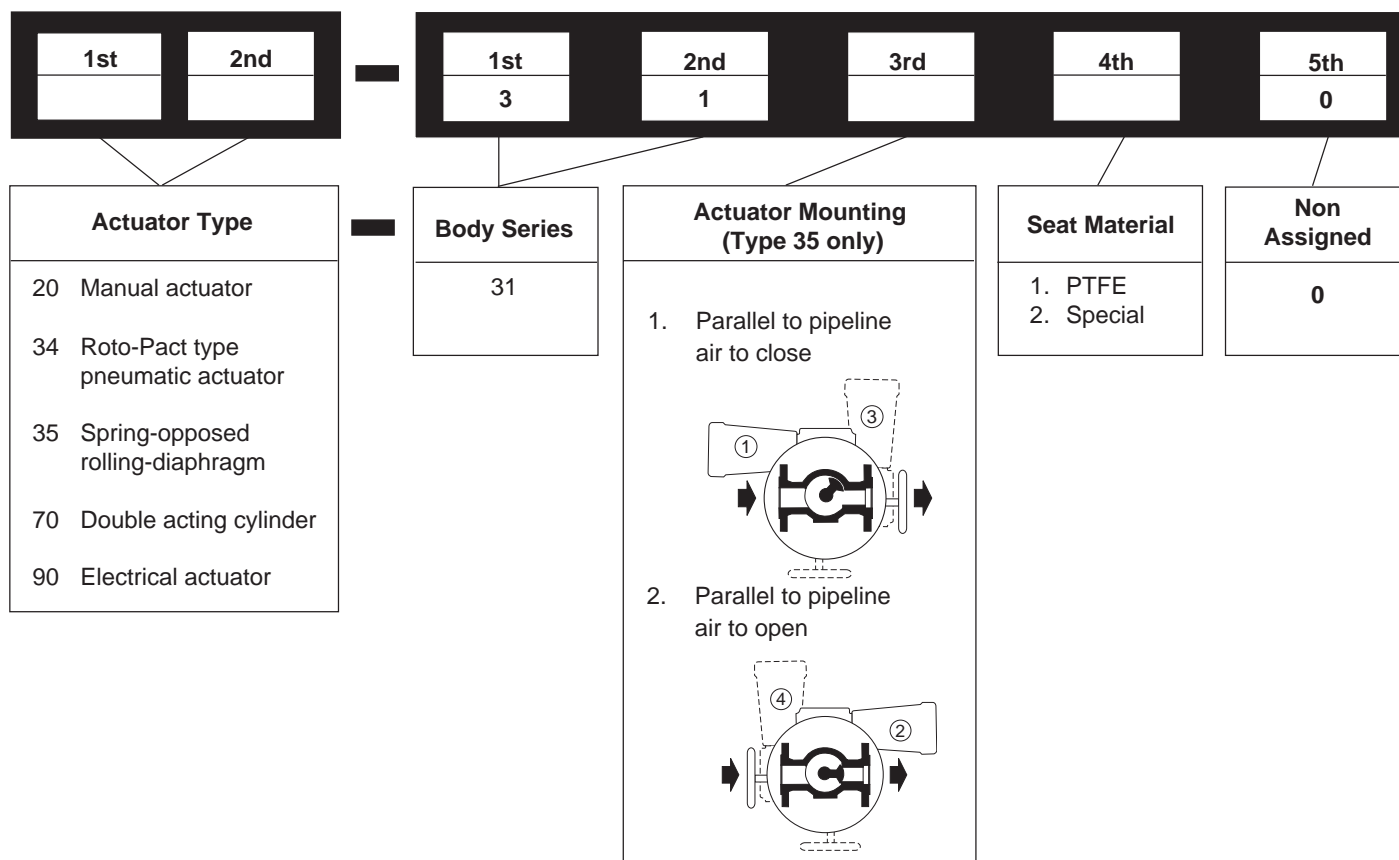
Foreword

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The 31000 Series control valve is a PFA lined control valve for corrosive applications which incorporates into its design the following features:

- |   |  |
|---|--|
| Eccentric rotary plug which results in tight shut off and low dynamic forces.                         | Dovetail grooves for mechanical anchoring between metal body and PFA lining to ensure high performance under vacuum and at high temperature. |
| PFA lining with guaranteed minimum wall thickness which provides resistance to most corrosive fluids. | Powerful, field proven rolling diaphragm actuator guaranteeing positive fail-safe action.  |
| Straight through flow pattern resulting in larger flow capacities.                                    | Totally enclosed actuator linkage.   |
| PTFE packing, chevron rings, backed up by double O-ring follower.                                     | Combination handwheel/adjustable limit stop with locking mechanism.  |
| Compact dimensions and low weight without compromise to piping forces.                                | Complete line of options and accessories.  |

## Numbering System



Note: Actuator position ① and ② are standard configurations.  
View seen from end opposite actuator.

**Other positions are available:** consult Masoneilan

## General Data

### • Body and Bonnet

type: cast, one piece, top entry, self flushing  
*optional: with steam / hot water jacket (SJ)*

material: nodular ductile iron, heat treated  
lining: PFA, translucent, melt processed

*optional: antistatic material*

connections: flanged

bonnet connection: through-bolted

outside protection: epoxy coating

### • Trim

plug type: eccentrically rotating

plug materials: PFA coated stainless steel

seat ring type: conical, sealed with O-ring

seat ring material: solid virgin PTFE

*optional: other materials (consult Masoneilan)*

*optional: PFE O-ring*

capacity: full capacity and reduced factor (0.4)  
in all sizes

flow characteristic: modified linear

C<sub>v</sub> ratio: 80 /1

packing: virgin PTFE, chevron type rings  
backed up by double O-ring follower  
*optional: leak detector or flushing connection*

• **Flow Direction:** flow to close

### • Actuator\*\*

type: spring-opposed rolling-diaphragm  
(Model 35)

yoke: cast iron

*optional: auxiliary handwheel / limit-stop  
manual actuator (20)  
Roto-Pact type pneumatic  
piston (34)\*  
double acting cylinder (70)\*  
electrical actuator (90)\*  
cast iron diaphragm case*

\* Interface according to ISO 5211 standard

\*\* Refer to specific actuator and accessory  
specification literature for complete information

### Accessories:

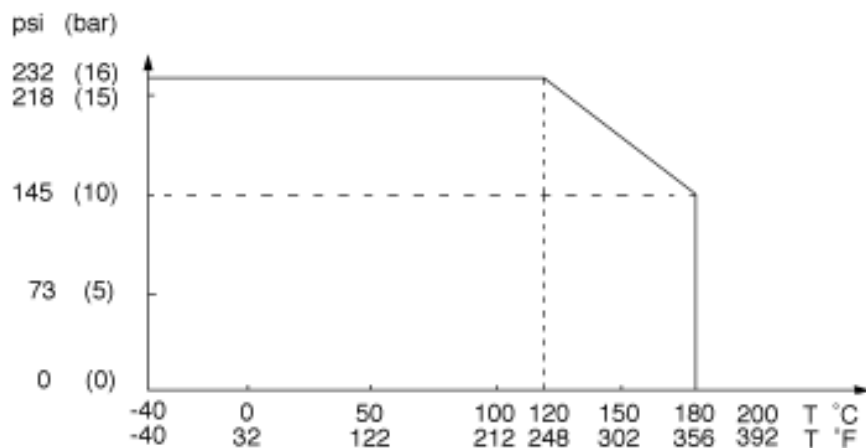
- Pneumatic Positioners
- Electropneumatic Positioners
- Electropneumatic Transducers
- Solenoid Valves
- Limit Switches
- Position Transmitters
- Various Others - Consult Factory

## Connections

Valve Size		PN Connections		ANSI Connections	
in.	mm	Flanges	Face to Face Dimension	Flanges	Face to Face Dimension
1, 2, 3	25, 50, 80	PN 10 ① PN 16 (125 AARH)	IEC 534-3 ②  Table II	150 RF ③  (125 AARH)	ANSI B16.10 Globe Control Valve

- ① Connections according to all standard PN (ISO, EN and equivalent National Standards, AFNOR, BS, DIN, etc.)  
 ② Equivalent to DIN 3202/F1  
 ③ Connections according to ANSI B16.5

## Pressure / Temperature Rating / Leakage Class



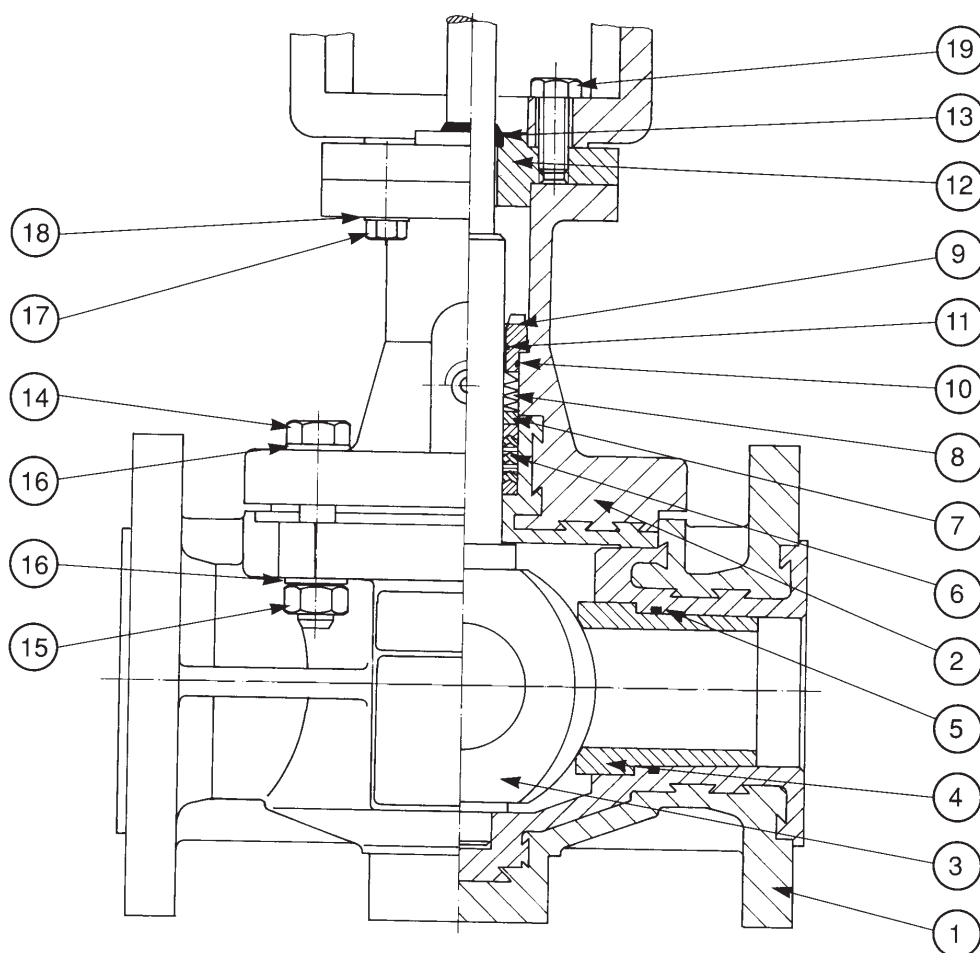
Vacuum operation within the same temperature range

Leakage Class VI, according to IEC 534-4 Mod. 1, 1986 and ANSI/FCI 70.2 (R 1982)

## C<sub>v</sub> and F<sub>L</sub> Versus Travel (With Type 35 Actuator)

Plug Rotation (%)				10	20	30	40	50	60	70	80	90	100
F <sub>L</sub>				0.90	0.88	0.86	0.80	0.74	0.69	0.66	0.65	0.64	0.64
Valve Size		Orifice Diameter in. (mm)	Actuator Travel in. (mm)	C <sub>v</sub>									
in.	mm												
1	25	.394 (10)	3.5 (89)	0.12	0.35	0.70	1.30	2	2.60	3.30	4	4.50	5
		.472 (12)	3.5 (89)	0.20	0.57	1.20	2	3.20	4.30	5.20	6.30	7.20	8
		.827 (21)	3.5 (89)	0.50	1.40	2.80	5	7.70	10	13	16	18	20
2	50	.945 (24)	3.5 (89)	0.80	2.30	4.70	8.50	13	17	21	26	30	33
		1.575 (40)	3.5 (89)	2	5.80	11.70	21	32	43	53	65	74	82
		1.732 (44)	3.5 (89)	2.6	7.30	14.50	26	41	54	68	83	94	104
3	80	2.283 (58)	3.5 (89)	4.6	12.7	25.50	46	73	95	118	146	164	182
		3.071 (71)	3.5 (89)	6.5	18	36	65	104	135	169	208	235	260

## Materials



Note: leak detector or flushing connection is optional

Ref. No.	Description	Standard Materials ( <i>Optional Materials</i> )
1	Body	Ductile Iron ASTM A395/PFA Lined
2	Bonnet	Ductile Iron ASTM A395/PFA Lined
3	Plug	PFA encapsulated Stainless Steel
4	Seat Ring	Virgin Solid PTFE <i>Other Materials (Consult Masoneilan)</i>
5	O-ring	FEP coated Viton® <i>Perfluoroelastomer (PFE)</i>
6	Packing	Virgin PTFE - Chevron Ring System
7	Packing Box Ring	Stainless Steel
8	Disc Springs (Set)	Spring Steel
9	Packing Follower	Stainless Steel
10-11	O-rings	Viton®
12	Actuator Connecting Flange	Stainless Steel
13	Wiper Ring	Neoprene
14-19	Bolting	Stainless Steel

## Allowable Pressure Drops (psi) (bar)

### Rolling-Diaphragm Pneumatic Actuator (Type 35)

#### Air to Open

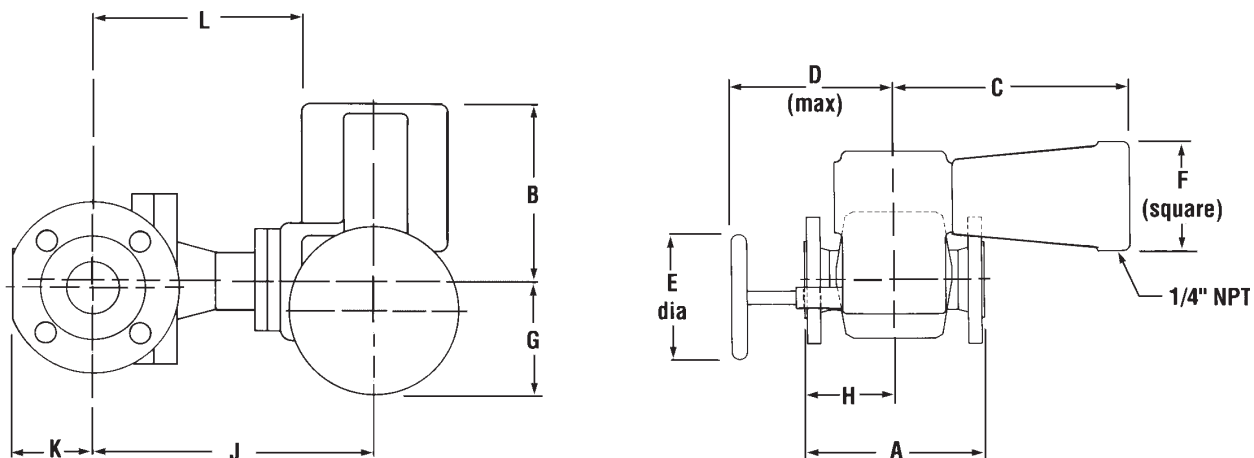
Valve Size		C <sub>v</sub>	Actuator Size	Bench Range (psi)	Air Supply psi (bar)			
					20 (1.4)	25 (1.7)	30 (2.0)	36 (2.5)
in.	mm				ΔP Max psi (bar)			
1	25	20	4 <sup>1</sup> / <sub>2</sub>	7-15	232 (16)			
		8	4 <sup>1</sup> / <sub>2</sub>	7-15	232 (16)			
		5	4 <sup>1</sup> / <sub>2</sub>	7-15	232 (16)			
2	50	82	4 <sup>1</sup> / <sub>2</sub>	7-15	189 (13)	232 (16)		
		33	4 <sup>1</sup> / <sub>2</sub>	7-15	232 (16)			
3	80	260	4 <sup>1</sup> / <sub>2</sub>	7-15	48 (3.3)	94 (6.5)	145 (10)	232 (16)
		182	4 <sup>1</sup> / <sub>2</sub>	7-15	73 (5)	145 (10)	203 (14)	232 (16)
		104	4 <sup>1</sup> / <sub>2</sub>	7-15	116 (8)	232 (16)		

#### Air to Close

Valve Size		C <sub>v</sub>	Actuator Size	Bench Range (psi)	Air Supply psi (bar)	
					20 (1.4)	30 (2.0)
in.	mm				ΔP Max psi (bar)	
1	25	20	4 <sup>1</sup> / <sub>2</sub>	7-15	232 (16)	
		8	4 <sup>1</sup> / <sub>2</sub>	7-15	232 (16)	
		5	4 <sup>1</sup> / <sub>2</sub>	7-15	232 (16)	
2	50	82	4 <sup>1</sup> / <sub>2</sub>	7-15	203 (14)	
		33	4 <sup>1</sup> / <sub>2</sub>	7-15	232 (16)	
3	80	260	4 <sup>1</sup> / <sub>2</sub>	7-24		109 (7.5)
		182	4 <sup>1</sup> / <sub>2</sub>	7-24		160 (11)
		104	4 <sup>1</sup> / <sub>2</sub>	7-24		232 (16)

For 3-15 bench range, consult Masoneilan

## Dimensions and Weights



Dimensions [in. (mm)]

Valve Size		A		B	C	D	E	F	G
		PN 10 PN 16	ANSI Class 150						
in.	mm								
1	25	6.30 (160)	7.25 (184)	6.93 (176)	11.81 (300)	8.31 (211)	6.42 (163)	5.52 (140)	4.61 (117)
2	50	9.06 (230)	10.00 (254)	6.93 (176)	11.81 (300)	8.31 (211)	6.42 (163)	5.52 (140)	4.61 (117)
3	80	12.21 (310)	11.75 (298)	6.93 (176)	11.81 (300)	8.31 (211)	6.42 (163)	5.52 (140)	4.61 (117)

Weights (lbs)

Valve Size		H		J	K	L	Valve Weight * (lbs)
		PN 10 PN 16	ANSI Class 150				
in.	mm						
1	25	3.15 (80)	3.62 (92)	10.04 (255)	2.05 (52)	7.28 (185)	40
2	50	4.53 (115)	5.00 (127)	10.63 (270)	3.07 (78)	7.87 (200)	60
3	80	6.10 (155)	5.87 (149)	11.42 (290)	3.94 (100)	8.66 (220)	97

\*Including handwheel

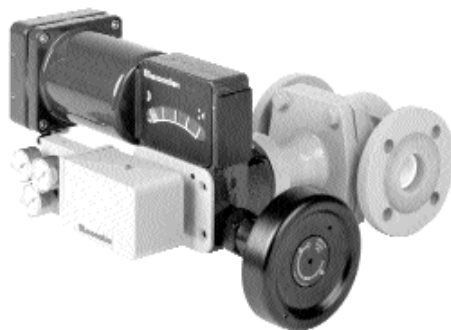
## 31000 Series Eccentric Rotary Control Valve

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### Recommended Specification

Control valves with internal linings designed for corrosive service shall conform to the following requirements:

- I. The face to face shall conform to ISA 75.03 (ANSI B16.10) dimensions for control valves.
- II. All valves shall have flanges according to ANSI B16.5.
- III. The design of the flow passage shall be self flushing, with no internal pockets to trap corrosive media.
- IV. The body and bonnet shall be cast from ASTM A395 ductile iron with maximum 5% pearlite content. All external surfaces shall be protected from external corrosion with a coating of a 2-part epoxy paint.
- V. All internal wetted surfaces shall be lined with melt processed unpigmented PFA. The lining shall be locked in place using dovetail recesses cast or machined into the body. The minimum lining thickness shall be .157 inches (4 mm).
- VI. The sealing member shall be an eccentrically rotating plug of stainless steel encapsulated with PFA. The PFA encapsulation shall extend beyond the shaft sealing area.
- VII. Shaft sealing shall be effected by PTFE V-rings backed up by a double O-ring follower. The standard packing design shall be capable of meeting the 500 ppm proposed EPA fugitive emission regulation.
- VIII. The actuator shall be connected directly to the valve shaft without the use of intermediate couplings. A clamped splined connection shall be used.
- IX. The control valve shall be designed to operate directly off the pneumatic controller output without the use of a positioner or booster.
- X. The PFA lined control valve shall be a Masoneilan Series 31000, no equal.



**Facilities:** Brazil, Canada, France, Germany, Italy, Japan, Mexico, Netherlands, Singapore, Spain, United Kingdom, United States



Masoneilan North American Operations  
Dresser Valve and Controls Division



Industries, Inc.  
Marketing Services  
15112 Morales Road  
P.O. Box 60078 (77205-0078)