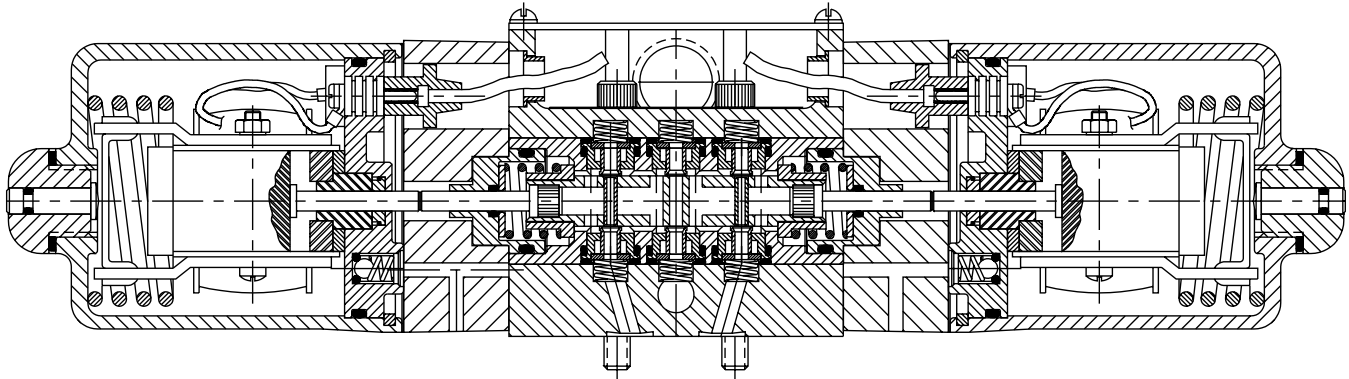


**Catalog Series 21100**  
**3 GPM**



**Features**

- Shear-type positive seal.
- Zero leakage (1 drop per min. per pressurized port).
- Ideal for water soluble systems (95-5).
- Pressures up to 6000 PSI.
- Long life, easy maintenance.
- Standard valves are interflow.
- No packing to wear or cut.
- High tolerance to contamination.
- High tolerance to silting.
- Manual overrides are standard.

**Specifications**

**Service Applications:**

Hydraulic oil. Water containing minimum of 5% soluble oil. Suggest water soluble oil with a sodium sulphonate-based emulsifier. Oil should have a viscosity of 250-350 SSU at 100° F. Others available on special order.

**Pressure Range:**

**Working:** To 6000 PSI  
**\*Proof:** 9000 PSI  
**\*Burst:** 15,000 PSI

\*Applicable to pressure and cylinder ports only.

**Note:** Installation of this valve should ensure that exhaust port pressure does not exceed cylinder port pressures by more than 50 PSI and never exceed 1000 PSI.

**Temperature Range:**

-40° to 225° F. (with Code 02 O-rings)

**CV Factor:** .28

**Rated Flow:** 3 GPM maximum.

**Internal Leakage:** 1 DPM per pressurized port.

**Mounting:** Sub-plate. Mounting bolts furnished.

**Materials:**

**Cover, Body, Bottom Plate, Inserts, Washers, Spring Retainer, Screws, Retainer Plate:** Steel.

**Name Plate, End Cap, Retainer Plate:** Aluminum alloy, anodized.

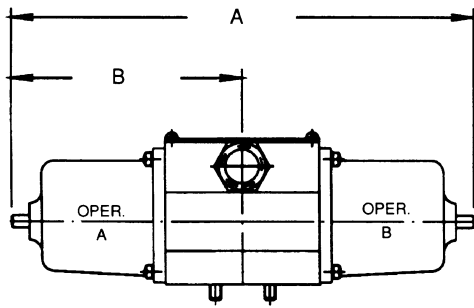
**Slide, Seals, Springs, Pilot Choke Plug:** Stainless steel.

**O-Rings:** Synthetic rubber.

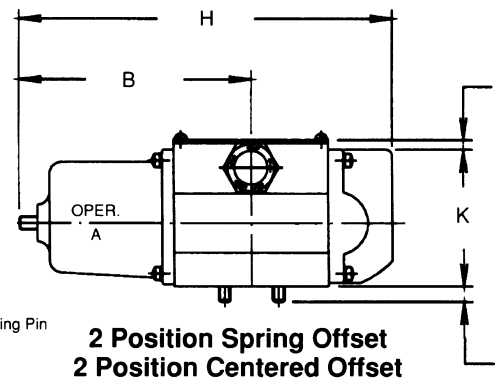
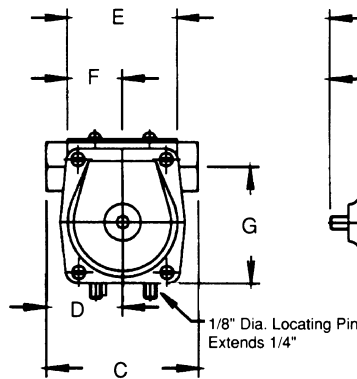
Electrical Data		Weight	
Inrush Current	4.2 Amps Maximum	One Solenoid	Two Solenoids
Holding Current	.85 Amps Maximum		
Drop-Out Voltage	Approx. 75% Rated Voltage	9.2 Lbs.	12 Lbs.
Voltage Required to Pull Back After Drop-Out	Approx. 95% Rated Voltage		



### Dimensions



**3 Position Spring Centered  
2 Position Detented**



**2 Position Spring Offset  
2 Position Centered Offset**

Power Source	Operating Type	All Dimensions are in Inches											Mounting Bolt Torque
		A	B	C	D	E	F	G	H	J	K	L	
Double Solenoid A.C.	01 04 3-Position Spring Centered 2-Position Detented	12 <sup>3</sup> / <sub>4</sub>	6 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	—	<sup>1</sup> / <sub>8</sub>	3	<sup>5</sup> / <sub>16</sub>	160 to 180 Inch Lbs.
Single Solenoid A.C.	02+03 11+21 2-Position Spring Offset 2-Position Centered Offset	—	6 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	9 <sup>5</sup> / <sub>16</sub>	<sup>1</sup> / <sub>8</sub>	3	<sup>5</sup> / <sub>16</sub>	
Double Solenoid D.C.	01 04 3-Position Spring Centered 2-Position Detented	14 <sup>15</sup> / <sub>16</sub>	7 <sup>15</sup> / <sub>32</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	—	<sup>1</sup> / <sub>8</sub>	3	<sup>5</sup> / <sub>16</sub>	
Single Solenoid D.C.	02+03 11+21 2-Position Spring Offset 2-Position Centered Offset	—	7 <sup>15</sup> / <sub>32</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	10 <sup>3</sup> / <sub>8</sub>	<sup>1</sup> / <sub>8</sub>	3	<sup>5</sup> / <sub>16</sub>	
Pneu. or Hyd. Double Operator	01 04 3-Position Spring Centered 2-Position Detented	9 <sup>9</sup> / <sub>16</sub>	4 <sup>25</sup> / <sub>32</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	—	<sup>1</sup> / <sub>8</sub>	3	<sup>5</sup> / <sub>16</sub>	
Pneu. or Hyd. Single Operator	02+03 11+21 2-Position Spring Offset 2-Position Centered Offset	—	4 <sup>25</sup> / <sub>32</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	7 <sup>11</sup> / <sub>16</sub>	<sup>1</sup> / <sub>8</sub>	3	<sup>5</sup> / <sub>16</sub>	

Note: Pneumatic and hydraulic operators, operating pressure is 20 to 150 PSI.

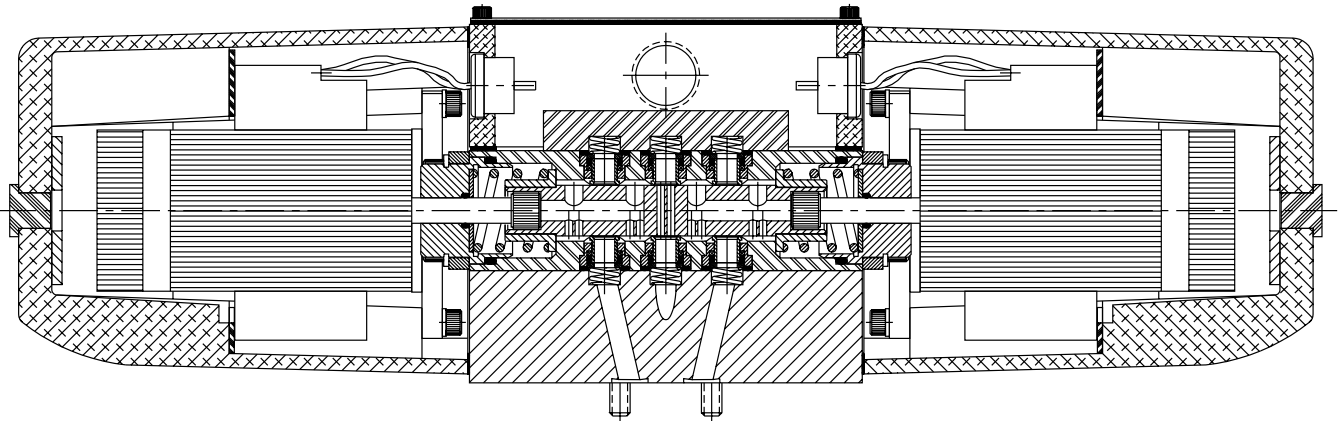
### Interpretation of Valve Number

211	04	-73	01		-02	00
<b>Catalog Number</b>	<b>Flow Pattern</b>	<b>Power Source</b>	<b>Operating Type</b>		<b>O-Ring Code</b>	<b>Optional Features</b>
211 3 GPM	01 02 03 04 05 06 07 08 09 10	54 12V/D.C. 56 24V/D.C. 58 48V/D.C. 70 Air - Oil Operator 73 115V/60C A.C. 75 110V/50C A.C. 77 230V/60C A.C. 79 220V/50C A.C. 81 460V/60C A.C. 83 440V/50C A.C.	01 = 3-Position, Spring Centered, Flow Patterns 1-9, Double Solenoid or Air-Oil Operated	04 = 2-Position, Detented, Flow Pattern 10, Double Solenoid or Air-Oil Operated	02 Commercial Buna N 03 Buna N (MIL-P-5516) 27 Buna N (MIL-P-25732) 28 Viton A 52 EPR	00 No Options 02 Pilot Speed Control Valve 10 Single Tel-Lite 12 Single Tel-Lite Pilot Speed Control Valve 20 Double Tel-Lite 22 Double Tel-Lite Pilot Speed Control Valve
			02 = 2-Position, Spring Offset, Flow Pattern 10, A Operated	11 = 2-Position, Centered Offset, Left & Center Positions of Flow Patterns 1-9, A Operated		
			03 = 2-Position, Spring Offset, Flow Pattern 10, B Operated	21 = 2-Position, Centered Offset, Right & Center Positions of Flow Patterns 1-9, B Operated		

**Note:**  
1. See Page 6-15 for sub-plate and mounting dimensions.  
2. Do not use these valves in series or tandem circuits.



## Catalog Series 21200 10 GPM



### Features

- Shear-type positive seal.
- Zero leakage (1 drop per min. per pressurized port).
- Ideal for water soluble systems (95-5).
- Pressures up to 6000 PSI.
- Long life, easy maintenance.
- Standard valves are interflow.
- No packing to wear or cut.
- High tolerance to contamination.
- High tolerance to silting.
- Manual overrides are standard.

### Specifications

#### Service Applications:

Hydraulic oil. Water containing minimum of 5% soluble oil. Suggest water soluble oil with a sodium sulphonate-based emulsifier. Oil should have a viscosity of 250-350 SSU at 100° F. Others available on special order.

#### Pressure Range:

**Working:** To 6000 PSI  
**\*Proof:** 9000 PSI  
**\*Burst:** 15,000 PSI

\*Applicable to pressure and cylinder ports only.

**Note:** Installation of this valve should ensure that exhaust port pressure does not exceed cylinder port pressures by more than 50 PSI and never exceed 1000 PSI.

#### Temperature Range:

-40° to 225° F. (with Code 02 O-rings)

#### CV Factor: 1.0

**Internal Leakage:** 1 DPM per pressurized port.

**Mounting:** Sub-plate. Mounting bolts furnished.

#### Materials:

**Cover, Body, Bottom Plate, Inserts, Washers, Spring Retainer, Screws, Retainer Plate:** Steel.

**Name Plate Housing, End Cap:** Aluminum alloy, anodized.

**Slide, Seals, Springs:** Stainless steel.

**O-Rings:** Synthetic rubber.

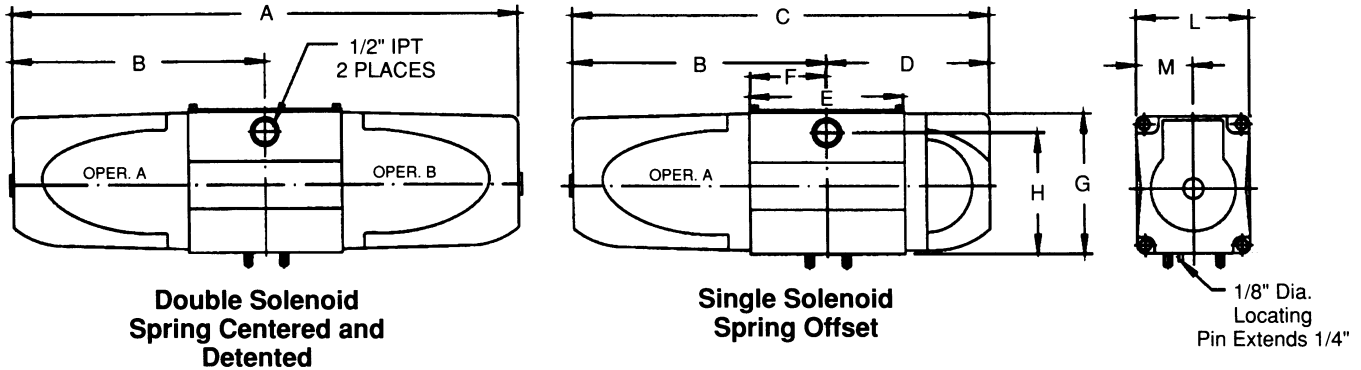
**Flow:** 10 gpm rated maximum.

**Operating Time:** 25 milliseconds.

Electrical Data		Weight	
Inrush Current	16 Amps Maximum	One Solenoid	Two Solenoids
Holding Current	2.5 Amps Maximum		
Drop-Out Voltage	Approx. 75% Rated Voltage	20 Lbs.	26 Lbs.
Voltage Required to Pull Back After Drop-Out	Approx. 95% Rated Voltage		

**K**

### Dimensions



Power Source	Operating Type	All Dimensions are in Inches										Mounting Bolt Torque
		A	B	C	D	E	F	G	H	L	M	
Double Solenoid A.C.	01 04 3-Position Spring Centered 2-Position Detented	15 <sup>13</sup> / <sub>16</sub>	7 <sup>29</sup> / <sub>32</sub>	—	—	4 <sup>13</sup> / <sub>16</sub>	2 <sup>13</sup> / <sub>32</sub>	4 <sup>7</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>	160 to 180 Inch Lbs.
Single Solenoid A.C.	02+03 11+21 2-Position Spring Offset 2-Position Centered Offset	—	7 <sup>29</sup> / <sub>32</sub>	13 <sup>31</sup> / <sub>32</sub>	5 <sup>1</sup> / <sub>8</sub>	4 <sup>13</sup> / <sub>16</sub>	2 <sup>13</sup> / <sub>32</sub>	4 <sup>7</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>	
Pneu. or Hyd. Double Operator	01 04 3-Position Spring Centered 2-Position Detented	12 <sup>1</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>32</sub>	—	—	4 <sup>13</sup> / <sub>16</sub>	2 <sup>13</sup> / <sub>32</sub>	4 <sup>7</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>	160 to 180 Inch Lbs.
Pneu. or Hyd. Single Operator	02+03 11+21 2-Position Spring Offset 2-Position Centered Offset	—	6 <sup>1</sup> / <sub>32</sub>	11 <sup>5</sup> / <sub>32</sub>	5 <sup>1</sup> / <sub>8</sub>	4 <sup>13</sup> / <sub>16</sub>	2 <sup>13</sup> / <sub>32</sub>	4 <sup>7</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>	

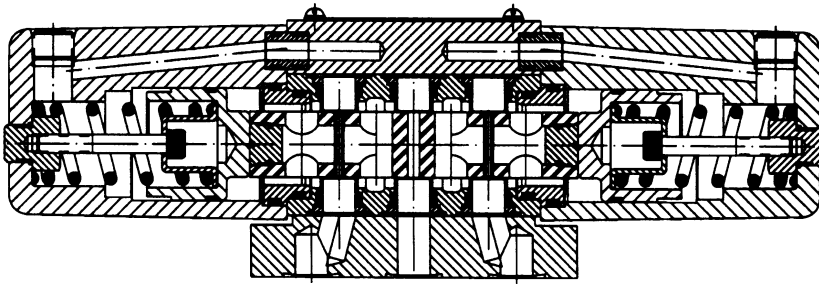
Note: Pneumatic and hydraulic operators, operating pressure is 20 to 150 PSI.

### Interpretation of Valve Number

212	04	-03	01	-02	00
Catalog Number	Flow Pattern	Power Source	Operating Type	O-Ring Code	Optional Features
212 10 GPM	01 	07 Air - Oil Operated	 01 = 3-Position, Spring Centered, Flow Patterns 1-9, Double Solenoid or Air-Oil Operated	02 Commercial Buna N	00 No Options
	02 	03 115V/60C A.C.	 02 = 2-Position, Spring Offset, Flow Pattern 10, A Operated	03 Buna N (MIL-P-5516)	02 Pilot Speed Control Valve
	03 	05 110V/50C A.C.	 03 = 2-Position, Spring Offset, Flow Pattern 10, B Operated	27 Buna N (MIL-P-25732)	10 Single Tel-Lite
	04 	07 230V/60C A.C.	 04 = 2-Position, Detented, Flow Pattern 10, Double Solenoid or Air-Oil Operated	28 Viton A	12 Single Tel-Lite Pilot Speed Control Valve
	05 	09 220V/50C A.C.	 11 = 2-Position, Centered Offset, Left & Center Positions of Flow Patterns 1-9, A Operated	52 EPR	20 Double Tel-Lite
	06 	11 460V/60C A.C.	 21 = 2-Position, Centered Offset, Right & Center Positions of Flow Patterns 1-9, B Operated		22 Double Tel-Lite Pilot Speed Control Valve
	07 	13 440V/50C A.C.			
	08 				
	09 				
	10 				

Note:  
 1. See Page 6-15 for sub-plate and mounting dimensions.  
 2. Do not use these valves in series or tandem circuits.





**Catalog Series**  
**23100 — 25 GPM**  
**23200 — 45 GPM**  
**23300 — 75 GPM**

**Features**

- Shear-type positive seal.
- Ideal for water soluble systems (95-5).
- Pressures up to 6000 PSI.
- Zero leakage (1 drop per min. per pressurized port).
- Mounts in any position.
- No packing to wear or cut.
- Standard valves are interflow.
- High tolerance to contamination.
- High tolerance to silting.
- Long life, easy maintenance.

**Specifications**

**Service Applications:**

Hydraulic oil. Water containing minimum of 5% soluble oil. Others available on special order.

**Pressure Range:**

\*Pilot (air or liquid): 150 to 6000 PSI  
 Working: To 6000 PSI  
 †Proof: 9000 PSI  
 †Burst: 15,000 PSI

†Applicable to pressure and cylinder ports only.  
 \* Pilot pressure must exceed exhaust port pressure by at least 150 PSI.

**Note:** Installation of this valve should ensure that exhaust port pressure does not exceed cylinder port pressures by more than 50 PSI.

For spring centered valves, exhaust port pressure not to exceed 50 PSI.

**Temperature Range:**

-40° to 250° F. (with Code 02 O-rings)

**External Leakage:** Zero.

**Internal Leakage:** 1 DPM maximum per port.

**Mounting:** Sub-plate. Mounting bolts furnished.

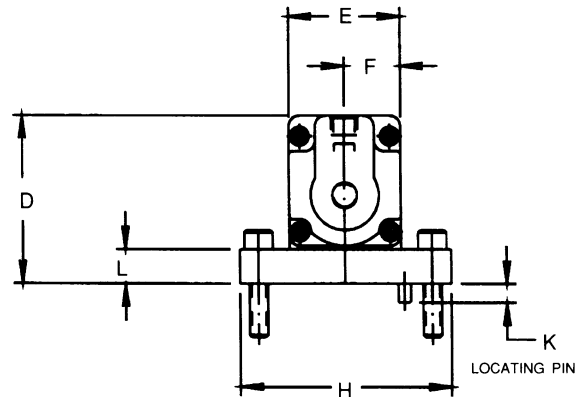
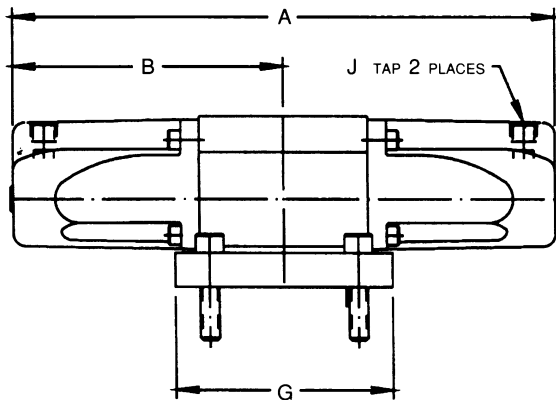
**Materials:**

**Body, Pistons, Spring Retainer, Pipe Plugs:** Steel.  
**End Caps:** Ductile iron.  
**Slide, Seals, Springs, Spring Washers:** Stainless steel.  
**O-Rings:** Synthetic rubber.  
**Back-up Rings:** PTFE.

Valve Number	Weight	CV Factor	Rated Flow	4 Flow Holes	Pilot Pistons 1/2 Stroke	Displacement Full Stroke	Pilot Port Sizes
23100	14 Lbs.	2.5	25 GPM	7/16 Dia.	.9 Cu. In.	1.8 Cu. In.	1/4 NPT
23200	23 Lbs.	4.3	45 GPM	9/16 Dia.	2.2 Cu. In.	4.4 Cu. In.	1/4 NPT
23300	54 Lbs.	7.4	75 GPM	3/4 Dia.	5.2 Cu. In.	10.4 Cu. In.	3/8 NPT

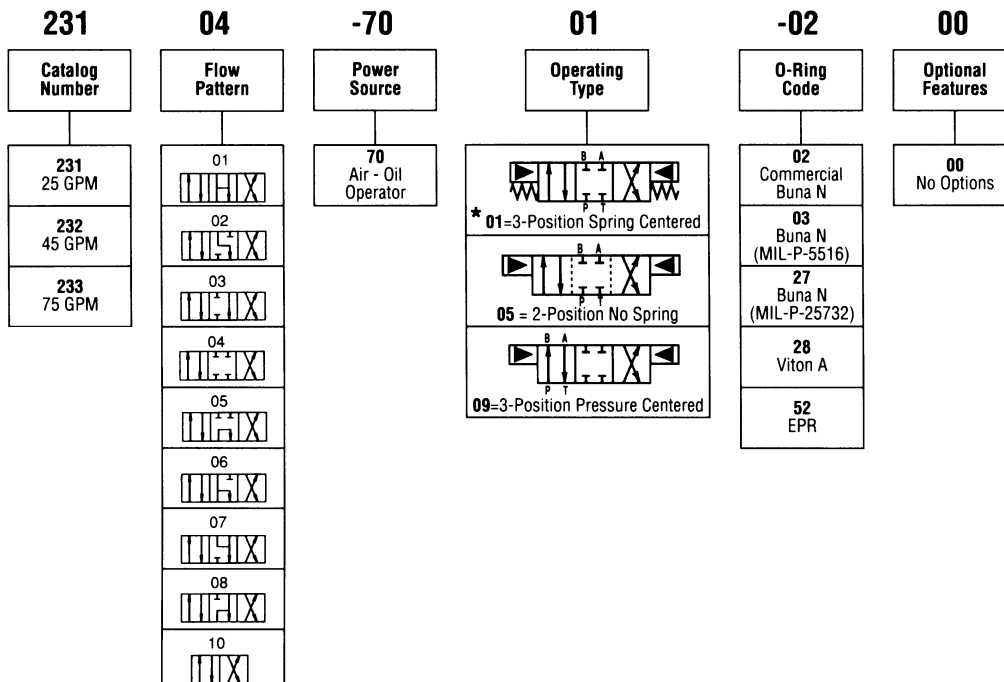


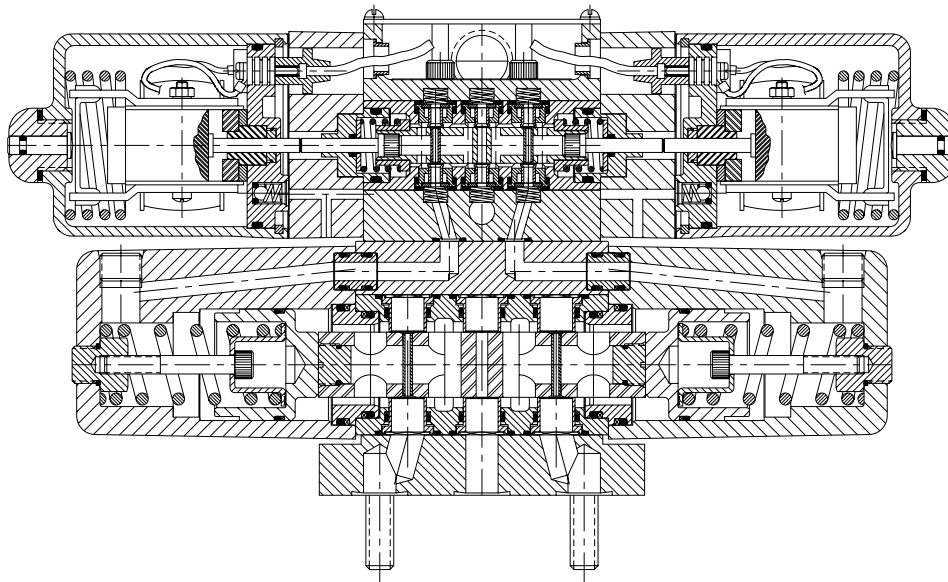
### Dimensions



Valve Series	All Dimensions are in Inches											Mounting Torque Required
	A	B	C	D	E	F	G	H	J	K	L	
23100	10 <sup>31</sup> / <sub>32</sub>	5 <sup>31</sup> / <sub>64</sub>	5/8	3 <sup>27</sup> / <sub>64</sub>	2 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub>	1/4 NPT	1/4 Dia. x Proj.	11/16	700 In. Lbs.
23200	13 <sup>1</sup> / <sub>2</sub>	6 <sup>3</sup> / <sub>4</sub>	7/8	3 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub>	1/4 NPT	3/8 Dia. x Proj.	11/16	700 In. Lbs.
23300	16 <sup>1</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>8</sub>	1	4 <sup>23</sup> / <sub>32</sub>	4 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>4</sub>	3/8 NPT	3/8 Dia. x Proj.	1 <sup>1</sup> / <sub>8</sub>	1100 In. Lbs.

### Interpretation of Valve Number





**Catalog Series**  
**25100 – 25 GPM**  
**25200 – 45 GPM**  
**27200 – 45 GPM**  
**27300 – 75 GPM**

**Features**

- Shear-type positive seal.
- Ideal for water soluble systems (95-5).
- Pressures up to 6000 PSI.
- Zero leakage (1 drop per min. per pressurized port).
- Mounts in any position.
- No packing to wear or cut.
- Standard valves are interflow.
- High tolerance to contamination.
- High tolerance to silting.
- Long life, easy maintenance.

**Specifications**

**Service Applications:**

Hydraulic oil. Water containing minimum of 5% soluble oil. Suggest water soluble oil with a sodium sulphonate-based emulsifier. Oil should have a viscosity of 250-350 SSU at 100° F. Others available on special order.

**Pressure Range:**

**Pilot:** 150 to 6000 PSI  
**Working:** To 6000 PSI  
**Proof:** 9000 PSI  
**Burst:** 15,000 PSI

**Note:** Installation of this valve should ensure that exhaust port pressure does not exceed cylinder port pressures by more than 50 PSI. Pilot pressure must be at least 150 PSI greater than the exhaust port pressure in order to power shift the valve. For spring return valves, maximum exhaust port pressure allowed is 50 PSI.

**Temperature Range:**

-40° to 225° F. (with Code 02 O-rings)

**Internal Leakage:**

1 DPM maximum per pressurized port.

**Mounting:**

Sub-plate. Mounting bolts furnished.

**Materials:**

**Covers, Bodies, Bottom Plates, Inserts, Washers, Spring Retainer, Screws, Retainer Plate, Sealing Ring, Pistons, Main End Caps:** Steel.

**Name Plate, Pilot End Cap, Retainer Plate (Pilot):** Aluminum alloy.

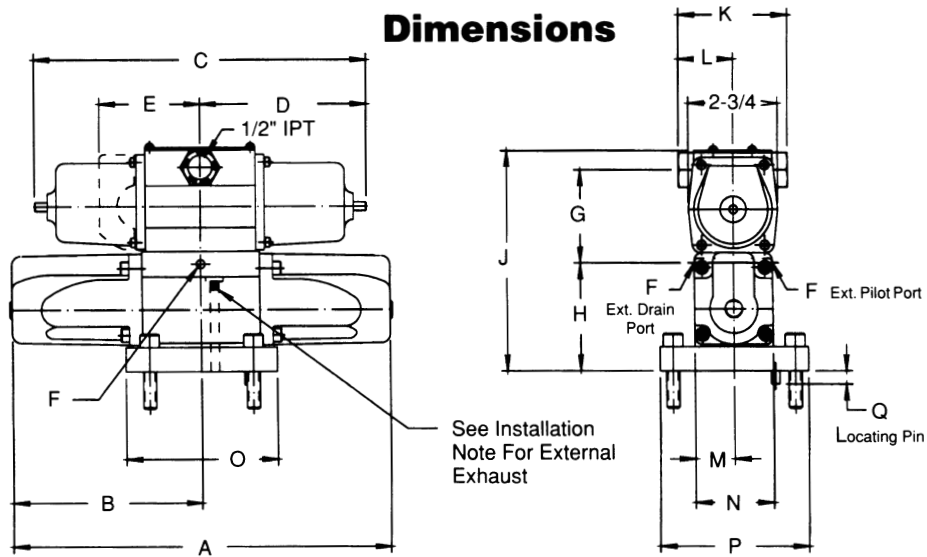
**Slides, Seals, Springs, Pilot Choke Plug:** Stainless steel.

**O-Rings:** Synthetic rubber.



Valve Series	Flow GPM	CV Factor	Pilot Valve Series	Weight Including Sequence Valve (Lbs.)
25100	25 Max.	2.5	21100 (3 GPM)	30 to 32
25200	45 Max.	4.3	21100 (3 GPM)	40 to 42.5
27200	45 Max.	4.3	21200 (10 GPM)	51.5 to 58.5
27300	75 Max.	7.4	21200 (10 GPM)	94 to 103

**Dimensions**



Valve Series	Power Source	All Dimensions are in Inches																			
		A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	Mounting Torque	S	T	
25100	A.C.			12 <sup>3</sup> / <sub>4</sub>	6 <sup>3</sup> / <sub>8</sub>			2 <sup>51</sup> / <sub>64</sub>										1/4 Dia. X 3/8 Proj.	700 In. Lbs.	.812	1 <sup>5</sup> / <sub>8</sub>
	D.C.	10 <sup>31</sup> / <sub>32</sub>	5 <sup>31</sup> / <sub>64</sub>	14 <sup>15</sup> / <sub>16</sub>	7 <sup>15</sup> / <sub>32</sub>	2 <sup>15</sup> / <sub>16</sub>	1/4		3 <sup>1</sup> / <sub>16</sub>	6 <sup>33</sup> / <sub>32</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub>					
	Air Oper.			9 <sup>9</sup> / <sub>16</sub>	4 <sup>9</sup> / <sub>32</sub>																
25200	A.C.			12 <sup>3</sup> / <sub>4</sub>	6 <sup>3</sup> / <sub>8</sub>			2 <sup>51</sup> / <sub>64</sub>										1/4 Dia. X 3/8 Proj.	700 In. Lbs.	1.000	2 <sup>1</sup> / <sub>8</sub>
	D.C.	13 <sup>1</sup> / <sub>4</sub>	6 <sup>5</sup> / <sub>8</sub>	14 <sup>15</sup> / <sub>16</sub>	7 <sup>15</sup> / <sub>32</sub>	2 <sup>15</sup> / <sub>16</sub>	1/4		3 <sup>17</sup> / <sub>64</sub>	6 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub>					
	Air Oper.			9 <sup>9</sup> / <sub>16</sub>	4 <sup>9</sup> / <sub>32</sub>																
27200	A.C.			15 <sup>13</sup> / <sub>16</sub>	7 <sup>29</sup> / <sub>32</sub>			4 <sup>15</sup> / <sub>64</sub>										1/4 Dia. X 3/8 Proj.	700 In. Lbs.	1.000	2 <sup>1</sup> / <sub>8</sub>
	D.C.	13 <sup>1</sup> / <sub>4</sub>	6 <sup>5</sup> / <sub>8</sub>			5 <sup>1</sup> / <sub>8</sub>	1/4		3 <sup>17</sup> / <sub>64</sub>	8 <sup>3</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub>					
	Air Oper.			12 <sup>1</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>32</sub>																
27300	A.C.			15 <sup>13</sup> / <sub>16</sub>	7 <sup>29</sup> / <sub>32</sub>			4 <sup>11</sup> / <sub>32</sub>										3/8 Dia. X 3/8 Proj.	1100 In. Lbs.	1.219	2 <sup>53</sup> / <sub>64</sub>
	D.C.	16 <sup>1</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>8</sub>			5 <sup>1</sup> / <sub>8</sub>	3/8		4 <sup>3</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>4</sub>					
	Air Oper.			12 <sup>1</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>32</sub>																

**Installation Information**

Minimum operating pilot pressure is 150 PSI.

**Internal Piloting:**

A sequence valve must be used to provide upstream minimum pilot pressure when using a single pressure source for both the slave and pilot valves.

**External Piloting:**

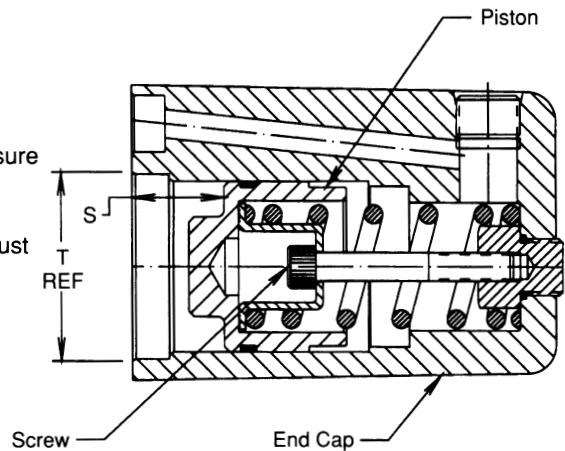
(No sequence valve used.) Minimum pilot pressure (150 PSI above exhaust pressure) must be supplied to the external pilot port of the pilot valve.

External exhaust for the pilot valve requires the use of part number 02050-2700-0000 installed as follows (see page 6-9 valve drawing):

1. Remove pilot valve.
2. Remove slave valve pilot cover.
3. Insert plug assembly into internal drain orifice.
4. Re-assemble valve and connect external drain at "F".

**Note:**

External drain should be used when pilot media is different from primary media.

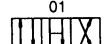
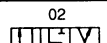
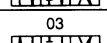
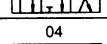
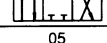
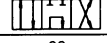
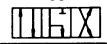
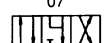
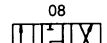
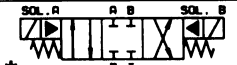
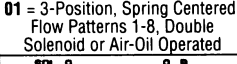

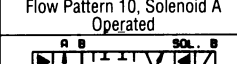
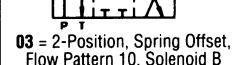
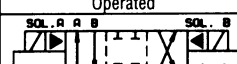

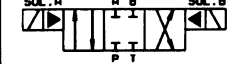
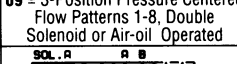


When reassembling spring centering end cap, maintain "S" dimension.





## Interpretation of Valve Number

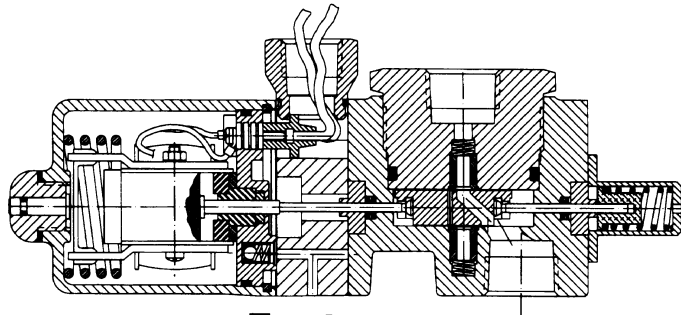
251	04	-73	02	-02	01																																																																																																									
Catalog Number	Flow Pattern	Power Source	Operating Type	O-Ring Code	Optional Features																																																																																																									
<b>251</b> 25 GPM Main Valve 3 GPM Pilot Valve	01  02  03  04  05  06  07  08  10 	<table border="1"> <tr> <th colspan="2">Series 25100, 25200</th> <th colspan="2">Series 27200, 27300, 27400</th> </tr> <tr> <td>54</td> <td>12V/D.C.</td> <td>03</td> <td>115V/60C A.C.</td> </tr> <tr> <td>56</td> <td>24V/D.C.</td> <td>05</td> <td>110V/60C A.C.</td> </tr> <tr> <td>58</td> <td>48V/D.C.</td> <td>07</td> <td>230V/60C A.C.</td> </tr> <tr> <td>70</td> <td>Air - Oil Operated</td> <td>09</td> <td>220V/50C A.C.</td> </tr> <tr> <td>73</td> <td>115V/60C A.C.</td> <td>11</td> <td>460V/60C A.C.</td> </tr> <tr> <td>75</td> <td>110V/50C A.C.</td> <td>13</td> <td>440V/50C A.C.</td> </tr> <tr> <td>77</td> <td>230V/60C A.C.</td> <td>70</td> <td>Air - Oil Operated</td> </tr> <tr> <td>79</td> <td>220V/50C A.C.</td> <td></td> <td></td> </tr> <tr> <td>81</td> <td>460V/60C A.C.</td> <td></td> <td></td> </tr> <tr> <td>83</td> <td>440V/50C A.C.</td> <td></td> <td></td> </tr> </table>	Series 25100, 25200		Series 27200, 27300, 27400		54	12V/D.C.	03	115V/60C A.C.	56	24V/D.C.	05	110V/60C A.C.	58	48V/D.C.	07	230V/60C A.C.	70	Air - Oil Operated	09	220V/50C A.C.	73	115V/60C A.C.	11	460V/60C A.C.	75	110V/50C A.C.	13	440V/50C A.C.	77	230V/60C A.C.	70	Air - Oil Operated	79	220V/50C A.C.			81	460V/60C A.C.			83	440V/50C A.C.			 <p>* 01 = 3-Position, Spring Centered, Flow Patterns 1-8, Double Solenoid or Air-Oil Operated</p>  <p>02 = 2-Position, Spring Offset, Flow Pattern 10, Solenoid A Operated</p>  <p>03 = 2-Position, Spring Offset, Flow Pattern 10, Solenoid B Operated</p>  <p>04 = 2-Position, Detented, Flow Pattern 10, Double Solenoid or Air-Oil Operated</p>  <p>09 = 3-Position Pressure Centered Flow Patterns 1-8, Double Solenoid or Air-oil Operated</p>  <p>* 11 = 2-Position, Centered Offset, Left &amp; Center Positions of Flow Patterns 1-8, Solenoid A Operated</p>  <p>* 21 = 2-Position, Centered Offset, Right &amp; Center Positions of Flow Patterns 1-8, Solenoid B Operated</p>  <p>31 = 2-Position, Pressure Centered, Right &amp; Center Positions of Flow Patterns 1-8, B Operated</p>  <p>41 = 2-Position, Pressure Centered, Left &amp; Center Positions of Flow Patterns 1-8, A Operated</p>	<table border="1"> <tr> <td>02</td> <td>Commercial Buna N</td> </tr> <tr> <td>03</td> <td>Buna N (MIL-P-5516)</td> </tr> <tr> <td>27</td> <td>Buna N (MIL-P-25732)</td> </tr> <tr> <td>28</td> <td>Viton A</td> </tr> <tr> <td>52</td> <td>EPR</td> </tr> </table>	02	Commercial Buna N	03	Buna N (MIL-P-5516)	27	Buna N (MIL-P-25732)	28	Viton A	52	EPR	<table border="1"> <tr> <th colspan="3">Optional Features</th> </tr> <tr> <td>00</td> <td>No Options</td> <td>10</td> <td>Single Tel-Lite</td> <td>20</td> <td>Double Tel-Lite</td> </tr> <tr> <td>01</td> <td>Sequence Valve</td> <td>11</td> <td>Single Tel-Lite Sequence Valve</td> <td>21</td> <td>Double Tel-Lite Sequence Valve</td> </tr> <tr> <td>02</td> <td>Pilot Speed Control Valve</td> <td>12</td> <td>Single Tel-Lite Pilot Speed Control Valve</td> <td>22</td> <td>Double Tel-Lite Pilot Speed Control Valve</td> </tr> <tr> <td>03</td> <td>External Drain</td> <td>13</td> <td>Single Tel-Lite External Drain</td> <td>23</td> <td>Double Tel-Lite External Drain</td> </tr> <tr> <td>04</td> <td>Sequence Valve Pilot Speed Control Valve</td> <td>14</td> <td>Single Tel-Lite Sequence Valve Pilot Speed Control Valve</td> <td>24</td> <td>Double Tel-Lite Sequence Valve Pilot Speed Control Valve</td> </tr> <tr> <td>05</td> <td>Sequence Valve External Drain</td> <td>15</td> <td>Single Tel-Lite Sequence Valve External Drain</td> <td>25</td> <td>Double Tel-Lite Sequence Valve External Drain</td> </tr> <tr> <td>06</td> <td>Pilot Speed Control Valve External Drain</td> <td>16</td> <td>Single Tel-Lite Pilot Speed Control Valve External Drain</td> <td>26</td> <td>Double Tel-Lite Pilot Speed Control Valve External Drain</td> </tr> <tr> <td>07</td> <td>Sequence Valve Pilot Speed Control Valve External Drain</td> <td>17</td> <td>Single Tel-Lite Sequence Valve Pilot Speed Control Valve External Drain</td> <td>27</td> <td>Double Tel-Lite Sequence Valve Pilot Speed Control Valve External Drain</td> </tr> </table>	Optional Features			00	No Options	10	Single Tel-Lite	20	Double Tel-Lite	01	Sequence Valve	11	Single Tel-Lite Sequence Valve	21	Double Tel-Lite Sequence Valve	02	Pilot Speed Control Valve	12	Single Tel-Lite Pilot Speed Control Valve	22	Double Tel-Lite Pilot Speed Control Valve	03	External Drain	13	Single Tel-Lite External Drain	23	Double Tel-Lite External Drain	04	Sequence Valve Pilot Speed Control Valve	14	Single Tel-Lite Sequence Valve Pilot Speed Control Valve	24	Double Tel-Lite Sequence Valve Pilot Speed Control Valve	05	Sequence Valve External Drain	15	Single Tel-Lite Sequence Valve External Drain	25	Double Tel-Lite Sequence Valve External Drain	06	Pilot Speed Control Valve External Drain	16	Single Tel-Lite Pilot Speed Control Valve External Drain	26	Double Tel-Lite Pilot Speed Control Valve External Drain	07	Sequence Valve Pilot Speed Control Valve External Drain	17	Single Tel-Lite Sequence Valve Pilot Speed Control Valve External Drain	27	Double Tel-Lite Sequence Valve Pilot Speed Control Valve External Drain
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**Note:**

1. See Pilot Valve data sheet for electrical data (page 6-1 thru 6-4).
- \*2. Operating type 01, 11 and 21 are not available for valve series 27400.
3. D.C. solenoids are not available on valve series 27200 and 27300.



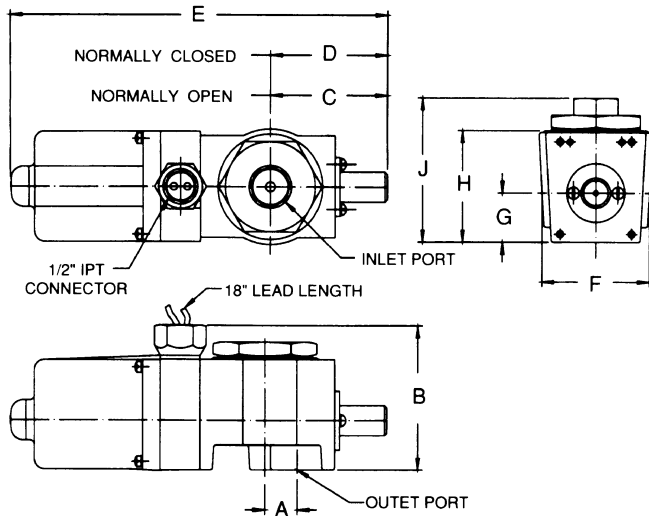
# Catalog Series 21353, 21356



## Features

- Designed to handle grease and oil in centralized lubricating systems.
- Self-cleaning and dirt resistant.
- Shear-type positive seal.
- Recommended for “venting” an R6701 relief valve as a high pressure shut-off or dump valve.

## Dimensions



## Specifications

### Service Applications:

Lubricating grease or oil.

### Pressure Range:

Working: 4500 PSI  
Proof: 6750 PSI  
Burst: 11250 PSI

### Temperature Range:

-40° to 225° F. (with Code 02 O-rings)

Sizes: NPT 3/8, 3/4.

Orifice Diameter: 3/16

### Type Ports:

NPT Pipe Threads.

CV Factor: 0.7

### Internal Leakage:

1 DPM maximum per pressurized port.

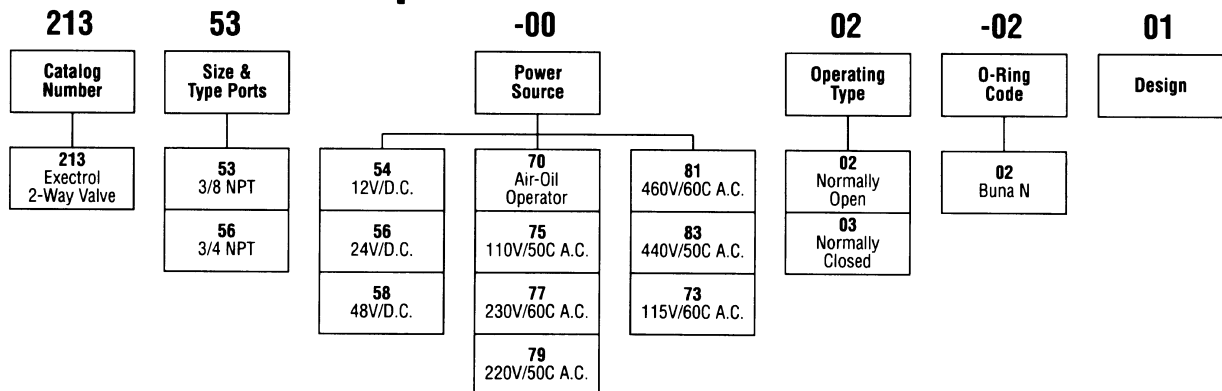
Mounting: In line (ports offset).

### Materials:

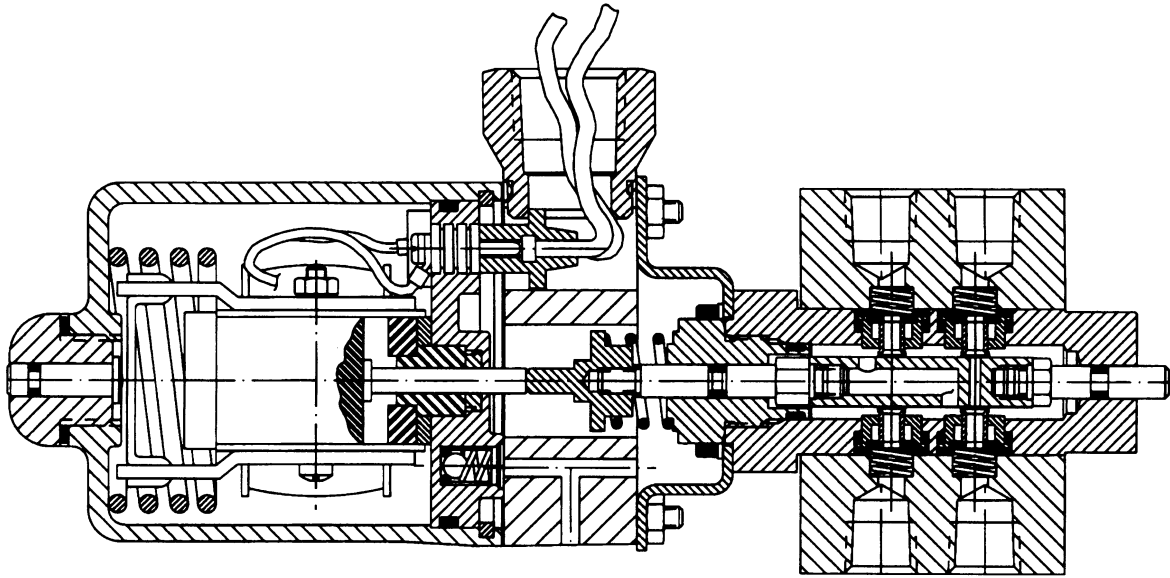
Body, Cap, Solenoid Housing & Cap: Aluminum alloy, anodized.  
Slide, Seals: Stainless steel type 440.  
Springs: Stainless steel.  
O-Rings: Synthetic rubber.  
Back-up Rings: PTFE.

Power Source	All Dimensions are in Inches									
	A	B	C	D	E	F	G	H	J	
A.C. Solenoid	13/16	3 1/2	3 1/16	2 15/16	9 7/16	2 29/32	1 15/64	2 51/64	3 3/16	
D.C. Solenoid	13/16	3 1/2	3 1/16	2 15/16	11	2 29/32	1 15/64	2 51/64	3 3/16	
Air - Oil Operator	13/16	3 1/2	3 1/16	2 15/16	8 13/16	2 29/32	1 15/64	2 51/64	3 3/16	

## Interpretation of Valve Number



# Catalog Series 21400



## Features

- Zero leakage (1 drop per min. per pressurized port).
- Available two-position operating types are: 2-way normally open; 2-way normally closed; 3-way and 4-way.
- Standard valves are interflow.
- Shear-type positive seal.

### A.C. Electrical Data

Inrush Current	4.2 Amps Maximum
Holding Current	.85 Amps Maximum
Drop-Out Voltage	Approx. 75% Rated Voltage
Voltage Required to Pull Back After Drop-Out	Approx. 95% Rated Voltage

## Specifications

### Service Applications:

Lubricated air and hydraulic oil.

### Pressure Range:

- Working** - Air: 1000 PSI  
 - Oil: 6000 PSI
- Proof** - Air: 2000 PSI  
 - Oil: 9000 PSI
- Burst** - Air: 2500 PSI  
 - Oil: 15000 PSI

### Temperature Range:

-65° to 160° F.  
 Higher on special order.

**Sizes:** NPT 1/4, 3/8 (except 4-way).

**Type Ports:** NPT Pipe Threads AND10053.

**CV Factor:** .28

### Internal Leakage:

Maximum at rated pressure: oil 1 DPM per pressurized port; air 15 bubbles/min.

**Mounting:** In line.

### Materials:

- Body:** Aluminum alloy, anodized.  
**Slide:** 440 stainless steel.  
**Seals:** 440 stainless steel.  
**O-Rings:** Synthetic rubber.  
**Back-up Rings:** PTFE.

### Weights:

2- and 3-way: AC 3 lbs.; DC 5 lbs. 10 oz.;  
 4-way: AC 3 lbs. 3 oz.; DC 5 lbs. 14 oz.

**Operating Time:** 25 milliseconds.

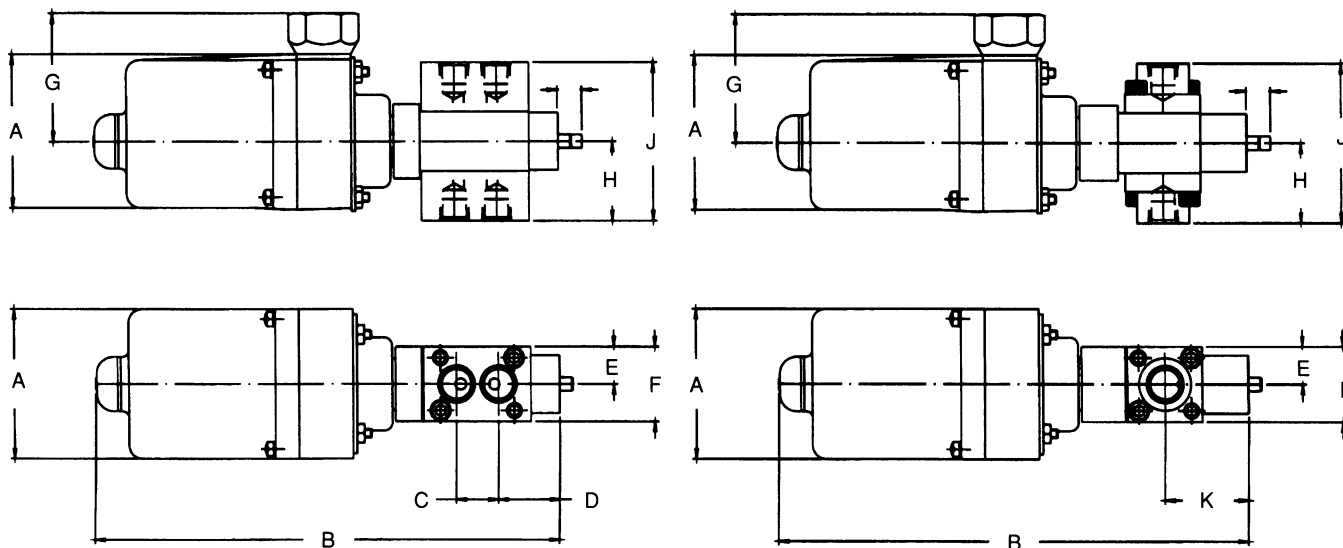
**Maximum Flow Capacity:** 3 GPM.

**Maximum Recommended Ambient Temperature:** 110° F.

**Maximum Outlet Port Back Pressure:** 1500 PSI.

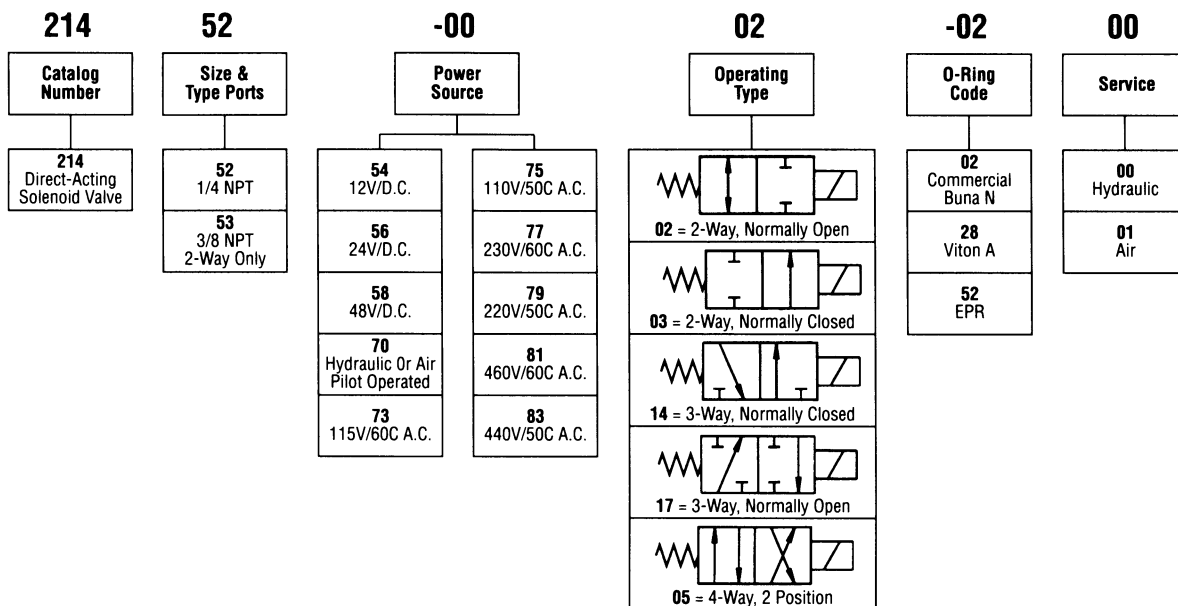


### Dimensions

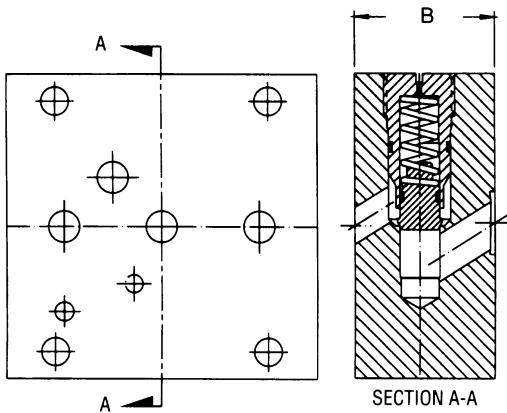


Valve Operator	All Dimensions are in Inches									
	A	B	C	D	E	F	G	H	J	K
A.C. Solenoid	2 <sup>3</sup> / <sub>4</sub>	8 <sup>7</sup> / <sub>16</sub>	<sup>25</sup> / <sub>32</sub>	1 <sup>5</sup> / <sub>32</sub>	<sup>11</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>29</sup> / <sub>64</sub>	2 <sup>29</sup> / <sub>32</sub>	1 <sup>17</sup> / <sub>32</sub>
D.C. Solenoid	2 <sup>3</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>8</sub>	<sup>25</sup> / <sub>32</sub>	1 <sup>5</sup> / <sub>32</sub>	<sup>11</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>29</sup> / <sub>64</sub>	2 <sup>29</sup> / <sub>32</sub>	1 <sup>17</sup> / <sub>32</sub>
Air - Oil Operator	2 <sup>3</sup> / <sub>4</sub>	6 <sup>13</sup> / <sub>16</sub>	<sup>25</sup> / <sub>32</sub>	1 <sup>5</sup> / <sub>32</sub>	<sup>11</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	—	1 <sup>29</sup> / <sub>64</sub>	2 <sup>29</sup> / <sub>32</sub>	1 <sup>17</sup> / <sub>32</sub>

### Interpretation of Valve Number



## Sequence Valve



The Sequence Valve should be used with all solenoid-controlled pilot-operated valves. It is used to maintain a minimum upstream non-adjustable pilot pressure of 150 PSI which is required to operate the *internally piloted* solenoid-controlled pilot-operated valve.

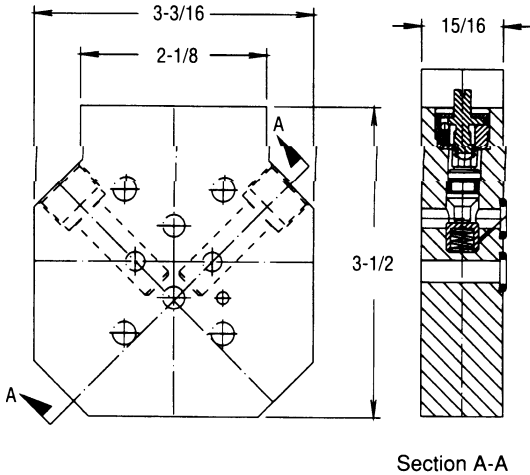
Because it *opens fully* on reaching its sequencing pressure it has the advantage of maintaining a pilot pressure without decreasing the system pressure. If a check or relief valve is used to maintain pilot pressure, as is the case with most other valves, its pressure drop is always robbing the system of power and creating heat.

When a Sequence Valve is not used in the assembly it may be necessary to provide a *separate source* for developing the 150 PSI minimum required for the operation of the valve. An external pilot port is provided in the pilot-operated valve for making this connection. The Ordering Part Number must be changed accordingly to obtain proper modification of the valve. See Data Sheet 6-9.

Valve Size	Sequence Valve Only Ordering Part Number	B	4 Socket Head Cap Screws Furnished - Size
25 GPM	02041-23XX-0000	1 $\frac{31}{32}$	$\frac{3}{8}$ -16UNC-3Ax3 $\frac{1}{2}$ "
45 GPM	02042-23XX-0000	1 $\frac{31}{32}$	$\frac{3}{8}$ -16UNC-3Ax3 $\frac{1}{2}$ "
75 GPM	02043-23XX-0000	2 $\frac{11}{16}$	$\frac{1}{2}$ -13UNC-3Ax5"
200 GPM	02044-23XX-0000	4 $\frac{1}{2}$	$\frac{5}{8}$ -11UNC-3x7"

\*Replace Xs with Media Seal Code symbol.

## Pilot Speed Control Valve



The Pilot Speed Control Valve controls the flow of media from either cylinder port when used with the direct solenoid-operated valve. When included in a solenoid-controlled pilot-operated assembly it allows the operator to select various pilot-operated valve speeds to ease starting movement or reversal of the cylinder or fluid motor.

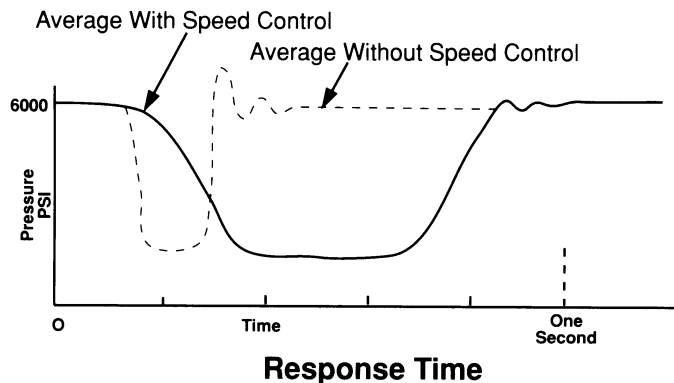
Both regulating screws are on the same side of the unit for convenience in valve installation and speed regulation. Settings of the regulating screws are made positive by a detented, non-rising stem.

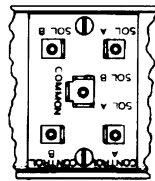
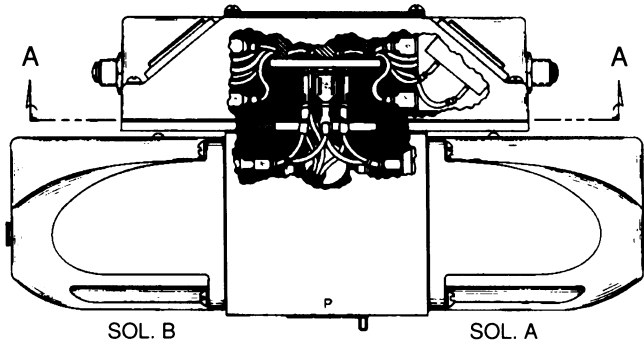
Both pressure and exhaust flows are directed through the Speed Control Valve. Adjustable flow metering poppets control the cylinder or pilot valve flow, with free flow into the system and controlled flow out of the system, to assure the advantage of the chatter-free "meter-out" principle.

The unit is always manifolded between the solenoid-operated valve and a sub-plate or the pilot-operated valve. Installation of the Speed Control requires no modification of the valve, and may be used or removed as desired.

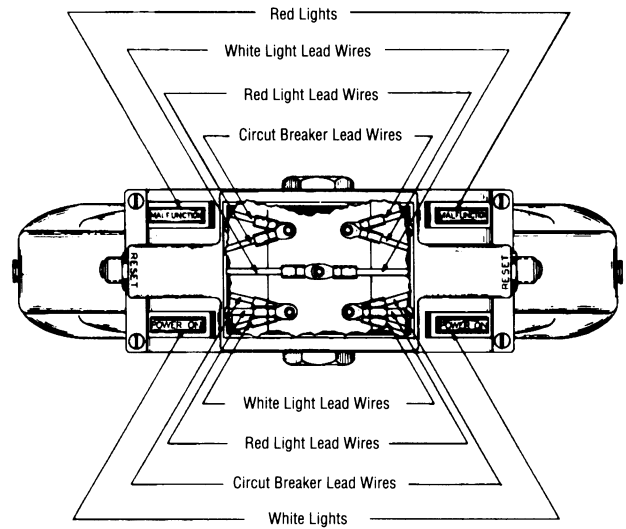
**Order P/N**  
 3 GPM — 02031-21\*\*-0000  
 10 GPM — 02032-21\*\*-0000  
 \*\*O-ring code

Typical Pressure Patterns of solenoid-controlled pilot-operated valves with and without the pilot speed control valve





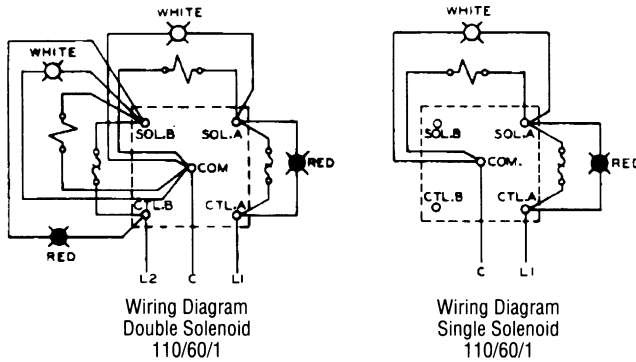
View AA  
(shown with wire leads removed)



Double Solenoid Application Shown

### Tel-Lite Installation

1. Turn off electrical power.
2. Remove valve nameplate.
3. Disconnect solenoid lead wires.
4. Remove Tel-Lite mounting plate.
5. Install mounting plate on the valve with gasket.
6. Connect solenoid and power leads to Tel-Lite per wiring diagram.
7. Mount Tel-Lite on mounting plate with the A solenoid terminal toward the valve A solenoid.
8. The blank nameplate should be stamped the same as the valve nameplate, except the third digit of the third group of numbers will be a one (1) for single solenoid valve or a two (2) for double solenoid valve.
9. Install nameplate and activate system.



### Features

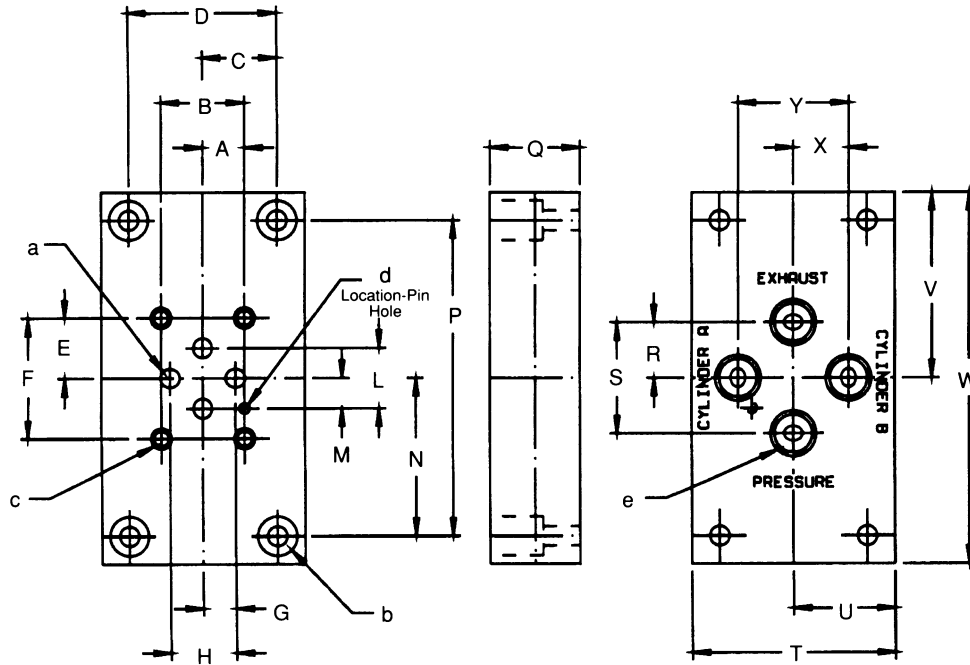
- The Tel-Lite is an optional accessory that can be installed at the factory or in the field.
- Long-lasting neon lights.
- Thermal cut-out circuit breaker.
- White light indicates solenoid is energized and valve is working properly.
- Red light indicates a mechanical or electrical malfunction which causes overload circuit breaker to open and prevent solenoid coil burn-out.
- For use with A.C. solenoids only.

Valve Size	Tel-Lite Unit Only	Ordering Part Number
3 GPM	Double Sol. Valve, 115V, 60 Cy Sol. A & B	02012-2103-0000
3 GPM	Single Sol. Valve, 115V, 60 Cy Sol. A	02011-2103-0100
3 GPM	Single Sol. Valve, 115V, 60 Cy Sol. B	02011-2103-0200
10 GPM	Double Sol. Valve, 115V, 60 Cy Sol. A & B	02022-2103-0000
10 GPM	Single Sol. Valve, 115V, 60 Cy Sol. A	02021-2103-0100
10 GPM	Single Sol. Valve, 115V, 60 Cy Sol. B	02021-2103-0200
Valve Size	Replacement Parts	Ordering Part Number
3 GPM	Circuit Breaker, 1-1/2 Amp. (-7)	00201-2100-1200
10 GPM	Circuit Breaker, 7-1/2 Amp. (-24)	00201-2100-1100
	Power On Light (White)	00201-2100-0900
	Malfunction Light (Red)	00201-2100-0800



### Features

- Manufactured in steel.
- Quickly and simply attached to valve unit.
- May be mounted during your product's assembly.



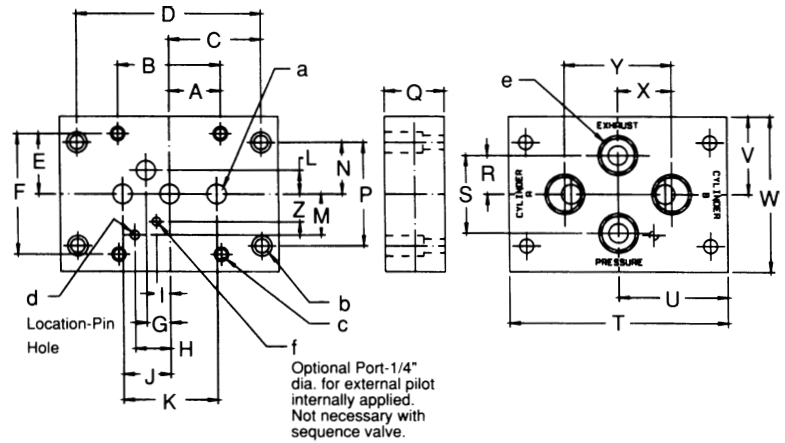
Valve Size	Sub-Plate Series	All Dimensions are in Inches													
		A	B	C	D	E	F	G	H	L	M	N	P	Q	
3 G.P.M.	00208-21**-0100	.562	1.125	1	2	.812	1.625	.440	.880	.812	.406	1 1/2	3	1 7/32	
10 G.P.M.	00208-21**-0200	.562	1.125	1	2	.812	1.625	.440	.880	.812	.406	2 1/8	4 1/4	1 7/32	
		R	S	T	U	V	W	X	Y	a	b	c		d	
3 G.P.M.	00208-21**-0100	3/4	1 1/2	2 3/4	1 3/8	1 13/16	3 5/8	3/4	1 1/2	1/4 Dia.	17/64 Dia.	1/4"-20UNC-3B x 1/2" Deep		9/64 Dia.	
10 G.P.M.	00208-21**-0200	3/4	1 1/2	2 3/4	1 3/8	2 1/2	5	3/4	1 1/2	1/4 Dia.	17/64 Dia.			9/64 Dia.	

\*\*Porting per chart below.

Valve Type	Valve	Rated Flow GPM	Port Size & Type		Ordering Part Number
			NPT	SAE IST	
Direct Solenoid Operated	21100	3	3/8	—	00208-2153-0100
			1/2	—	00208-2106-0101 00208-2154-0100
	21200	10	3/8	—	00208-2153-0200
			1/2	—	00208-2154-0200 00208-2108-0201

### Features

- Manufactured in steel.
- Quickly and simply attached to valve unit.
- May be mounted during your product's assembly.



Valve Size	Sub - Plate Series	All Dimensions are in Inches													
		A	B	C	D	E	F	G	H	I	J	K	L	M	
25 & 45 G.P.M.	00208-23**-0100	1 1/2	3	2 11/16	5 3/8	1 3/4	3 1/2	.687	1.375	.393	1.375	2.750	.687	1.187	
75 G.P.M.	00208-23**-0300	1 3/4	3 1/2	3 7/16	6 7/8	2 5/8	5 1/4	.875	.875	.437	1.750	3.500	.812	.656	
200 G.P.M.	00208-23**-0400	3	6	5 1/2	11	3 3/4	7 1/2	1.500	1.500	.437	3.000	6.000	1.187	1.000	
		N	P	Q	R	S	T	U	V	W	X	Y	Z		
25 & 45 G.P.M.	00208-23**-0100	1 1/2	3	1 3/4	1 1/8	2 1/4	6 3/8	3 3/16	2 1/8	4 1/4	1 9/16	3 1/8	.799		
75 G.P.M.	00208-23**-0300	2 1/4	4 1/2	2 3/4	1 5/8	3 1/4	8	4	3 1/8	6 1/4	2 1/2	5	1.078		
200 G.P.M.	00208-23**-0400	3 1/4	6 1/2	3 15/16	2 1/2	5	12 1/2	6 1/4	4 5/16	8 5/8	3 5/8	7 1/4	1.625		
		a	b	c	d	e	f								
25 & 45 G.P.M.	00208-23**-0100	9/16 Dia.	13/32 Dia.	3/8-16UNC-3B 1 1/8 Deep	17/64 Dia. 13/32 Deep	Port Tap ** Size	1/4 Dia.								
75 G.P.M.	00208-23**-0300	3/4 Dia.	17/32 Dia.	1/2-13UNC-3B 1 1/8 Deep	25/64 Dia. 9/16 Deep	Port Tap ** Size	1/4 Dia.								

\*\*Porting per chart below

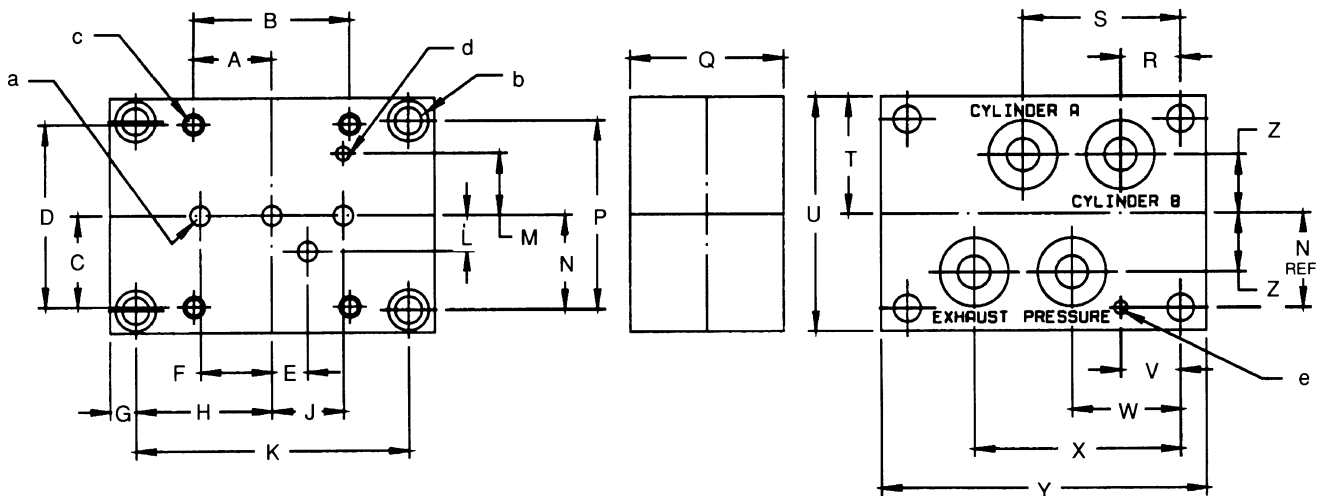
Valve Type	Valve Series	Rated Flow GPM	Port Size & Type Ordering		Part Number
			NPT	SAE IST	
Pilot-Operated and Solenoid Controlled, Pilot Operated	23100 25100	25	3/4	—	00208-2356-0100
			1	—	00208-2358-0100
			—	12	00208-2312-0101
	23200 25200 27200	45	3/4	—	00208-2356-0100
			1	—	00208-2358-0100
			—	12	00208-2312-0101
	23300 27300	75	1-1/4	—	00208-2360-0300
			1-1/2	—	00208-2362-0300
			—	24	00208-2324-0301





**00206-2312-0000**  
**Application Information**

- I. This adapter plate may be used to field-mount Exectrol Series 231, 232, 251, 252, and 272 valves to any of the following sub-plates:
  - A. Vickers = DGSM-06
  - B. Double A = #85-06 or -08
  - C. Racine = D4H-06S or -085
  - D. Rivett = Series P2
  - E. Denison = SS-P-12-02-05 or SS-S-17-02-06
- II. Also conforms to NFPA Standard Directional Control Valve size D06.



All Dimensions are in Inches												
A	B	C	D	E	F	G	H	J	K	L	M	N
1 1/2	3	1 3/4	3 1/2	.687	1.375	1/2	2.750	1.375	5 1/8	.687	1.187	1 13/16
P	Q	R	S	T	U	V	W	X	Y	Z		
3 5/8	2 15/16	1 5/32	3 1/32	2 1/4	4 1/2	1 5/32	2 3/32	3 31/32	6 1/4	1.125		
a	b	c	d	e								
9/16 Dia.	33/64 Dia. 25/32 C-Bore	3/8-16UNC-3B x 1.0 Deep	17/64 Dia. 7/16 Deep	250/256 Dia. x .250 Deep								



## To Mount Exectrol Valves (211 & 212 Series) to Non-Exectrol Sub-Plates

These Adapter Plates are offered as a convenience to facilitate mounting of Exectrol Valves to existing sub-plates.

Exectrol sub-plates are recommended for all new design installations.

### 00206-2112-0000 Application Information

I. This adapter plate may be used to field-mount Exectrol Series #211 (3 GPM), and #212 (10 GPM) valves to any of the following sub-plates:

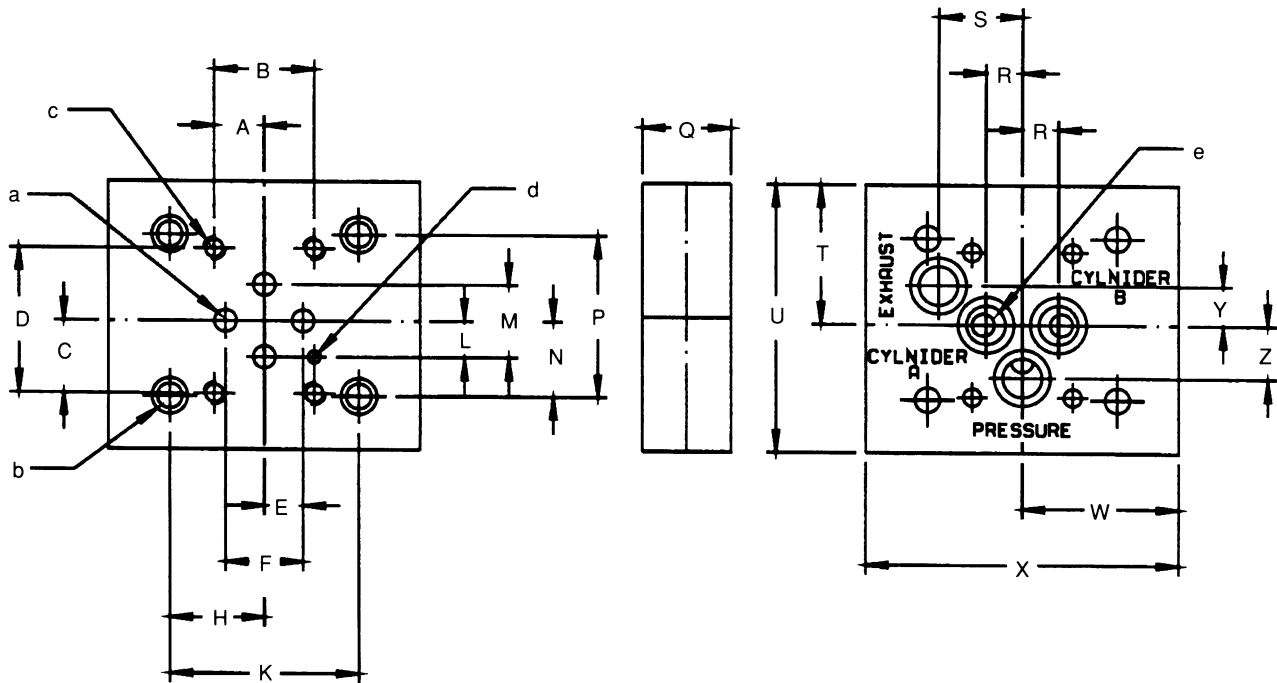
- A. Vickers = DGSM-01
- B. Double A = P81-02 or -03 or -04
- C. Racine = D4H-03A or -04A

D. Continental = Code B or F -(1/2")

E. Rivett = P1 Series -(1/2")

F. Denison = SS-P-04-01-07, SS-S-09-01-0M or SS-P-06-01-0L

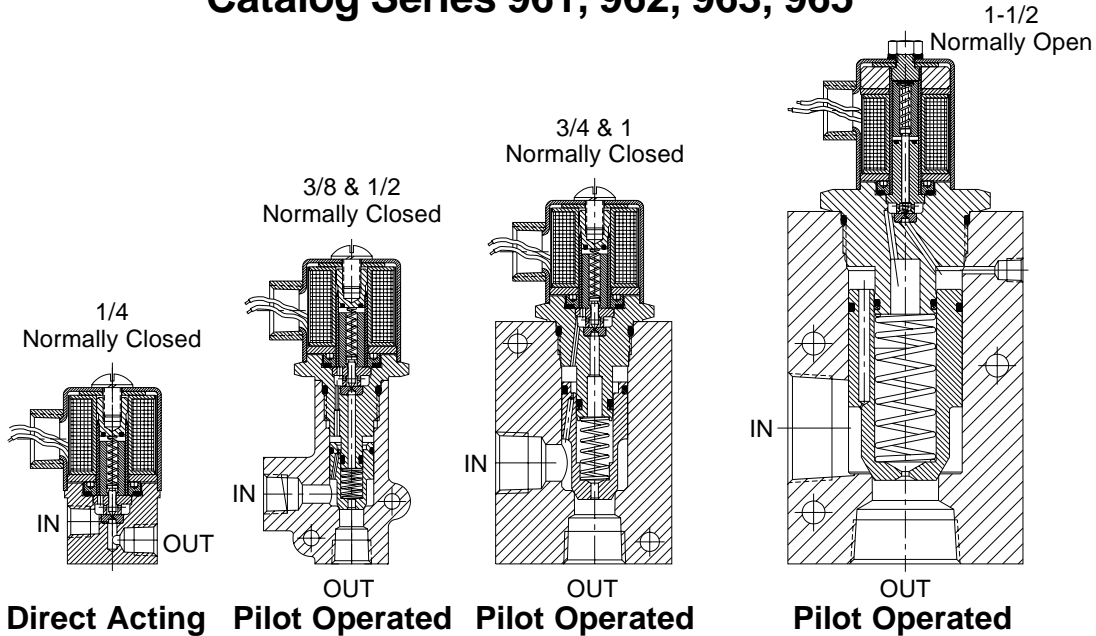
II. Also conforms to NFPA Standard T3.5.65.1 Directional Control Valve size D.02.



All Dimensions are in Inches												
A	B	C	D	E	F	H	K	L	M	N	P	Q
.562	1.125	.812	1.625	.440	.880	1 $\frac{1}{16}$	2 $\frac{1}{8}$	.406	.812	$\frac{31}{32}$	1 $\frac{13}{16}$	1
R	S	T	U	W	X	Y	Z	a	b	c	d	e
$\frac{13}{32}$	$\frac{15}{16}$	1 $\frac{1}{2}$	3	1 $\frac{3}{4}$	3 $\frac{1}{2}$	$\frac{7}{16}$	$\frac{19}{32}$	$\frac{1}{4}$ Dia.	$\frac{9}{32}$ Dia. Thru C-Bore X $\frac{3}{8}$ Deep	$\frac{1}{4}$ -20 UNC-3B X $\frac{5}{8}$ Deep	$\frac{9}{64}$ Dia. X $\frac{9}{32}$ Deep	$\frac{7}{16}$ Dia. X $\frac{3}{8}$ Deep



## Catalog Series 961, 962, 963, 965



Direct Acting Pilot Operated Pilot Operated

### Features

- Designed for fast remote unloading and closing.
- High pressure, high flow valves for hydraulic service.
- Pilot-operated for fast, smooth, non-shock operation.

### Specifications

#### Service Applications:

Hydraulic oil.

#### Pressure Range:

**Working:** Minimum: 25 PSID  
Maximum: See availability list  
**Proof:** 1-1/2 times operating pressure

#### Temperature Range:

-40° to 225° F.

**Sizes:** NPT 1/4, 3/8, 3/4, 1-1/2

**Type Ports:** NPT Pipe Threads

**Internal Leakage:** 1 cc/min.

#### Mounting:

Bolted - see drawing for dimensions. **Install with Solenoid Up.**

#### Materials:

**Body:** 1/4, 3/8, 3/4 - aluminum alloy.  
1-1/2 - steel.

**Spring:** Stainless steel AMS5688.

**Piston:** Steel.

**Seat, Solenoid Valve:** Brass.

**Seat 1-1/2" Valve Piston:** Stainless steel.

**O-Rings:** Synthetic rubber.

#### Note:

Will not operate satisfactorily with reverse flow on exhaust port.

#### Electric Service:

See Electrical Data Table for other services.

**Coil Lead Length:** 24"

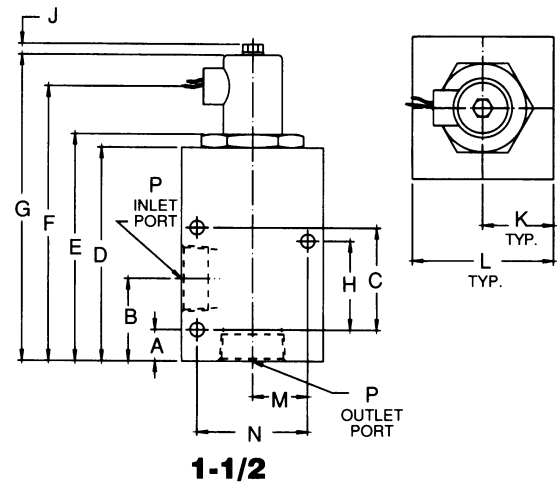
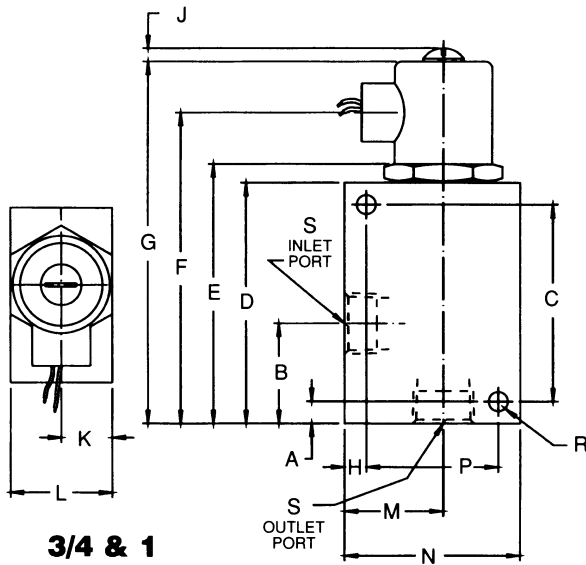
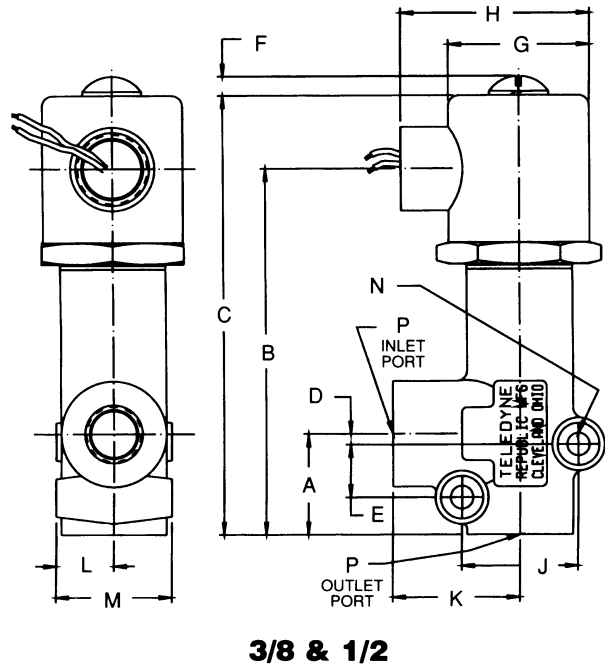
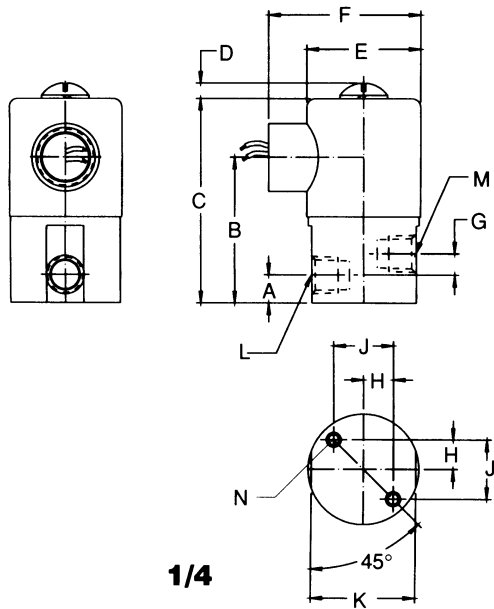
#### Electrical Data

Service Code	Service	Power Consumption Watts Maximum	Current Drain	
			Inrush Amps.	Holding Amps.
A	115V 60Cy AC	16.5	.450	.300
B	230V 60Cy AC	10.0	.130	.087
C	460V 60Cy AC	10.0	.065	.044
E	*24V DC	6.0	—	.326
G	*12V DC	6.0	—	.708
J	240V DC	6.0	—	.035
K	115V DC	6.0	—	.074

\*Not available for 5000 PSI valves.  
HEAT RISE: 80° C. Continuous Service

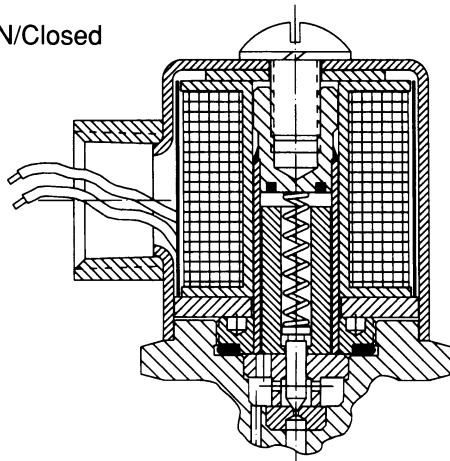
Valve Size	Valve Number	CV Factors	Orifice Size	Weight
1/4	961	.032	.040	1.2 Lbs.
	962	.022	.030	
	963	.014	.024	
	965	.013	.028	

Valve Size	CV Factor	Flows GPM Rec. Max.	Operating Time at Max. Flow		Weight
			Opening	Closing	
3/8	1.9	7.5	25 Milliseconds	0.7 Sec.	1 Lbs. 8 Oz.
3/4	4.0	20.0		1.0 Sec.	3 Lbs.
1-1/2	25.0	90.0		2.0 Sec.	18 Lbs.

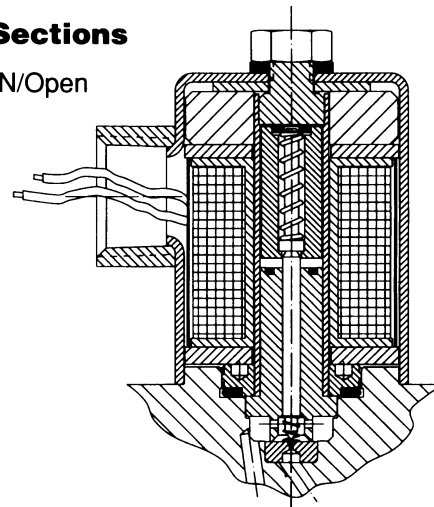


**Solenoid Cross Sections**

N/Closed

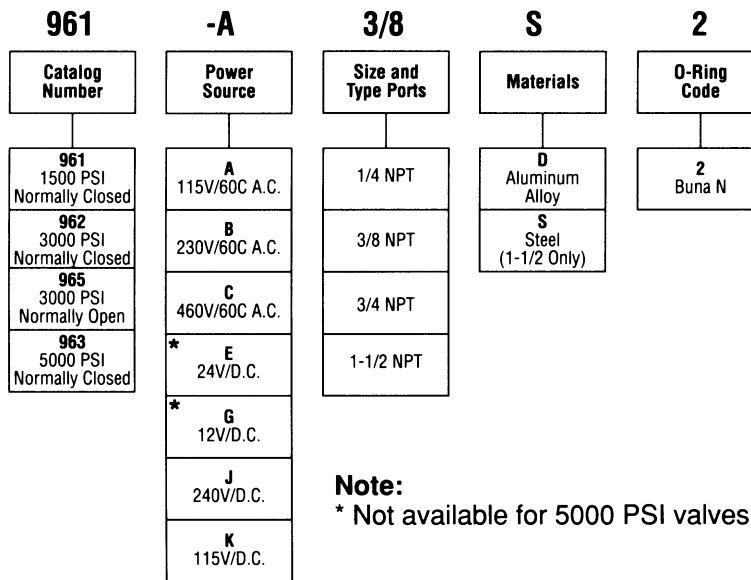


N/Open



	Valve Size	All Dimensions are in Inches															
		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
Normally Closed	1/4	13/32	2 1/16	3 1/8	1/4	1 5/8	2 7/32	9/32	7/16	7/8	—	1/4 NPT	1/4 NPT	10-32 Thds	—	—	—
Normally Closed	3/8	1 3/16	2 15/16	4	1/8	.625	1/4	1 21/32	2 7/32	1.375	1 1/2	11/16	1 3/8	17/64 Dia.	3/8 NPT	—	—
Normally Closed	1/2	1 3/16	2 15/16	4	1/8	.625	1/4	1 21/32	2 7/32	1.375	1 1/2	11/16	1 3/8	17/64 Dia.	1/2 NPT	—	—
Normally Closed	3/4	3/8	1 23/32	3 3/8	4 1/8	4 7/16	5 1/8	6 3/16	3/8	1/4	11/16	1 3/4	1 11/16	3	2 1/4	21/64 Dia.	3/4 NPT
Normally Closed	1	5/8	1 31/32	3 3/8	4 3/8	4 11/16	5 3/8	6 7/16	5/8	1/4	11/16	1 3/4	1 15/16	3 1/4	2 1/4	21/64 Dia.	1 NPT
Normally Closed	1 1/2	7/8	2 5/16	2 7/8	6	6 3/8	7 1/16	8 1/8	2 1/2	1/4	2	4	1 9/16	3 1/8	1 1/2 NPT	—	—

### Interpretation of Valve Number



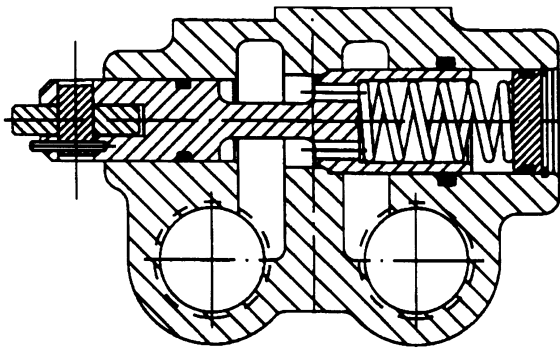
### Reference

Aluminum Alloy				
Valve Number	Normal Position	Maximum Working Pressure	Pilot Orifice	Piston Orifice
961-A3/8D2	Closed	1500 PSI	.040	.032
961-A3/4D2	Closed	1500 PSI		
962-A3/8D2	Closed	3000 PSI	.030	.024
962-A3/4D2	Closed	3000 PSI		
963-A3/8D2	Closed	5000 PSI	.024	.020
963-A3/4D2	Closed	5000 PSI		
965-A3/8D2	Open	3000 PSI	.028	.024
965-A3/4D2	Open	3000 PSI		
Steel				
961-A1 1/2S2	Closed	1500 PSI	.040	.032
962-A1 1/2S2	Closed	3000 PSI	.030	.024
963-A1 1/2S2	Closed	5000 PSI	.024	.020
965-A1 1/2S2	Open	3000 PSI	.028	.024



# Catalog Series 964

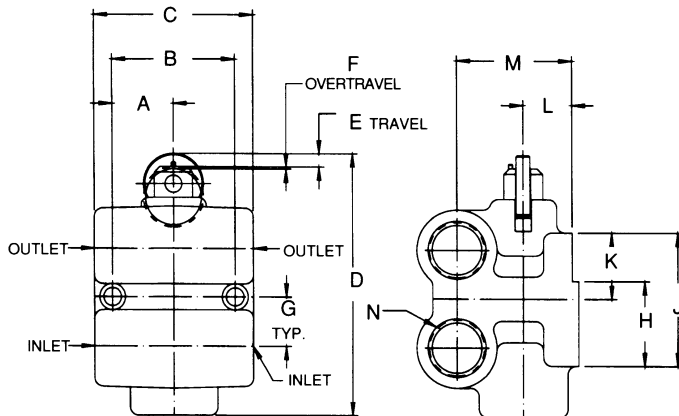
# Specifications



## Features

- Unloading valve designed for coolant or cutting oil control on machine tools.
- Rugged construction.
- Easy installation.

## Dimensions



All Dimensions are in Inches												
A	B	C	D	E	F	G	H	J	K	L	M	N
1.400	2.800	3 <sup>5</sup> / <sub>8</sub>	5 <sup>29</sup> / <sub>32</sub>	.300	.060	1.100	1.900	3	1 <sup>1</sup> / <sub>2</sub>	1.250	2.750	1 NPT

### Service Applications:

Hydraulic oil or water with minimum of 5% soluble oil.

### Pressure Range:

Working: 60 PSI  
Proof: 90 PSI  
Burst: 150 PSI

### Temperature Range:

-40° to 225° F.

### Sizes: NPT 1

### Type Ports:

NPT Pipe Threads.

### CV Factors:

Inlet to outlet: 17.5  
Inlet to inlet: 25.5

### Internal Leakage:

25 cc/min. maximum

### Mounting:

Bolted. See drawing for dimensions.

### Materials:

Body: Gray iron SAE G3000.  
Plunger and Stop: Steel, type 12L14.  
Spring: Stainless steel AMS5688.  
O-Rings: Synthetic rubber.

### Cam Load: At 60 PSI: 65 lbs.

### Weight: 8 lbs. 12 oz.

## Interpretation of Valve Number

