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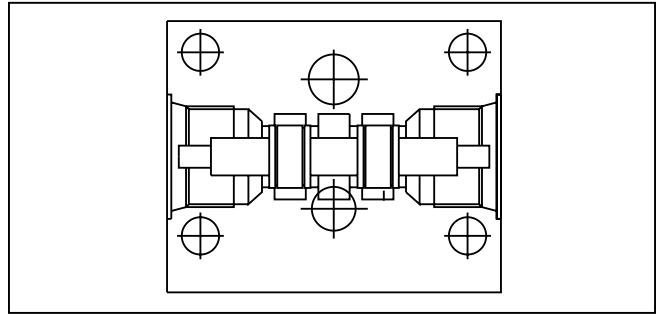
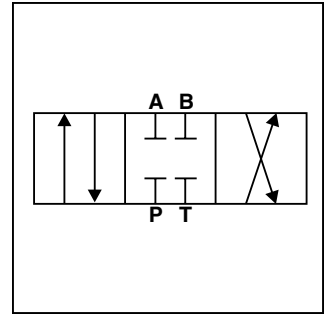
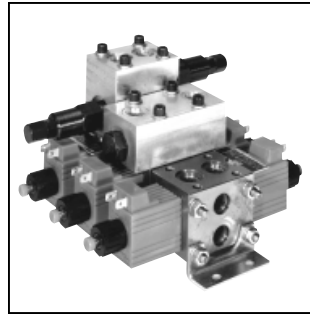


### General Description

Series BV06 Bankables are 2 or 3 position, 4-way, solenoid operated directional control valves. They provide a spool valve that can be used either individually or in multiple spool banks. BV06 bankable valves have auxiliary banking sections that can be mounted to provide auxiliary functions such as an inlet relief or unloading function. In addition, stack-on sections can be mounted on the cylinder port face of the BV06 bankable valve spool sections to provide additional functions such as crossover reliefs, cylinder port reliefs, P.O. checks, flow controls, and counterbalances. BV06 valves can be used to create custom, multi-functional circuits.

### Features

- High flow capacity with reduced space requirements.
- High back pressure; all ports withstand maximum working pressure.
- Precision machined valve body is made from high tensile cast iron.
- Six different spool styles are available.
- Available operators include single or double solenoids.
- All solenoids are a one-piece coil featuring numerous voltages and terminations.



### Operation

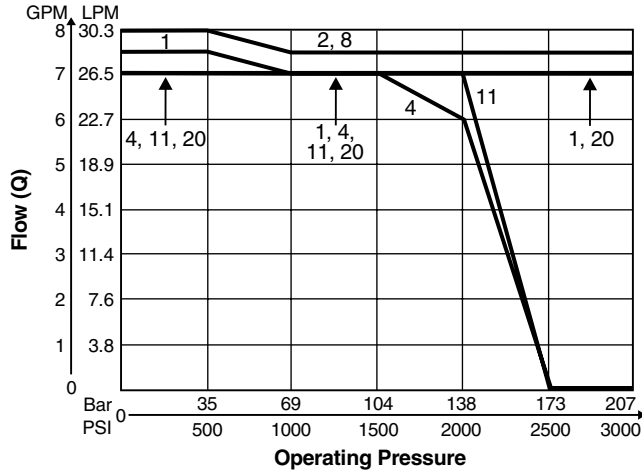
The spool is shifted from its center position by energizing one of the solenoids. Three-position spring centered and two-position spring offset valves are available.

### Specifications

|  |   |
|--|---|
| <b>Nominal Flow (at 70 PSI ΔP)</b>                                 | 23-38 LPM (6-10 GPM) depending on spool   |
| <b>Maximum Inlet &amp; Tank Pressure</b>                           | Parallel: 210 Bar (3000 PSI) Inlet<br>210 Bar (3000 PSI) Tank<br>Series: 210 Bar (3000 PSI) Inlet & Tank  |
| <b>Porting</b>   | SAE -6  |
| <b>Maximum Internal Leakage @ 210 Bar (3000 PSI) (110 SSU oil)</b> | #1 Spool: 82 cc per land/min. (5.00 cu. in. per land/min.)<br>#2 Spool: 164 cc per land/min. (10.01 cu. in. per land/min.)<br>#4 Spool: 82 cc per land/min. (5.00 cu. in. per land/min.)<br>#8 Spool: 82 cc per land/min. (5.00 cu. in. per land/min.)<br>#11 Spool: 164 cc per land/min. (10.01 cu. in. per land/min.) |
| <b>Operating Temperature Range (Ambient)</b>                       | Nitrile: -40°C to +93°C (-40°F to +200°F)<br>Fluorocarbon: -32°C to +121°C (-25°F to +250°F)  |
| <b>Material</b>  | Body: Precision machined and honed from cast iron.<br>Spool: Hardened and ground steel.   |
| <b>Filtration</b>  | ISO Code 16/13, SAE Class 4 or better   |
| <b>Mounting Position</b>   | No restrictions   |
| <b>Mounting Type</b>   | Individually or line mounted  |



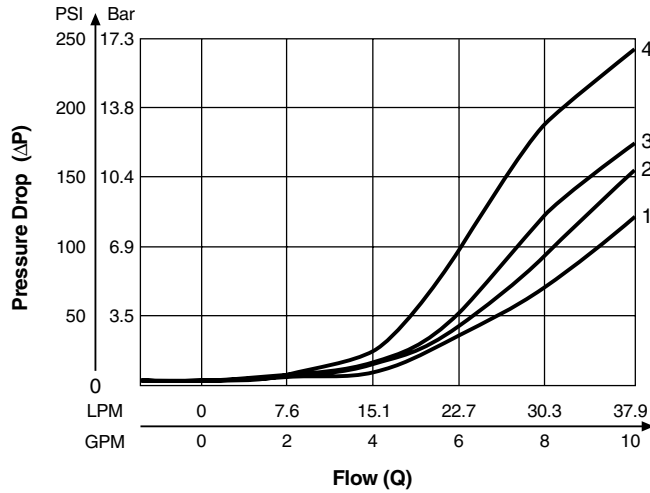
**Switching Limits**



**Notes:**

1. Unless otherwise specified, all curves were generated using solenoid actuators at 90% of rated with voltage.
2. All valves tested using 110 SSU oil.

**Differential Pressure**



|          | Spool No./<br>Flow Direction | P21 | P1,<br>P23 | P4 | P11 | S2, S8,<br>S24 |
|----------|------------------------------|-----|------------|----|-----|----------------|
| Spool    | P to A or B                  | 1   | 2          | 2  | 2   | 4              |
| Shifted  | A or B to T                  | 1   | 2          | 1  | 2   | 4              |
| Spool    | P to T                       |     |            |    |     | 2              |
| Centered | A or B to T                  |     |            | 3  |     |                |

**Note:** Flow in center position for spool P11 as compared to P4 is 7% of the nominal flow.

**Solenoid Coil Specifications**

| Solenoid Code | Nominal Voltage/Hz | In Rush Amps     | Holding Amps   | Wattage |
|---------------|--------------------|------------------|----------------|---------|
| D012          | 12 VDC             | Not Applicable   | 2.3            | 30      |
| D024          | 24 VDC             | Not Applicable   | 1.2            | 30      |
| A120          | 120 VAC            | (Rectified Coil) | Not Applicable | 30      |

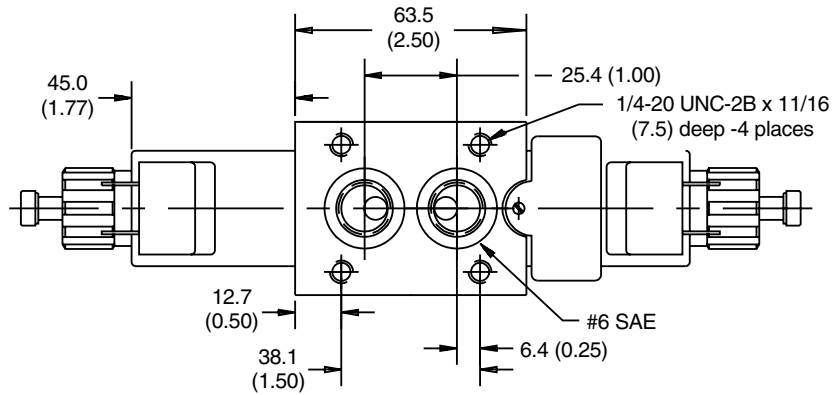
**Solenoid Response Times**

| DC COILS |                 |         |                               |                        |
|----------|-----------------|---------|-------------------------------|------------------------|
| Spool    | Coil Type       | Pull In | Pressure Response<br>Drop Out | Full Shift<br>Drop Out |
| 1        | 12 VDC, 30 Watt | 30 ms   | 73 ms                         | 244 ms                 |
| 2        | 12 VDC, 30 Watt | 20 ms   | 10 ms                         | 134 ms                 |
| 4        | 12 VDC, 30 Watt | 23 ms   | 41 ms                         | 287 ms                 |
| 8        | 12 VDC, 30 Watt | 26 ms   | 13 ms                         | 136 ms                 |
| 11       | 12 VDC, 30 Watt | 19 ms   | 22 ms                         | 200 ms                 |
| 20       | 12 VDC, 30 Watt | 17 ms   | 6.9 ms                        | 244 ms                 |
| 21       | 12 VDC, 30 Watt | 30 ms   | 73 ms                         | 244 ms                 |
| 23       | 12 VDC, 30 Watt | 30 ms   | 73 ms                         | 244 ms                 |
| 24       | 12 VDC, 30 Watt | 26 ms   | 13 ms                         | 136 ms                 |

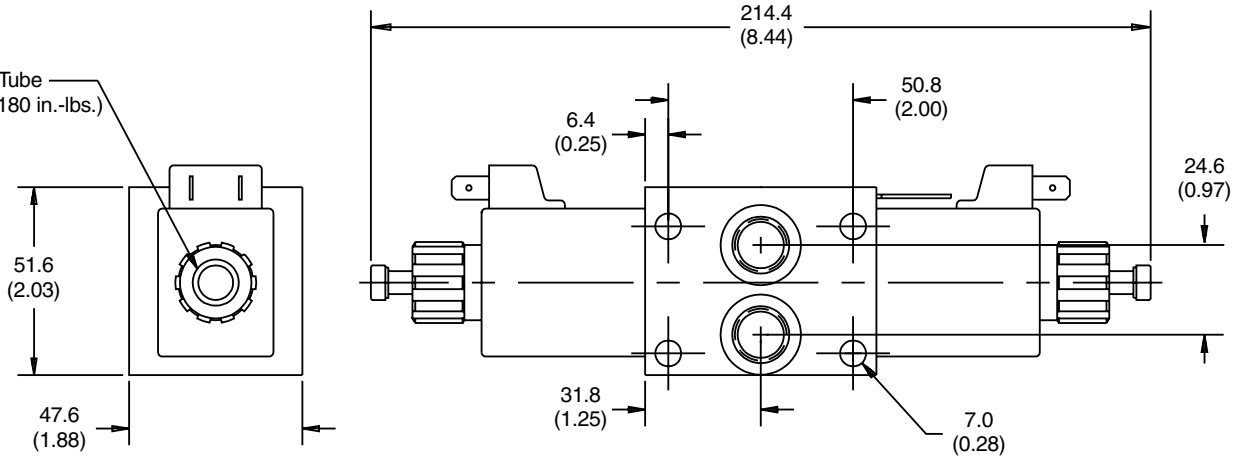
\*Inch equivalents for millimeter dimensions are shown in (\*\*)



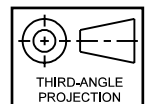
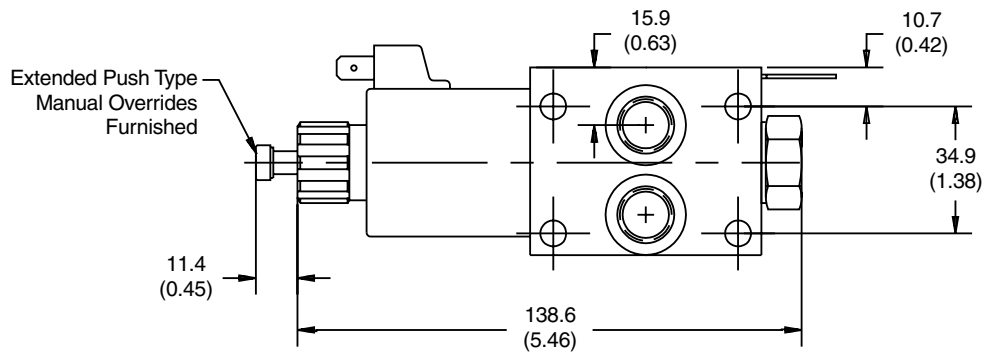
**Double Solenoid**



Solenoid Tube  
 20 N.m. (180 in.-lbs.)  
 Torque



**Single Solenoid**



**Spool Sections**

**A**

**BV**

Bankable  
Valves

**06**

Size

| Code | Description                      |
|------|----------------------------------|
| 06   | 22.7 LPM (6 GPM)<br>Nominal Flow |



Spools



Seals

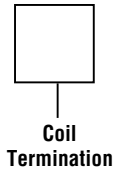
| Code | Description  |
|------|--------------|
| Omit | Nitrile      |
| V    | Fluorocarbon |

| Code | Description   | Symbol |
|------|---|--------|
| P1   | 30.0 LPM (8 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
| P4   | 22.7 LPM (6 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
| P11  | 26.5 LPM (7 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
| P20  | 22.7 LPM (6 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
| P21  | 22.7 LPM (6 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
| P23  | 30.0 LPM (8 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
| S2   | 26.5 LPM (7 GPM) Max. Flow*<br>without Malfunction; Series Circuit Only   |        |
| S8   | 26.5 LPM (7 GPM) Max. Flow*<br>without Malfunction; Series Circuit Only   |        |
| S24  | 26.5 LPM (7 GPM) Max. Flow*<br>without Malfunction; Series Circuit Only   |        |

\*At 70 PSI ΔP

**Note:** Maximum of six spools per assembly. For each additional spool repeat spool option after stack-on option.

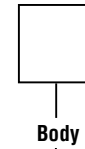
**Note:** Standard setting 2500 PSI @ 6 GPM, with screw adjustments on all relief cartridges.  
 Standard setting 1000 PSI @ crack, with screw adjustments on all counterbalance cartridges.



| Code | Description  |
|------|--|
| D    | DIN 43650 Plug Face (AC or DC)   |
| PV   | SAE 1B-0.25 Double Spade, Vertically-Oriented (DC Only)                  |
| SV   | Double 8-32 Screw & Nut Vertically-Oriented (DC Only)                    |
| S1V  | Single 8-32 Screw & Nut Internally Ground, Vertically-Oriented (DC Only) |
| W    | Double Wire 24" Class H (DC Only)  |
| WP   | Weather Pack Connector, 5" Leads, Male Connector (DC Only)               |



| Code | Description      |
|------|------------------|
| D012 | 12 VDC; 30 Watt  |
| D024 | 24 VDC; 30 Watt  |
| A120 | 120 VAC; 30 Watt |



| Code | Description  |
|------|--|
| 6T   | Individual Body with 9/16-18 SAE Straight Thread Ports                 |
| 6TF  | Individual Body with 9/16-18 SAE Straight Thread Ports & Mounting Feet |
| E6T  | Inlet/Outlet Parallel Body with 9/16-18 SAE Straight Thread Ports      |
| M6T  | Middle Parallel Body with 9/16-18 SAE Straight Thread Ports            |
| SM6T | Series Middle Body with 9/16-18 SAE Straight Thread Ports              |
| SI6T | Series Inlet Body with 9/16-18 SAE Straight Thread Ports               |
| SO6T | Series Outlet Body (No Spool)  |

**Service Parts**

**Bodies**

- BV06-6T Parallel or Series Individual Body
- BV06-E6T Parallel Inlet/Outlet Body
- BV06-M6T Parallel Middle Body
- BV06-SI6T Series Inlet Body
- BV06-SM6T Series Middle Body
- BV06-SO6T Series Outlet Body (No Spool)

**Coils**

- P/N 851050\*\*\*\*\* Double Spade Coil
- P/N 851052\*\*\*\*\* Double Wire Coil
- P/N 851054\*\*\*\*\* Double Screw Coil
- P/N 851056\*\*\*\*\* Single Screw Coil
- P/N 851020\*\*\*\*\* DIN Plug Face Coil (AC or DC)
- P/N 1500189 Weather Pack Coil

**Note:** Coils are available in 12 VDC, 24 VDC, & 120 VAC versions only.  
P/N 851052-012 VDC is a 12 VDC Double Wire Coil.

**Tube Assemblies**

- P/N 709780-01 Tube Assembly with heavy spring - use with P1, P11, & P23 spools
- P/N 1500051 Tube Assembly with light spring - use with P4, S2, S8, & S24 spools
- P/N 1500056 Tube Assembly with heavy spring - use with P20 & P21 spools

**Plug Assemblies (Single Solenoid Valve only)**

- P/N 710020-01 Plug Assembly with Heavy Spring - use with P1, P11, & P23 spools
- P/N 710020-03 Plug Assembly with Light Spring - use with P4, P20, P21, S2, S8, & S20 spools

**Tube End Nut** P/N 118113-00

**Tube O-ring**

- P/N 3908N-9 (Nitrile)
- P/N 3908V-9 (Fluorocarbon)

**Spools**

- P/N 118736-00 Code P1 Spool
- P/N 118737-00 Code P4 Spool
- P/N 118767-00 Code P11 Spool
- P/N 118731-00 Code P20 Spool
- P/N 118731-00 Code P21 Spool
- P/N 118736-00 Code P23 Spool
- P/N 710025-00 Code S2 Spool
- P/N 710015-00 Code S8 Spool
- P/N 710015-00 Code S24 Spool

**Weights:**

- Single Solenoid
- Spool Section 1.26 kg (2.8 lbs.)
- Double Solenoid
- Spool Section 1.50 kg (3.3 lbs.)

## General Description

Series BVB06 Bankable Inlets include Inlet Reliefs, Bankable Unloader, Bankable Inlet Relief with Unloader, and Proportional Bankable Unloader. They are used in conjunction with BV06 bankable valve sections. They are used to regulate system pressure, unload the pump in a closed center circuit, or regulate pressure and unload the pump in a closed center circuit.

## Operation

**Inlet Relief** — The inlet relief on the bankable valves is used to regulate the maximum system pressure. The inlet relief on the BV06 is a RD083 series cartridge valve.

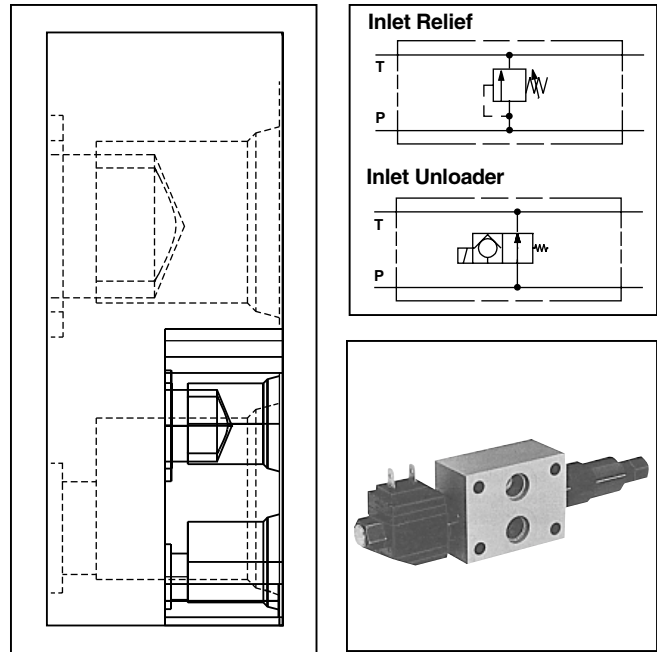
**Unloading Valve** — The inlet unloader is normally used with closed center directional valves to unload the pump when the directional control valves are in a neutral position. This is a normally open solenoid valve that is energized whenever one of the directional control valves are shifted out of neutral. The inlet unloader on a BV06 is a DS081N series cartridge valve.

**Inlet Relief with Unloader** — This valve is normally used with closed center directional control valves to provide a system relief and to unload the pump when the directional control valves are in the neutral position.

**Proportional Unloader** — This valve is used in systems with single or multiple non-proportional directional control valves. The unloader is a normally open proportional flow control valve. By actuating one of the directional control valves and varying the input current to the proportional valve; the actuated directional control valve receives the benefit of proportional flow from the proportional unloader. As less flow is directed to tank by the proportional unloader, more flow is available to the actuated directional control valve. Once the optimum speed is achieved to the actuator from the directional control valve, the current to the proportional unloader can then be held constant.

## Specifications

|  | Inlet Relief   | Unloader   | Proportional Unloader          |
|--|--|--|--------------------------------|
| <b>Rated Flow</b>                            | 37.9 LPM (10 GPM)  | 34.1 LPM (9 GPM)                                     | 30.3 LPM (8 GPM)               |
| <b>Max. Inlet Pressure</b>                   | 210 Bar (3000 PSI)   | 210 Bar (3000 PSI)                                   | 210 Bar (3000 PSI)             |
| <b>Max. Setting Pressure</b>                 | 210 Bar (3000 PSI)   | Not Applicable                                       | Not Applicable                 |
| <b>Reseat Pressure</b>                       | 80% of Crack Pressure  | Not Applicable                                       | Not Applicable                 |
| <b>Max. Internal Leakage</b>                 | 2/3 cc/min. (10 drops/min.)<br>at 350 Bar (5000 PSI)   | 2/3 cc/min. (10 drops/min.)<br>at 350 Bar (5000 PSI) | 82 cc/min.<br>(5 cu. in./min.) |
| <b>Cavity</b>                                | C08-2  | C08-2  | C09-2                          |
| <b>Operating Temperature Range (Ambient)</b> | Nitrile: -40°C to +93°C (-40°F to +200°F)<br>Fluorocarbon: -23°C to +121°C (-10°F to +250°F) |  |                                |
| <b>Cartridge Material</b>                    | All parts steel. All working parts hardened, ground, and lapped.                             |  |                                |
| <b>Body Material</b>                         | High Tensile Aluminum or Continuous Cast Steel   |  |                                |
| <b>Filtration</b>                            | ISO Code 16/13, SAE Class 4 or better  |  |                                |
| <b>Mounting</b>                              | No restrictions  |  |                                |



## Features

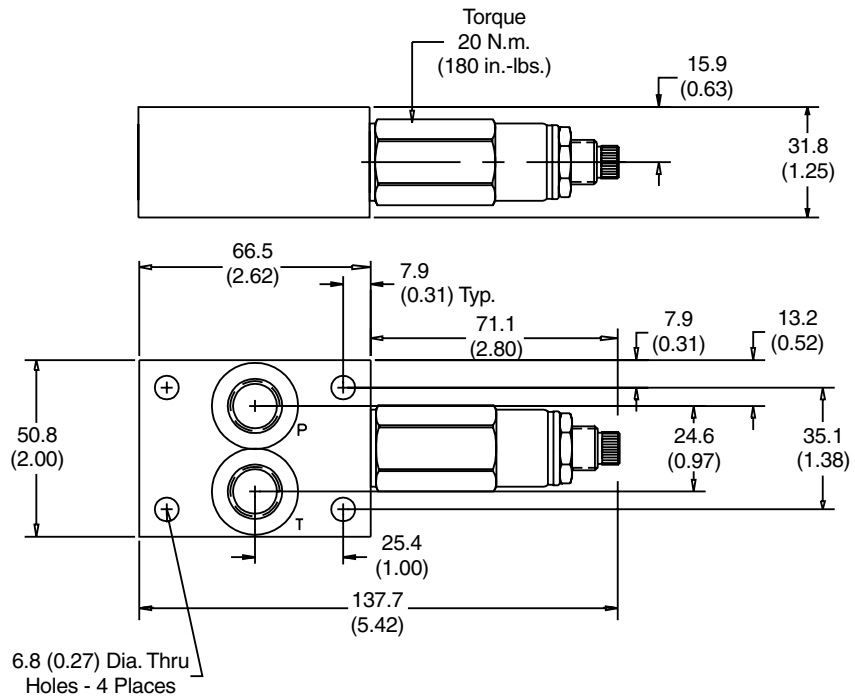
- High flow capacity with reduced space requirements.
- Full cartridge design — no loose parts — standard cartridge valves.
- Relief valve is differential area, direct-acting, poppet design.
- Manual override optional for unloading valve.
- Manual override standard for proportional unloader.



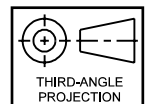
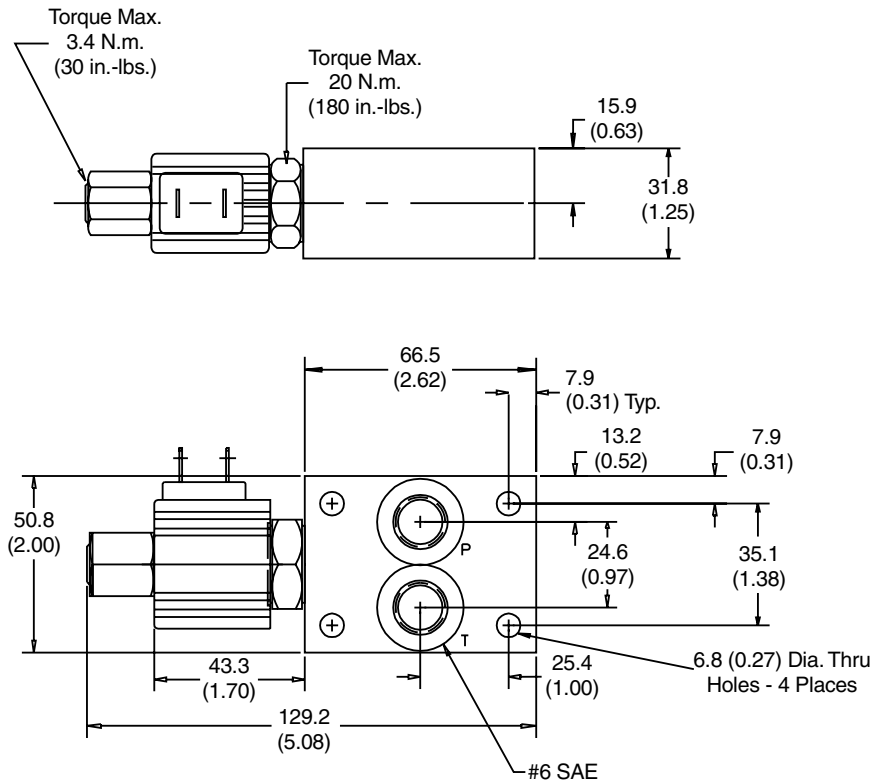
\*Inch equivalents for millimeter dimensions are shown in (\*\*)



**Inlet Relief**



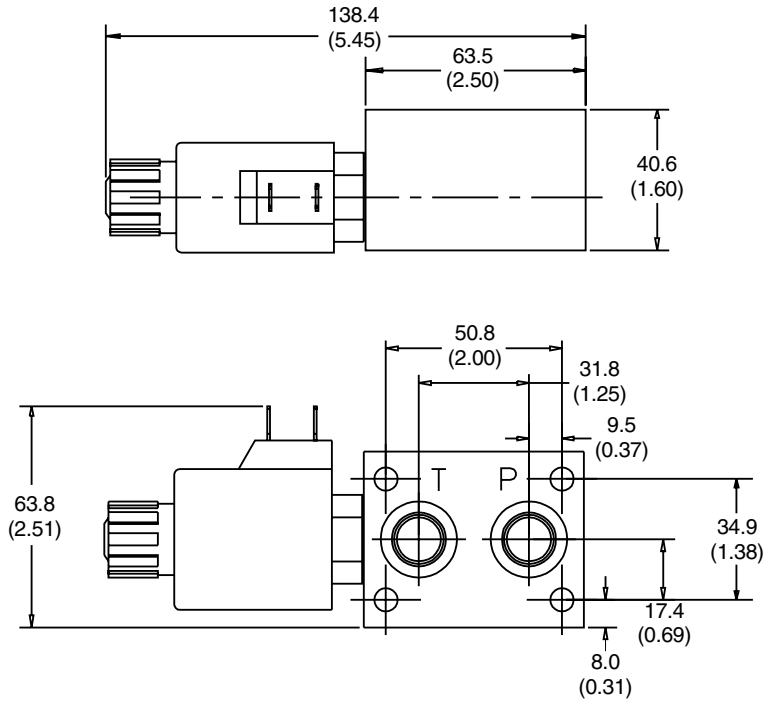
**Inlet Unloader**



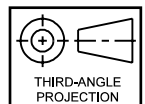
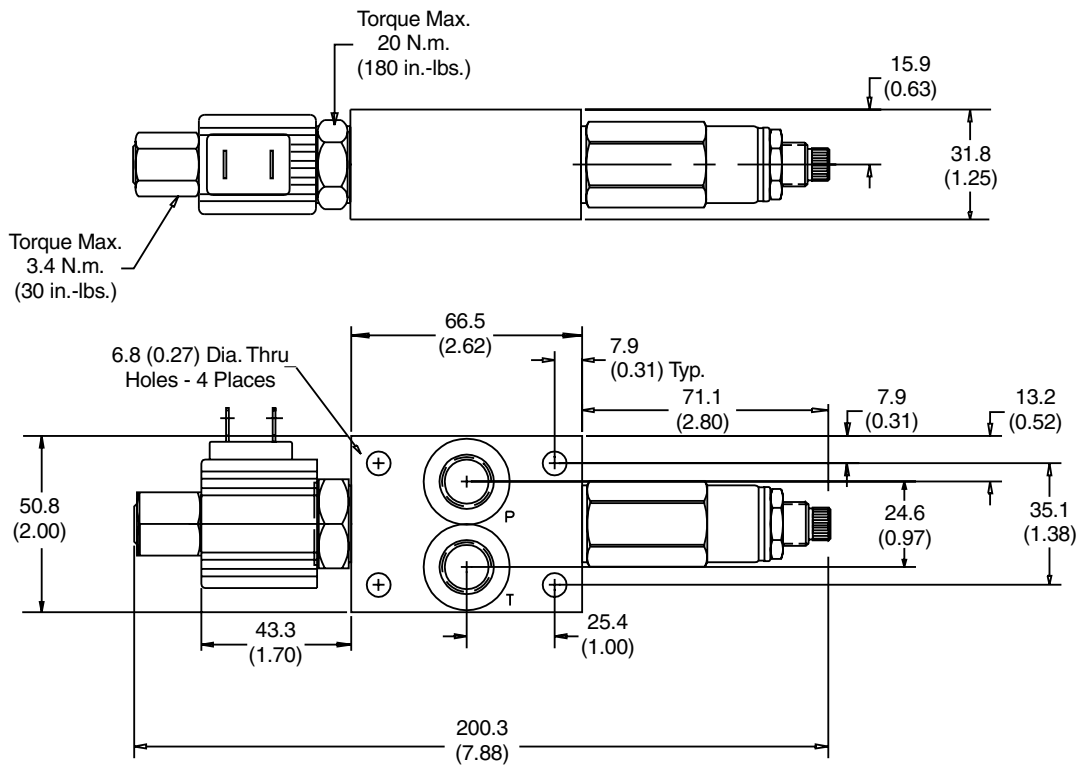
\*Inch equivalents for millimeter dimensions are shown in (\*\*)

**A**

**Proportional Inlet**



**Inlet Unloader with Relief**





|                |          |                   |                  |                           |              |              |                            |                  |       |            |           |
|----------------|----------|-------------------|------------------|---------------------------|--------------|--------------|----------------------------|------------------|-------|------------|-----------|
| <b>BVB06</b>   |          |                   |                  |                           |              |              |                            |                  |       |            | <b>6T</b> |
| Bankable Valve | Function | Relief Adjustment | Adjustment Range | Optional Pressure Setting | Coil Voltage | Coil Wattage | Override Option (Unloader) | Coil Termination | Seals | SAE-6 Body |           |

| Code | Description                      |
|------|----------------------------------|
| Omit | Unloader Only                    |
| C    | Capped with Concealed adjustment |

| Code | Description   |
|------|---|
| Omit | Unloader Only   |
| 20   | 21-138 Bar (300-2000 PSI)<br>Setting: 121 Bar (1750 PSI)<br>@ 1.6 LPM (6 GPM)   |
| 30   | 103-207 Bar (1500-3000 PSI)<br>Setting: 172 Bar (2500 PSI)<br>@ 1.6 LPM (6 GPM) |

| Code | Description      |
|------|------------------|
| Omit | Main Relief Only |
| D012 | 12 VDC           |
| D024 | 24 VDC           |
| A120 | 120 VAC          |

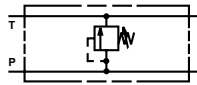
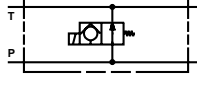
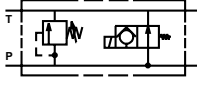
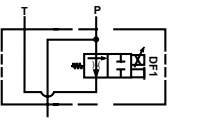
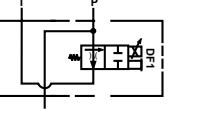
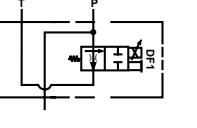
  

| Code | Description                              |
|------|--|
| Omit | Main Relief Only                         |
| D    | DIN 43650 Plug Face (AC or DC)           |
| P    | Dual Spade (DC Only)                     |
| S    | Double Screw (DC Only)                   |
| S1   | Single Screw Internally Ground (DC Only) |
| W    | Dual Wire (DC Only)                      |
| WP   | Weather Pack (DC Only)                   |

| Code | Description              |
|------|--------------------------|
| Omit | No Override/Proportional |
| M    | Flush Type               |
| E    | Extended Pin             |

| Code | Description  | Symbol  |
|------|--|---|
| MR   | Main Relief  |  |
| U    | Unloader   |  |
| UR   | Unloader & Relief  |  |
| PU3  | Proportional Unloader<br>11.3 LPM (3 GPM) with<br>17 Watt Coil |  |
| PU6  | Proportional Unloader<br>22.5 LPM (6 GPM) with<br>17 Watt Coil |  |
| PU8  | Proportional Unloader<br>30 LPM (8 GPM) with<br>30 Watt Coil   |  |

| Code | Description        |
|------|--------------------|
| Omit | Main Relief Only   |
| L    | 12 Watt (non-Prop) |
| L    | 17 Watt (Prop)     |
| H    | 25 Watt (non-Prop) |
| H    | 30 Watt (Prop)     |

**Weights:**

|               |                   |
|---------------|-------------------|
| Model BVB06U  | .48 kg (1.1 lbs.) |
| Model BVB06UR | .64 kg (1.4 lbs.) |
| Model BVB06MR | .43 kg (0.9 lbs.) |
| Model BVB06PU | .48 kg (1.1 lbs.) |

| Service Parts         |                                      |
|-----------------------|--------------------------------------|
| <b>Solenoid Coils</b> |                                      |
| BVB06MR-6T            | (Body for main relief or unloader)   |
| BVB06UR-6T            | (Body for main relief with unloader) |
| BVB06PU-6T            | (Body for proportional unloader)     |

### General Description

Bankable Stack-On valves include single and double P. O. check valves, single and double crossover relief valves, single and double meter-in and meter-out, pressure compensated and non-compensated flow controls, single and double reliefs to tank, and single and double counterbalance valves.

All stack-on valves fit on top of their BV06 bankable spool sections to provide secondary functions. Up to two different stack-on valves can be installed on top of their respective bankable spool sections.

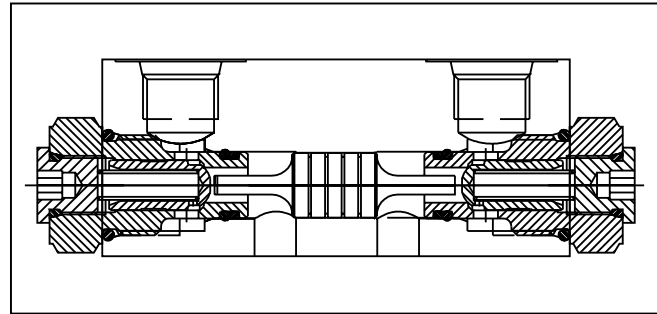
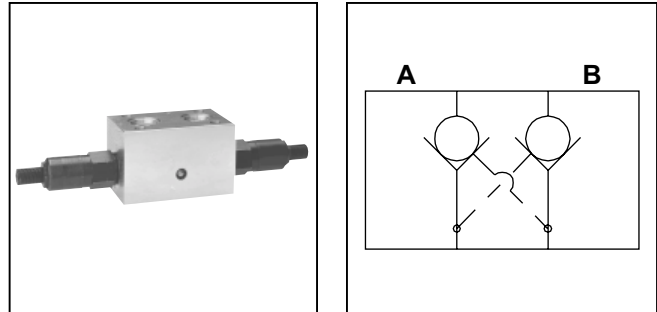
### Operation

Stack-on single and double P.O. Check valves are used in load holding operations. These should only be used in conjunction with a motor spool, a bleeder spool, or a series spool.

Single and dual crossover reliefs are used to vent shocks that occur at a motor. Any spool can be used in conjunction with these reliefs.

Meter-in and meter-out flow controls are used to control speed either to or from the actuator. The pressure compensated version will provide constant flow regardless of changes in load or pressure. Any spool can be used in conjunction with these flow controls.

Single and double counterbalances are used in load holding and over center applications. These should only be used in conjunction with a motor spool, a bleeder spool, or a series spool.



### Features

- Cartridge design eliminates leak points.
- High flow capacity with reduced space requirements.
- Reduced cumulative pressure drop.
- Easy to service.

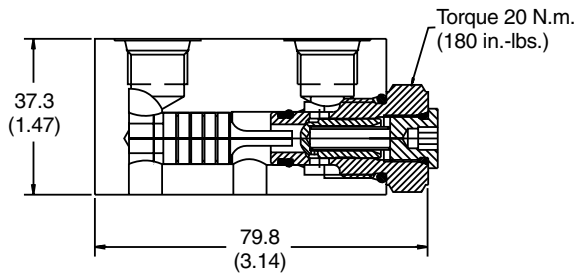
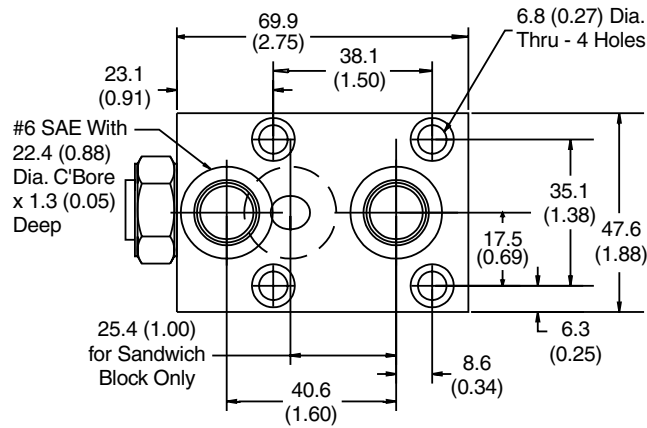
### Specifications

|                                      | <b>P.O. Checks</b>   | <b>Crossover Reliefs</b>    | <b>Flow Controls</b>       | <b>P.C. Flow Controls</b> | <b>Counterbalances</b>     |
|--------------------------------------|--|-----------------------------|----------------------------|---------------------------|----------------------------|
| <b>Rated Flow</b>                    | 37.9 LPM (10 GPM)  | 37.9 LPM (10 GPM)           | 45.4 LPM (12 GPM)          | 30.3 LPM (8 GPM)          | 56.8 LPM (15 GPM)          |
| <b>Max. Operating Pressure</b>       | 350 Bar (5000 PSI)   | 350 Bar (5000 PSI)          | 210 Bar (3000 PSI)         | 210 Bar (3000 PSI)        | 275 Bar (4000 PSI)         |
| <b>Max. Leakage @ Rated Pressure</b> | 1/3 cc/min. (5 drops/min.)                                       | 2/3 cc/min. (10 drops/min.) | 1/3 cc/min. (5 drops/min.) | Not Applicable            | 1/3 cc/min. (5 drops/min.) |
| <b>Oper. Temp. Range (Ambient)</b>   | -25°C to +93°C (-40°F to +200°F)                                 |                             |                            |                           |                            |
| <b>Cartridge Material</b>            | All parts steel. All working parts hardened, ground, and lapped. |                             |                            |                           |                            |
| <b>Body Material</b>                 | Aluminum Alloy   |                             |                            |                           |                            |
| <b>Porting</b>                       | SAE -6   | SAE -6                      | SAE -6                     | SAE -6                    | SAE -6                     |
| <b>Filtration</b>                    | ISO Code 16/13, SAE Class 4 or better                            |                             |                            |                           |                            |
| <b>Mounting</b>                      | No restrictions  |                             |                            |                           |                            |
| <b>Cavity</b>                        | C08-2  | C09-2                       | C10-2                      | C10-2                     | Special                    |

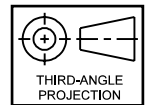
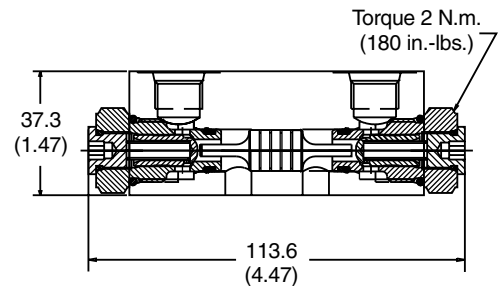
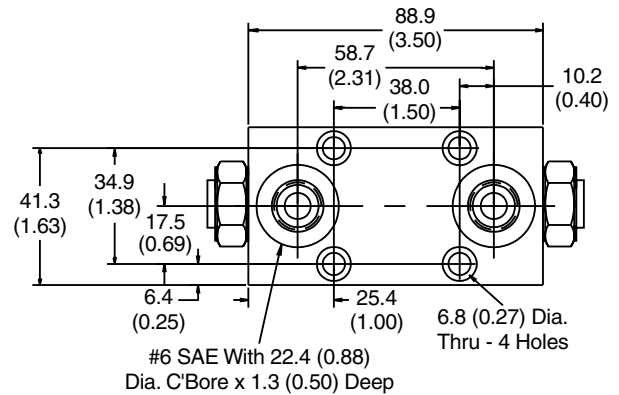
**Dimensions**

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

**Single P.O. Check**



**Double P.O. Check**



**Single P.O. Check**

| Description | Part Number |
|-------------|-------------|
| Block       | 118778-01   |
| Cartridge   | CVH081P     |
| Piston      | 118763-00   |

**Double P.O. Check**

| Description | Part Number |
|-------------|-------------|
| Block       | 118779-01   |
| Cartridge   | CVH081P     |
| Piston      | 118764-00   |

**Ordering Information**

**BV**

Bankable Valve

**06**

Size

Location

Cracking Pressure

| Code | Description                   |
|------|-------------------------------|
| 06   | 22.7 LPM (6 GPM) Nominal Flow |

| Code | Description           |
|------|-----------------------|
| A    | A Port P.O. Check     |
| B    | B Port P.O. Check     |
| C    | A & B Port P.O. Check |

| Code | Description      |
|------|------------------|
| Omit | 0.3 Bar (5 PSI)  |
| 10   | 0.7 Bar (10 PSI) |
| 20   | 1.4 Bar (20 PSI) |
| 65   | 4.4 Bar (65 PSI) |

**Weights:**

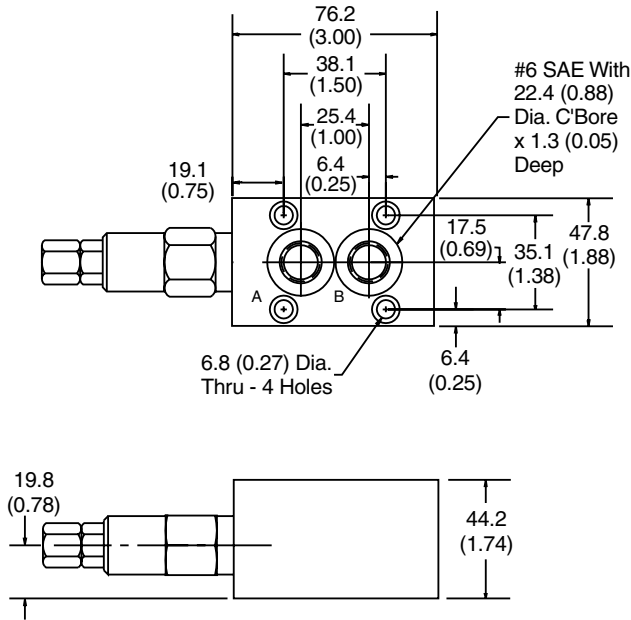
BV06-A or BV06-B .51 kg (18 oz.)  
 BV06-C .76 kg (27 oz.)



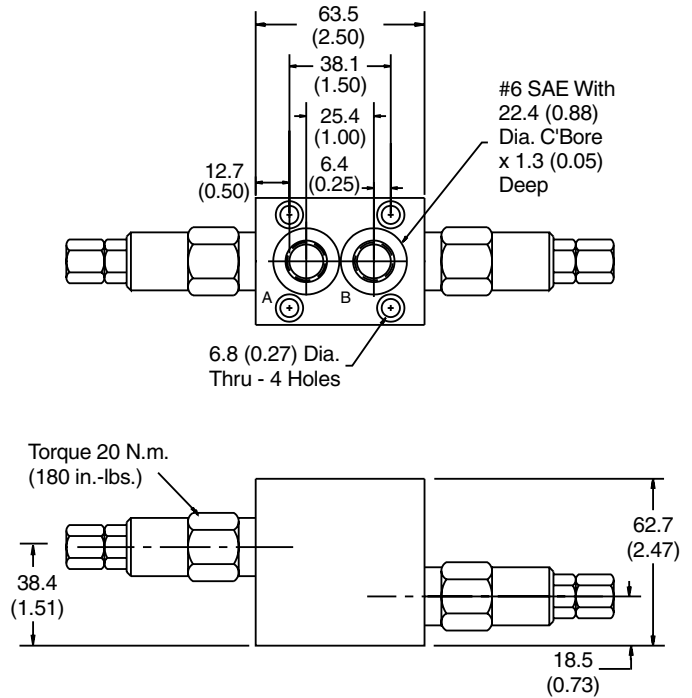
**Dimensions**

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

**Single Crossover Relief**



**Double Crossover Relief**



**Single Crossover Relief**

| Description                              | Part Number |
|--|-------------|
| Block                                    | 118780-01   |
| Cartridge<br>21-138 Bar (300-2000 PSI)   | RD083C20    |
| Cartridge<br>104-207 Bar (1500-3000 PSI) | RD083C30    |

**Double Crossover Relief**

| Description                              | Part Number |
|--|-------------|
| Block                                    | 118781-01   |
| Cartridge<br>21-138 Bar (300-2000 PSI)   | RD083C20    |
| Cartridge<br>104-207 Bar (1500-3000 PSI) | RD083C30    |

**Ordering Information**

**BV**

Bankable Valve

**06**

Size

Location

**C**

Adjustment Style

Adjustment Range

| Code | Description                   |
|------|-------------------------------|
| 06   | 22.7 LPM (6 GPM) Nominal Flow |

| Code | Description                       |
|------|-----------------------------------|
| D    | A Port to B Port Crossover Relief |
| E    | B Port to A Port Crossover Relief |
| F    | A & B Port Crossover Relief       |

| Code | Description      |
|------|------------------|
| C    | Concealed Adjust |

| Code | Description   |
|------|---|
| 15   | 7-104 Bar (100-1500 PSI)<br>Setting: 52 Bar (750 PSI)<br>@ 11.4 LPM (3 GPM)     |
| 30   | 69-207 Bar (1000-3000 PSI)<br>Setting: 135 Bar (2000 PSI)<br>@ 11.4 LPM (3 GPM) |

**Weights:**

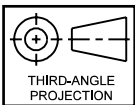
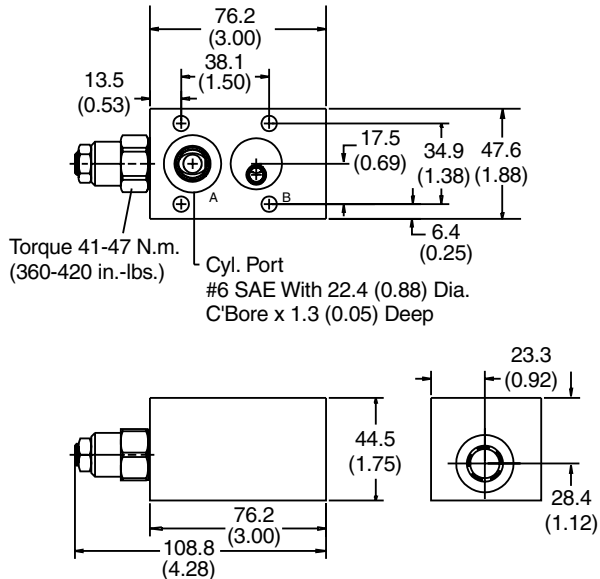
BV06-D or BV06-E .51 kg (18 oz.)  
 BV06-F .76 kg (27 oz.)

**Dimensions**

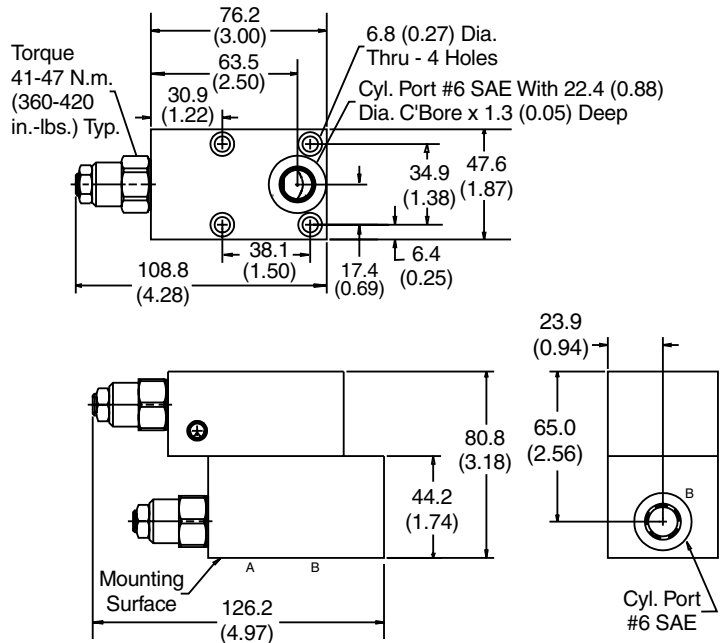
\*Inch equivalents for millimeter dimensions are shown in (\*\*)



**Counterbalance**



**Double Counterbalance**



**Counterbalance**

| Description                             | Part Number        | Qty |
|---|--------------------|-----|
| Block                                   | 118776-01          | 1   |
| Cartridge<br>28-104 Bar (400-1500 PSI)  | Consult<br>Factory | 1   |
| Cartridge<br>69-207 Bar (1000-3000 PSI) | Consult<br>Factory | 1   |
| 102X1                                   | Pipe Plug          | 1   |

**Double Counterbalance**

| Description                             | Part Number        | Qty |
|---|--------------------|-----|
| Block                                   | 118776-01          | 1   |
| Block                                   | 118777-01          | 1   |
| Cartridge<br>28-104 Bar (400-1500 PSI)  | Consult<br>Factory | 2   |
| Cartridge<br>69-207 Bar (1000-3000 PSI) | Consult<br>Factory | 2   |
| 102X1                                   | Pipe Plug          | 2   |
| O-ring                                  | 2018N-7            | 2   |

**Ordering Information**

**BV**

Bankable  
Valve

**06**

Size

| Code | Description                      |
|------|----------------------------------|
| 06   | 22.7 LPM (6 GPM)<br>Nominal Flow |

Location

Location

| Code | Description               |
|------|---------------------------|
| NN   | A Port Counterbalance     |
| PP   | B Port Counterbalance     |
| RR   | A & B Port Counterbalance |

**3**

3:1 Pilot Ratio

| Code | Description |
|------|-------------|
| 3    | 3:1 Ratio   |

**S**

Adjustment Style

| Code | Description |
|------|-------------|
| S    | Screw       |

Adjustment Range

Adjustment Range

| Code | Description   |
|------|---|
| 15   | 28-104 Bar (400-1500 PSI)<br>Setting: 86 Bar (1250 PSI)<br>@ 22.5 LPM (6 GPM)   |
| 40   | 69-276 Bar (1000-4000 PSI)<br>Setting: 172 Bar (2500 PSI)<br>@ 22.5 LPM (6 GPM) |

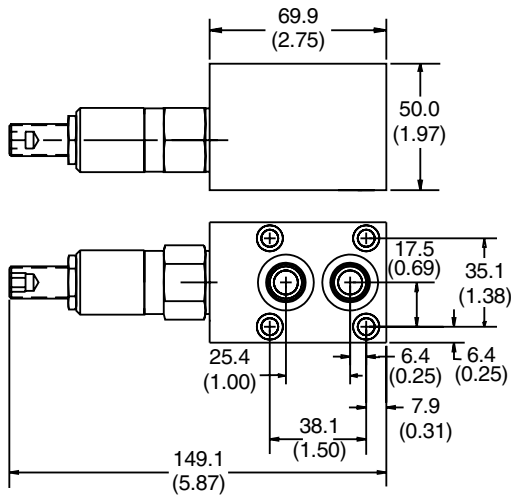
**Weights:**

BV06-NN & BV06-PP .51 kg (18 oz.)  
 BV06-RR .96 kg (34 oz.)

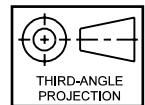
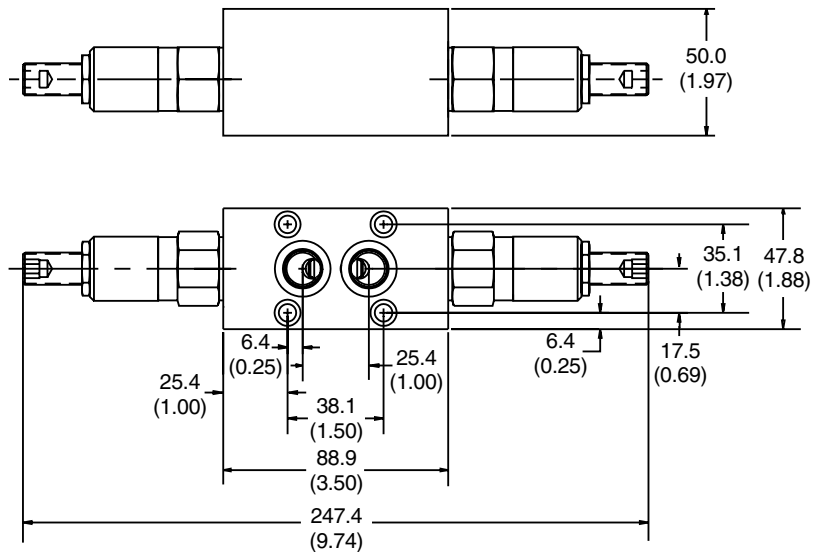
**Dimensions**

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

**Single P.C. Flow Control  
 Meter-In or Meter-Out**



**Double P.C. Flow Control  
 Meter-In or Meter-Out**



**Single Flow Control**

| Description     | Part Number | Qty |
|-----------------|-------------|-----|
| Block Meter-In  | 1500168     | 1   |
| Block Meter-Out | 1500167     | 1   |
| Cartridge       | FC101       | 1   |

**Double Flow Control**

| Description     | Part Number | Qty |
|-----------------|-------------|-----|
| Block Meter-In  | 1500170     | 1   |
| Block Meter-Out | 1500169     | 1   |
| Cartridge       | FC101       | 2   |

**Ordering Information**

**BV**

Bankable Valve

**06**

Size

[ ]

Location

[ ]

Adjustment Style

[ ]

Adjustment Range

| Code | Description                   |
|------|-------------------------------|
| 06   | 22.7 LPM (6 GPM) Nominal Flow |

| Code | Description          |
|------|----------------------|
| G    | A Port Meter-In      |
| H    | B Port Meter-In      |
| J    | A & B Port Meter-In  |
| K    | A Port Meter-Out     |
| L    | B Port Meter-Out     |
| M    | A & B Port Meter-Out |

| Code | Description      |
|------|------------------|
| S    | Screw Adjust     |
| K    | Knob Adjust      |
| T    | Tamper Resistant |

| Code | Description  |
|------|--|
| 050  | 1.1-3.8 LPM (0.3-1.0 GPM)<br>Setting: @ 1.88 LPM (0.56 GPM)  |
| 100  | 3.0-8.3 LPM (0.8-2.2 GPM)<br>Setting: @ 3.75 LPM (1.0 GPM)   |
| 300  | 7.6-15.1 LPM (2.0-4.0 GPM)<br>Setting: @ 11.25 LPM (3.0 GPM) |
| 600  | 15.1-30.3 LPM (4.0-8.0 GPM)<br>Setting: @ 22.5 LPM (6.0 GPM) |

**Weights:**

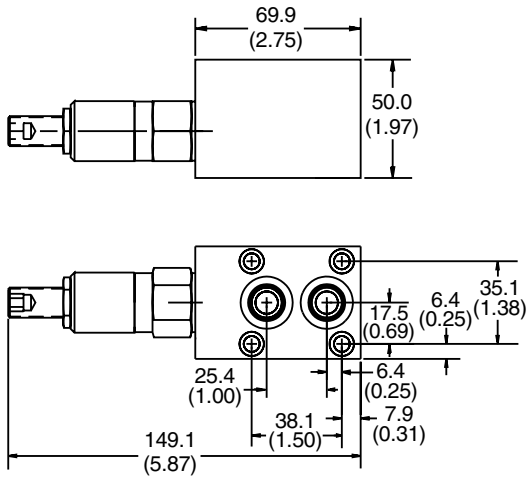
BV06-G, BV06-H, BV06-K & BV06-L .54 kg (19 oz.)  
 BV06-J & BV06-M .76 kg (27 oz.)



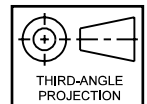
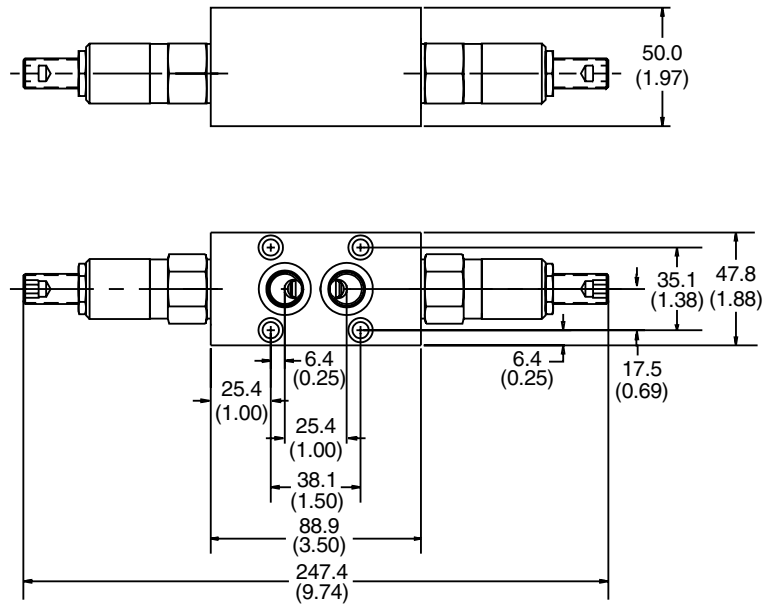
**Dimensions**

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

**Single Flow Control  
 Meter-In or Meter-Out**



**Double Flow Control  
 Meter or Meter-Out**



**Single Flow Control**

| Description     | Part Number | Qty |
|-----------------|-------------|-----|
| Block Meter-In  | 1500167     | 1   |
| Block Meter-Out | 1500168     | 1   |
| Cartridge       | FV101       | 1   |

**Dual Flow Control**

| Description     | Part Number | Qty |
|-----------------|-------------|-----|
| Block Meter-In  | 1500169     | 1   |
| Block Meter-Out | 1500170     | 1   |
| Cartridge       | FV101       | 2   |

**Ordering Information**

**BV**

Bankable Valve

**06**

Size

Location

Adjustment Style

| Code | Description                   |
|------|-------------------------------|
| 06   | 22.7 LPM (6 GPM) Nominal Flow |

| Code | Description          |
|------|----------------------|
| G5   | A Port Meter-In      |
| H5   | B Port Meter-In      |
| J5   | A & B Port Meter-In  |
| K5   | A Port Meter-Out     |
| L5   | B Port Meter-Out     |
| M5   | A & B Port Meter-Out |

| Code | Description  |
|------|--------------|
| S    | Screw Adjust |
| K    | Knob Adjust  |

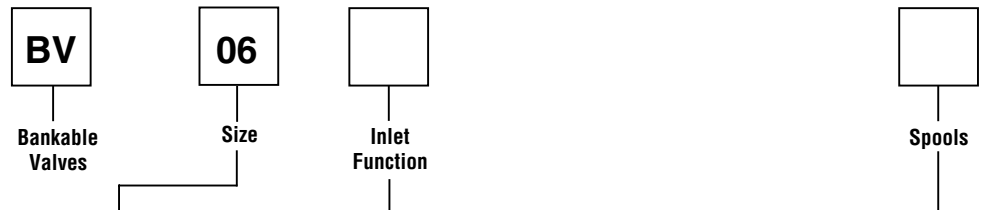
**Weights:**

- BV06-G5, BV06-H5, BV06-K5 & BV06-L5 .54 kg (19 oz.)
- BV06-J5 & BV06-M5 .76 kg (27 oz.)



**Valve Assemblies with or without Stack-On Options**

**A**



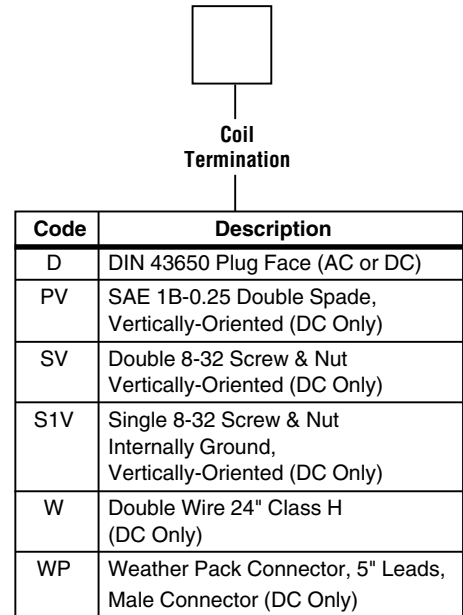
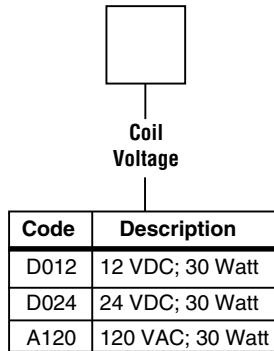
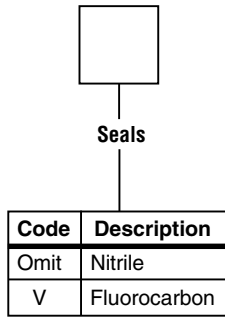
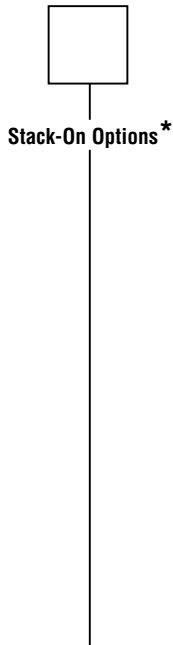
| Code | Description                   | Code | Description  | Symbol | Code | Description   | Symbol |
|------|-------------------------------|------|--|--------|------|---|--------|
| 06   | 22.7 LPM (6 GPM) Nominal Flow | Omit | Std Inlet<br>No Relief<br>No Unloader                          |        | P1   | 30.0 LPM (8 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
|      |                               | MR   | Main Relief  |        | P4   | 22.7 LPM (6 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
|      |                               | U    | Unloader   |        | P11  | 26.5 LPM (7 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
|      |                               | UR   | Unloader & Relief  |        | P20  | 22.7 LPM (6 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
|      |                               | PU3  | Proportional Unloader<br>11.3 LPM (3 GPM) with<br>17 Watt Coil |        | P21  | 22.7 LPM (6 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
|      |                               | PU6  | Proportional Unloader<br>22.5 LPM (6 GPM) with<br>17 Watt Coil |        | P23  | 30.0 LPM (8 GPM) Max. Flow*<br>without Malfunction; Parallel Circuit Only |        |
|      |                               | PU8  | Proportional Unloader<br>30.0 LPM (8 GPM) with<br>30 Watt Coil |        | S2   | 26.5 LPM (7 GPM) Max. Flow*<br>without Malfunction; Series Circuit Only   |        |
|      |                               |      |  |        | S8   | 26.5 LPM (7 GPM) Max. Flow*<br>without Malfunction; Series Circuit Only   |        |
|      |                               |      |  |        | S24  | 26.5 LPM (7 GPM) Max. Flow*<br>without Malfunction; Series Circuit Only   |        |

**Note:** Standard setting 2500 PSI @ 6 GPM, with screw adjustments on all relief cartridges.  
 Standard setting 1000 PSI @ crack, with screw adjustments on all counterbalance cartridges.

\*At 70 PSI ΔP

**Note:** Maximum of six spools per assembly. For each additional spool repeat spool option after stack-on option.

| Service Parts  |   |
|--|---|
| <b>Bodies</b>  | <b>Spools</b>   |
| BV06-6T Parallel or Series Individual Body   | P/N 118736-00 Code P1 Spool   |
| BV06-E6T Parallel Inlet/Outlet Body  | P/N 118737-00 Code P4 Spool   |
| BV06-M6T Parallel Middle Body  | P/N 118767-00 Code P11 Spool  |
| BV06-SI6T Series Inlet Body  | P/N 118731-00 Code P20 Spool  |
| BV06-SM6T Series Middle Body   | P/N 118731-00 Code P21 Spool  |
| BV06-SO6T Series Outlet Body (No Spool)  | P/N 118736-00 Code P23 Spool  |
|  | P/N 710025-00 Code S2 Spool   |
| <b>Coils</b>   | P/N 710015-00 Code S8 Spool   |
| P/N 851050***** Double Spade Coil  | P/N 710015-00 Code S24 Spool  |
| P/N 851052***** Double Wire Coil   |   |
| P/N 851054***** Double Screw Coil  |   |
| P/N 851056***** Single Screw Coil  |   |
| P/N 851020***** DIN Plug Face Coil (AC or DC)  |   |
| P/N 1500189 Weather Pack Coil  |   |
| <b>Note:</b> Coils are available in 12 VDC, 24 VDC, & 120 VAC versions only.<br>P/N 851052-012 VDC is a 12 VDC Double Wire Coil. |   |
|  | <b>Tube Assemblies</b>  |
|  | P/N 709780-01 Tube Assembly with heavy spring - use with P1, P11, & P23 spools              |
|  | P/N 1500051 Tube Assembly with light spring - use with P4, S2, S8, & S24 spools             |
|  | P/N 1500056 Tube Assembly with heavy spring - use with P20 & P21 spools                     |
|  | <b>Plug Assemblies (Single Solenoid Valve only)</b>   |
|  | P/N 710020-01 Plug Assembly with Heavy Spring - use with P1, P11, & P23 spools              |
|  | P/N 710020-02 Plug Assembly with Light Spring - use with P4, P20, P21, S2, S8, & S20 spools |
|  | <b>Tube End Nut</b> P/N 118113-00   |
|  | <b>Seals</b>  |
|  | P/N 2013N-7 (Between sections)  |
|  | P/N 2018N-7 (Between stacks)  |



| Code | Description                                     | Symbol | Code | Description   | Symbol |
|------|---|--------|------|---|--------|
| A    | A Port P.O. Check                               |        | M    | A & B Port Meter-Out Pressure Comp.                 |        |
| B    | B Port P.O. Check                               |        | G5   | A Port Meter-In Flow Control Non-Pressure Comp.     |        |
| C    | A & B Port P.O. Checks                          |        | H5   | B Port Meter-In Flow Control Non-Pressure Comp.     |        |
| D    | A Port to B Port Crossover Relief               |        | J5   | A & B Port Meter-In Flow Control Non-Pressure Comp. |        |
| E    | B Port to A Port Crossover Relief               |        | K5   | A Port Meter-Out Flow control Non-Pressure Comp.    |        |
| F    | A & B Ports Dual Crossover Relief               |        | L5   | B Port Meter-Out Flow Control Non-Pressure Comp.    |        |
| G    | A Port Meter-In Flow Control Pressure Comp.     |        | M5   | A & B Port Meter-Out Non-Pressure Comp.             |        |
| H    | B Port Meter-In Flow Control Pressure Comp.     |        | NN   | A Port Counterbalance 56.8 LPM (15 GPM) Max.        |        |
| J    | A & B Port Meter-In Flow Control Pressure Comp. |        | PP   | B Port Counterbalance 56.8 LPM (15 GPM) Max.        |        |
| K    | A Port Meter- Out Flow Control Pressure Comp.   |        | RR   | A & B Port Counterbalance 56.8 LPM (15 GPM) Max.    |        |
| L    | B Port Meter-Out Flow Control Pressure Comp.    |        |      |   |        |

**Weights:**

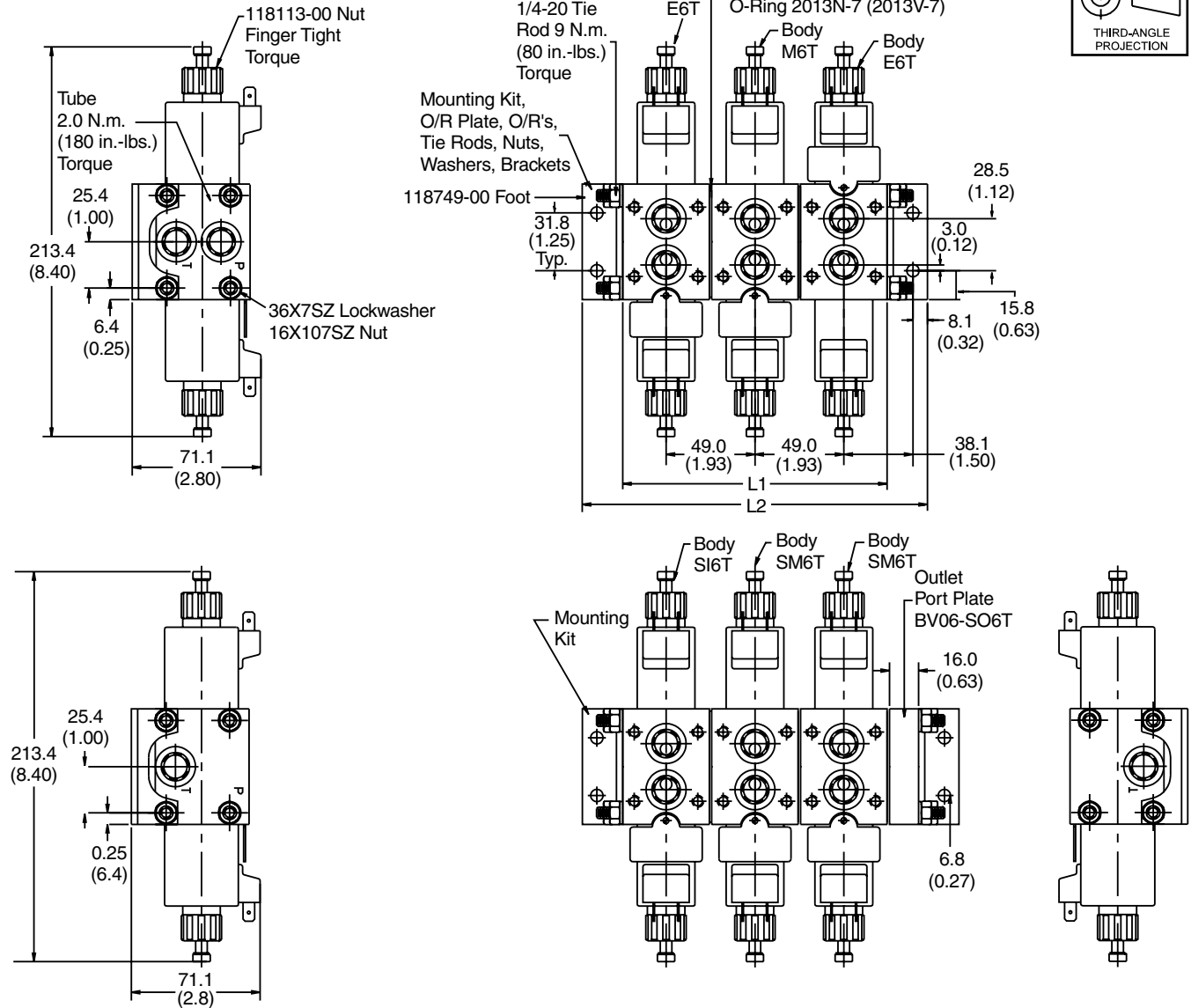
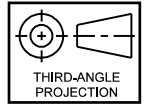
|                               |                    |
|-------------------------------|--------------------|
| Single Solenoid Spool Section | 1.26 kg (2.8 lbs.) |
| Double Solenoid Spool Section | 1.50 kg (3.3 lbs.) |

**Note:** Maximum of two stack-ons per spool section.

\* Meter-In is from the valve to the actuator. Meter-Out is from the actuator to the valve.

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

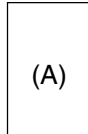
**A**



| Number of Spool Sections   | 1           |              | 2            |              | 3            |              | 4            |               | 5             |               | 6             |               |
|--|-------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|
|  | L1          | L2           | L1           | L2           | L1           | L2           | L1           | L2            | L1            | L2            | L1            | L2            |
| Dimensions   |             |              |              |              |              |              |              |               |               |               |               |               |
| Individual-Parallel or Series                                    | 47.8 (1.88) | 92.2 (3.63)  |              |              |              |              |              |               |               |               |               |               |
| Parallel   |             |              | 96.8 (3.81)  | 141.2 (5.56) | 145.8 (5.74) | 190.3 (7.49) | 194.8 (7.67) | 239.3 (9.42)  | 243.8 (9.60)  | 288.3 (11.35) | 325.9 (12.83) | 370.3 (14.58) |
| Parallel, Parallel with Inlet Relief, Inlet Unloader with Relief | 80.8 (3.18) | 125.2 (4.93) | 129.8 (5.11) | 174.2 (6.86) | 178.8 (7.04) | 223.3 (8.79) | 227.8 (8.97) | 272.3 (10.72) | 276.9 (10.90) | 321.3 (12.65) | 329.2 (12.96) | 373.6 (14.71) |
| Series   |             |              | 113.9 (4.49) | 158.4 (6.24) | 162.9 (6.42) | 207.4 (8.17) | 212.0 (8.35) | 256.4 (10.10) | 261.0 (10.28) | 305.4 (12.03) | 310.0 (12.21) | 354.5 (13.96) |
| Series with Inlet Relief   | 80.8 (3.18) | 125.2 (4.93) | 149.2 (5.79) | 191.4 (7.54) | 196.0 (7.72) | 240.4 (9.47) | 244.9 (9.65) | 289.4 (11.40) | 294.8 (11.58) | 338.5 (13.33) | 343.0 (13.51) | 387.5 (15.26) |
| <b>Mounting Kit</b>  |             |              |              |              |              |              |              |               |               |               |               |               |
| Individual-Parallel or Series                                    | BV06-MK1    |              |              |              |              |              |              |               |               |               |               |               |
| Parallel   |             |              | BV06-MK2     |              | BV06-MK3     |              | BV06-MK4     |               | BV06-MK5      |               | BV06-MK6      |               |
| Parallel with Inlet Relief, Inlet Unloader with Relief           | BV06-MK1A   |              | BV06-MK2A    |              | BV06-MK3A    |              | BV06-MK4A    |               | BV06-MK5A     |               | BV06-MK6A     |               |
| Series   | BV06-MK1B   |              | BV06-MK2B    |              | BV06-MK3B    |              | BV06-MK4B    |               | BV06-MK5B     |               | BV06-MK6B     |               |
| Series with Inlet Relief   | BV06-MK1C   |              | BV06-MK2C    |              | BV06-MK3C    |              | BV06-MK4C    |               | BV06-MK5C     |               | BV06-MK6C     |               |

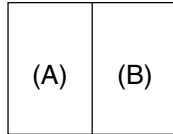


One spool section – parallel or series



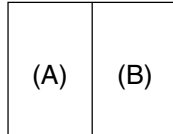
1 — BV06-6T Body (A)

One spool section with inlet relief, inlet unloader, or inlet unloader with relief – parallel only



1 — BV06-MR,U, or, UR-6T Body (A)  
 1 — BV06-E6T Body (B)  
 1 — Mounting kit, BV06-MK1A

Two spool sections – parallel only



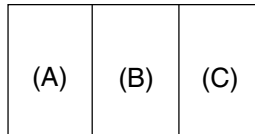
1 — BV06-E6T (A)  
 1 — BV06-E6T (B)  
 1 — Mounting kit, BV06-MK2

Two spool sections with inlet relief, inlet unloader, or inlet unloader with relief – parallel only



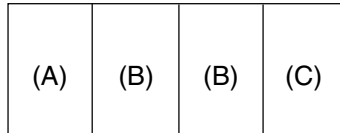
1 — BV06-MR,U, or, UR-6T Body (A)  
 1 — BV06-M6T Body (B)  
 1 — BV06-E6T Body (C)  
 1 — Mounting kit, BV06-MK2A

Three spool sections – parallel only



1 — BV06-E6T (A)  
 1 — BV06-M6T Body (B)  
 1 — BV06-E6T Body (C)  
 1 — Mounting kit, BV06-MK3

Three spool sections with inlet relief, inlet unloader, or inlet unloader with relief – parallel only

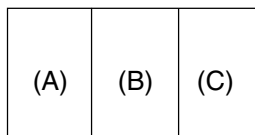


1 — BV06-MR,U, or, UR-6T Body (A)  
 2 — BV06-M6T Body (B)  
 1 — BV06-E6T Body (C)  
 1 — Mounting kit, BV06-MK3A

For four to six section parallel assemblies, use the three spool section – parallel only assembly as shown as a starting point. For each additional section, add one BV06-M6T section between the BV06-E6T sections. Mounting kits will be BV06-MK4 to MK6 respectively.

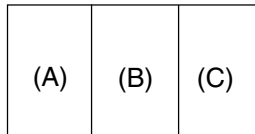
For four to six section parallel assemblies with an inlet relief, inlet unloader, inlet unloader with relief, use the three spool parallel assembly as shown as a starting point. For each additional section, add one BV06-M6T section between the BV06-MR, U, or UR6T and BV06-E6T sections. Mounting kits will be BV06-MK4A to MK6A respectively.

One spool section with inlet relief, inlet unloader, or inlet unloader with relief — series only



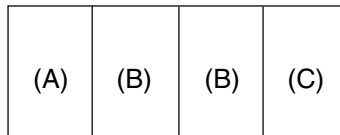
1 — BV06-MR,U, or, UR-6T Body (A)  
 1 — BV06-SM6T Body (B)  
 1 — BV06-SO6T Body (C)  
 1 — Mounting kit, BV06-MK1C

Two spool sections – series only



1 — BV06-SI6T Body (A)  
 1 — BV06-SM6T Body (B)  
 1 — BV06-SO6T Body (C)  
 1 — Mounting kit, BV06-MK2B

Two spool sections with inlet relief, inlet unloader, or inlet unloader with relief – series only



1 — BV06-MR,U, or, UR-6T Body (A)  
 2 — BV06-SM6T Body (B)  
 1 — BV06-SO6T Body (C)  
 1 — Mounting kit, BV06-MK2C

For three to six section series assemblies, use the two spool section – series only assembly as shown as a starting point. For each additional section, add one BV06-SM6T section between the BV06-SI6T and BV06-SO6T sections. Mounting kits will be BV06-MK3B to MK6B respectively.

For three to six section series assemblies with an inlet relief, inlet unloader, inlet unloader with relief, use the three spool series assembly as shown as a starting point. For each additional section, add one BV06-SM6T section between the BV06-MR, U, or UR6T and BV06-SO6T bodies. Mounting kits will be BV06-MK3C to MK6C respectively.

**Stack Mounting Kit Matrix**

**Single Stack Valve:** Choose stack valve in column to left. Follow chart to column labeled Single Stack. Choose stack mounting kit part number.

**Double Stack Valves:** Choose bottom stack from column at left. Follow chart over to top stack valve. Choose stack mounting kit part number.

| Bottom or Single Stack                                      |                         | Top Stack                       |                                   |                                      |                               |
|---|-------------------------|---------------------------------|-----------------------------------|--------------------------------------|-------------------------------|
| Stacking Kit P/N<br>Nitrile O-rings<br>Fluorocarbon O-rings | Single Stack            | Single and Double<br>P.O. Check | Single Flow and<br>Double Control | Single<br>Counterbalance<br>(A or B) | Double<br>Crossover<br>Relief |
| Single and Double<br>P.O. Check                             | BV06-SK1<br>BV06-SK1V   | Not Applicable                  | Not Applicable                    | Not Applicable                       | Not Applicable                |
| Single and Double<br>Flow Control                           | BV06-SK1<br>BV06-SK1V   | BV06-SK4A<br>BV06-SK4AV         | Not Applicable                    | BV06-SK5A<br>BV06-SK5AV              | BV06-SK7A<br>BV06-SK7AV       |
| Single Counter-<br>balance (A or B)                         | BV06-SK1A<br>BV06-SK1AV | BV06-SK3A<br>BV06-SK3AV         | BV06-SK3A<br>BV06-SK3AV           | Not Applicable                       | Not Applicable                |
| Double<br>Counterbalance                                    | BV06-SK3A<br>BV06-SK3AV | Not Applicable                  | Not Applicable                    | Not Applicable                       | Not Applicable                |
| Single Crossover<br>Relief (A or B)                         | BV06-SK1A<br>BV06-SK1AV | BV06-SK3A<br>BV06-SK3AV         | BV06-SK3A<br>BV06-SK3AV           | BV06-SK4A<br>BV06-SK4AV              | Not Applicable                |
| Double Crossover<br>Relief                                  | BV06-SK2A<br>BV06-SK2AV | BV06-SK6A<br>BV06-SK6AV         | BV06-SK6A<br>BV06-SK6AV           | BV06-SK7A<br>BV06-SK7AV              | Not Applicable                |

**Stack Valve Component Data**

**Alternate Method of Determining Stack Valve Mounting Kits:**

Determine Cap Screw Minimum Length (L) using formula below and choose next longest cap screw and associated mounting kit from the Cap Screw Data chart:

$$\text{Single Stack Cap Screw Minimum Length (L) = Stack Valve Height (H) - Stack Valve Counterbore (CB) + 9.5 mm (0.38")}$$

$$\text{Double Stack Cap Screw Minimum Length (L) = Bottom Stack Valve Height (H) + Top Stack Valve Height (H) - Top Stack Valve Counterbore (CB) + 9.5 mm (0.38")}$$

| Stack Valve                        | Single and<br>Double P.O.<br>Check | Single and<br>Double Flow<br>Control | Single<br>Counterbalance<br>(A or B) | Double<br>Counterbalance | Single Cross-<br>over Relief<br>(A or B) | Double<br>Crossover<br>Relief |
|------------------------------------|------------------------------------|--------------------------------------|--------------------------------------|--------------------------|--|-------------------------------|
| Stack Valve<br>Height (H)          | 37.3 mm<br>(1.47")                 | 50.0 mm<br>(1.97")                   | 44.4 mm<br>(1.75")                   | 80.8 mm<br>(3.18")       | 44.2 mm<br>(1.74")                       | 62.7 mm<br>(2.47")            |
| Stack Valve<br>Counterbore<br>(CB) | 7.6 mm<br>(0.30")                  | 20.3 mm<br>(0.80")                   | 6.6 mm<br>(0.26")                    | 7.6 mm<br>(0.30")        | 6.4 mm<br>(0.25")                        | 11.2 mm<br>(0.44")            |

**Stacking Kits**

| Cap Screw<br>Length                       | 44.4 mm<br>(1.75") | 50.8 mm<br>(2.00") | 63.5 mm<br>(2.50") | 88.9 mm<br>(3.50") | 95.2 mm<br>(3.75") | 101.6 mm<br>(4.00") | 108.0 mm<br>(4.25") | 114.3 mm<br>(4.50") |
|---|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|---------------------|
| Mounting<br>Kit Number<br>w/ Nitrile      | BV06-SK1           | BV06-SK1A          | BV06-SK2A          | BV06-SK3A          | BV06-SK4A          | BV06-SK5A           | BV06-SK6A           | BV06-SK7A           |
| Mounting<br>Kit Number<br>w/ Fluorocarbon | BV06-SK1V          | BV06-SK1AV         | BV06-SK2AV         | BV06-SK3AV         | BV06-SK4AV         | BV06-SK5AV          | BV06-SK6AV          | BV06-SK7AV          |

Stack valve mounting kits are furnished complete with socket head cap screws, lock washers, and o-ring seals. Please contact the factory for combinations not shown in the chart for application approval.

**Mounting Kits**

**BV**

Bankable  
Valve

**06**

Size

—

**MK**

Mounting Kit

No. of Spool  
Sections  
(1 to 6)

Combinations

| Code | Description  |
|------|--|
| Omit | Individual parallel spool sections.<br>(Note: When only one section is used, the individual spool section can be either parallel or series.) |
| A    | Parallel assemblies with inlet relief, inlet unloader, or unloader with relief.  |
| B    | Two through six section series assemblies without inlet relief, inlet unloader, or unloader with relief.                                     |
| C    | Series assemblies with inlet relief, inlet unloader, or unloader with relief.  |

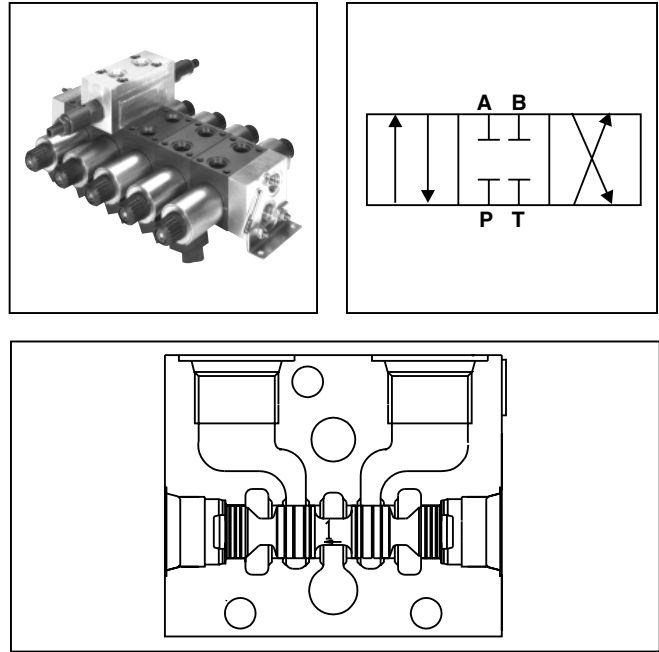


## General Description

Series BV18 Bankables are 2 or 3 position, 4-way, directional control valves. They provide a spool valve that can be used either individually or in multiple spool banks. BV18 bankable valves have auxiliary banking sections that can be mounted to provide auxiliary functions such as an inlet relief or unloading function. In addition, stack-on sections can be mounted on the cylinder port face of the BV18 bankable valve spool sections to provide additional functions such as crossover reliefs, cylinder port reliefs, P.O. checks, flow controls, and counterbalances. BV18 bankable valves are also available with two different proportional spool options, and can be used to create custom, multi-functional circuits.

## Operation

The spool is shifted from its center position by either energizing one of the solenoids, applying air or hydraulic pressure, or by shifting the lever. Three-position spring centered and two-position spring offset valves are available. The spools of the proportional BV18 bankable valves are shifted by energizing one of the solenoid coils. The travel of the spool is in direct proportion to the amperage applied to the solenoid coil. The more amperage that is applied, the further the spool shifts until it is at full travel. As long as the coil amperage is held steady, the spool will hold its position. As the amperage decreases, the spool will travel back towards its neutral position. Metering notches on the spool vary the pressure drop across the spool. As the spool travels, the flow varies. Once the spool is held in a given position, the pressure drop across the metering notches of the spool determines the flow.



## Features

- High flow capacity with reduced space requirements.
- High back pressure; all ports withstand maximum working pressure.
- Precision machined valve body is made from high tensile cast iron.
- A five chamber style body ensures high pressure operation.
- Six different spool styles are available; all are four land spools for smoother shifting.
- Available operators include single or double solenoids, lever, hydraulic pilot, or air pilot.
- All solenoids are a one-piece coil featuring numerous voltages and terminations.

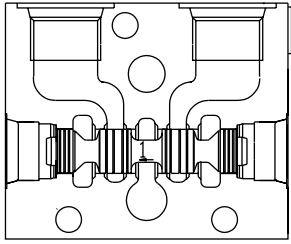




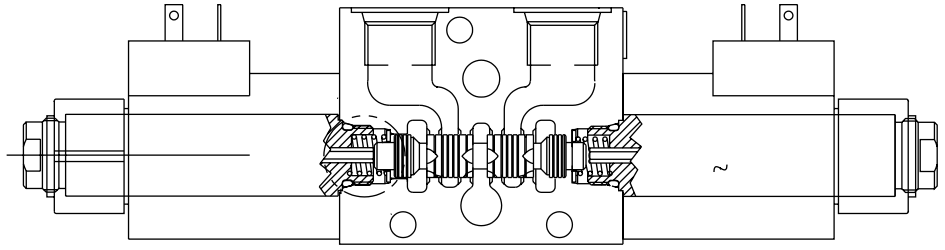
|  | <b>BV18</b>   | <b>BV18 Proportional</b>   |
|--|---|--|
| <b>Nominal Flow (at 70 PSI ΔP)</b>                       | 30-90 LPM (8-24 GPM)<br>depending on spool  | Up to 22.5 LPM (6 GPM)<br>depending on spool   |
| <b>Maximum Inlet &amp; Tank Pressure</b>                 | Parallel: 350 Bar (5000 PSI) Inlet<br>210 Bar (3000 PSI) Tank<br>Series: 210 Bar (3000 PSI) Inlet & Tank  | Parallel: 350 Bar (5000 PSI) Inlet<br>210 Bar (3000 PSI) Tank  |
| <b>Porting</b>   | SAE -8  | SAE -8   |
| <b>Maximum Internal Leakage (3000 PSI) (110 SSU oil)</b> | #1 Spool: 22.9 cc per land/min.<br>(1.40 cu. in. per land/min.)<br>#2 Spool: 47.2 cc per land/min.<br>(2.88 cu. in. per land/min.)<br>#9 Spool: 24.4 cc per land/min.<br>(1.49 cu. in. per land/min.)<br>#11 Spool: 87.4 cc per land/min.<br>(5.33 cu. in. per land/min.) | #81 Spool: 22.9 cc per land/min.<br>(1.40 cu. in. per land/min.)<br>#82 Spool: 22.9 cc per land/min.<br>(1.40 cu. in. per land/min.) |
| <b>Hysteresis</b>  | Not Applicable  | 8%   |
| <b>Frequency</b>   | Not Applicable  | 200 Hz PWM   |
| <b>Air Pressure to Shift</b>                             | Crack - 3.5 Bar (50 PSIA)<br>Full Shift - 6.9 Bar (100 PSIA)  | Not Applicable<br>Not Applicable   |
| <b>Maximum Air Pressure</b>                              | 10.3 Bar (150 PSIA)   | Not Applicable   |
| <b>Air Piston Area</b>                                   | 506 sq. mm (.785 sq. in.)   | Not Applicable   |
| <b>Air Piston Stroke</b>                                 | 3.4 mm (.135 in.)   | Not Applicable   |
| <b>Hydraulic Pressure to Shift</b>                       | Crack - 15.2 Bar (200 PSI )<br>Full Shift- 20.7 Bar (300 PSI)   | Not Applicable   |
| <b>Max. Hydraulic Pilot Pressure</b>                     | 210 Bar (3000 PSI)  | Not Applicable   |
| <b>Hydraulic Piston Area</b>                             | 198 sq. mm (.307 sq. in.)   | Not Applicable   |
| <b>Hydraulic Piston Stroke</b>                           | 3.4 mm (.135 in.)   | Not Applicable   |
| <b>Operating Temperature Range (Ambient)</b>             | Nitrile: -40°C to +93°C (-40°F to +200°F)<br>Fluorocarbon: -32°C to +121°C (-25°F to +250°F)  | Nitrile: -40°C to +93°C (-40°F to +200°F)<br>Fluorocarbon: -32°C to +121°C (-25°F to +250°F)   |
| <b>Material</b>  | Body: Precision machined and honed from cast iron<br>Spool: Hardened and ground steel   | Body: Precision machined and honed from cast iron<br>Spool: Hardened and ground steel  |
| <b>Filtration</b>  | ISO Code 16/13,<br>SAE Class 4 or better  | ISO Code 16/13,<br>SAE Class 4 or better   |
| <b>Mounting Position</b>                                 | No restrictions   | No restrictions  |
| <b>Mounting Type</b>                                     | Line mounted  | Line mounted   |

**A**

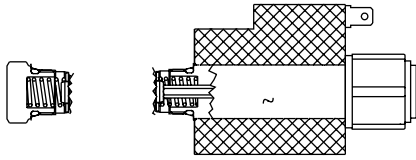
**Valve Body With Spool**



**Proportional Valve Body With Spool**

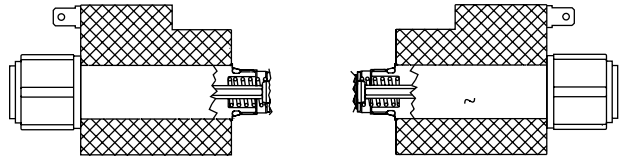


**Single Solenoid**



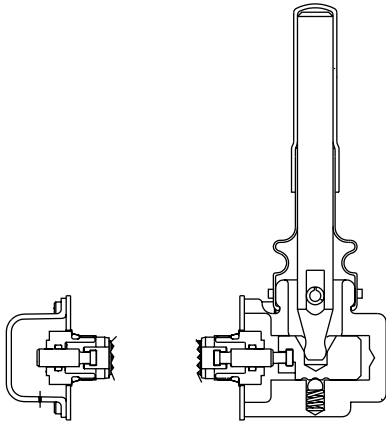
BV18SA (A Side) - BV18SB (B Side)

**Double Solenoid**



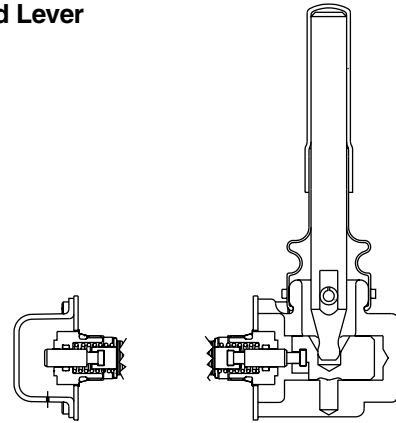
BV18S

**Lever**



BV18LA (A Side) - BV18LB (B Side)

**Detented Lever**



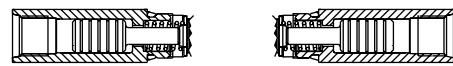
BV18DA (A Side) - BV18DB (B Side)

**Single Hydraulic Pilot**



BV18-HA (A Side) - BV18-HB (B Side)

**Double Hydraulic Pilot**



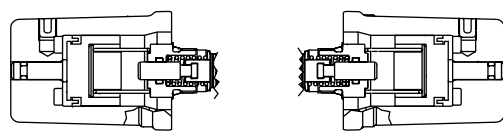
BV18-H

**Single Air Pilot**



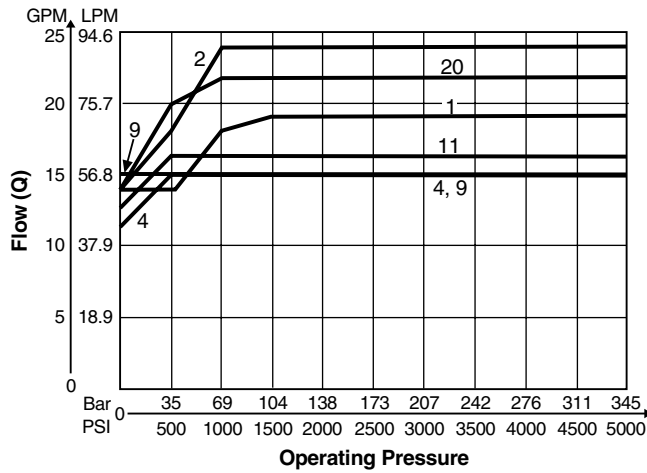
BV18-PA (A Side) - BV18-PB (B Side)

**Double Air Pilot**



BV18-P

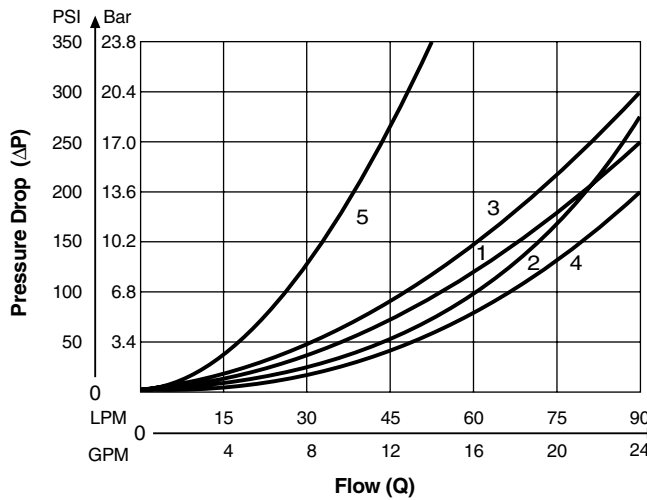
**Switching Limits**



**Notes:**

1. Shift limits apply to all actuator types.
2. Unless otherwise specified, all curves were generated using solenoid actuators at 90% of rated with voltage.
3. The 4 spool maximum working pressure drop cannot exceed 136 Bar (2000 PSI) from inlet to work port using 24 watt coils, and 204 Bar (3000 PSI) using 30 watt coils.
4. The 1 spool and the 11 spool should be used with 30 watt coils when working pressure exceeds 238 Bar (3500 PSI).
5. All valves tested using 110 SSU oil.
6. Maximum flow for the 2 spool is 45 LPM (12 GPM) using AC coils.
7. All AC coils must be 25 watt rated.

**Differential Pressure**



|          |    | Flow Path |     |     |     |     |
|----------|----|-----------|-----|-----|-----|-----|
|          |    | P-A       | P-B | A-T | B-T | P-T |
| <b>S</b> | 1  | 1         | 1   | 2   | 2   |     |
|          | 2  | 1         | 1   | 2   | 2   | 2   |
| <b>O</b> | 4  | 1         | 1   | 1   | 3   |     |
|          | 9  | 1         | 1   | 2   | 2   | 5   |
| <b>L</b> | 11 | 1         | 1   | 2   | 2   |     |
|          | 20 | 1*        | 1** | 4** | 3** |     |

\*20 Spool, De-energized    \*\*20 Spool, Energized

**Notes:**

1. Refer to shift limit curves for flow capabilities of individual spools.
2. Curves were generated using 110 SSU hydraulic oil.



**Solenoid Coil Specifications**

| Solenoid Code | Nominal Voltage/Hz | In Rush Amps | Holding Amps | Wattage |
|---------------|--------------------|--------------|--------------|---------|
| D10           | 10 VDC             | —            | 3.0          | 24      |
| D10H          | 10 VDC             | —            | 3.5          | 30      |
| D12           | 12 VDC             | —            | 2.0          | 24      |
| D12H          | 12 VDC             | —            | 2.5          | 30      |
| D24           | 24 VDC             | —            | 1.0          | 24      |
| D24H          | 24 VDC             | —            | 1.25         | 30      |
| A120H         | 120 VAC/60 Hz      | 2.00         | 0.49         | 25      |
| A120H         | 110 VAC/50 Hz      | 2.10         | 0.58         | 27      |
| A240H         | 240 VAC/60 Hz      | 1.00         | 0.26         | 25      |
| A240H         | 220 VAC/60 Hz      | 1.05         | 0.31         | 27      |

**Typical Solenoid Response Times**

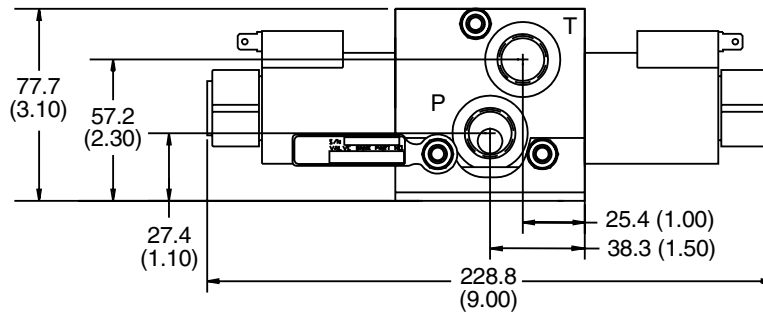
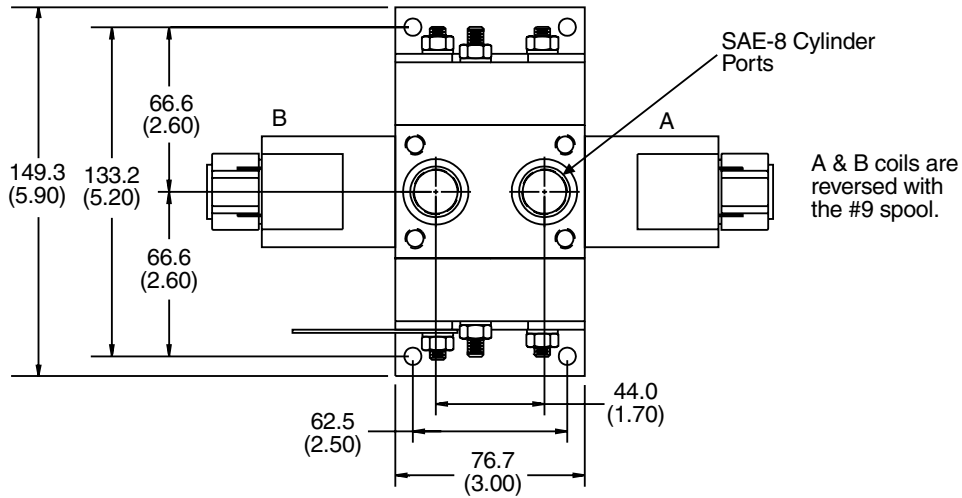
| DC COILS |                       |         |                            |                     |
|----------|-----------------------|---------|----------------------------|---------------------|
| Spool    | Coil Type             | Pull In | Pressure Response Drop Out | Full Shift Drop Out |
| 1        | 12 VDC, 24 Watt (12)  | 65 ms   | 40 ms                      | 239 ms              |
| 1        | 12 VDC, 30 Watt (12H) | 42 ms   | 40 ms                      | 239 ms              |
| 2        | 12 VDC, 24 Watt (12)  | 174 ms  | 40 ms                      | 140 ms              |
| 2        | 12 VDC, 30 Watt (12H) | 155 ms  | 40 ms                      | 144 ms              |
| 4        | 12 VDC, 24 Watt (12)  | 44 ms   | 40 ms                      | 294 ms              |
| 4        | 12 VDC, 30 Watt (12H) | 40 ms   | 40 ms                      | 292 ms              |
| 9        | 12 VDC, 24 Watt (12)  | 426 ms  | 40 ms                      | 340 ms              |
| 9        | 12 VDC, 30 Watt (12H) | 191 ms  | 40 ms                      | 431 ms              |
| 11       | 12 VDC, 24 Watt (12)  | 45 ms   | 40 ms                      | 233 ms              |
| 11       | 12 VDC, 30 Watt (12H) | 38 ms   | 40 ms                      | 257 ms              |
| 20       | 12 VDC, 24 Watt (12)  | 69 ms   | 20 ms                      | 23 ms               |
| 20       | 12 VDC, 30 Watt (12H) | 47 ms   | 20 ms                      | 27 ms               |
| AC COILS |                       |         |                            |                     |
| Spool    | Coil Type             | Pull In | Pressure Response Drop Out | Full Shift Drop Out |
| 1        | 120 VAC/60 Hz, (11H)  | 12 ms   | 20 ms                      | 279 ms              |
| 1        | 110 VAC/50 Hz, (11H)  | 12 ms   | 20 ms                      | 279 ms              |
| 2        | 120 VAC/60 Hz, (11H)  | 12 ms   | 20 ms                      | 278 ms              |
| 2        | 110 VAC/50 Hz, (11H)  | 12 ms   | 20 ms                      | 278 ms              |
| 4        | 120 VAC/60 Hz, (11H)  | 12 ms   | 20 ms                      | 278 ms              |
| 4        | 110 VAC/50 Hz, (11H)  | 12 ms   | 20 ms                      | 278 ms              |
| 9        | 120 VAC/60 Hz, (11H)  | 16 ms   | 20 ms                      | 242 ms              |
| 9        | 110 VAC/50 Hz, (11H)  | 16 ms   | 20 ms                      | 242 ms              |
| 11       | 120 VAC/60 Hz, (11H)  | 16 ms   | 20 ms                      | 249 ms              |
| 11       | 110 VAC/50 Hz, (11H)  | 16 ms   | 20 ms                      | 249 ms              |
| 20       | 120 VAC/60 Hz, (11H)  | 17 ms   | 20 ms                      | 236 ms              |
| 20       | 110 VAC/50 Hz, (11H)  | 17 ms   | 20 ms                      | 236 ms              |

**Proportional Solenoid Coil Specifications**

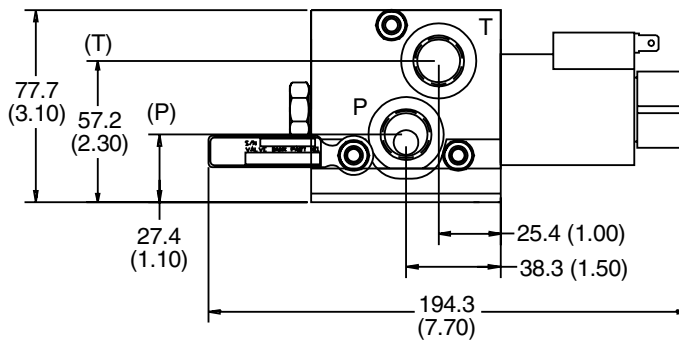
| Solenoid Code | Nominal Voltage/Hz | Watts | Step Response | Ramp Time       |
|---------------|--------------------|-------|---------------|-----------------|
| D012          | 12 VDC             | 24    | 96 ms         | Up to 3 seconds |
| D024          | 24 VDC             | 24    | 96 ms         | Up to 3 seconds |

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

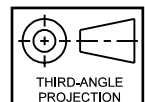
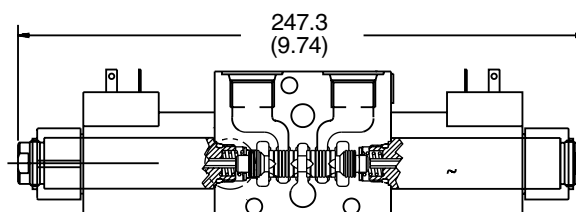
**Double Solenoid**



**Single Solenoid**



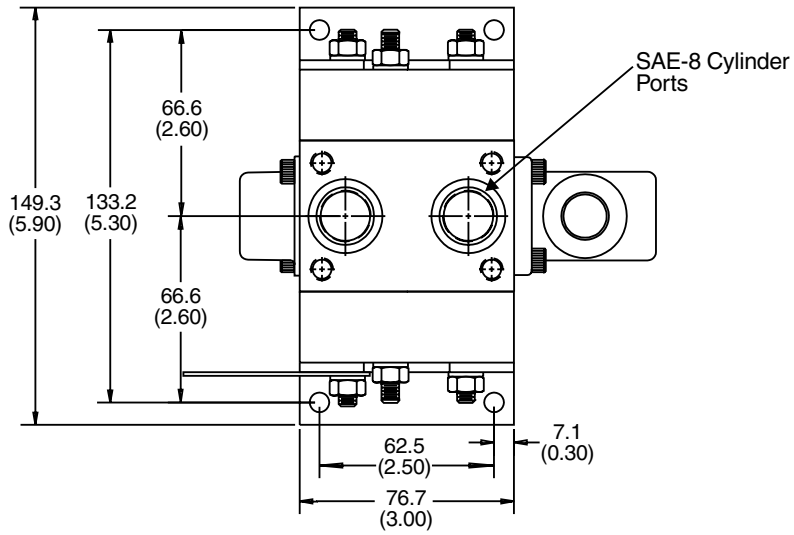
**Proportional Double Solenoid**



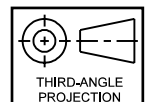
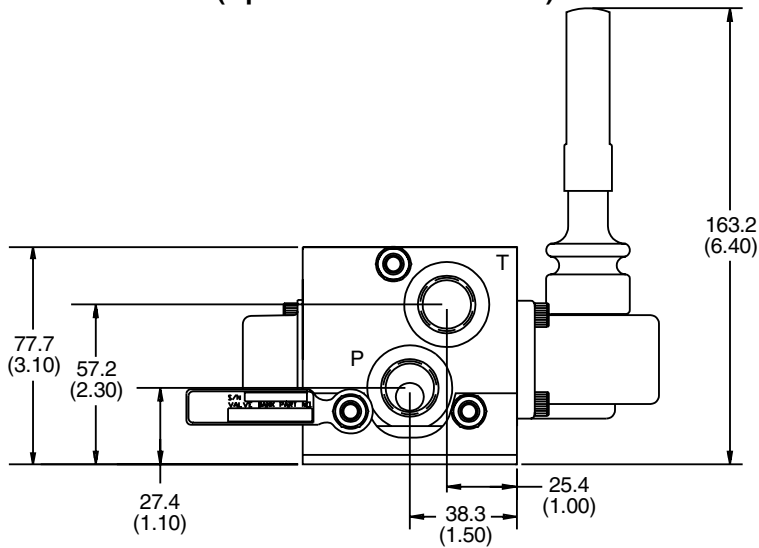
\*Inch equivalents for millimeter dimensions are shown in (\*\*)

**A**

**Lever  
 (Operates Port A as shown)**

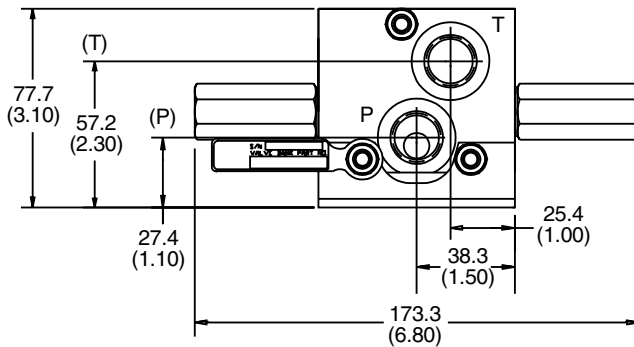
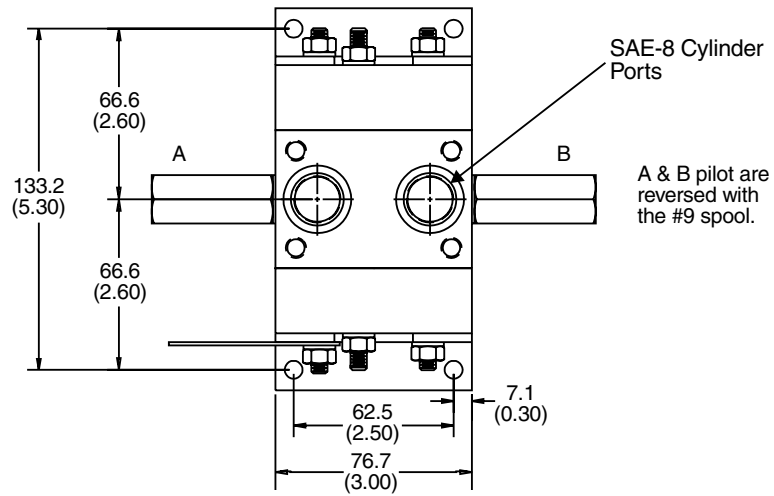


**Detented Lever  
 (Operates Port A as shown)**

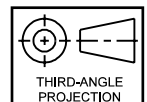
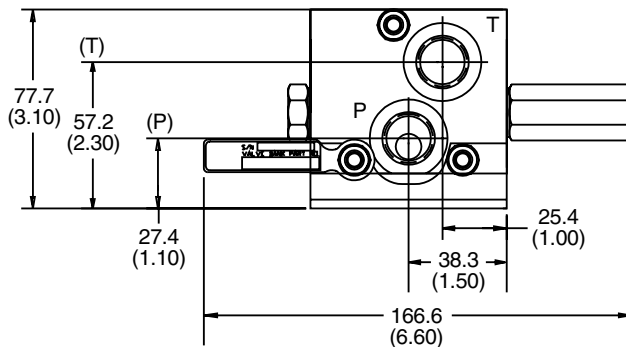


\*Inch equivalents for millimeter dimensions are shown in (\*\*)

**Double Hydraulic Pilot**



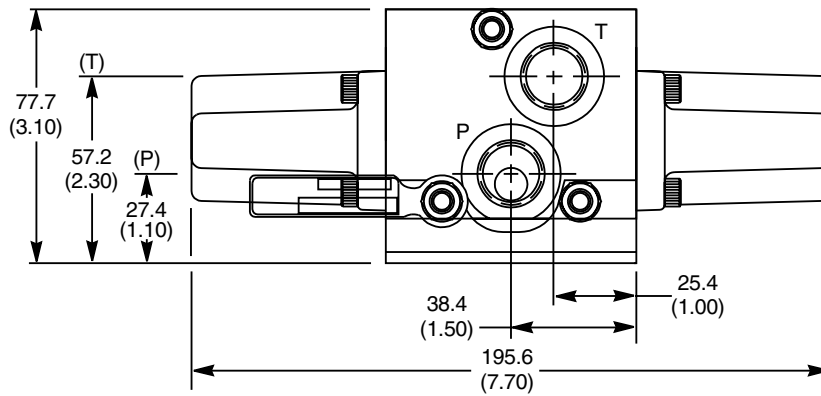
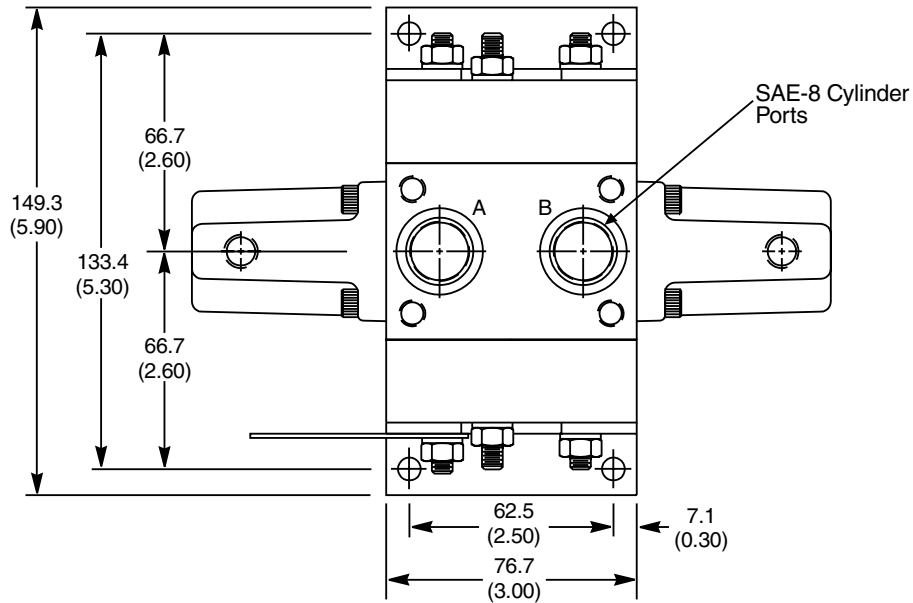
**Single Hydraulic Pilot  
 (Operates A Port as shown)**



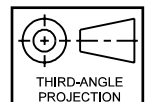
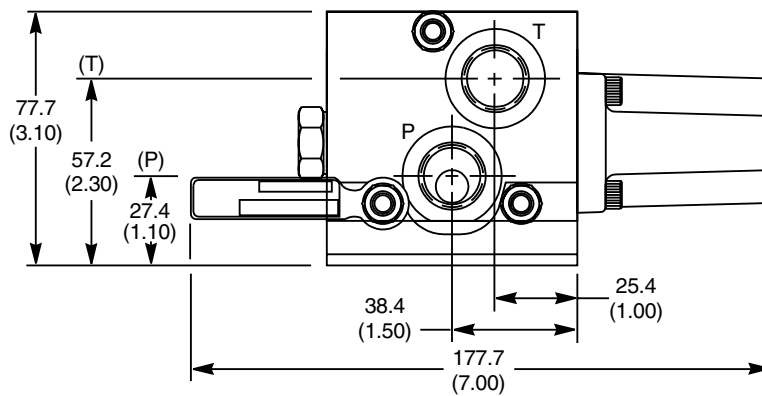
\*Inch equivalents for millimeter dimensions are shown in (\*\*)

**A**

**Double Air Pilot**

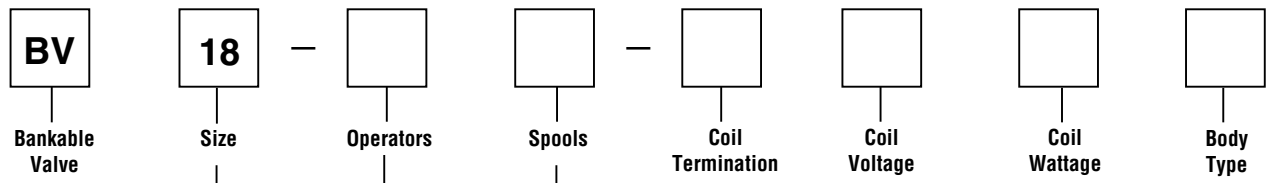


**Single Air Pilot**





**Spool Assemblies (Individual Sections)**



| Code | Description                    |
|------|--------------------------------|
| 18   | 68.1 LPM (18 GPM) Nominal Flow |

| Code | Description                        |
|------|------------------------------------|
| S    | Dual Solenoids                     |
| SA   | Single Solenoid on A               |
| SB   | Single Solenoid on B               |
| LA   | Lever on A                         |
| LB   | Lever on B                         |
| DA   | Lever w/detent on A                |
| DB   | Lever w/detent on B                |
| H    | Dual Hydraulic Pilot               |
| HA   | Hydraulic Pilot on A               |
| HB   | Hydraulic Pilot on B               |
| P    | Dual Air Pilot                     |
| PA   | Air Pilot on A                     |
| PB   | Air Pilot on B                     |
| F    | Proportional; Dual Solenoids       |
| FA   | Proportional; Single Solenoid on A |
| FB   | Proportional; Single Solenoid on B |

| Code | Description   |
|------|---|
| 1    | Closed Center; 68.1 LPM (18 GPM) Nominal; Parallel              |
| 2    | Open Center 90.8 LPM (24 GPM) Nominal; Series or Parallel       |
| 4    | Motor; 90.8 LPM (24 GPM); Parallel                              |
| 9    | Tandem; 68.1 LPM (15 GPM); Series                               |
| 11   | Bleeder; 56.8 LPM (15 GPM); Parallel                            |
| 20   | Two Position; 64.3 LPM (17 GPM); Parallel                       |
| 81   | Closed Center; Closed Transition; Proportional 22.7 LPM (6 GPM) |
| 82   | Motor; Meter-In; Proportional 22.7 LPM (6 GPM)                  |

| Code | Description                        |
|------|------------------------------------|
| Omit | Non-Solenoid                       |
| D10  | 10 VDC                             |
| D12  | 12 VDC                             |
| D24  | 24 VDC                             |
| A120 | 120 VAC (60 Hz)<br>110 VAC (50 Hz) |
| A240 | 240 VAC (60 Hz)<br>220 VAC (50 Hz) |

| Code | Description                                   |
|------|---|
| Omit | Non-Solenoid                                  |
| L    | 24 Watt DC Only                               |
| H    | 30 Watt - DC (& Proportional)<br>24 Watt - AC |

| Code | Description   |
|------|---|
| Omit | Non-Solenoid  |
| D    | DIN 43650 Plug Face (AC or DC)  |
| P    | SAE 1B-0.25 Double Spade (DC Only)  |
| S    | Double 8-32 Screw & Nut (DC & non-Proportional Only)                          |
| S1   | Single 8-32 Screw & Nut; Internally Ground (DC & non-Proportional Only)       |
| W    | Double Wire 24" Class H (DC & non-Proportional Only)                          |
| WP   | Weather Pack Connector, 5" Leads, Male Connector (DC & non-Proportional Only) |

**Note:** Proportional coils are available in 12 VDC and 24 VDC voltages with DIN and Dual Spade coils only.

| Code | Description  |
|------|--|
| Omit | Without Inlet/Outlet - Spool Section Only  |
| T    | Without Inlet/Outlet - Spool Section Only with Added Tank Port for Tank Port Reliefs |

**Weights:**

Double Solenoid    2.93 kg (6 lbs.)  
 Single Solenoid    2.03 kg (4.5 lbs.)



**Service Parts**

**Bodies**

BV18-W Individual Body - Series or Parallel  
 BV18-WT Individual Body - Series or Parallel  
 with added Tank Port for Tank Port Reliefs

**Coils**

1550090-10 10 VDC, 24 Watt Dual Spade Coil  
 1550090-12 12 VDC, 24 Watt Dual Spade Coil  
 1550090-24 24 VDC, 24 Watt Dual Spade Coil  
 1550091-10 10 VDC, 30 Watt Dual Spade Coil  
 1550091-12 12 VDC, 30 Watt Dual Spade Coil  
 1550091-24 24 VDC, 30 Watt Dual Spade Coil  
 1550092-10 10 VDC, 24 Watt Dual Wire Coil  
 1550092-12 12 VDC, 24 Watt Dual Wire Coil  
 1550092-24 24 VDC, 24 Watt Dual Wire Coil  
 1550093-10 10 VDC, 30 Watt Dual Wire Coil  
 1550093-12 12 VDC, 30 Watt Dual Wire Coil  
 1550093-24 24 VDC, 30 Watt Dual Wire Coil  
 1550094-10 10 VDC, 24 Watt DIN Plug Face Coil  
 697228 120 VAC 60 Hz/110 VAC 50 Hz  
 25 Watt DIN Plug Face Coil  
 1550094-12 12 VDC, 24 Watt DIN Plug Face Coil  
 697229 240 VAC 60 Hz/220 VAC 50 Hz  
 25 Watt DIN Plug Face Coil  
 1550094-24 24 VDC, 24 Watt DIN Plug Face Coil  
 1550095-10 10 VDC, 30 Watt DIN Plug Face Coil  
 1550095-12 12 VDC, 30 Watt DIN Plug Face Coil  
 1550095-24 24 VDC, 30 Watt DIN Plug Face Coil  
 1550177-12 12 VDC, 30 Watt Double Spade Proportional Coil  
 1550177-24 24 VDC, 30 Watt Double Spade Proportional Coil  
 1550178-12 12 VDC, 30 Watt Double Wire Proportional Coil  
 1550178-24 24 VDC, 30 Watt Double Wire Proportional Coil  
 1550174-12 12 VDC, 30 Watt DIN Plug Face Proportional Coil  
 1550174-24 24 VDC, 30 Watt DIN Plug Face Proportional Coil

**Tube Assemblies**

P/N 697632 AC Tube Assembly  
 P/N 697633 DC Tube Assembly  
 P/N 697188 DC Proportional Tube Assembly

**Spools**

P/N 697601 #1 Spool  
 P/N 697602 #2 Spool  
 P/N 697604 #4 Spool  
 P/N 1302128 #9 Spool  
 P/N 697611 #11 Spool  
 P/N 697620 #20 Spool  
 P/N 1210011 #81 Proportional Spool  
 P/N 1210012 #82 Proportional Spool

**Seals**

2013N-9 Body Seals (two required per Body)  
 3907N-9 Tube/End Cap Seal (one required per  
 Tube/End Cap)

## General Description

Bankable Inlet Reliefs, Bankable Unloaders, Bankable Reliefs with Unloaders, and Proportional Bankable Unloaders are used in conjunction with BV18 bankable valve sections. They are used to regulate system pressure, unload the pump in a closed center circuit, or regulate pressure and unload the pump in a closed center circuit.

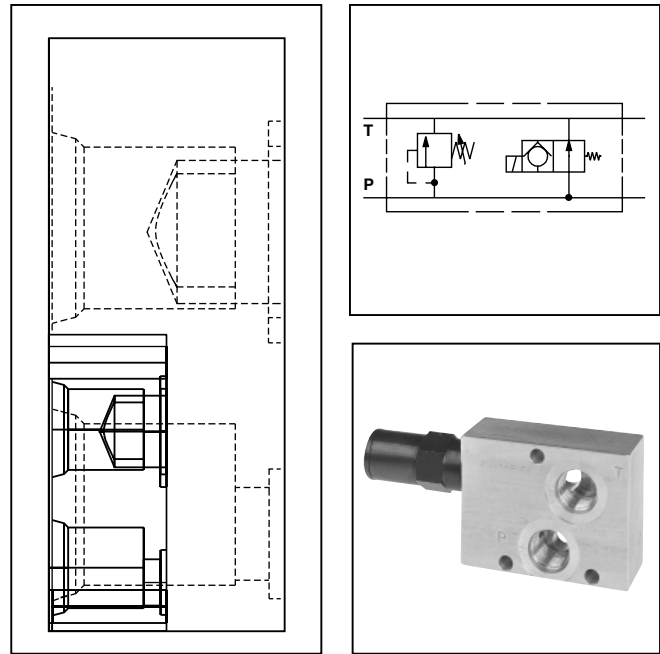
## Operation

**Inlet Relief** — The inlet relief on the bankable valves is used to regulate the maximum system pressure. The inlet relief on the BV18 is a RDH103 series cartridge valve.

**Unloading Valve** — The inlet unloader is normally used with closed center directional valves to unload the pump when the directional control valves are in a neutral position. This is a normally open solenoid valve that is energized whenever one of the directional control valves are shifted out of neutral. The inlet unloader on a BV18 is a DSH101NR series cartridge valve.

**Inlet Relief with Unloader** — This valve is normally used with closed center directional control valves to provide a system relief and to unload the pump when the directional control valves are in the neutral position.

**Proportional Unloader** — This valve is used in systems with single or multiple non-proportional directional control valves. The unloader is a normally open proportional flow control valve. By actuating one of the directional control valves and varying the input current to the proportional valve; the actuated directional control valve receives the benefit of proportional flow from the proportional unloader. As less flow is directed to tank by the proportional unloader, more flow is available to the actuated directional control valve. Once the optimum speed is achieved to the actuator from the directional control valve, the current to the proportional unloader can then be held constant.



## Features

- High flow capacity with reduced space requirements.
- Full cartridge design — no loose parts — standard cartridge valves.
- Relief valve is differential area, direct-acting, poppet design.
- Manual override optional for unloading valve.
- Manual override standard for proportional unloader.

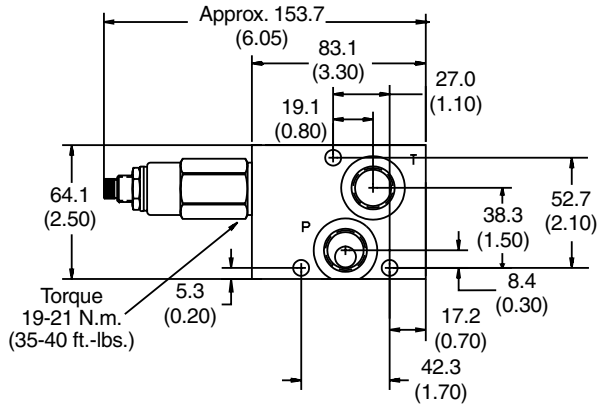
## Specifications

|  | <b>Inlet Relief</b>  | <b>Unloader</b>                                   | <b>Proportional Unloader</b> |
|--|--|---|------------------------------|
| <b>Rated Flow</b>                            | 75 LPM (20 GPM)  | 56.3 LPM (15 GPM)                                 | 52.5 LPM (14 GPM)            |
| <b>Max. Inlet Pressure</b>                   | 375 Bar (5500 PSI)   | 350 Bar (5000 PSI)                                | 210 Bar (3000 PSI)           |
| <b>Max. Setting Pressure</b>                 | 350 Bar (5000 PSI)   | Not Applicable                                    | Not Applicable               |
| <b>Reseat Pressure</b>                       | 80% of Crack Pressure  | Not Applicable                                    | Not Applicable               |
| <b>Max. Internal Leakage</b>                 | 2/3 cc/min. (10 drops/min.) at 350 Bar (5000 PSI)  | 2/3 cc/min. (10 drops/min.) at 350 Bar (5000 PSI) | 82 cc/min. (5 cu. in./min.)  |
| <b>Cavity</b>                                | C10-2  | C10-2   | C12-2                        |
| <b>Operating Temperature Range (Ambient)</b> | Nitrile: -40°C to +93°C (-40°F to +200°F)<br>Fluorocarbon: -23°C to +121°C (-10°F to +250°F) |   |                              |
| <b>Cartridge Material</b>                    | All parts steel. All working parts hardened, ground, and lapped.                             |   |                              |
| <b>Body Material</b>                         | High Tensile Aluminum or Continuous Cast Steel   |   |                              |
| <b>Filtration</b>                            | ISO Code 16/13, SAE Class 4 or better  |   |                              |
| <b>Mounting</b>                              | No restrictions  |   |                              |

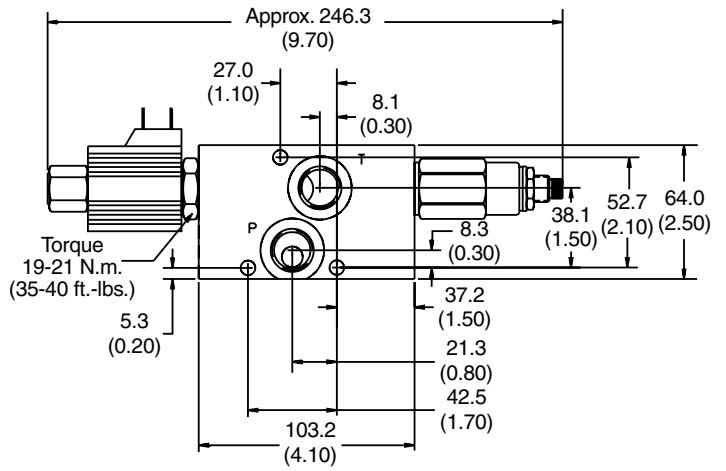
\*Inch equivalents for millimeter dimensions are shown in (\*\*)

**A**

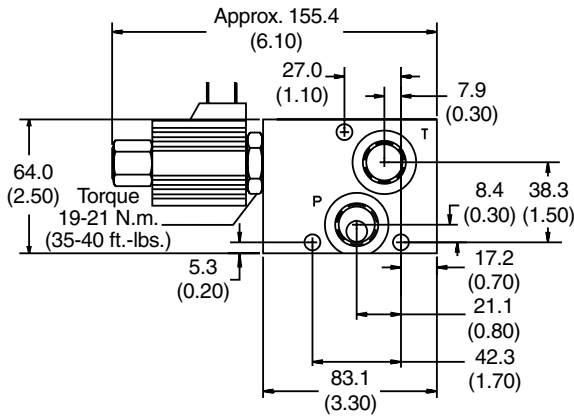
**Inlet Relief**



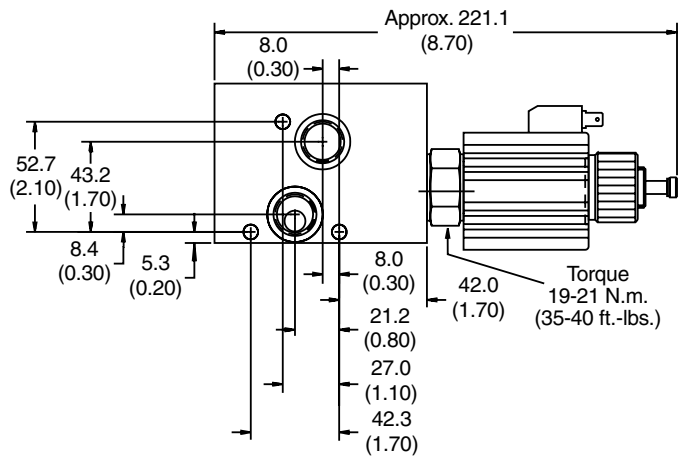
**Inlet Unloading/Relief**



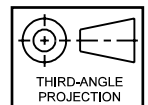
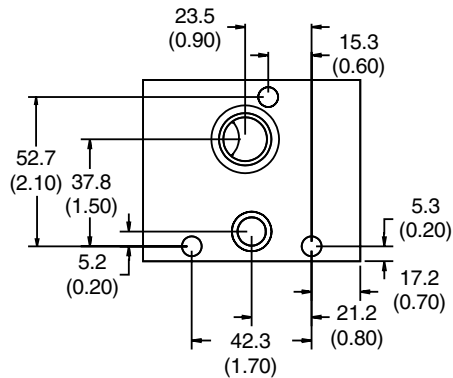
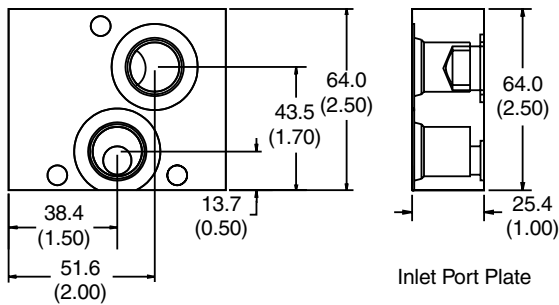
**Inlet Unloading**

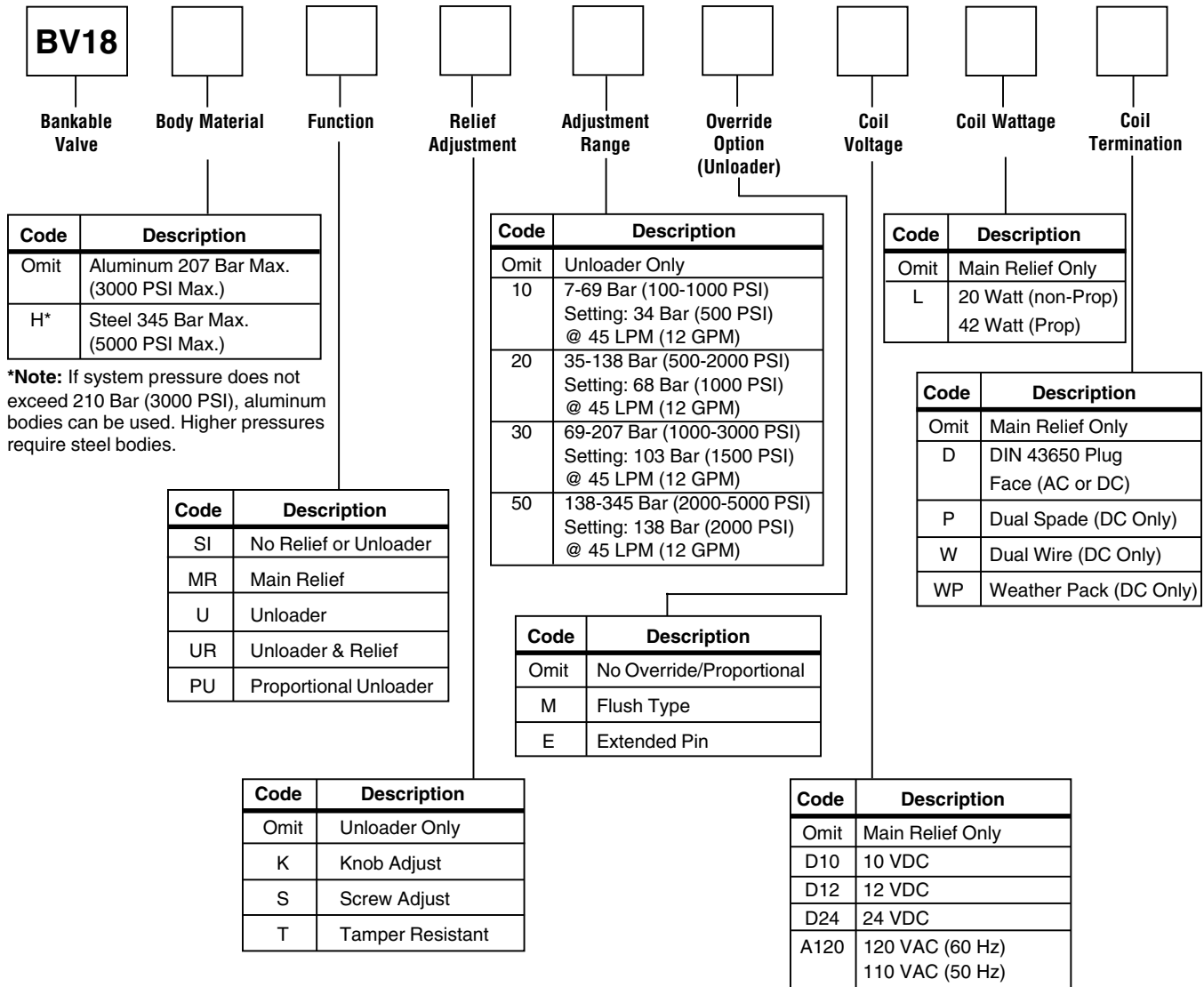


**Proportional Inlet**



**Standard Inlet**





| Service Parts         |   |
|-----------------------|---|
| Inlet Relief          | RDH103***   |
| Inlet Unloader        | DSH101N   |
| Proportional Unloader | DF122N14  |
| <b>Solenoid Coils</b> |   |
| S10LD*****            | DIN (Hirschman) Coil - Non Proportional                         |
| S10LP*****            | Double Shade Coil - Non Proportional                            |
| S10LW*****            | Double Wire Coil - Non Proportional                             |
| S10LWT*****           | Double Wire Coil with weather pack connector - Non Proportional |
| P/N 851058*****       | DIN (Hirschman) Coil - Proportional                             |
| P/N 851060*****       | Double Shade Coil - Proportional                                |
| P/N 851062*****       | Double Wire Coil - Proportional                                 |
| P/N 852855*****       | Double Wire Coil with weather pack connector - Proportional     |
| <b>Seals</b>          |   |
| 2013N-9               | Body Seal   |
| 2019N-9               | Body Seal   |

**Weights:**  
 BV18SI - 0.3 kg (12 oz.)  
 BV18MR - 0.5 kg (17 oz.)  
 BV18U - 1.1 kg (37 oz.)  
 BV18UR - 1.5 kg (54 oz.)  
 BV18PU - 1.2 kg (40 oz.)

## General Description

Bankable Stack-On valves are available on the BV18. These include single and double P.O. check valves, single and double crossover relief valves, single and double meter-in and meter-out, pressure compensated and non-compensated flow controls, single and double reliefs to tank, and single and double counterbalance valves.

All stack-on valves fit on top of their respective Bankable spool sections to provide secondary functions. Up to two different stack-on valves can be installed on top of their respective bankable spool sections.

## Operation

Stack-On single and double P.O. check valves are used in load holding operations. These should only be used in conjunction with a motor spool, a bleeder spool, or a series spool.

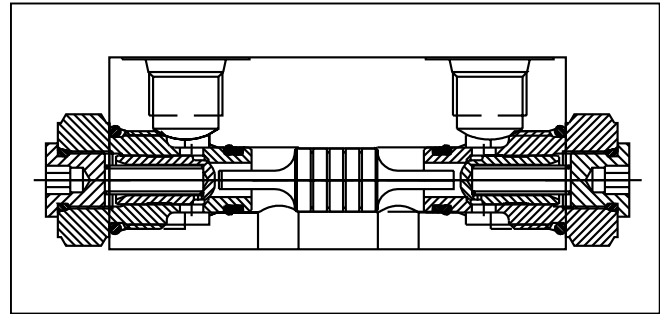
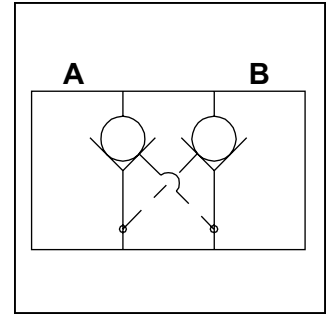
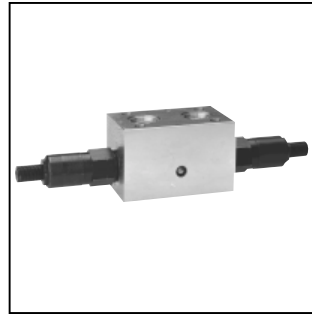
Single and double reliefs to tank are used to vent any shocks that occur at the cylinder to tank. Single and dual crossover reliefs are used to vent shocks that occur at a motor. Any spool can be used in conjunction with these reliefs.

Meter-in and meter-out flow controls are used to control speed either to or from the actuator. The pressure compensated version will provide constant flow regardless of changes in load or pressure. Any spool can be used in conjunction with these flow controls.

Single and double counterbalances are used in load holding and over center applications. These should only be used in conjunction with a motor spool, a bleeder spool, or a series spool.

## Specifications

|                                      | <b>P.O. Checks</b>   | <b>Tank Port &amp; Crossover Reliefs</b> | <b>Flow Controls</b>       | <b>P.C. Flow Controls</b> | <b>Counterbalances</b>     |
|--------------------------------------|--|--|----------------------------|---------------------------|----------------------------|
| <b>Rated Flow</b>                    | 79.5 LPM (21 GPM)  | 75.7 LPM (20 GPM)                        | 45.4 LPM (12 GPM)          | 30.3 LPM (8 GPM)          | 56.8 LPM (15 GPM)          |
| <b>Max. Operating Pressure</b>       | 350 Bar (5000 PSI)   | 350 Bar (5000 PSI)                       | 210 Bar (3000 PSI)         | 210 Bar (3000 PSI)        | 275 Bar (4000 PSI)         |
| <b>Max. Leakage @ Rated Pressure</b> | 1/3 cc/min. (5 drops/min.)   | 2/3 cc/min. (10 drops/min.)              | 1/3 cc/min. (5 drops/min.) | Not Applicable            | 1/3 cc/min. (5 drops/min.) |
| <b>Oper. Temp. Range (Ambient)</b>   | -25°C to +93°C (-40°F to +200°F)   |  |                            |                           |                            |
| <b>Cartridge Material</b>            | All parts steel. All working parts hardened, ground and lapped.                            |  |                            |                           |                            |
| <b>Body Material</b>                 | Aluminum alloy for 210 Bar (3000 PSI) or continuous cast steel for over 210 Bar (3000 PSI) |  |                            |                           |                            |
| <b>Porting</b>                       | SAE -8   | SAE -8                                   | SAE -8                     | SAE -8                    | SAE -8                     |
| <b>Filtration</b>                    | ISO Code 16/13, SAE Class 4 or better  |  |                            |                           |                            |
| <b>Mounting</b>                      | No restrictions  |  |                            |                           |                            |
| <b>Cavity</b>                        | C10-2  | C10-2                                    | C10-2                      | C10-2                     | Special                    |



## Features

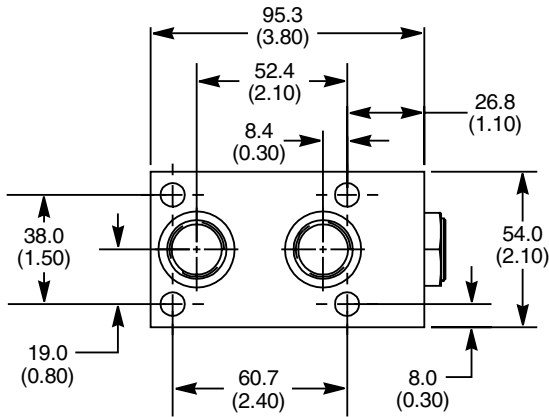
- Cartridge design eliminates leak points.
- High flow capacity with reduced space requirements.
- Reduced cumulative pressure drop.
- Easy to service.



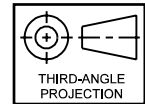
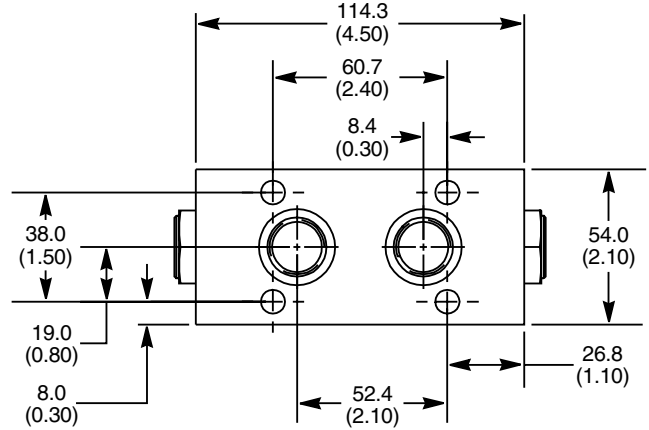
**Dimensions**

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

**Single P.O. Check**



**Double P.O. Check**



**Single P.O. Check**

| Description | Part Number                             |
|-------------|---|
| Body        | 1550014                                 |
| Piston      | 5/10 PSI - 830739<br>20/65 PSI - 830306 |
| Check Valve | CVH103                                  |

**Double P.O. Check**

| Description | Part Number                             |
|-------------|---|
| Body        | 1550012                                 |
| Piston      | 5/10 PSI - 823263<br>20/65 PSI - 830307 |
| Check Valve | CVH103                                  |

**Ordering Information**



Bankable  
Valve



Location

| Code | Description            |
|------|------------------------|
| A    | A Port P.O. Check      |
| B    | B Port P.O. Check      |
| C    | A & B Port P.O. Checks |



Cracking  
Pressure

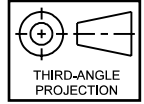
| Code | Description      |
|------|------------------|
| Omit | .68 Bar (10 PSI) |
| 5    | .34 Bar (5 PSI)  |
| 20   | 1.4 Bar (20 PSI) |
| 65   | 4.4 Bar (65 PSI) |

**Weights:**

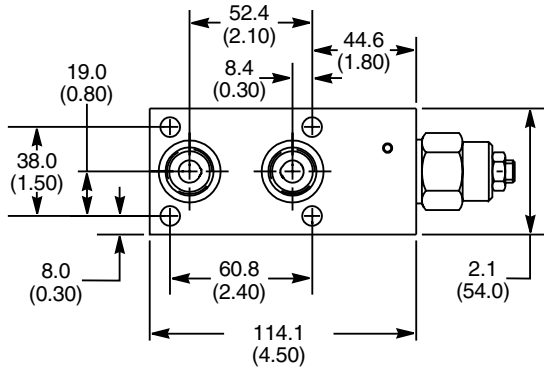
BV18A & BV18B .54 kg (19 oz.)  
 BV18C .77 kg (27 oz.)

**Dimensions**

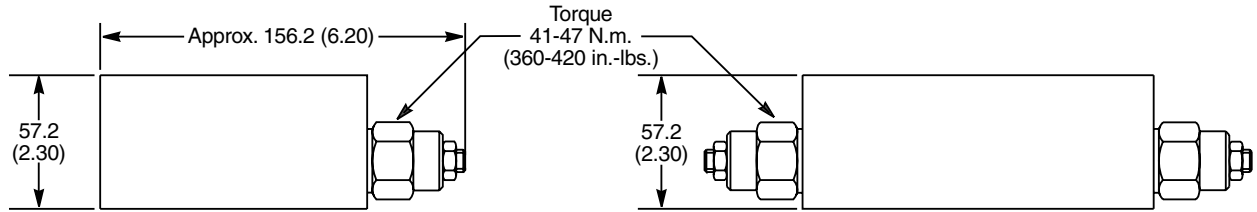
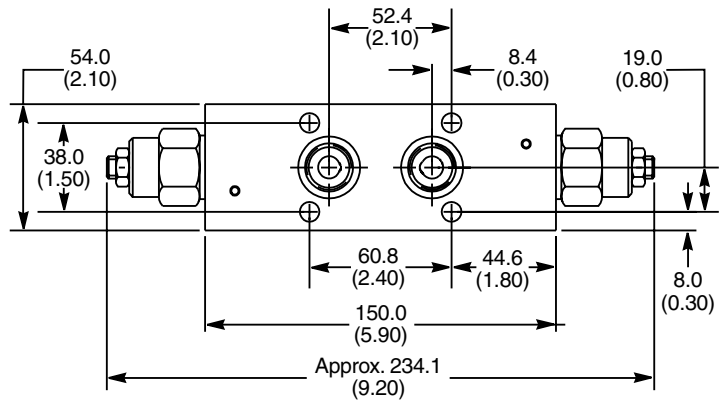
\*Inch equivalents for millimeter dimensions are shown in (\*\*)



**Single Counterbalance**



**Double Counterbalance**



**Single Counterbalance**

| Description           | Part Number     |
|-----------------------|-----------------|
| Body (N or P)         | 1550030         |
| Body (NN or PP)       | 1550148         |
| Counterbalance Valves | Consult Factory |

**Double Counterbalance**

| Description           | Part Number     |
|-----------------------|-----------------|
| Body (R)              | 1550028         |
| Body (RR)             | 1550146         |
| Counterbalance Valves | Consult Factory |

**Ordering Information**

|                             |                   |                 |                         |                              |                         |
|-----------------------------|-------------------|-----------------|-------------------------|------------------------------|-------------------------|
| <b>BV</b><br>Bankable Valve | <b>18</b><br>Size | <b>Location</b> | <b>3</b><br>Pilot Ratio | <b>S</b><br>Adjustment Style | <b>Adjustment Range</b> |
|-----------------------------|-------------------|-----------------|-------------------------|------------------------------|-------------------------|

| Code | Description                    | Code | Description                                      |
|------|--------------------------------|------|--|
| 18   | 68.1 LPM (18 GPM) Nominal Flow | N    | A Port Counterbalance<br>75.5 LPM (0-20 GPM)     |
|      |                                | NN   | A Port Counterbalance<br>56.8 LPM (0-15 GPM)     |
|      |                                | P    | B Port Counterbalance<br>75.7 LPM (0-20 GPM)     |
|      |                                | PP   | B Port Counterbalance<br>56.8 LPM (0-15 GPM)     |
|      |                                | R    | A & B Port Counterbalance<br>75.7 LPM (0-20 GPM) |
|      |                                | RR   | A & B Port Counterbalance<br>56.8 LPM (0-15 GPM) |

| Code | Description |
|------|-------------|
| S    | Screw       |

| Code | Description |
|------|-------------|
| 3    | 3.1         |

| Code | Description                    |
|------|--------------------------------|
| 15   | 27.3-102.0 Bar (400-1500 PSI)  |
| 40   | 68.0-272.1 Bar (1000-4000 PSI) |

**Weights:**  
 BV18N, BV18NN, BV18P & BV18PP .74 kg (26 oz.)  
 BV18R & BV18RR 1.25 kg (44 oz.)

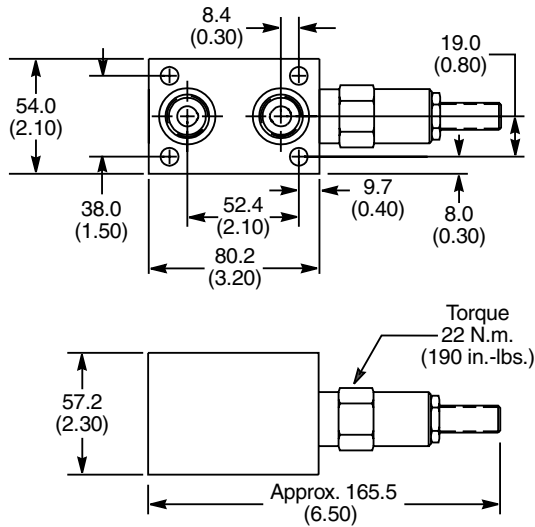




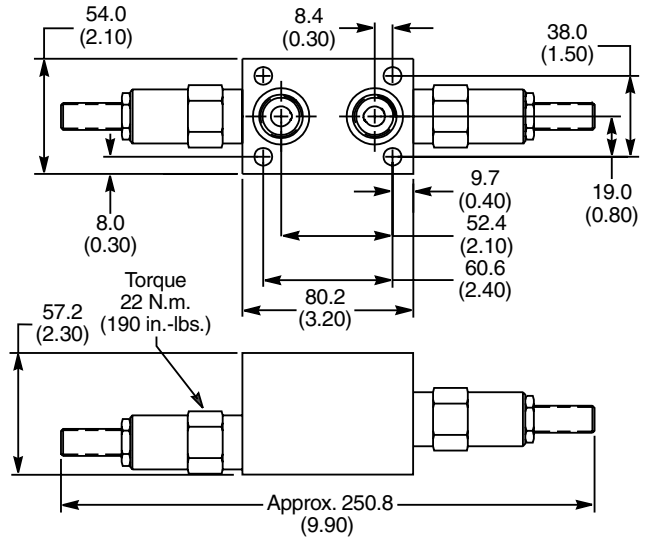
**Dimensions**

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

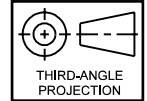
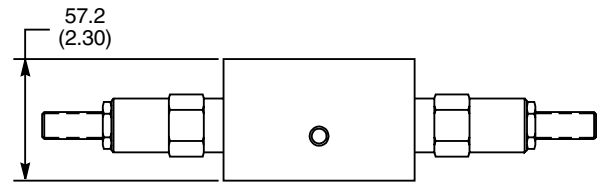
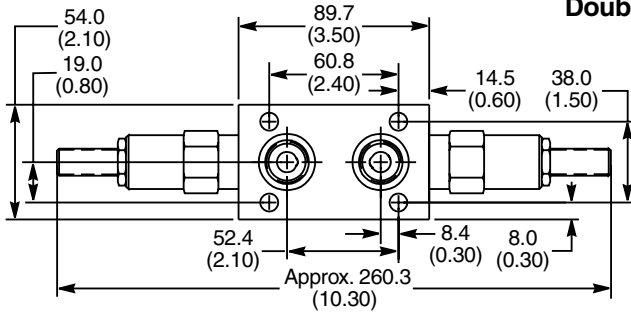
**Single Crossover Relief/Single Port Relief**



**Double Crossover Relief**



**Double Port Relief**



**Single Port Relief**

| Description   | Part Number |
|---------------|-------------|
| Body          | 1550034     |
| Relief Valves | RDH103      |

**Double Port Relief**

| Description   | Part Number |
|---------------|-------------|
| Body          | 1550036     |
| Relief Valves | RDH103      |

**Single Cross-Over Relief**

| Description   | Part Number |
|---------------|-------------|
| Body          | 1550018     |
| Relief Valves | RDH103      |

**Double Cross-Over Relief**

| Description   | Part Number |
|---------------|-------------|
| Body          | 1550017     |
| Relief Valves | RDH103      |

**Ordering Information**

**BV**

Bankable Valve

**18**

Size

Location

Adjustment Style

Adjustment Range

| Code | Description                    |
|------|--------------------------------|
| 18   | 68.1 LPM (18 GPM) Nominal Flow |

| Code | Description                       |
|------|-----------------------------------|
| D    | A Port to B Port Crossover Relief |
| E    | B Port to A Port Crossover Relief |
| F    | A Port & B Port Crossover Relief  |
| T    | A Port to Tank Relief             |
| W    | B Port to Tank Relief             |
| Y    | A & B Port to Tank Relief         |

| Code | Description  |
|------|--------------|
| S    | Screw Adjust |
| K    | Knob Adjust  |

| Code | Description   |
|------|---|
| 10   | 7-69 Bar (100-1000 PSI) Setting: 35 Bar (500 PSI) @ 11.4 LPM (10 GPM)       |
| 20   | 35-138 Bar (500-2000 PSI) Setting: 69 Bar (1000 PSI) @ 11.4 LPM (10 GPM)    |
| 30   | 69-207 Bar (1000-3000 PSI) Setting: 104 Bar (1500 PSI) @ 11.4 LPM (10 GPM)  |
| 50   | 138-345 Bar (2000-5000 PSI) Setting: 173 Bar (2500 PSI) @ 11.4 LPM (10 GPM) |

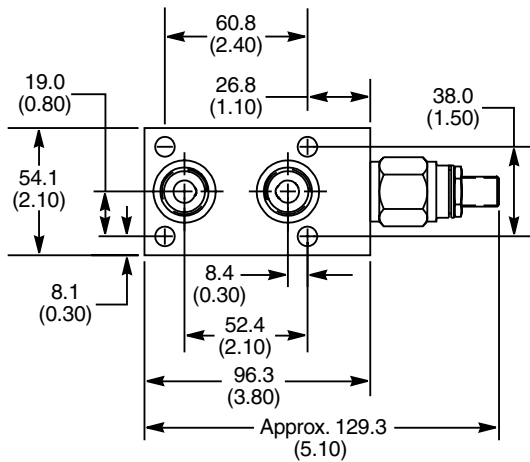
**Weights:**

BV18D, BV18E,  
 BV18T, BV18W .54 kg (19 oz.)  
 BV18F, BV18Y .79 kg (28 oz.)

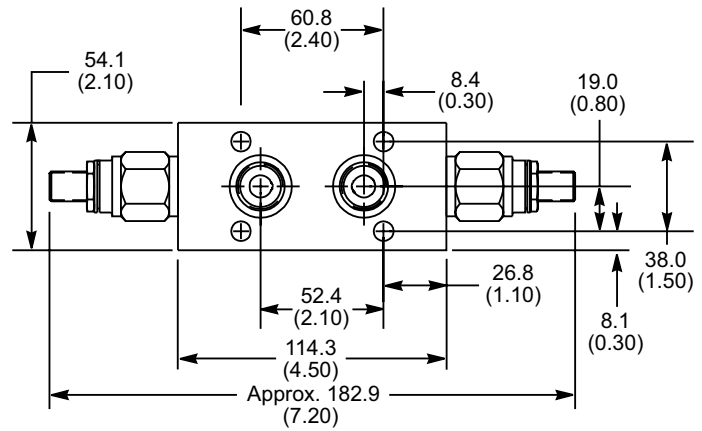
**Dimensions**

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

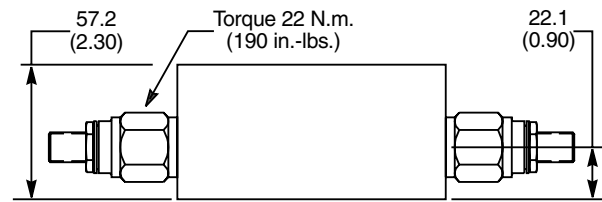
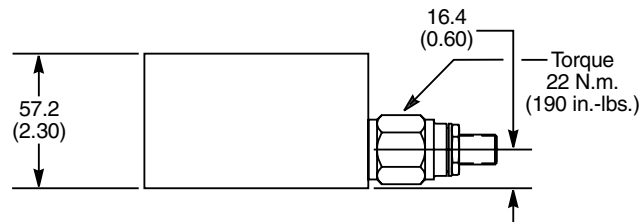
**Single P.C. Flow Control  
 Meter-In/Meter-Out**



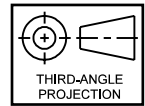
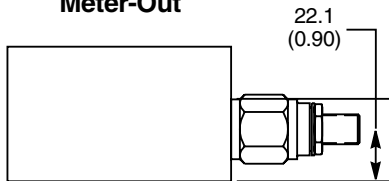
**Double P.C. Flow Control  
 Meter-In/Meter-Out**



**Meter-In**



**Meter-Out**



**Single — Meter-In P.C.  
 Flow Controls**

| Description  | Part Number |
|--------------|-------------|
| Body         | 1550026     |
| Flow Control | FC101       |

**Double — Meter-In P.C.  
 Flow Controls**

| Description  | Part Number |
|--------------|-------------|
| Body         | 1550020     |
| Flow Control | FC101       |

**Single — Meter-Out P.C.  
 Flow Controls**

| Description  | Part Number |
|--------------|-------------|
| Body         | 1550024     |
| Flow Control | FC101       |

**Double — Meter-Out P.C.  
 Flow Controls**

| Description  | Part Number |
|--------------|-------------|
| Body         | 1550023     |
| Flow Control | FC101       |

**Ordering Information**

**BV**

Bankable  
Valve

**18**

Size

Location \*

Adjustment  
Style

Adjustment  
Range

| Code | Description                       |
|------|-----------------------------------|
| 18   | 68.1 LPM (18 GPM)<br>Nominal Flow |

| Code | Description          |
|------|----------------------|
| G    | A Port Meter-In      |
| H    | B Port Meter-In      |
| J    | A & B Port Meter-In  |
| K    | A Port Meter-Out     |
| L    | B Port Meter-Out     |
| M    | A & B Port Meter-Out |

| Code | Description      |
|------|------------------|
| S    | Screw Adjust     |
| K    | Knob Adjust      |
| T    | Tamper Resistant |

| Code | Description                     |
|------|---------------------------------|
| 050  | 1.13-3.75 LPM<br>(0.3-1.0 GPM)  |
| 100  | 2.81-8.25 LPM<br>(0.75-2.2 GPM) |
| 300  | 7.5-15.0 LPM<br>(2.0-4.0 GPM)   |
| 600  | 15.1-30.3 LPM<br>(4.0-8.0 GPM)  |

**Weights:**

- BV18G, BV18H, .65 kg (23 oz.)
- BV18K, BV18L .79 kg (28 oz.)
- BV18J, BV18M .79 kg (28 oz.)

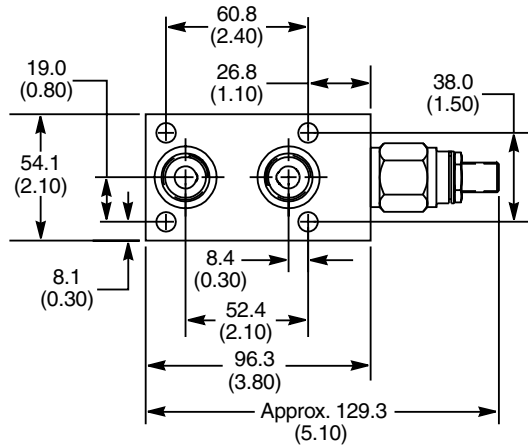
\*Meter-in is from the valve to the actuator. Meter-Out is from the actuator to the valve.



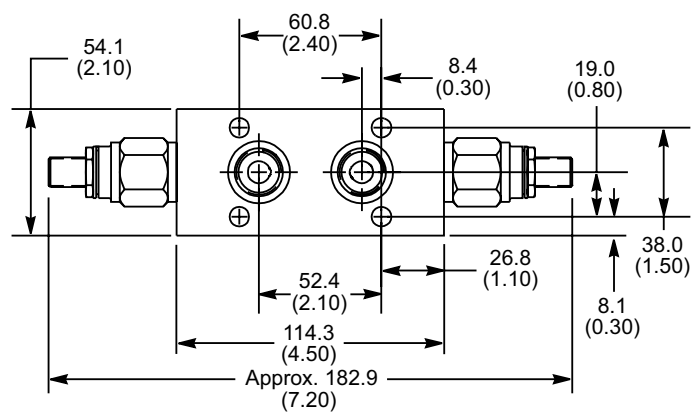
**Dimensions**

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

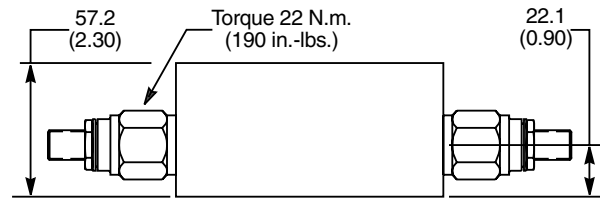
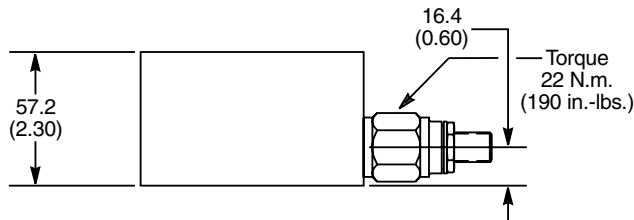
**Single — Meter-In/Meter-Out**



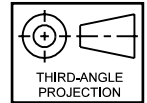
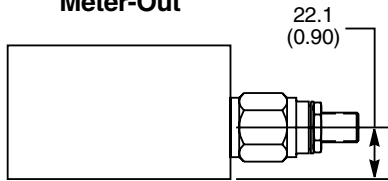
**Double — Meter-In/Meter-Out**



**Meter-In**



**Meter-Out**



**Single — Meter-In**

| Description  | Part Number |
|--------------|-------------|
| Body         | 1550024     |
| Flow Control | FV101       |

**Double — Meter-In**

| Description  | Part Number |
|--------------|-------------|
| Body         | 1550023     |
| Flow Control | FV101       |

**Single — Meter-Out**

| Description  | Part Number |
|--------------|-------------|
| Body         | 1550026     |
| Flow Control | FV101       |

**Double — Meter-Out**

| Description  | Part Number |
|--------------|-------------|
| Body         | 1550020     |
| Flow Control | FV101       |

**Ordering Information**

**BV**

Bankable Valve

**18**

Size

Location\*

Location\*

Adjustment Style

Adjustment Style

| Code | Description                    |
|------|--------------------------------|
| 18   | 68.1 LPM (18 GPM) Nominal Flow |

| Code | Description          |
|------|----------------------|
| G5   | A Port Meter-In      |
| H5   | B Port Meter-In      |
| J5   | A & B Port Meter-In  |
| K5   | A Port Meter-Out     |
| L5   | B Port Meter-Out     |
| M5   | A & B Port Meter-Out |

| Code | Description  |
|------|--------------|
| S    | Screw Adjust |
| K    | Knob Adjust  |

**Weights:**

BV18G5, BV18H5,  
 BV18K5, BV18L5 .65 kg (23 oz.)  
 BV18J5, BV18M5 .79 kg (28 oz.)

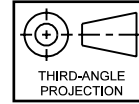
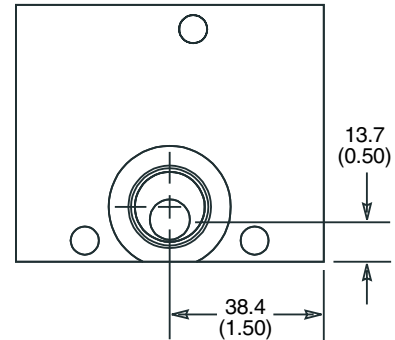
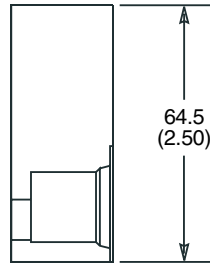
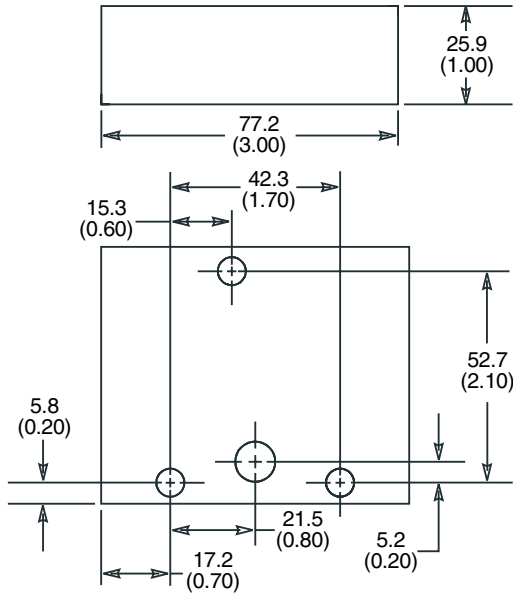
\*Meter-in is from the valve to the actuator. Meter-Out is from the actuator to the valve.

**Dimensions**

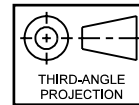
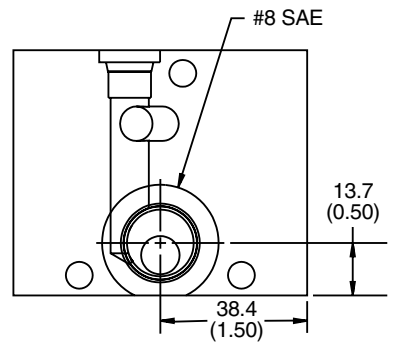
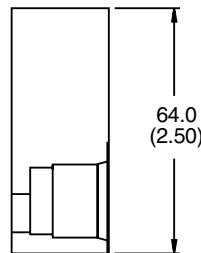
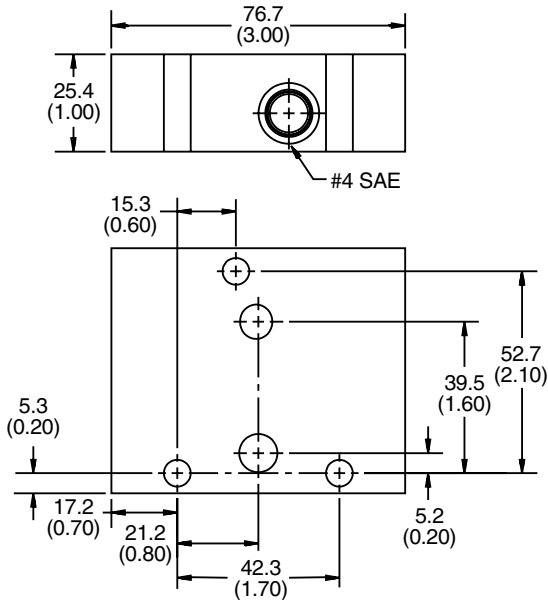
\*Inch equivalents for millimeter dimensions are shown in (\*\*)



**End Plates  
 BV18\* — EP1**



**BV18\* — EP2**



**Ordering Information**

**BV18**  
 Bankable Valve

Material

| Code | Description |
|------|-------------|
| Omit | Aluminum    |
| S    | Steel       |

**EP**  
 End Plate

Variation

| Code | Description       |
|------|-------------------|
| 1    | P & T Porting     |
| 2    | Turn Around Plate |

Weight: 0.3 kg (12 oz.)

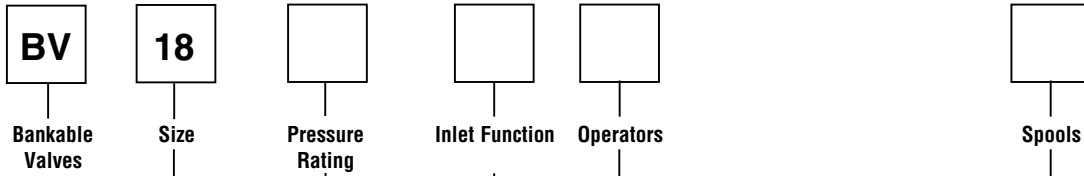
**Notes**

**A**

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**Valve Assemblies with or without Stack-On Options**

**A**



| Code | Description       |
|------|-------------------|
| 18   | 67.5 LPM (18 GPM) |

| Code | Description        |
|------|--------------------|
| Omit | 210 Bar (3000 PSI) |
| H    | 350 Bar (5000 PSI) |

| Code | Description   | Symbol |
|------|---|--------|
| SI   | No Relief<br>No Unloader  |        |
| MR   | Main Relief   |        |
| U    | Unloader  |        |
| UR   | Unloader & Relief   |        |
| PU8  | Proportional Unloader<br>52.5 LPM (14 GPM) with<br>17 Watt Coil |        |

**Note:** Specify pressure times 100.  
 Example: 20 x 100 = 2000 PSI.

| Code | Description  | Symbol |
|------|--|--------|
| 1    | Closed Center; 68.1 LPM (18 GPM)<br>Nominal; Parallel              |        |
| 2    | Open Center 90.8 LPM (24 GPM)<br>Nominal; Series or Parallel       |        |
| 4    | Motor; 90.8 LPM (24 GPM);<br>Parallel                              |        |
| 9    | TandemCenter; 68.1 LPM<br>(15 GPM); Series                         |        |
| 11   | Bleeder; 56.8 LPM (15 GPM);<br>Parallel                            |        |
| 20   | Two Position; 64.3 LPM (17 GPM);<br>Parallel                       |        |
| 81   | Closed Center; Closed Transition;<br>Proportional 22.7 LPM (6 GPM) |        |
| 82   | Motor; Meter-In; Proportional<br>22.7 LPM (6 GPM)                  |        |

**Note:** Each bank must consist of all parallel spools or all series spools.

| Code | Description           | Symbol | Code | Description                           | Symbol |
|------|-----------------------|--------|------|---------------------------------------|--------|
| S    | Dual Solenoids        |        | HA   | Hydraulic Pilot on A                  |        |
| SA   | Single Solenoid on A  |        | HB   | Hydraulic Pilot on B                  |        |
| SB   | Single Solenoid on B  |        | P    | Dual Air Pilots                       |        |
| LA   | Lever on A            |        | PA   | Air Pilot on A                        |        |
| LB   | Lever on B            |        | PB   | Air Pilot on B                        |        |
| DA   | Lever w/Detent on A   |        | F    | Proportional;<br>Dual Solenoids       |        |
| DB   | Lever w/Detent on B   |        | FA   | Proportional;<br>Single Solenoid on A |        |
| H    | Dual Hydraulic Pilots |        | FB   | Proportional;<br>Single Solenoid on B |        |



| Stack-On Options |   |               | Coil Termination   |  |               | Coil Voltage |  | Coil Wattage |             | End Plate            |  | Mounting Kit |  |
|------------------|---|---------------|--|--|---------------|--------------|--|--------------|-------------|----------------------|--|--------------|--|
| <b>Code</b>      | <b>Description</b>  | <b>Symbol</b> | <b>Code</b>  | <b>Description</b>   |               |              |  |              | <b>Code</b> | <b>Description</b>   |  |              |  |
| A                | A Port<br>P.O. Check                                      |               | Omit   | Non-Solenoid   |               |              |  |              | Omit        | P and T<br>Porting   |  |              |  |
| B                | B Port<br>P.O. Check                                      |               | D  | DIN 43650 Plug Face<br>(AC or DC)  |               |              |  |              | 2           | Turn Around<br>Plate |  |              |  |
| C                | A & B Port<br>P.O. Checks                                 |               | P  | SAE 1B-0.25<br>Double Spade (DC Only)  |               |              |  |              |             |                      |  |              |  |
| D                | A Port to B Port<br>Crossover Relief                      |               | S  | Double 8-32 Screw & Nut<br>(DC & non-Proportional<br>Only)                             |               |              |  |              |             |                      |  |              |  |
| E                | B Port to A Port<br>Crossover Relief                      |               | S1   | Single 8-32 Screw & Nut;<br>Internally Ground<br>(DC & non-Proportional Only)          |               |              |  |              |             |                      |  |              |  |
| F                | A & B Ports Dual<br>Crossover Relief                      |               | W  | Double Wire 24" Class H<br>(DC & non-Proportional Only)                                |               |              |  |              |             |                      |  |              |  |
| G                | A Port Meter-In<br>Flow Control<br>Pressure Comp.         |               | WP   | Weather Pack Connector,<br>5" Leads, Male Connector<br>(DC & non-Proportional<br>Only) |               |              |  |              |             |                      |  |              |  |
| H                | B Port Meter-In<br>Flow Control<br>Pressure Comp.         |               | <b>Note:</b> Proportional coils are available in 12 VDC and 24 VDC voltages with DIN coils only. |  |               |              |  |              |             |                      |  |              |  |
| J                | A & B Port Meter-In<br>Flow Control<br>Pressure Comp.     |               |  |  |               |              |  |              |             |                      |  |              |  |
| K                | A Port Meter- Out<br>Flow Control<br>Pressure Comp.       |               | <b>Code</b>  | <b>Description</b>   | <b>Symbol</b> |              |  |              |             |                      |  |              |  |
| L                | B Port Meter-Out<br>Flow Control<br>Pressure Comp.        |               | N  | A Port<br>Counterbalance   |               |              |  |              |             |                      |  |              |  |
| M                | A & B Port Meter-Out<br>Pressure Comp.                    |               | P  | B Port<br>Counterbalance   |               |              |  |              |             |                      |  |              |  |
| G5               | A Port Meter-In<br>Flow Control<br>Non-Pressure Comp.     |               | R  | A & B Port<br>Counterbalance   |               |              |  |              |             |                      |  |              |  |
| H5               | B Port Meter-In<br>Flow Control<br>Non-Pressure Comp.     |               | NN   | A Port<br>Counterbalance<br>56.8 LPM (15 GPM) Max.                                     |               |              |  |              |             |                      |  |              |  |
| J5               | A & B Port Meter-In<br>Flow Control<br>Non-Pressure Comp. |               | PP   | B Port<br>Counterbalance<br>56.8 LPM (15 GPM) Max.                                     |               |              |  |              |             |                      |  |              |  |
| K5               | A Port Meter-Out<br>Flow control<br>Non-Pressure Comp.    |               | RR   | A & B Port<br>Counterbalance<br>56.8 LPM (15 GPM) Max.                                 |               |              |  |              |             |                      |  |              |  |
| L5               | B Port Meter-Out<br>Flow Control<br>Non-Pressure Comp.    |               | T  | A Port to<br>Tank Relief   |               |              |  |              |             |                      |  |              |  |
| M5               | A & B Port<br>Meter-Out<br>Non-Pressure Comp.             |               | W  | B Port to<br>Tank Relief   |               |              |  |              |             |                      |  |              |  |
|                  |   |               | Y  | A & B Port to<br>Tank Relief   |               |              |  |              |             |                      |  |              |  |

**Note:** Maximum of two stack-ons per spool section.

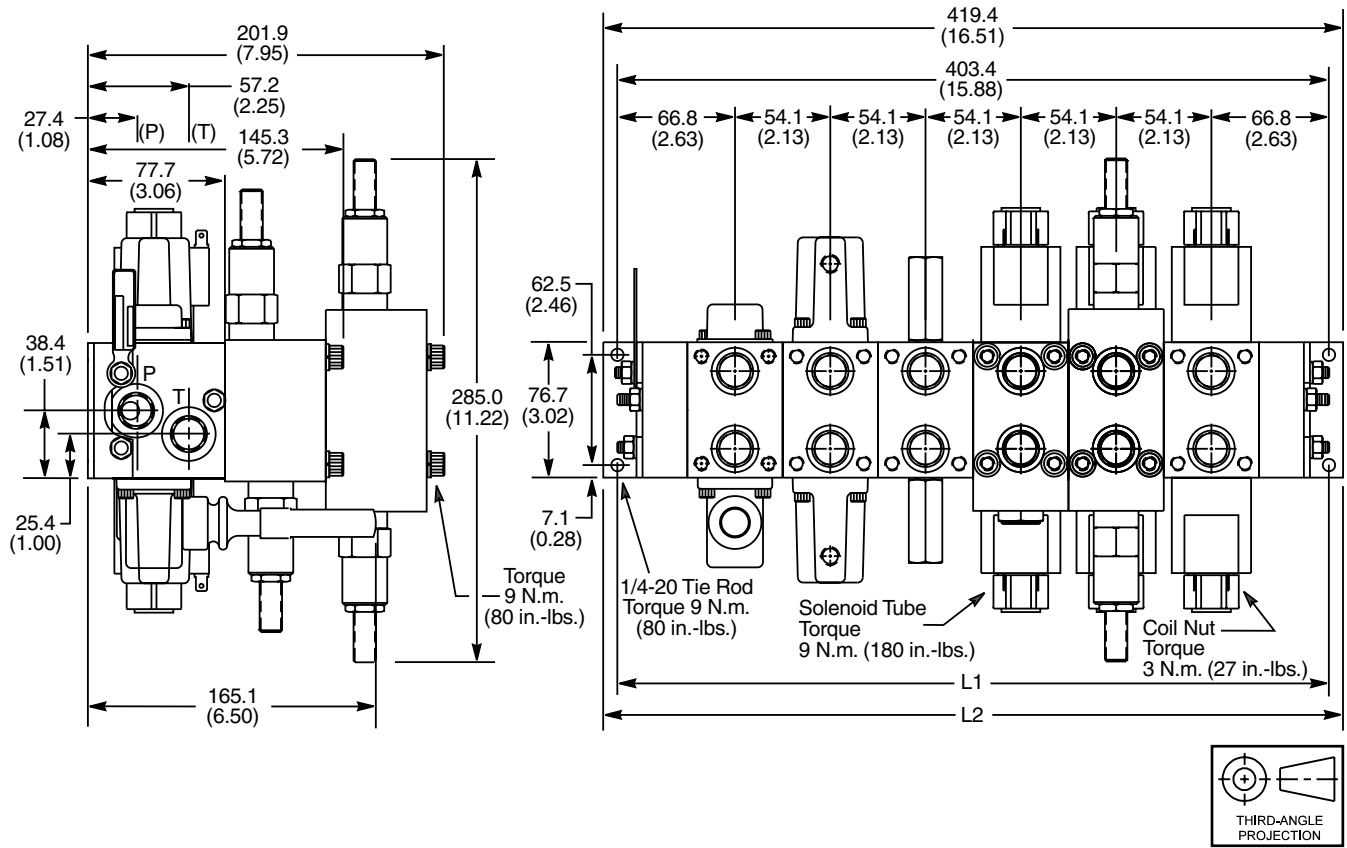
**Weights:**  
 Double Solenoid 2.93 kg (6 lbs.)  
 Single Solenoid 2.03 kg (4.5 lbs)

| Code | Description  |
|------|--------------|
| Omit | Mounting Kit |

**Note:** Mounting Kit included. See price sheet for adder.

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

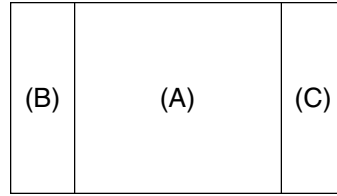
**A**



| Number of Spool Sections       | 1                                  |                 | 2               |                 | 3                                    |                  | 4                |                  | 5                                     |                  | 6                |                  |
|--------------------------------|------------------------------------|-----------------|-----------------|-----------------|--------------------------------------|------------------|------------------|------------------|---------------------------------------|------------------|------------------|------------------|
| Dimensions                     | L1                                 | L2              | L1              | L2              | L1                                   | L2               | L1               | L2               | L1                                    | L2               | L1               | L2               |
| Mounting Hole to Mounting Hole | 133.4<br>(5.25)                    |                 | 187.5<br>(7.38) |                 | 241.3<br>(9.50)                      |                  | 295.4<br>(11.63) |                  | 349.3<br>(13.75)                      |                  | 403.4<br>(15.88) |                  |
| End to End                     |                                    | 149.4<br>(5.88) |                 | 203.2<br>(8.00) |                                      | 257.3<br>(10.13) |                  | 311.2<br>(12.25) |                                       | 365.3<br>(14.38) |                  | 419.4<br>(16.51) |
| Dimensions with MR, U or UR    | 139.7<br>(5.50)                    | 155.7<br>(6.13) | 193.8<br>(7.63) | 209.6<br>(8.25) | 247.7<br>(9.75)                      | 257.3<br>(10.13) | 301.8<br>(11.88) | 317.5<br>(12.50) | 355.6<br>(14.00)                      | 371.6<br>(14.63) | 409.7<br>(16.13) | 425.7<br>(16.76) |
| Height                         | Without Stack-On<br>77.7<br>(3.06) |                 |                 |                 | With One Stack-On<br>145.3<br>(5.72) |                  |                  |                  | With Two Stack-Ons<br>202.4<br>(7.97) |                  |                  |                  |

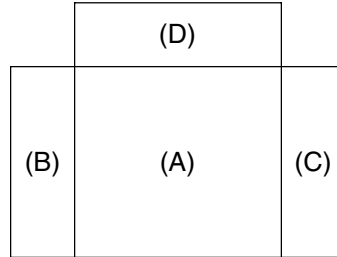


One spool section —  
 parallel or series



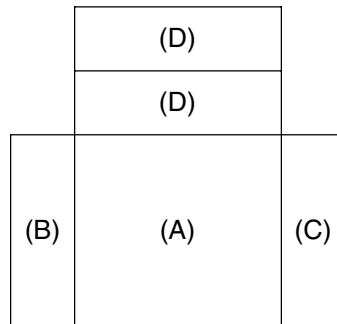
- 1 — Valve section (A)
- 1 — Inlet section (one required)  
 (Standard, unloader, inlet relief  
 or unloading relief) (B)
- 1 — End plate, BV18EP-1 (required) (C)
- 1 — Mounting Kit, BV18MK-1

One spool section —  
 parallel or series



- 1 — Valve section (A)
- 1 — Inlet section (one required)  
 (Standard, unloader, inlet relief  
 or unloading relief) (B)
- 1 — End plate, BV18EP-1 (required) (C)
- 1 — Mounting Kit, BV18MK-1
- 1 — Stacking Kit, BV18SK-1
- 1 — Stack-on section (Relief, flow  
 control, p.o. check or  
 counterbalance) (D)

One spool section —  
 parallel or series



- 1 — Valve section (A)
- 1 — Inlet section (one required)  
 (Standard, unloader, inlet relief  
 or unloading relief) (B)
- 1 — End plate, BV18EP-1 (required) (C)
- 1 — Mounting Kit, BV18MK-1
- 1 — Stacking Kit, BV18SK-2
- 2 — Stack-on sections (Relief, flow  
 control, p.o. check or  
 counterbalance) (D)

**Note:** For two spool sections through six spool sections use one spool section as a starting point.  
 Mounting kits will be — BV18MK-2, BV18MK-3, BV18MK-4, BV18MK-5 and BV18MK-6 respectively.



**Mounting Kits**

**A**

**BV18**

Bankable  
Valve

**MK**

Bolt Kit  
(Section to  
Section)

—

Number of  
Sections  
(1-6)

Circuit

| Code | Circuit   |
|------|---|
| Omit | Series or Parallel without Inlet Relief and/or Unloader |
| A    | Series or Parallel with Inlet Relief and/or Unloader    |

**Stack-on Kits**

**BV18**

Basic Valve

**SK**

Stack Kit  
(Stack-on  
to Section)

—

Number of  
Stack-ons  
(1-2)

### General Description

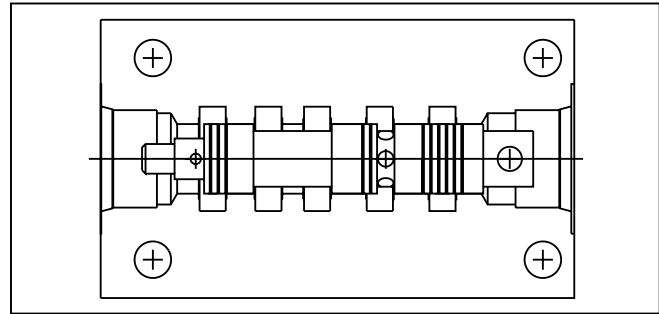
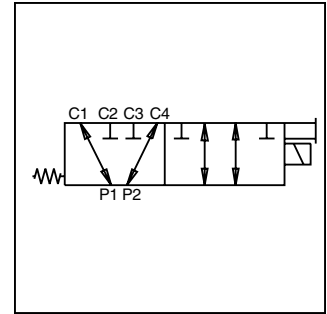
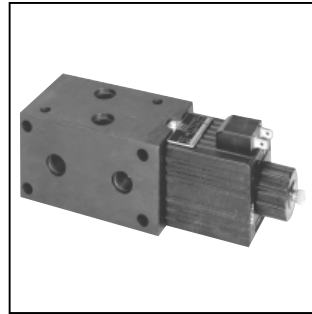
Series BVCS10 Bankables are 2 or 3 position, 4-way circuit selector valves. BVCS10 bankable valves can be used individually or in banks of up to three each. Typically, these are used in fork lift trucks for attachments such as a barrel rolling attachment.

### Operation

When the solenoid coil of the BVCS10 is de-energized, the spool connects Port P1 with Port C1 and Port P2 with Port C4; allowing flow to pass in either direction between the connected ports. When the solenoid coil is energized, the spool is shifted connection Port P1 with Port C2 and Port P2 with Port C3; allowing flow to pass in either direction between the connecting ports.

### Specifications

|   |  |
|---|--|
| <b>Nominal Flow (at 70 PSI ΔP)</b>            | 37.5 LPM (10 GPM)  |
| <b>Maximum Inlet &amp; Tank Pressure</b>      | Parallel: 210 Bar (3000 PSI) Inlet<br>210 Bar (3000 PSI) Tank<br>Series: Not Applicable            |
| <b>Porting</b>                                | SAE -6 & SAE -8  |
| <b>Maximum Internal Leakage (110 SSU oil)</b> | Selector Spool: 10817.4 cc/min.<br>(660 cu. in./min.) @ 210 Bar<br>(3000 PSI)                      |
| <b>Operating Temp. Range (Ambient)</b>        | Nitrile: -40°C to +93°C<br>(-40°F to +200°F)<br>Fluorocarbon: -32°C to +121°C<br>(-25°F to +250°F) |
| <b>Material</b>                               | Body: Precision machined and honed from cast iron<br>Spool: Hardened and ground steel              |
| <b>Filtration</b>                             | ISO Code 16/13,<br>SAE Class 4 or better   |
| <b>Mounting Position</b>                      | No restrictions  |
| <b>Mounting Type</b>                          | Individually or line mounted   |

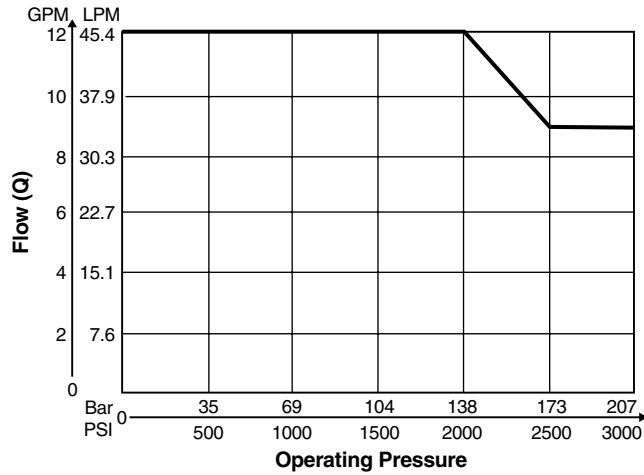


### Features

- High flow capacity with reduced space requirements.
- High back pressure; all ports withstand maximum working pressure.
- Precision machined valve body is made from high tensile cast iron.
- All solenoids are a one-piece coil featuring numerous voltages and terminations.



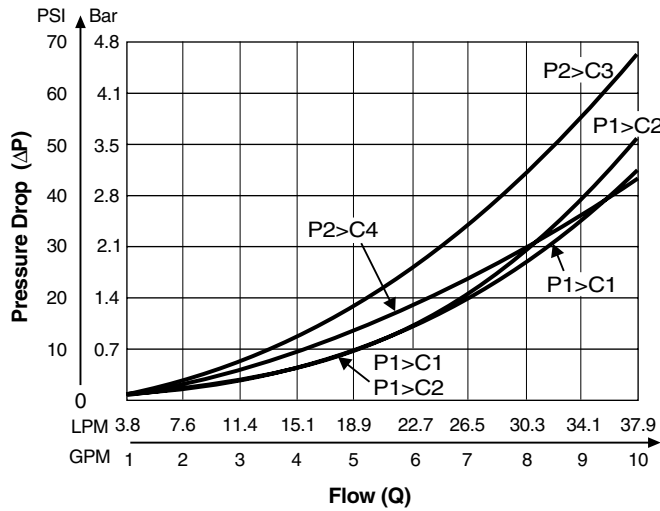
**Switching Limits**



**Notes:**

1. Unless otherwise specified, all curves were generated using solenoid actuators at 90% of rated with voltage.
2. All valves tested using 110 SSU oil.

**Differential Pressure**

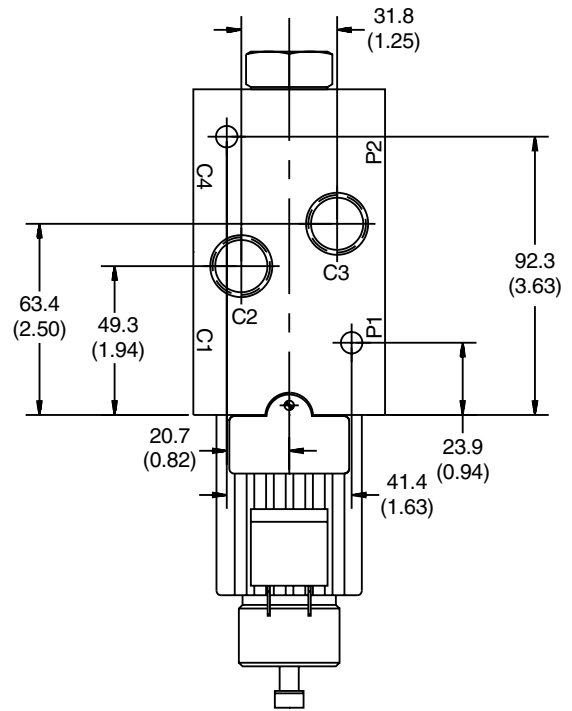
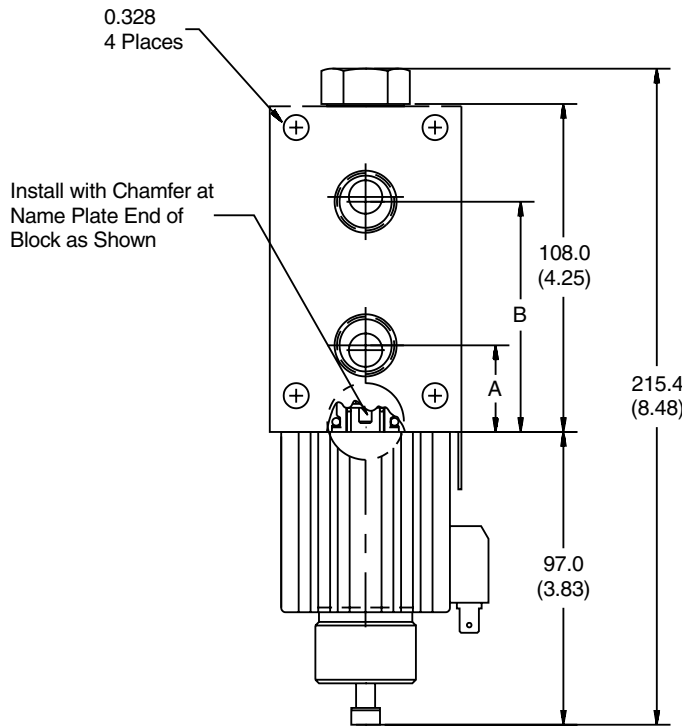


**Solenoid Coil Specifications**

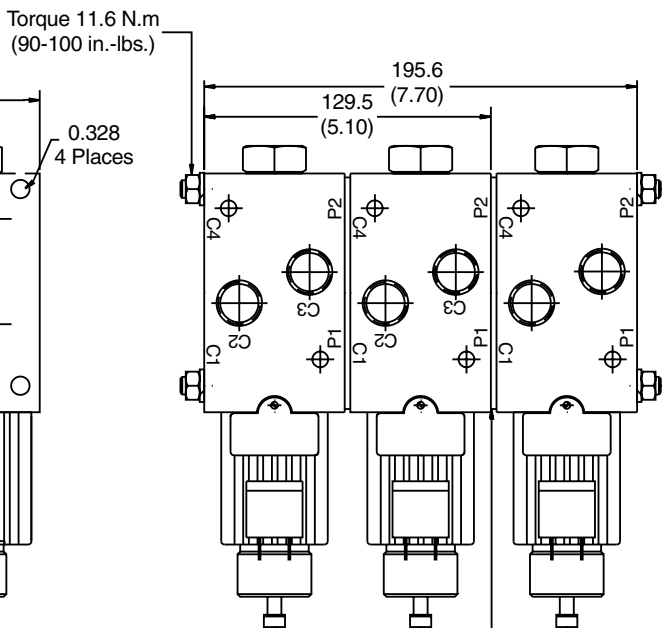
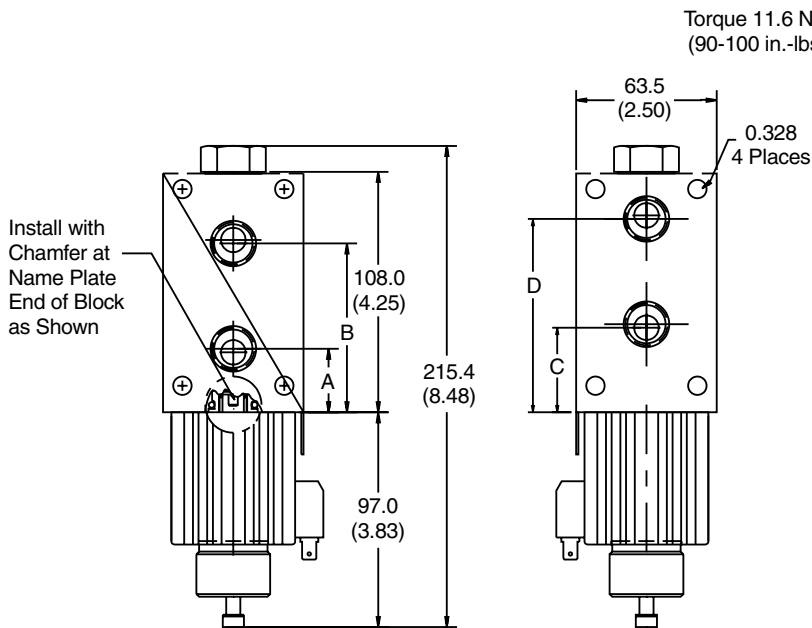
| Solenoid Code | Nominal Voltage/Hz | In Rush Amps | Holding Amps | Watts |
|---------------|--------------------|--------------|--------------|-------|
| D012          | 12 VDC             | —            | 2.0          | 42    |
| D024          | 24 VDC             | —            | 2.0          | 42    |

| Spool    | Coil Type        | Pull In | Pressure Response Drop Out | Full Shift Drop Out |
|----------|------------------|---------|----------------------------|---------------------|
| Selector | 12 VDC, 42 Watt  | 38 ms   | 18 ms                      | 175 ms              |
| Selector | 24 VDC, 42 Watt  | 36 ms   | 18 ms                      | 175 ms              |
| Selector | 120 VAC, 42 Watt | 27 ms   | 107 ms                     | 180 ms              |

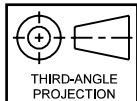
\*Inch equivalents for millimeter dimensions are shown in (\*\*)



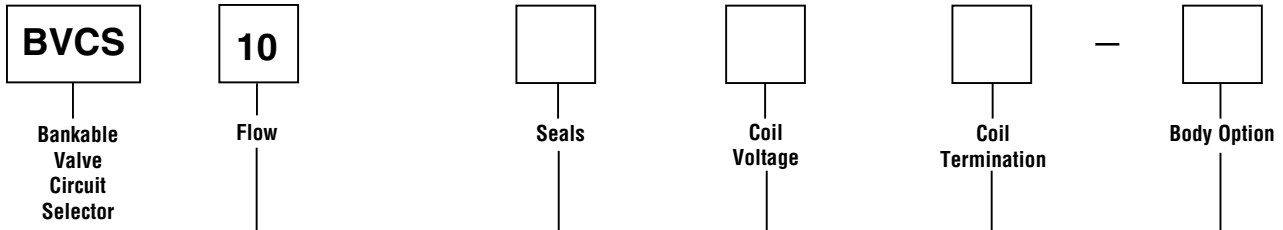
**Assembled Valves**



O-Ring Plate with 2 2217N-9 O-Rings



| Valve Port | Dimension |      |      |      |
|------------|-----------|------|------|------|
|            | A         | B    | C    | D    |
| SAE #6     | 1.06      | 3.06 | 1.50 | 3.50 |
| SAE #8     | 1.13      | 3.00 | 1.56 | 3.44 |



| Code | Description                       |
|------|-----------------------------------|
| 10   | 37.9 LPM (10 GPM)<br>Nominal Flow |

| Code | Description  |
|------|--------------|
| Omit | Nitrile      |
| V    | Fluorocarbon |

| Code | Description |
|------|-------------|
| D012 | 12 VDC      |
| D024 | 24 VDC      |
| A120 | 120 VAC     |

| Code | Description                          |
|------|--------------------------------------|
| 6T   | 9/16-18 SAE<br>Straight Thread Ports |
| 8T   | 3/4-16 SAE<br>Straight Thread Ports  |

**Weight:** 4.05 kg (9.0 lbs.)

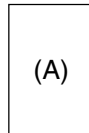
| Service Parts  |   |
|--|---|
| <b>Bodies</b>  |   |
| BVCS10-6T  | Body with 9/16-18 SAE Straight Thread Ports |
| BVCS10-8T  | Body with 3/4-16 SAE Straight Thread Ports  |
| <b>Spools</b> P/N 118985-00  |   |
| <b>Coils</b>   |   |
| P/N 851057*****  | Conduit Coil (AC or DC)                     |
| P/N 851062*****  | Double Wire Coil (DC Only)                  |
| P/N 851058*****  | DIN (Hirschman) (AC or DC)                  |
| P/N 851064*****  | Double Screw Vertically Oriented (DC Only)  |
| P/N 851060*****  | Double Spade Vertically Oriented (DC Only)  |
| P/N 851065*****  | Single Screw Vertically Oriented (DC Only)  |
| Coils are available in 12 VDC, 24 VDC, or 120 VAC only<br>851057-120V AC is a 120V AC Conduit Coil |   |
| <b>Tube Assemblies</b>   | P/N 709294-00                               |
| <b>Plug Assemblies</b>   | P/N 711168-00                               |
| <b>Tube End Nut</b>  | P/N 118378-00                               |

**Note:** All valves furnished with extended push type manual overrides.

| Code | Description  |
|------|--|
| C    | 1/2" NPTF Conduit<br>Class H Wires (AC order)              |
| D    | DIN 43650 Hirschman Plug<br>Face (AC or DC)                |
| PV   | SAE 1B-0.25 Double Spade,<br>Vertically Oriented (DC only) |
| SV   | Double 8-32 Screw & Nut<br>(DC only)                       |
| S1V  | Single 8-32 Screw & Nut,<br>Internally Ground (DC only)    |
| W    | Double Wire 24" Class H<br>(DC Only)                       |

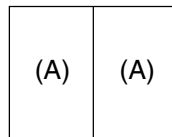
**Assembly Configurations**

One spool section



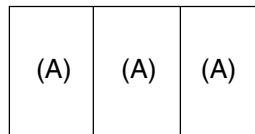
1 — BVCS10-6T or -8T Body (A)

Two spool section



2 — BVCS10-6T or -8T Body (A)  
1 — Mounting kit, BVCS10-MK2

Three spool section



3 — BVCS10-6T or -8T Body (A)  
1 — Mounting kit, BVCS10-MK3

**Mounting Kits**

| Number of Spool Section in Bank | 1          | 2          | 3          |
|---------------------------------|------------|------------|------------|
| Mounting Kit                    | BVCS10-MK1 | BVCS10-MK2 | BVCS10-MK3 |



## General Recommendations for Using Parker Products

### Pressure Ratings

Unless otherwise specified, all Parker valves have the continuous duty pressure ratings as shown in this catalog. All cartridge valve pressure ratings above 3000 PSI apply to cartridge valves installed in steel carrier blocks only. The maximum rated operating pressure for Parker valves installed in aluminum alloy carrier blocks is 207.0 Bar (3000 PSI).

### Cartridge Installation

Cartridges must be lubricated prior to installation to prevent seal damage. Install and torque to the following values to prevent leakage and potential cartridge back-out:

| Cartridge Size | Torque Specifications |
|----------------|-----------------------|
| No. 8          | 12-18 lb.-ft.         |
| No. 9          | 12-18 lb.-ft.         |
| No. 10         | 15-20 lb.-ft.         |
| No. 12         | 18-25 lb.-ft.         |

**Note:** Do not exceed these torque values, as it may result in damage to the block or valve malfunction.

### Service

Integrated hydraulic circuit valves designed with Parker valves are easily serviced by simply unscrewing the defective valve and replacing with a new one. Parker valves are not field serviceable with the exception of the external seals. Replacement seal kits for the external seals are available for all Parker valves.

### Cartridge Porting

Prior to installation of individual cartridges or cartridges in bodies, please review flows on individual cartridges and on bodies.

### System Cleanliness

Any hydraulic system that includes Parker valves should be carefully protected against dirt and fluid contamination. Life of the valves, as well as of all other components, will be greatly lengthened. Operation will be smoother and more precise. Maintenance and repairs will be reduced. Lost production because of low pressure and flow will be minimized. Fluid contamination should be maintained to less than 500 particles larger than 10 micrometers per milliliter of fluid (SAE Class 4 or better/ISO Code 16/13).

### Hydraulic Fluids

Parker recommends using top — quality hydraulic fluids having a viscosity range of 150 to 250 SSU (32 to 54 cst.) at 38°C (100°F). The absolute viscosity range should be 80 to 1000 SSU (16 to 220 cst.) Fluids should have highest anti-wear characteristics and be treated to avoid rust and oxidation.

### Seals

When used with water — glycol, water/oil emulsions, and high — grade petroleum base hydraulic fluids, Parker standard nitrile seals are suitable.

When using phosphate esters fluids or their blends, specify Parker optional seals made of DuPont Viton. Synthetic fire — resistant fluids require special seal materials which your Parker representative can recommend.

### Special Requirements

Consult your Parker representative for factory recommendations on such situations as:

- Installations that will operate regularly at pressures higher than published catalog ratings;
- Use of hydraulic fluids other than those mentioned above;
- Operations where fluid temperature will exceed 121°C (250°F).

**Parker**

Common Cavity Concept

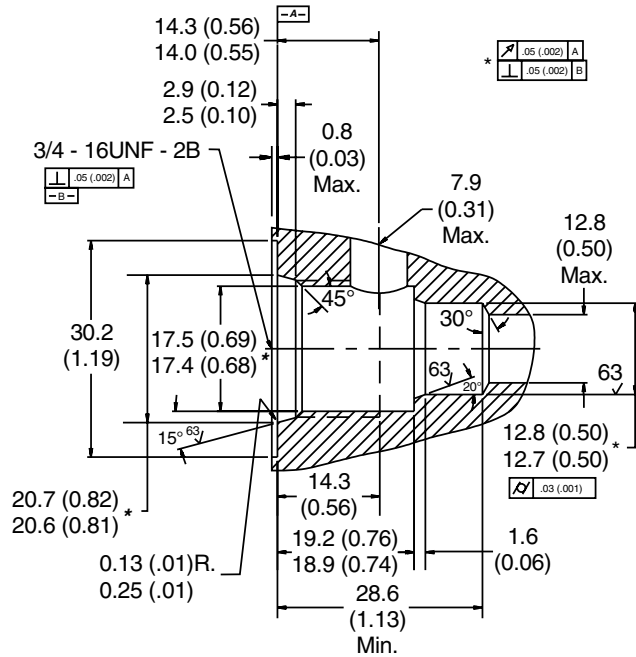
**Benefits**

- Reduces number of form tools required
- Increases manifold design efficiency
- Increases manifold machining efficiency

**Dimensions**

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

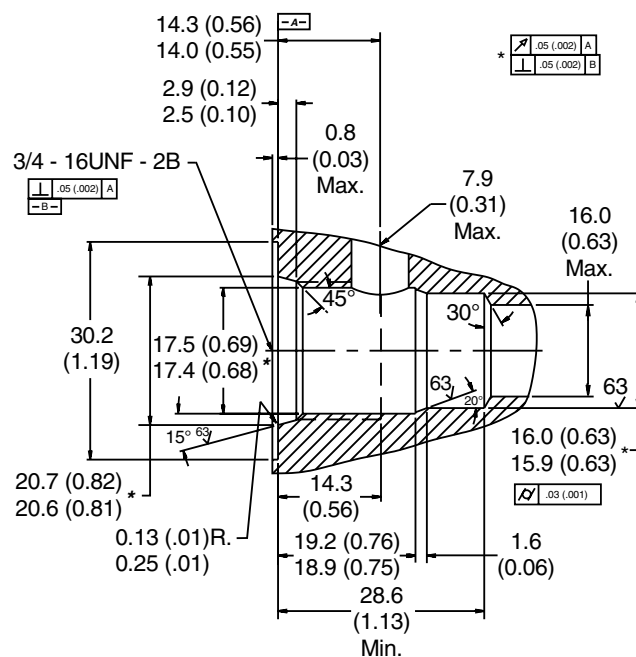
**Common Cavity No. C08-2**



**Ordering Information** Installation Tools

| Cavity No. | Form Tool No. |
|------------|---------------|
| C08-2      | FT08-2        |

**Common Cavity No. C09-2**



**Ordering Information** Installation Tools

| Cavity No. | Form Tool No. |
|------------|---------------|
| C09-2      | FT09-2        |



**Parker**

Common Cavity Concept

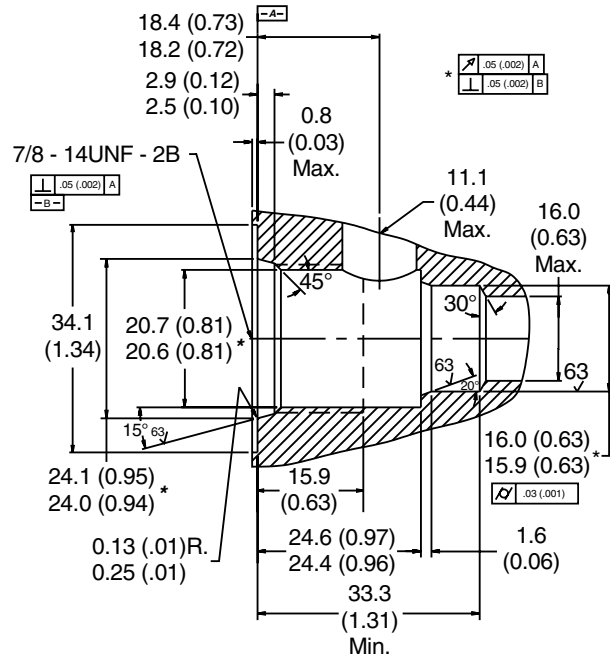
**Benefits**

- Reduces number of form tools required
- Increases manifold design efficiency
- Increases manifold machining efficiency

**Dimensions**

\*Inch equivalents for millimeter dimensions are shown in (\*\*)

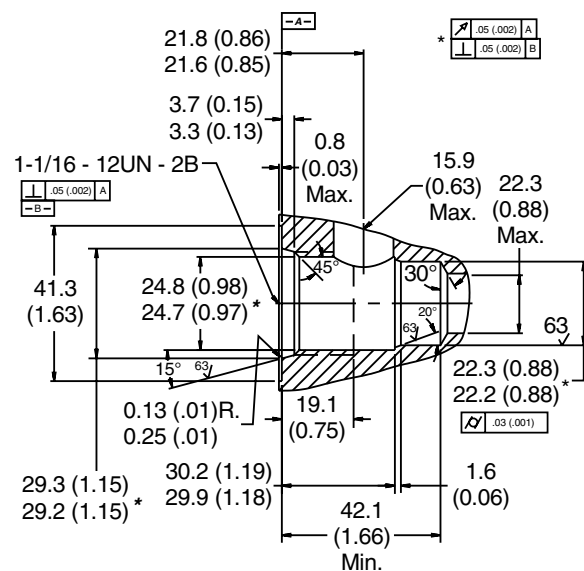
**Common Cavity No. C10-2**



**Ordering Information** Installation Tools

| Cavity No. | Form Tool No.   |             |
|------------|-----------------|-------------|
|            | 3/4" Str. Shank | Morse Taper |
| C10-2      | FT10-2          | FT10-2-T    |

**Common Cavity No. C12-2**



**Ordering Information** Installation Tools

| Cavity No. | Form Tool No.   |
|------------|-----------------|
|            | 3/4" Str. Shank |
| C12-2      | FTP12-2         |



