

Electronic Control Valves



Schematic Diagram

Item	Description
1	Hytrol (Main Valve)
2	CS2 Solenoid Control
3	CK2 Cock (Solenoid By-pass)

Optional Features

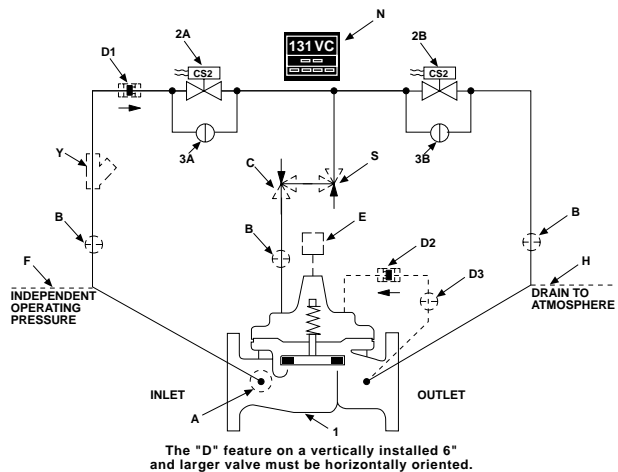
Item	Description
A	X46A Flow Clean Strainer
B	CK2 Cock (Isolation Valve)
C	CV Flow Control (Closing)
D	Check Valves With Cock
E	X117C Position Transmitter
F	Independent Operating Pressure
H	Atmospheric Drain
N	Electronic Controller
S	CV Flow Control (Opening)
Y	X43 "Y" Strainer

- Simple Proven Design
- Quality Solenoid Pilot Controls
- Ideal For SCADA Systems
- Multi-Function Capability; Hydraulic Backup
- Easy To Maintain

The Cla-Val Series 131/631 Electronic Control Valves are designed specifically for applications where control of the valve with electrical signals is preferred. It is a hydraulically operated, pilot controlled, diaphragm valve. The solenoid pilot controls are actuated by electrical signals from the optional 131VC Electronic Valve Controller. The solenoid pilots either add or relieve line pressure from the cover chamber of the valve, causing it to open or close as directed by the electronic controller.

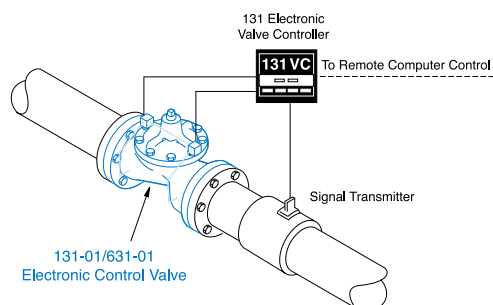
Series 131/631 valves can be configured to perform a wide range of functions, such as; pressure reducing, pressure sustaining, flow control, or level control. The electric controls can also be combined with hydraulic controls to create dual function, or fail-safe capability.

The basic 131-01/631-01 Electronic Control Valve (Schematic shown below) includes the main valve and dual solenoid pilot controls. Optional features include the 131VC Electronic Valve Controller and the X117C Valve Position Transmitter. If the check feature option is added, and a pressure reversal occurs, the downstream pressure is admitted into the cover, closing the valve.



Typical Applications

The Model 131-01/631-01 Electronic Control Valve is typically installed in a pipeline with an electronic signal transmitter and the Model 131VC Electronic Valve Controller. This system can be designed to control flow, pressure, tank level or valve position. The 131VC Electronic Valve Controller enables remote computer control over valve operations.



131-02/631-02

Electronic Control Valve, Powertrol Type

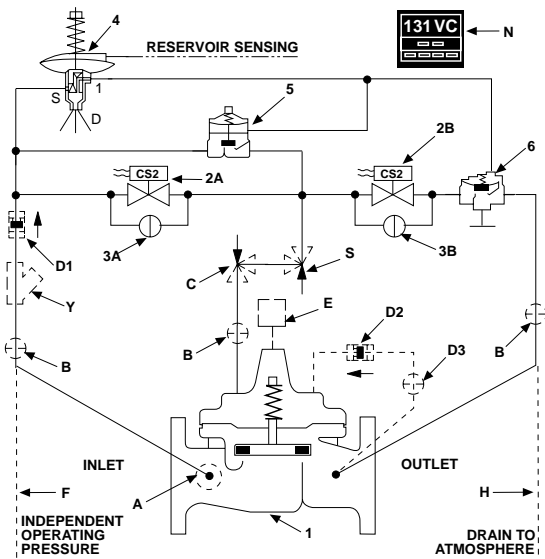
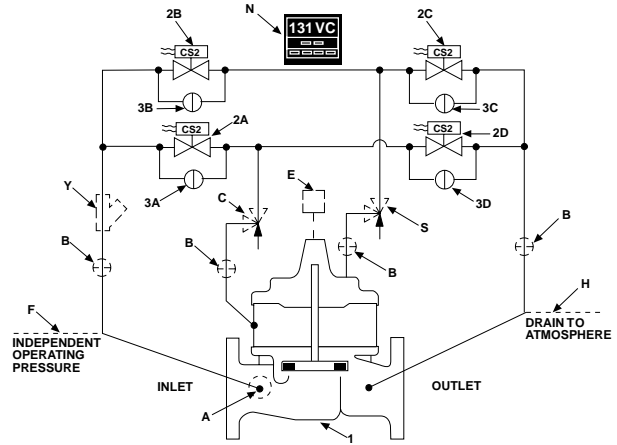
The electronically controlled Powertrol valve is well suited for applications where the line pressure is low and precise control is required. It is also ideal where independent operating pressure is to be used for operating the valve. The pilot system includes four solenoid controls which apply or relieve hydraulic pressure to either side of the diaphragm, causing the valve to open or close as desired. The optional electronic controller modulates the valve to control flow, pressure, tank level or valve position.

Schematic Diagram

Item	Description
1	Powertrol (Main Valve)
2	CS2 Solenoid Control
3	CK2 Cock (Solenoid By-pass)

Optional Features

Item	Description
A	X46A Flow Clean Strainer
B	CK2 Cock (Isolation Valve)
C	CV Flow Control (Closing)
E	X117C Position Transmitter
F	Independent Operating Pressure
H	Drain To Atmosphere
N	Electronic Controller
S	CV Flow Control (Opening)
Y	X43 "Y" Strainer



Schematic Diagram

Item	Description
1	Hytrol (Main Valve)
2	CS2 Solenoid Control
3	CK2 Cock (Solenoid By-pass)
4	CDS5 Altitude Control
5	100-02 Powertrol (Reverse Flow)
6	100-01 Hytrol (Reverse Flow)

Optional Features

Item	Description
A	X46A Flow Clean Strainer
B	CK2 Cock (Isolation Valve)
C	CV Flow Control (Closing)
D	Check Valves With Cock
E	X117C Position Transmitter
F	Independent Operating Pressure
H	Atmospheric Drain
N	Electronic Controller
S	CV Flow Control (Opening)
Y	X43 "Y" Strainer

131-06/631-06

Combination Electronic Control And High Level Shut-Off Valve

This valve is used in reservoir applications where the filling or draining rate is controlled and modulated by the electronic controller. Should the liquid in the reservoir reach a high level, the hydraulic altitude control automatically overrides the electronic control and closes the valve. The altitude control can be adjusted to close the valve over a wide range of settings. The optional check feature will close the valve if there is a pressure reversal in the line.

Model 131-04/631-04 Electronic Interface Control with Back Pressure Sustaining and Solenoid Shutoff

(4" and smaller valves - Model 131-04/631-04)
(6" and larger valves - Model 131-16/631-16)

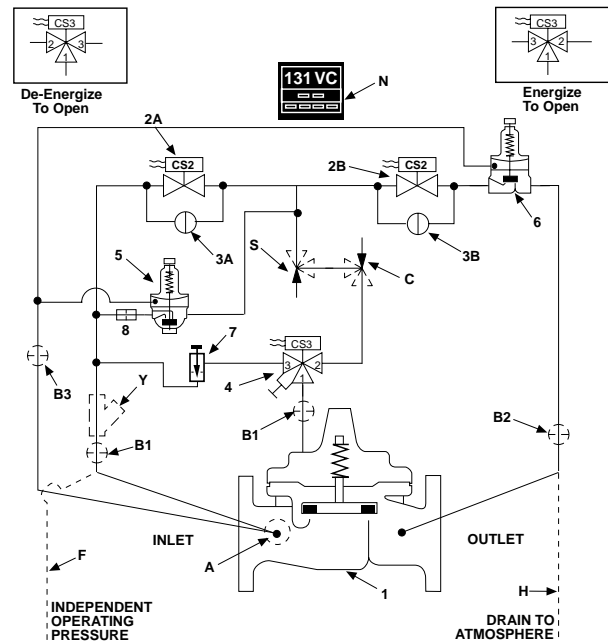
Flow through this valve is normally controlled and modulated by the electronic controller. Should the upstream line pressure fall below a preset level, the hydraulic pilot controls will override the electronic controller and throttle the valve. In this manner the valve will automatically close as needed to maintain a minimum line pressure. The solenoid shut-off feature overrides all other controls and will immediately close the valve when activated. It can also be set-up to close the valve on power failure, flow, pressure, tank level or valve position.

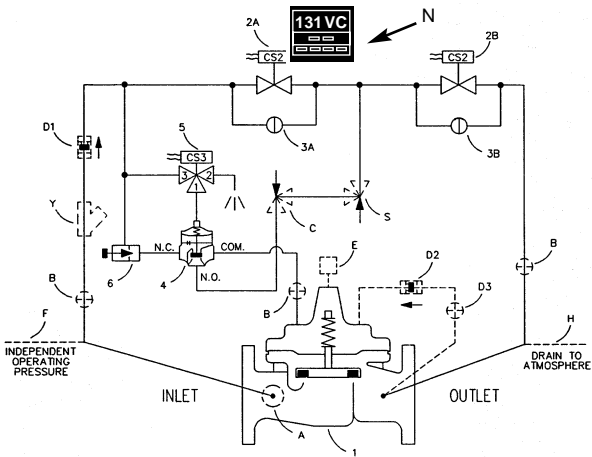
Schematic Diagram

Item	Description
1	Hytrol (Main Valve)
2	CS2 Solenoid Control
3	CK2 Cock (Solenoid By-pass)
4	CS3M Solenoid Control
5	CRA Pressure Reducing Control
6	CRL Pressure Relief Control
7	CNA Angle Needle Valve
8	X58 Restriction Assembly

Optional Features

Item	Description
A	X46A Flow Clean Strainer
B	CK2 Cock (Isolation Valve)
C	CV Flow Control (Closing)
F	Independent Operating Pressure
H	Atmospheric Drain
N	Electronic Controller (Single)
S	CV Flow Control (Opening)
Y	X43 "Y" Strainer





Schematic Diagram

- | Item | Description |
|------|-----------------------------|
| 1 | Hytrol (Main Valve) |
| 2 | CS2 Solenoid Control |
| 3 | CK2 Cock (Solenoid By-pass) |
| 4 | 102C-3H Three Way Valve |
| 5 | CS3 Solenoid Control |

131-05/631-05 Electronic Control Valve Equipped To Close On Power Failure

The electronic controller modulates and controls flow through this valve. If power failure should occur, the third solenoid control shifts and hydraulic line pressure will close the valve automatically. This pilot system can also be configured to open the valve on power failure. The optional check feature automatically will close the valve if a pressure reversal occurs in the line.

Optional Features

- | Item | Description |
|------|--------------------------------|
| A | X46A Flow Clean Strainer |
| B | CK2 Cock (Isolation Valve) |
| C | CV Flow Control (Closing) |
| D | Check Valves With Cock |
| E | X117C Position Transmitter |
| F | Independent Operating Pressure |
| H | Atmospheric Drain |
| N | Electronic Controller |
| S | CV Flow Control (Opening) |
| Y | X43 "Y" Strainer |

Model 131-08/631-08 Electronic Control Valve With Rate of Flow Control, Solenoid Selected

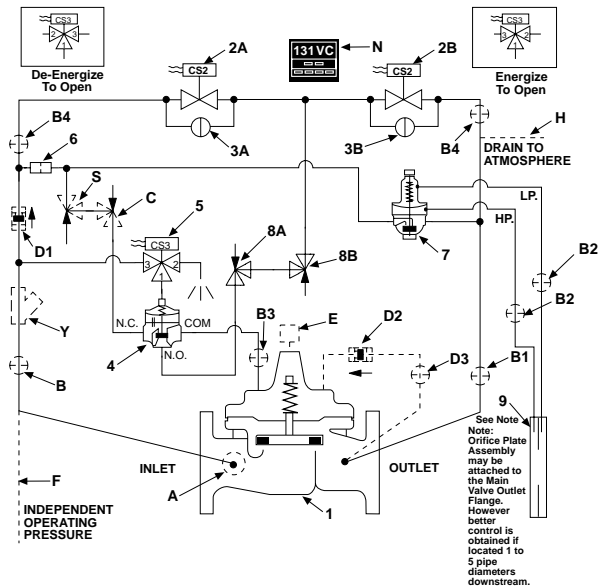
Flow through this valve is normally controlled and modulated by the electronic controller. If a power failure should occur, the third solenoid shifts and flow is controlled by the hydraulic pilot system and orifice plate. The hydraulic pilot control can be adjusted to limit the flow over a wide range of settings. The optional check feature will close the valve if a pressure reversal occurs in the line.

Schematic Diagram

- | Item | Description |
|------|-------------------------------|
| 1 | 100-01 Hytrol (Main Valve) |
| 2 | CS2 Solenoid Control |
| 3 | CK2 Cock (Solenoid By-pass) |
| 4 | 102C-3H Three Way Valve |
| 5 | CS3 Solenoid Control |
| 6 | X58C Restriction Assembly |
| 7 | CDHS19 Differential Control |
| 8 | CV Flow Control |
| 9 | X52D-1 Orifice Plate Assembly |

Optional Features

- | Item | Description |
|------|--------------------------------|
| A | X46A Flow Clean Strainer |
| B | CK2 Cock (Isolation Valve) |
| C | CV Flow Control (Closing) |
| D | Check Valves With Cock |
| E | X117C Position Transmitter |
| F | Independent Operating Pressure |
| H | Atmospheric Drain |
| N | Electronic Controller |
| S | CV Flow Control (Opening) |
| Y | X43 "Y" Strainer |



Schematic Diagram

- | Item | Description |
|------|------------------------------|
| 1 | Hytrol (Main Valve) |
| 2 | X74B-3 Stem Valve |
| 3 | CFM-7 Float Pilot |
| 4 | 100-01 Hytrol (Reverse Flow) |
| 5 | CS3 Solenoid Control |
| 6 | CS2 Solenoid Control |
| 7 | CK2 Cock (Solenoid By-pass) |

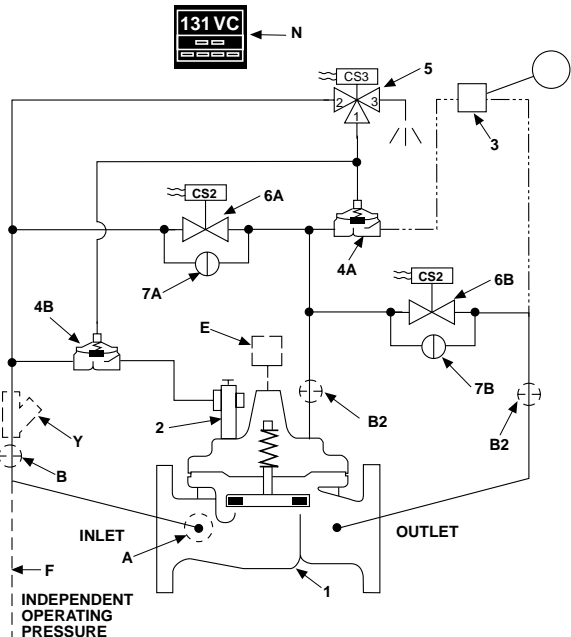
131-09/631-09

Modulating Float Valve With Solenoid Lockout of Float Control and Electronic Positioning

The electronic controller modulates the flow through this valve to control liquid level in a tank. If power failure should occur, the third solenoid shifts and the float control will allow the valve to modulate using hydraulic line pressure. The optional 131VC Electronic Valve Controller and X117C Valve Position Transmitter are used in combination with an electronic level sensing device to provide modulating flow control of the valve.

Optional Features

- | Item | Description |
|------|--------------------------------|
| A | X46A Flow Clean Strainer |
| B | CK2 Cock (Isolation Valve) |
| E | X117C Position Transmitter |
| F | Independent Operating Pressure |
| N | Electronic Controller |
| Y | X43 "Y" Strainer |



Model 131-01 (Uses Basic Valve Model 100-01)

Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class			
		Flanged			Screwed
Grade	Material	ANSI Standards*	150 lb.	300 lb.	End** Details
ASTM A536	Ductile Iron	B16.42	250	400	400
ASTM A216-WCB	Cast Steel	B16.5	285	400	400
ASTM B62	Bronze	B16.24	225	400	400
ASTM A743	Stainless Steel	B16.5	285	400	400
356-T6	Aluminum	B16.1	275	—	—

Note: *ANSI standards are for flange dimensions only.
 Flanged valves are available faced but not drilled.
 ** End Details machined to ANSI B2.1 specifications.

Materials

Component	Material Options				
Body & Cover	Ductile Iron	Cast Steel	Bronze	Stainless Steel	Aluminum
Available Sizes	1¼" - 16", 24"	1¼" - 16", 24"	1¼" - 16"	1¼" - 16"	1¼" - 16"
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze	Stainless Steel	Aluminum
Trim: Disc Guide, Seat & Cover Bearing	Bronze is standard. Stainless Steel is optional.			Stainless Steel is standard.	
Disc	Buna-N® Rubber				
Diaphragm	Nylon Reinforced Buna-N® Rubber				
Stem, Nut & Spring	Stainless Steel				



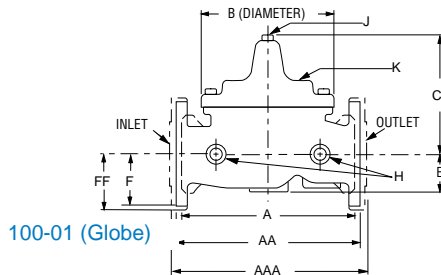
2" Globe, Screwed



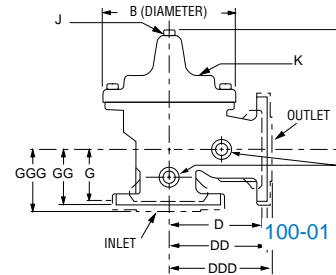
4" Globe, Flanged



4" Angle, Flanged



100-01 (Globe)



100-01 (Angle)

Model 131-01 Dimensions (In inches)

*1 1/2" size

Valve Size (Inches)	1¼-1½	2	2 ½	3	4	6	8	10	12	14	16	24
A Screwed	7.25	9.38	11.00	12.50	—	—	—	—	—	—	—	—
AA 150 ANSI	8.50*	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00	39.00	41.38	61.50
AAA 300 ANSI	9.00*	10.00	11.62	13.25	15.62	21.00	26.38	31.12	35.50	40.50	43.50	63.24
B Dia.	5.62	6.62	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50	53.16
C Max.	5.50	6.50	7.56	8.19	10.62	13.38	16.00	17.12	20.88	24.19	25.00	43.93
D Screwed	3.25	4.75	5.50	6.25	—	—	—	—	—	—	—	—
DD 150 ANSI	4.00*	4.75	5.50	6.00	7.50	10.00	12.75	14.88	17.00	19.50	20.81	—
DDD 300 ANSI	4.25*	5.00	5.88	6.38	7.88	10.50	13.25	15.56	17.75	20.25	21.62	—
E	1.12	1.50	1.69	2.06	3.19	4.31	5.31	9.25	10.75	12.62	15.50	17.75
F 150 ANSI	2.50	3.00	3.50	3.75	4.50	5.50	6.75	8.00	9.50	10.50	11.75	19.25
FF 300 ANSI	3.06	3.25	3.75	4.13	5.00	6.25	7.50	8.75	10.25	11.50	12.75	—
G Screwed	1.88	3.25	4.00	4.50	—	—	—	—	—	—	—	—
GG 150 ANSI	4.00*	3.25	4.00	4.00	5.00	6.00	8.00	8.62	13.75	14.88	15.69	—
GGG 300 ANSI	4.25*	3.50	4.31	4.38	5.31	6.50	8.50	9.31	14.50	15.62	16.50	—
H NPT Body Tapping	⅜	⅜	½	½	¾	¾	1	1	1	1	1	1
J NPT Cover Center Plug	¼	½	½	½	¾	¾	1	1	1 ¼	1 ½	2	1 ½
K NPT Cover Tapping	⅜	⅜	½	½	¾	¾	1	1	1	1	1	1
Valve Stem Internal Thread UNF	10-32	10-32	10-32	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24	½-20	3/4-16
Stem Travel	0.4	0.6	0.7	0.8	1.1	1.7	2.3	2.8	3.4	4.0	4.5	6.50
Approx. Ship Wt. Lbs.	15	35	50	70	140	285	500	780	1165	1600	2265	6200

Model 631-01 (Uses Basic Valve Model 100-20)

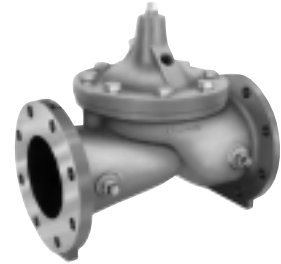
Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class		
		Flanged		
Grade	Material	ANSI Standards*	150 lb.	300 lb.
ASTM A536	Ductile Iron	B16.42	250	400
ASTM A216-WCB	Cast Steel	B16.5	285	400
ASTM B62	Bronze	B16.24	225	400
ASTM A743	Stainless Steel	B16.5	285	400
356-T6	Aluminum	B16.1	275	—

Note: *ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.



3" Globe, Flanged



6" Globe, Flanged

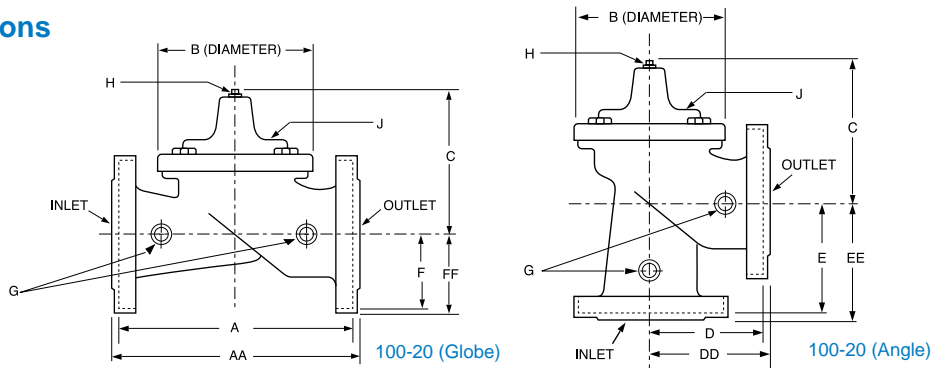


6" Angle, Flanged

Materials

Component	Material Options				
Body & Cover	Ductile Iron	Cast Steel	Bronze	Stainless Steel	Aluminum
Available Sizes	3"-30"	3"-30"	3"-16"	3"-16"	3"-16"
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze	Stainless Steel	Aluminum
Trim: Disc Guide, Seat & Cover Bearing	Bronze is standard. Stainless Steel is optional.			Stainless Steel is standard.	
Disc	Buna-N® Rubber				
Diaphragm	Nylon Reinforced Buna-N® Rubber				
Stem, Nut & Spring	Stainless Steel				


















































Dimensions
(In inches)



Model 631-01 Dimensions (In inches)

VALVE SIZE (Inches)	3	4	6	8	10	12	14	16	18	20	24	30
A 150 ANSI	10.25	13.88	17.75	21.38	26.00	30.00	34.25	35.00	42.12	48.00	48.00	63.25
AA 300 ANSI	11.00	14.50	18.62	22.38	27.38	31.50	—	36.62	43.63	49.62	49.75	—
B DIA.	6.62	9.12	11.50	15.75	20.00	23.62	28.00	28.00	35.44	35.44	35.44	53.19
C MAX.	7.00	8.62	11.62	15.00	17.88	21.00	20.88	25.75	25.00	31.00	31.00	43.94
D 150 ANSI	—	6.94	8.88	10.69	—	—	—	—	—	—	—	—
DD 300 ANSI	—	7.25	9.38	11.19	—	—	—	—	—	—	—	—
E 150 ANSI	—	5.50	6.75	7.25	—	—	—	—	—	—	—	—
EE 300 ANSI	—	5.81	7.25	7.75	—	—	—	—	—	—	—	—
F 150 ANSI	3.75	4.50	5.50	6.75	8.00	9.50	11.00	11.75	15.88	14.56	17.00	19.88
FF 300 ANSI	4.12	5.00	6.25	7.50	8.75	10.25	—	12.75	15.88	16.06	19.00	—
G NPT Body Tapping	3/8	1/2	3/4	3/4	1	1	1	1	1	1	1	1
H NPT Cover Center Plug	1/2	1/2	3/4	3/4	1	1	1 1/4	1 1/4	2	2	2	2
J NPT Cover Tapping	3/8	1/2	3/4	3/4	1	1	1	1	1	1	1	1
Valve Stem Internal Thread UNF	10-32	1/4-28	1/4-28	3/8-24	3/8-24	3/8-24	3/8-24	3/8-24	1/2-20	1/2-20	1/2-20	3/4-16
Stem Travel	0.6	0.8	1.1	1.7	2.3	2.8	3.4	3.4	4.5	4.5	4.5	6.5
Approx Ship Wt. Lbs.	45	85	195	330	625	900	1250	1380	2733	2551	2733	6500

Valve Selection

		These Symbols  and  Indicate Available Sizes																	
		Inches	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	30	
		mm	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750	
		End Detail	Screwed			Screwed & Flanged						Flanged							
Model 131	Basic Valve 100-01	Globe																	
		Angle																	
	Suggested Flow (GPM)	Max. Continuous	93	125	210	300	460	800	1800	3100	4900	7000	8400	11000					25000
		Max. Intermittent	120	160	260	370	580	990	2250	3900	6150	8720	10540	13700					31300
		Min. Continuous	10	10	15	20	30	50	115	200	300	400	500	650					1750
	Suggested Flow (Liters/sec)	Max. Continuous	6	8	13	19	29	50	113	195	309	441	529	693					1575
Max. Intermittent		7.6	10.1	16.4	23	37	62	142	246	387	549	664	863					1972	
Min. Continuous		.6	.6	.9	1.3	1.9	3.2	7.2	13	19	25	32	41					110	
Model 631	Basic Valve 100-20	Globe																	
		Angle																	
	Suggested Flow (GPM)	Max. Continuous					260	580	1025	2300	4100	6400	9230	9230	16500	16500	16500	28000	
		Min. Continuous					15	30	50	115	200	300	500	500	900	900	900	1850	
	Suggested Flow (Liters/sec)	Max. Continuous					16	37	65	145	258	403	581	581	1040	1040	1040	1764	
		Min. Continuous					.9	1.9	3.2	7.2	13	19	32	32	57	57	57	117	

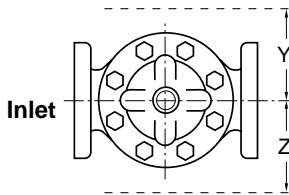
* 631 is the reduced internal port size version of the 131.

For 100-01 basic valves suggested flow calculations were based on flow through Schedule 40 Pipe. Maximum continuous flow is approx. 20 ft/sec (6.1 meters/sec) & maximum intermittent flow is approx. 25 ft/sec (7.6 meters/sec) & minimum continuous flow is approx. 1 ft/sec (.3 meters/sec). For 100-20 basic valves suggested flow calculations were based on flow through the valve seat. Approx. 26 ft/sec (7.9 meters/sec) is used for maximum continuous flow & 1 ft/sec (.3 meters/sec) is used for minimum continuous flow. Maximum continuous flow through the valve seat for the 30" 100-20 is approx. 20 ft/sec (6.1 meters/sec). *Screwed End Detail Only **Flanged End Detail Only

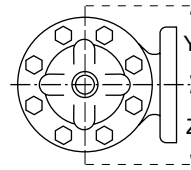
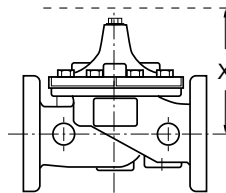
Pilot System Dimensions (In Inches)

We recommend providing adequate space around valve for maintenance work

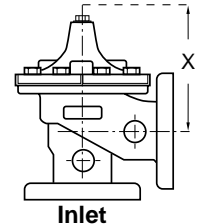
VALVE SIZE	1 1/4" & 1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"
X	Max.	16.00	16.25	16.75	17.00	17.50	17.75	19.75	22.00	25.75	29.00	31.00	34.00	62.00	62.00
Y	Max.	4.00	4.00	4.50	5.00	6.00	8.00	10.25	12.00	14.25	16.75	31.00	31.00	18.00	30.00
Z	Max.	7.00	7.00	7.50	9.00	9.50	10.00	12.25	14.00	15.00	17.25	18.00	18.00	30.00	30.00



GLOBE



ANGLE



Inlet

131-01/631-01 Dimensions Only

Pilot System Specifications

Temperature Range

Water: to 180°F

Rubber Parts:

Buna-N® Rubber Synthetic

Solenoid Control

Body:

Brass ASTM B283

Enclosure:

NEMA Type 1,2,3,3S,4,4X general purpose watertight*

NEMA Type 6,6P,7,9 watertight Explosion Proof available at extra cost

For specifications on other 131/631 series valves, please consult factory. The 131/631 is shown.

Voltages:

110, 220, -50Hz Ac

24, 120, 240, 480 - 60Hz AC

6, 12, 24, 120, 240 - DC

Others available at extra cost

Max. operating pressure differential:

200 psi*

Coil:

Insulation molded Class F

Watts AC 6

AC Volt Amps Inrush 30

AC Volt Amps Holding 16

Watts DC 10.6

Manual operator available at extra cost.

*Supplied unless otherwise specified

When Ordering, Please Specify

1. Catalog No. 131 or No. 631
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Screwed or Flanged
6. Trim Material
7. Electrical Specifications
8. Desired Options
9. When Vertically Installed



E-131/631 (R-11/01)

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