Directional Control Valves

SECTIONAL BODY

Model SV

STANDARD FEATURES

- 1-10 Sections Per Valve Bank
- Load Checks On Each Section
- Hard Chrome Plated Spools
- Compact Construction
- Enhanced Metering Section Available in both the High and Low Sections
- Differential Poppet Style Relief, Adjustable from 1500 to 3000 psi (Also available in Low Pressure Version Adjustable from 500 to 1500 psi)
- Power Beyond Capability
- Reversible Handle
- Mid-Inlet and Lock Valve Section available
- Flow Control Inlet

SPECIFICATIONS

Parallel or Series Circuit Construction
Pressure Rating
  Maximum Operating Pressure ........ 3000 psi
  Maximum Tank Pressure............... 500 psi
Nominal Flow Rating .................... 12 GPM
  Refer to Pressure Drop Curves.
Filtration: For general purpose valves, fluid cleanliness should meet the ISO 4406 19/17/14 level. For extended life or for pilot operated valves, the 18/16/13 fluid cleanliness level is recommended.

Foot Mounting
Maximum Operating Temp. .................... 180°F
Weight Per Section
Inlet Section .................................. Approx 3.75 lbs
Outlet Section .............................. Approx 3.75 lbs.
Work Section (Standard) .............. Approx 5.50 lbs.
Work Section (High) ...................... Approx 8.00 lbs.
### INLET SECTIONS
ALL HAVE BOTH TOP AND SIDE INLET PORTS

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>RELIEF TYPE AND SETTING</th>
<th>PORT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV12</td>
<td>Adjustable Low Pressure Relief Set at 1000 PSI</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
<tr>
<td>SV14</td>
<td>Adjustable High Pressure Relief Set At 2000 PSI</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SV15</td>
<td>Adjustable High Pressure Relief Set at 2000 PSI</td>
<td>#10 SAE ORB (7/8-14 THD)</td>
</tr>
</tbody>
</table>

### WORK SECTIONS
ALL HAVE #8 SAE ORB (3/4-16 THD) PORTS, LOAD CHECK AND STANDARD LEVER HANDLE

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>SPOOL TYPE AND ACTION</th>
<th>PORT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVE1A1</td>
<td>3-Way Single w/ Spring Center</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1B1</td>
<td>4-Way Double Acting w/ Spring Center</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1C1</td>
<td>4-Way Motor Spool w/ Spring Center (Work Ports Open to Tank in Neutral)</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1D1</td>
<td>4-Way 4 Position Float w/ Spring Center and Float Detent</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1CA1</td>
<td>4-Way Spool w/ Spring Center (with Pilot Operated Checks on Both Work Ports)</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1BA1</td>
<td>4-Way Double Acting w/ Spring Center (Work Ports Blocked in Neutral)</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1BA2</td>
<td>4-Way Double Acting w/ Spring Center</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1BA3</td>
<td>4-Way Double Acting w/ Spring Center (Work Ports Blocked in Neutral)</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1BA4</td>
<td>4-Way 4 Position Float w/ Spring Center and Float Detent</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1BB6</td>
<td>4-Way Double Acting w/ Spring Center (Work Ports Blocked in Neutral)</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1BB8</td>
<td>4-Way Double Acting w/ Spring Center</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE1BA1</td>
<td>4-Way Double Acting w/ Spring Center</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
</tbody>
</table>

### OUTLET SECTIONS
ALL HAVE BOTH TOP AND SIDE OUTLET PORTS

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>EXHAUST OPTIONS</th>
<th>PORT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVE11</td>
<td>Open Center Outlet w/ Conversion Plug</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>SVE21</td>
<td>Open Center Outlet w/ Conversion Plug</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
<tr>
<td>SVE22</td>
<td>Power Beyond Outlet w/ #8 SAE Power Beyond Port</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
<tr>
<td>SVE23</td>
<td>Closed Center Outlet</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
<tr>
<td>SVE26</td>
<td>Open Center Outlet Pressure Build-Up Valve</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
<tr>
<td>SVE27</td>
<td>Power Beyond Pressure Build-Up Valve</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
<tr>
<td>SVE28</td>
<td>Medium Pressure Build-Up (for Low Flow Applications)</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
</tbody>
</table>

### TIE ROD KITS

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>TIE ROD TORQUE</th>
<th>PORT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>660401001</td>
<td>1 Section*</td>
<td>#8 SAE ORB (3/4-16 THD)</td>
</tr>
<tr>
<td>660401002</td>
<td>2 Sections*</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
<tr>
<td>660401003</td>
<td>3 Sections*</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
<tr>
<td>660401004</td>
<td>4 Sections*</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
<tr>
<td>660401005</td>
<td>5 Sections*</td>
<td>#8 SAE ORB (7/8-14 THD)</td>
</tr>
</tbody>
</table>

### SPECIAL INLET AND OUTLET SECTIONS AVAILABLE:
Sections other than standard models listed can be made to order. Use order code Matrix below to generate a model number that meets your requirements. If you prefer, contact your Sales Representative with your specific requirements and a model number will be assigned for you. This model number can be used for future orders. A minimum order quantity will apply to special valves. Please consult Sales Representative.

#### INLET SECTIONS

<table>
<thead>
<tr>
<th>PORT SIZE</th>
<th>S V I X X - XXXX</th>
<th>RELIEF SETTING (in PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. #8 SAE ORB (3/4-16 THD)</td>
<td><strong>PORT SIZE</strong> 1. No Relief Plug 2. Adj. Low Pressure 500-1500 PSI 3. Adj. High Pressure 1500-3000 PSI 4. Plastic Plug in relief cavity. Use only when cartridge is to be installed at a later date.</td>
<td></td>
</tr>
<tr>
<td>2. #10 SAE ORB (7/8-14 THD)</td>
<td><strong>PORT SIZE</strong> 1. No Relief Plug 2. Adj. Low Pressure 500-1500 PSI 3. Adj. High Pressure 1500-3000 PSI 4. Plastic Plug in relief cavity. Use only when cartridge is to be installed at a later date.</td>
<td></td>
</tr>
</tbody>
</table>

#### PORT RELIEF WORK SECTIONS

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>SPOOL TYPE AND ACTION</th>
<th>PORT RELIEFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVE1A1</td>
<td>4-Way Double Acting w/ Spring Center</td>
<td>Adjustable 500-1500 PSI</td>
</tr>
<tr>
<td>SVE1A2</td>
<td>4-Way Double Acting w/ Spring Center</td>
<td>Adjustable 1500-3000 PSI</td>
</tr>
<tr>
<td>SVE1B1</td>
<td>4-Way Double Acting w/ Spring Center</td>
<td>Adjustable 1500-3000 PSI</td>
</tr>
<tr>
<td>SVE1B2</td>
<td>4-Way Double Acting w/ Spring Center</td>
<td>Adjustable 1500-3000 PSI</td>
</tr>
<tr>
<td>SVE1C1</td>
<td>4-Way Motor Spool w/ Spring Center (Work Ports Open to Tank in Neutral)</td>
<td>Adjustable 1500-3000 PSI</td>
</tr>
<tr>
<td>SVE1C2</td>
<td>4-Way Motor Spool w/ Spring Center (Work Ports Open to Tank in Neutral)</td>
<td>Adjustable 1500-3000 PSI</td>
</tr>
<tr>
<td>SVE1D1</td>
<td>4-Way 4 Position Float w/ Spring Center and Float Detent</td>
<td>Adjustable 1500-3000 PSI</td>
</tr>
<tr>
<td>SVE1D2</td>
<td>4-Way 4 Position Float w/ Spring Center and Float Detent</td>
<td>Adjustable 1500-3000 PSI</td>
</tr>
</tbody>
</table>

### OUTLET SECTION

<table>
<thead>
<tr>
<th>PORT SIZE</th>
<th>S V E X X</th>
<th>EXHAUST OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. #10 SAE ORB (7/8-14 THD)</td>
<td><strong>PORT SIZE</strong> 1. No Relief Plug 2. Adj. Low Pressure 500-1500 PSI 3. Adj. High Pressure 1500-3000 PSI 4. Plastic Plug in relief cavity. Use only when cartridge is to be installed at a later date.</td>
<td>1. No Relief Plug 2. Adj. Low Pressure 500-1500 PSI 3. Adj. High Pressure 1500-3000 PSI 4. Plastic Plug in relief cavity. Use only when cartridge is to be installed at a later date.</td>
</tr>
</tbody>
</table>

### VALVE ASSEMBLIES

The Model SV sectional body directional control valve can be ordered as separate sections or as a complete factory tested assembly. This will need to be specified with each order. An assembly number will be assigned at the time of the order. This assembly number can then be used for future orders.

ASSEMBLY MODEL NUMBER SVA-XXXX

XXX = Sequence of Numbers. This number will be assigned to final valve to be assembled and tested at the factory. Each new order or quote will be assigned a new assembly model number. Please use quotation sheet at the end of SV section.
PORT RELIEF WORK SECTIONS

**SECTION TYPE**

- M - Metering Work Section
- L - Work Section with Double P.O. Checks
- F - Fine Metering

**PORT SIZE**

1. #6 SAE ORB (3/4-16 THD)
2. #6 SAE ORB (9/16-18 THD)

**SPOOL TYPE**

- A - 3-Way 3-Position
- B - 4-Way 3-Position
- C - 4-Way 3 Position Motor
- D - 4-Way 4 Position Float (Must Use Float Action)
- E - 4-Way 3 Position Metering (SVM only)
- K - 4-Way 3 Position Counterbalance Drain (SVM)
- H - 4-Way 3 Position Counterbalance Drain/Motor (SVM)

1. Lock Valve Section available only with Spool Option C.
2. Metering Section available only with Spool Options E, F, or M.
3. Fine Metering available only with Spool Options J.

**PORT RELIEF WORK SECTIONS**

**SECTION TYPE**

- H - Port Relief Section
- R - Port Relief Metering Section
- G - Port Relief Metering Section

**PORT SIZE**

1. #6 SAE ORB (3/4-16 THD)
2. #6 SAE ORB (9/16-18 THD)

**SPOOL TYPE**

- A - 3-Way 3-Position
- B - 4-Way 3-Position
- C - 4-Way 3 Position Motor
- D - 4-Way 4 Position Float (Must Use Float Action)
- E - 4-Way 3 Position Metering (SVM only)
- K - 4-Way 3 Position Counterbalance Drain (SVM)
- H - 4-Way 3 Position Counterbalance Drain/Motor (SVM)

**PORT RELIEF “B” OPTION**

- A - Relief Cavity Plugged
- B - Non-Adjustable Direct Acting Relief 1500-3000 PSI
- C - Non-Adjustable Direct Acting Relief 500-1500 PSI
- D - Anti-Cavitation Check
- E - Adjustable Combination Port Relief/Anti-Cavitation Check 1000-2500 PSI***
- F - Non-Adjustable Combination Port Relief/Anti-Cavitation Check 1000-2500 PSI***
- G - Adjustable Direct Acting Relief 1500-3000 PSI
- H - Adjustable Direct Acting Relief 500-1500 PSI

**PORT RELIEF “A” OPTION**

- A - Relief Cavity Plugged
- B - Non-Adjustable Direct Acting Relief 1500-3000 PSI
- C - Non-Adjustable Direct Acting Relief 500-1500 PSI
- D - Anti-Cavitation Check
- **E - Adjustable Combination Port Relief/Anti-Cavitation Check 1000-2500 PSI***
- F - Non-Adjustable Combination Port Relief/Anti-Cavitation Check 1000-2500 PSI***
- **G - Adjustable Direct Acting Relief 1500-3000 PSI***
- **H - Adjustable Direct Acting Relief 500-1500 PSI***
- **Cannot be used on work sections with float option due to interference with handle.**
- **Do not use in applications that require low work port leakage.**

Max allowable leakage 5 in³/min @1000 psi.

**HANDLE OPTION**

1. Standard Lever Handle
2. Less Handle Only
3. Less Complete Handle Assembly
4. Adjustable Handle
5. Tang SPOOL End Only
6. Clevis SPOOL End Only
7. Vertical Handle
8. Blank for Optional Joystick Handle
9. Extended Enclosed Handle

**CUSTOM SECTION**

For OEM application custom sections can often be designed to meet your specifications. Consult your sales representative with your specific requirements and a model number will be assigned for you. This model number can be used for future orders. A minimum order quantity will apply to special valves. Please consult Sales Representative.
**FIELD CONVERSION KITS, REPAIR KITS AND RELIEF CARTRIDGES**

### SPool ATTachment KIts
- 660180001 Spring Center Kit (except SVM)
- 660180002 3 Position Detent Kit
- 660180003 Friction Detent Kit
- 6601800051 Float Detent Kit
- 660180036 Spring Center Detent In
- 660180037 Spring Center Detent Out
- 660180015 S/C w/Micro-Switch, 2 Position
- 660180016 S/C w/Micro-Switch, 1 Position

### HANDLE KITS
- 660180011 Std. Handle Kit
- 660180032 Clevis Sub-Assy
- 660180005 Complete Handle Kit
- 660180031 Pin Kit
- 660180026 Vertical Handle Kit
- 660180028 Straight Handle Kit
- 660180007 Complete Adjustable Handle Kit
- 660180006 Adjustable Handle Kit
- 660180055 Joystick Handle Kit Less Handle
- 660180234 Locking Handle Kit

*Bracket only, Micro-Switch is not provided.

### SEAL KITS
- 660580001 SVW/SVM Replacement Seal Kit
- 660580002 Inlet Seal Kit
- 660580003 Outlet Seal Kit
- 660580004 Between Section Seal Kit
- 660580010 SVH/SVR Replacement Seal Kit
- 660580009 SVL Replacement Seal Kit
- 660580011 SVS Replacement Seal Kit

### PORT RELIEFS
- 660280004 Port Relief Plug
- 660280003 Shim Adj. Port Relief 1500-3000 PSI
- 660280010 Shim Adj. Port Relief 500-1500 PSI
- 660280012 Adj. Combination Port
- 660280008 Shim Adj. Combination Port

**** Boot to be ordered in addition to joystick handle kits

### INLET RELIEFS
- 660250006 Inlet Relief Plug
- 660250005 Adj. Low Pressure Inlet Relief
- 660250002 Adj. High Pressure Inlet Relief

### OUTLET CARTRIDGES
- 200400030 Open Center Plug
- 660280001 #8 SAE Power Beyond Cart.
- 660280002 Closed Center Plug
- 660280093 Open Center Build-Up Cart.
- 660280092 Power Beyond Build-Up Cart.

### MISC. KITS
- 660180052 Load Check Kit

---

**PERFORMANCE CURVES**

**PRESSURE DROP P TO T**

<table>
<thead>
<tr>
<th>Flow GPM</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Drop PSI</td>
<td>250</td>
<td>200</td>
<td>150</td>
<td>100</td>
<td>50</td>
<td>25</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

**120 SUS OIL AT 100°F**

<table>
<thead>
<tr>
<th>Flow GPM</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Drop PSI</td>
<td>3000</td>
<td>2500</td>
<td>2000</td>
<td>1500</td>
<td>1000</td>
<td>500</td>
<td>250</td>
<td>100</td>
</tr>
</tbody>
</table>

**RELIEF VALVE CURVES**

**PRESSURE DROP P TO A OR B**

<table>
<thead>
<tr>
<th>Flow GPM</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
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<tbody>
<tr>
<td>Pressure Drop PSI</td>
<td>100</td>
<td>75</td>
<td>50</td>
<td>25</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>1</td>
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</tbody>
</table>

**PRESSURE DROP A OR B TO T**

<table>
<thead>
<tr>
<th>Flow GPM</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Drop PSI</td>
<td>100</td>
<td>75</td>
<td>50</td>
<td>25</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

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**SVS SERIES SECTION TEST DATA**

**OPEN CENTER PRESSURE DROP P TO T**

<table>
<thead>
<tr>
<th>Flow GPM</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Drop PSI</td>
<td>25</td>
<td>50</td>
<td>75</td>
<td>100</td>
<td>125</td>
<td>150</td>
<td>175</td>
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</tbody>
</table>

**OPEN CENTER PRESSURE DROP P-A-B-T**

<table>
<thead>
<tr>
<th>Flow GPM</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Drop PSI</td>
<td>25</td>
<td>50</td>
<td>75</td>
<td>100</td>
<td>125</td>
<td>150</td>
<td>175</td>
</tr>
</tbody>
</table>

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**V32**

PRINCE MANUFACTURING CORPORATION • NORTH SIoux CITY, SOUTH DAKOTA 57049

URL: www.princehyd.com • E-MAIL: prince@princehyd.com • PHONE: (605) 235-1220

CATV 32-04-21-01
### Dimensional Data

#### Work Sections

<table>
<thead>
<tr>
<th>SVW</th>
<th>2.18</th>
<th>2.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVH/SVR/SVG</td>
<td>1.50</td>
<td>1.75</td>
</tr>
<tr>
<td>SVL</td>
<td>1.50</td>
<td>1.75</td>
</tr>
<tr>
<td>SVS</td>
<td>1.50</td>
<td>1.75</td>
</tr>
<tr>
<td>SVM/SVF</td>
<td>1.50</td>
<td>1.75</td>
</tr>
</tbody>
</table>

#### Outlet Cover

- Conversion Plug: 1.09
- Top Outlet: 1.50
- Side Outlet: 2.00

#### Inlet Cover

- Top Inlet: 1.09
- Side Inlet: 1.50
- Part Number Will Be Stamped in This Location

#### Bottom View of Mounting Dimensions

- 3/8-16 UNC THD 3 Places
- Side Inlet: 2.00
- Side Outlet: 2.00

### Table: Number of Work Sections

<table>
<thead>
<tr>
<th>Number of Work Sections</th>
<th>“A”</th>
<th>“B”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.875</td>
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</tr>
<tr>
<td>2</td>
<td>4.312</td>
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<td>5.750</td>
<td>8.750</td>
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<tr>
<td>4</td>
<td>7.187</td>
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</tr>
<tr>
<td>10</td>
<td>15.812</td>
<td>18.812</td>
</tr>
</tbody>
</table>

*With #10 plug in inlet & power beyond in outlet.*
**TYPICAL STACK DIMENSIONAL DATA**

**ENCLOSED HANDLE, OPTIONS 11 AND 12**

Durable die cast metal housing. Weather and oil resistant rubber boot. Reversible handle can be mounted in either a vertical or horizontal position. The extended handle option provides the necessary clearance for work port relief and lock cartridges. The extended handle option can also be used on the SVW and SVM, work sections when it is desired to keep handles aligned in an assembly with both low and high sections.

660180149 = Option 11, enclosed handle kit
660180151 = Option 12, extended enclosed handle kit
660180150 = handle kit for enclosed handle options (handle, knob, hex nut)

(handle kit is not included in the Option 11 or 12 kits above)

**THE ROD TORQUE**
150 in-lbs +6 in - lbs
(12 1/2 ft - lbs +1/2)

---

**DURABLE DIE CAST METAL HOUSING**

**WEATHER AND OIL RESISTANT RUBBER BOOT**

**REVERSIBLE HANDLE**
Can be mounted in either a vertical or horizontal position.

**THE EXTENDED HANDLE OPTION PROVIDES THE NECESSARY CLEARANCE FOR WORK PORT RELIEF AND LOCK CARTRIDGES.**

**THE EXTENDED HANDLE OPTION CAN ALSO BE USED ON THE SVW AND SVM, WORK SECTIONS WHEN IT IS DESIRED TO KEEP HANDLES ALIGNED IN AN ASSEMBLY WITH BOTH LOW AND HIGH SECTIONS.**
PARALLEL CIRCUIT SVW, SVM, SVF, SVH, SVR, SVG AND SVL WORK SECTIONS

Parallel circuit sections are by far the most common. The SVW, SVM, SVF, SVH, SVR, SVG and SVL are all of parallel circuit construction. They can be combined together in any order in an assembly. When any one of the spools is shifted, it blocks off the open center passage through the valve. The oil then flows into the parallel circuit core making oil available to all spools. If more than one spool is fully shifted, the oil will go to the spool with the lowest pressure requirements. However, it is possible to meter the flow to the spool with the least load and provide flow to two unequal loads.

ENHANCED METERING SECTIONS
The SVM, SVF, SVR and SVG sections have metering notches machined into the spool to allow for better “feathering” of a load. The spool travel for these sections is also a little longer at .281” vs. .250” for the standard sections. In addition to the metering notches in the spool, the lands in the SVF and SVG bodies have been machined to give more precise control over the flow. The metering notches in the SVF and SVG have been optimized for flows of 10 gpm or less. For enhanced metering on higher flows, it is recommended that the SVM or SVR be used.

LOCK SECTIONS
The SVL section combines both a 4-way directional valve and a double pilot operated check valve. This provides very low leakage when the spool is in neutral. When the spool is shifted, oil is directed through a work port check to the cylinder. Pressure on the work port applies pressure to the shuttle spool, opening the opposite check valve and allowing oil to return to the valve. Depending on load pressures, the metering of the spool may be affected. In some cases a one way restrictor in a work port may be beneficial. Cracking pressure on the standard SVL section is 40psi. Higher pressure cartridges are available.

SERIES CIRCUIT SVS WORK SECTIONS

A series circuit valve is most commonly used to control more than one hydraulic component simultaneously. The entire circuit flow is available to each valve section that is actuated. In a two spool series valve with both spools actuated, the oil flows from the inlet to the work port of the first section. The return flow of the first section is directed to the open center core of the second section. (In a parallel valve the return oil from the work port is directed to the tank core.) From the open center core of the second section, the oil flows to the work port with the return oil going to the outlet. In a series circuit valve, the summation of the pressures required for each work section will equal the total pressure required for the circuit. The total pressure required must not exceed the system relief setting or the pump pressure rating. It is not required to have a SV Series section as the last section, unless series flow is required to a downstream valve. In this application, a power beyond plug must be used in the outlet section.

COMBINED SERIES / PARALLEL CIRCUITS
The SV Series circuit valve sections may be stacked with SV parallel circuit valve sections. This allows both series and parallel control in the same valve assembly.

In the valve assembly shown below, the first, third and fourth sections are parallel. The second section is series. The first parallel section has priority over all downstream valves. When the spool of the first parallel section is actuated, the return oil from the work port is directed to the tank core, thus oil flow to downstream sections is cut off. The second and third sections are in series with each other as is the second and fourth sections. The third and fourth sections are in parallel with each other.

SERIES MOTOR SPOOL
The SV Series Motor Spool provides control of reversible hydraulic motors. Both work ports are connected to the open center core in the neutral position. It should be noted that in the neutral position, the work ports will be equally pressurized to the same pressure that is required of any downstream valve sections and that a work port relief in the section will also limit the pressure of any other sections in the valve. The series motor spool should not be used to control a hydraulic cylinder as unwanted cylinder drift may occur in the neutral position.

CLOSED CENTER APPLICATIONS
The SV Series Circuit Valve sections cannot be used in a closed center valve assembly.
WORK SECTIONS

SV WORK PORT RELIEF*
SV WORK PORT RELIEFS, OPTION B, C, G, & H CAN BE ORDERED PRETESTED. USE ORDER CODE AT RIGHT

* Also used as standard main relief only models and RD4100 models.
### SV INLET RELIEF OPTIONS

**OPTION 1 NO RELIEF**
This option provides no built in relief. This is used when a relief is provided elsewhere in the system or in a closed center application. This plug can be replaced with a relief cartridge at a later date.

**OPTION 4 LOW PRESSURE ADJUSTABLE RELIEF**
This option provides for a differential poppet relief adjustable from 500-1500 PSI. Set at 1000 PSI @ 10 GPM.

**OPTION 5 HIGH PRESSURE ADJUSTABLE RELIEF**
This option provides for a differential poppet relief adjustable from 1500-3000 PSI. Set at 2000 PSI @ 10 GPM. The differential poppet relief provides smooth quiet operation with high cracking pressure. RELIEF CARTRIDGES CAN BE ORDERED PRETESTED SEE RV-OX RELIEF, PAGE V68.

### SV OUTLET COVER OPTIONS

**OPTION 1 STANDARD OPEN CENTER OUTLET WITH CONVERSION PLUG**
This is the standard outlet option. This option allows for conversion in the field for power beyond or closed center applications. When spools are in neutral the inlet is unloaded to tank.

**OPTION 2 POWER BEYOND OUTLET WITH #8 SAE BEYOND PORT**
This option provides for a high pressure power beyond port. This would be used if a valve is to be added downstream. THE OUTLET PORT MUST STILL BE CONNECTED TO TANK. When spools are in neutral the inlet is connected to the power beyond port.

**OPTION 3 CLOSED CENTER OUTLET**
This option provides for closed center operation. This is typically used with a variable displacement pressure compensated pump or in a system with an unloading valve. When the spools are in neutral the inlet port is blocked. Closed center can also be accomplished by plugging the power beyond port of option 2.

**OPTION 6 OPEN CENTER OUTLET PRESSURE BUILD-UP VALVE FOR SOLENOID OPTION**
This option directs oil from open center core thru pressure build-up valve and then to tank. See solenoid section for description of operation. Option 8 is the same as option 6, but has a higher rate spring designed to build pressure in low flow applications. (Flows Ranging from 1 to 6 gpm.)

**OPTION 7 POWER BEYOND PRESSURE BUILD-UP VALVE FOR SOLENOID OPTION**
This option directs oil from inlet thru pressure build-up valve and then downstream. This pressure build-up valve provides a #8 SAE power beyond port. The outlet must be connected to tank. Option 9 is the same as option 7, but has a higher rate spring designed to build pressure in low flow applications. (Flows Ranging from 1 to 6 gpm.)

### SV MID-INLET SECTION

**DESCRIPTION:**
A Mid-Inlet provides an inlet port for a second pump mid stream in the valve stack. A relief can be provided in this section. With the combined flow the flow from both pumps is available to the downstream sections when all the work sections upstream are in neutral. The split flow completely separates the two pump flows. The common tank passage is all that is shared between the two pump flows.

**Note:** Split flow mid inlet is not available when used after a series section and the core block plate is not used after a series section.

<table>
<thead>
<tr>
<th>SVIM</th>
<th>Last Four Digits Specify A Non-Standard Relief Pressure. When blank, refer to standard setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No Relief</td>
</tr>
<tr>
<td>2</td>
<td>SHIM Adjustable 500-1500 PSI Std. Setting 1000 PSI @ 10 GPM</td>
</tr>
<tr>
<td>3</td>
<td>SHIM Adjustable 1500-3000 PSI Std. Setting 2000 PSI @ 10 GPM</td>
</tr>
<tr>
<td>4</td>
<td>Adjustable 500-1500 PSI Std. Setting 1000 PSI @ 10 GPM</td>
</tr>
<tr>
<td>5</td>
<td>Adjustable 1500-3000 PSI Std. Setting 2000 PSI @ 10 GPM</td>
</tr>
<tr>
<td>C</td>
<td>Combined Flow Mid-Inlet</td>
</tr>
<tr>
<td>S</td>
<td>Split Flow Mid-Inlet (not available after a series section)</td>
</tr>
<tr>
<td>L</td>
<td>Pressure Build Up, Split Low Flow 1-6 GPM (for solenoid valves upstream)</td>
</tr>
<tr>
<td>H</td>
<td>Pressure Build Up, Split High Flow 7-12 GPM (for solenoid valves upstream)</td>
</tr>
</tbody>
</table>

See Section View at left. Note Location of Spacer, Part Number 671200035

1. Port Size #8 SAE ORB (3/4-16 THD)
The SV Flow Control Inlet is interchangeable with the standard SV inlet section.

**FLOW CONTROL OPTIONS:**
- **P OPTION** incorporates a solenoid operated, electrically variable pressure-compensated flow control cartridge. With the solenoid de-energized, all of the inlet flow is diverted to the tank core/EF port. By increasing the current through the solenoid, the flow directed to the power core and downstream sections will be proportionally increased, (the maximum rating of the cartridge is 16 gpm at 1500 mA) Control current is normally provided via a controller card providing, a PWM signal.
- **U OPTION** incorporates a solenoid operated, unloader cartridge. With the solenoid de-energized, all of the inlet flow is diverted to the tank core/EF port. With the solenoid energized all the inlet flow is directed to the power core and downstream sections.
- **M OPTION** incorporates a manually operated pressure-compensated flow control cartridge. With the control knob turned fully in (clockwise), all of the inlet flow is diverted to the tank core/EF port. By turning the flow control knob counterclockwise, the inlet flow directed to the power core and downstream sections is proportionally increased. Approximately 5 revolutions varies flow from no flow to full flow.

PORT OPTION 2 The flow being directed to the tank core/EF port may be utilized by a second circuit by inserting a 1/4 pipe plug into the tank core passage on the seal side of the casting and then connecting the EF port to the second circuit.

### SOLENOID OPTION
- **M- Manual Flow Control**
- **P- Electro-Proportional**
- **U- Solenoid Unloading**

### RELIEF VALVE
1. No Relief
2. Direct acting non-adjustable 500-1500 psi set at 1000 psi
3. Direct acting non-adjustable 1500-3000 psi set at 2000 psi
4. Direct acting adjustable 500-1500 psi set at 1000 psi
5. Direct acting adjustable 1500-3000 psi set at 2000 psi

*For other settings please specify, i.e. SVIF15P12Q2700 is set at 2700 psi*

### PROPORTIONAL CONTROL BOX (USE WITH SVIFP & 20IF FLOW CONTROL INLETS); P/N 671300048

The proportional control box is used to provide an adjustable electrical signal to a proportional solenoid on the SVIF and 20IF inlet sections. Once the dial is set, the regulated flow through the valve should remain approximately constant regardless of pressure. Within the operation range, flow varies approximately linearly with dial rotation.

**CONNECTIONS AND OPERATION:**
- Connect leads to the power supply and solenoid coil. Power supply should be between 9 and 30 VDC.
- With the power off, the inlet flow is directed to tank (or excess flow port).
- To provide power to the control, move the power switch to ‘ON’. (RED LED is on when control box is powered).
- Minimum flow is directed into the valve when 0% on the dial is aligned with the center mark. Maximum flow is directed into the valve when 100% is aligned with the center mark.
- Clockwise knob rotation increases flow into the valve.
- Some adjustment may be needed for operation. I-min, I-max, dither frequency & ramp time can be adjusted. See drawing for calibration instructions.
This is a special handle for the model SV stack valve that allows the spools of two adjacent sections to be operated by one common handle. The spools can be operated independently or simultaneously depending on handle movement. The option is normally used on spring center to neutral sections, but can also be used on other sections such as float sections. This handle is normally installed on valves assembled at the factory but can be installed on work sections that have handle option 3 or 9. The drawing at right shows two joysticks with offset handles installed on a six section valve. When two joysticks are installed on the same valve assembly it is recommended that there be two standard sections between them to prevent handle interference. A two section spacer is available, part no. 660380002.

Please refer to these part numbers and state which sections the handle is to be installed on when ordering a valve assembly. This handle can be installed in the field to work sections with handle option 3 (no handle).

**JOYSTICK ASSEMBLY W/STRAIGHT HANDLE:**
ASSEMBLED ON VALVE..................SVJS
KIT......................................660180017

**JOYSTICK ASSEMBLY W/OFFSET HANDLE:**
ASSEMBLED ON VALVE..................SVJO
KIT......................................660180018

**JOYSTICK ASSEMBLY W/BENT HANDLE:**
ASSEMBLED ON VALVE..................SVJB
KIT......................................660180033

**ORDERING INFORMATION**

**HEX BRASS RESTRICTOR**

<table>
<thead>
<tr>
<th>#6 SAE 9/16-18</th>
<th>#8 SAE 3/4-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>670806XXX</td>
<td>670805XXX</td>
</tr>
</tbody>
</table>

**SQUARE STEEL RESTRICTOR**

CONICAL SPRING

661181XXX

The last three digits of part number are the orifice size in thousandths of an inch. **EXAMPLE:**

<table>
<thead>
<tr>
<th>#6 SAE 9/16-18THD</th>
<th>#8 SAE 3/4-16THD</th>
</tr>
</thead>
<tbody>
<tr>
<td>670806062</td>
<td>670805062 .062 ORIFICE</td>
</tr>
<tr>
<td>670806125</td>
<td>670805125 .125 ORIFICE</td>
</tr>
<tr>
<td>670806000</td>
<td>670805000 NO ORIFICE</td>
</tr>
</tbody>
</table>

**ORDERING INFORMATION**

**ADAPTER W/HEX BRASS RESTRICTOR**

<table>
<thead>
<tr>
<th>#6 SAE 9/16-18</th>
<th>#8 SAE 3/4-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>661280XXX</td>
<td>661180XXX</td>
</tr>
</tbody>
</table>

**ADAPTER WITH SQUARE STEEL RESTRICTOR AND CONICAL SPRING**

The last three digits of part number are the orifice size in thousandths of an inch. **EXAMPLE:**

<table>
<thead>
<tr>
<th>#6 SAE 9/16-18THD</th>
<th>#8 SAE 3/4-16THD</th>
</tr>
</thead>
<tbody>
<tr>
<td>661280062</td>
<td>661180062 .062 ORIFICE</td>
</tr>
<tr>
<td>661280125</td>
<td>661180125 .125 ORIFICE</td>
</tr>
<tr>
<td>661280000</td>
<td>661180000 NO ORIFICE</td>
</tr>
</tbody>
</table>

A molded rubber boot (671300011) is available for the joystick.
Directional Control Valves

SV SOLENOID OPERATED

Work Sections

• Type “-D” and “-T” Solenoid Operated
• Type “-C” and “-S” Solenoid and Manual Operation

STANDARD FEATURES

• Open center or closed center applications
• Port relief options available
• Internal pilot supply and drain
• 12VDC, 24VDC and 120VAC
• Power beyond capability
• Load checks on each section
• May be stacked with Manual SV Sections
• 8 Series (“C” and “D”) more economical and compact

SPECIFICATIONS

Parallel or Series Circuit Construction
Pressure Rating
Maximum Operating Pressure 3000 psi
Maximum Tank Pressure 150 psi
Nominal Flow Rating 12 GPM
Differential Pressure
Required to Actuator Approx. 150 PSI

Filtration: For general purpose valves, fluid cleanliness should meet the ISO 4406 19/17/14 level. For extended life or for pilot operated valves, the 18/16/13 fluid cleanliness level is recommended.

Foot Mounting
Maximum Operating Temp......................... 180°F
Weight Per Section
Inlet Section ...................................... Approx. 3.75 lbs.
Outlet Section ................................. Approx. 3.75 lbs.
Solenoid Operated
Type “-D” and “-T” Work Section...... Approx. 11.0 lbs.
Type “-C” and “-S” Work Section .... Approx. 14.5 lbs.
The Type “-C” SV Solenoid Work Section allows remote electrical on-off or manual control. The “-C” sections are 8 series work sections which use screw in cartridges with a #8 thread size. The screw in cartridges provide a robust platform for the higher tank pressures often seen in mobile applications and the #8 size allows for a more compact section size. Cartridges and coils on the 8 series are not interchangeable with the Prince 10 series solenoid sections or sections manufactured prior to November 2014. Any of the standard “S”, “T”, “C” or “D” style Prince SV solenoid operated work sections may be used in any combination within a stack valve assembly.

The Type “-C” SV Solenoid Section contains two 3-way 2-position, #8 solenoid cartridge valves and a pilot operated piston attached to the main control spool. When both solenoids are de-energized, both sides of the pilot piston are open to tank pressure and the spool remains spring centered. When solenoid “A” is energized, pilot pressure is applied to one side of the pilot piston, causing the spool to shift from the neutral position and direct flow to work port “A”. When solenoid “B” is energized, pilot pressure is applied to the other side of the pilot piston, causing the spool to shift and direct flow to work port “B”. An optional manual override feature is available for the solenoid cartridges.

Internal pilot lines provide pilot pressure to the solenoid actuator. Pilot pressure is generated by a “Pressure Build-Up Valve” that is installed in the standard outlet section. Two versions of the pressure build-up valve are offered, the open center pressure build-up valve and power beyond pressure build-up valve. Both versions supply 150-200 PSI pilot pressure to the solenoid actuator. A closed center assembly does not require a pressure build-up valve. For an open center system, the pilot pressure can also be provided by an in-line manifold, which can provide filtered pilot flow.

### ORDER CODE MATRIX - TYPE “-C” SOLENOID OR MANUAL WORK SECTIONS

#### 8 SERIES SOLENOID OPERATED SVW, SVM AND SVL SECTION

<table>
<thead>
<tr>
<th>SECTION TYPE</th>
<th>S V W X X X X X X X X X X X X X C X X X</th>
</tr>
</thead>
<tbody>
<tr>
<td>PORT SIZE</td>
<td>1. #8 SAE</td>
</tr>
<tr>
<td>SPOOL TYPE</td>
<td>A - 3-Way 3-Position</td>
</tr>
<tr>
<td></td>
<td>B - 4-Way 3-Position</td>
</tr>
<tr>
<td></td>
<td>C - 4-Way 3-Position Motor</td>
</tr>
<tr>
<td></td>
<td>E - 4-Way 3 Position Metering (SVM only)</td>
</tr>
<tr>
<td></td>
<td>F - 3-Way 3 Position Metering (SVM only)</td>
</tr>
<tr>
<td></td>
<td>K - 4-Way 3 Position Counterbalance Drain (SVW only)</td>
</tr>
<tr>
<td></td>
<td>M - 4-Way 3 Position Counterbalance Drain (SVM only)</td>
</tr>
<tr>
<td>SPOOL ACTIONS</td>
<td>A - Spring Center</td>
</tr>
<tr>
<td></td>
<td>B - Non-Adjustable Direct Acting</td>
</tr>
<tr>
<td></td>
<td>C - Non-Adjustable Direct Relief</td>
</tr>
<tr>
<td></td>
<td>G - Adjustable Direct Acting</td>
</tr>
<tr>
<td></td>
<td>H - Adjustable Direct Acting</td>
</tr>
<tr>
<td></td>
<td>K - 4-Way Series Motor</td>
</tr>
<tr>
<td></td>
<td>L - Lock Section (Use C Spool)</td>
</tr>
<tr>
<td></td>
<td>M - Metering Work Section (Use E, F, or M Spool)</td>
</tr>
</tbody>
</table>

#### 8 SERIES SOLENOID OPERATED PORT RELIEF WORK SECTIONS

<table>
<thead>
<tr>
<th>SECTION TYPE</th>
<th>S V H X X X X X X X X X X X X X C X X X</th>
</tr>
</thead>
<tbody>
<tr>
<td>PORT SIZE</td>
<td>1. #8 SAE</td>
</tr>
<tr>
<td>SPOOL TYPE</td>
<td>A - 3-Way 3-Position</td>
</tr>
<tr>
<td></td>
<td>B - 4-Way 3-Position</td>
</tr>
<tr>
<td></td>
<td>C - 4-Way 3-Position Motor</td>
</tr>
<tr>
<td></td>
<td>E - 4-Way 3 Position Metering (SVR only)</td>
</tr>
<tr>
<td></td>
<td>F - 3-Way 3 Position Metering (SVR only)</td>
</tr>
<tr>
<td></td>
<td>G - 4-Way Series</td>
</tr>
<tr>
<td></td>
<td>H - 4-Way Series Motor</td>
</tr>
<tr>
<td></td>
<td>K - 4-Way Series Motor</td>
</tr>
<tr>
<td></td>
<td>L - Lock Section (Use C Spool)</td>
</tr>
<tr>
<td></td>
<td>M - Metering Work Section (Use E, F, or M Spool)</td>
</tr>
</tbody>
</table>

#### COIL VOLTAGE & TERMINATION *

- 12Q, 12 VDC Double Spade
- 12L, 12 VDC Double Wire
- 12H, 12 VDC DIN 43650
- 12D, 12 VDC Integral Deutsch
- 24Q, 24 VDC Double Spade
- 24L, 24 VDC Double Wire
- 24H, 24 VDC DIN 43650
- 24D, 24 VDC Integral Deutsch
- 11H, 120 VAC DIN 43650

#### SOLENOID OPERATION

- A - Relief Cavity Plugged
- B - Non-Adjustable Direct Acting
- C - Non-Adjustable Direct Acting
- G - Adjustable Direct Acting
- H - Adjustable Direct Acting
- M - 4-Way Series Motor
- N - Adjustable Direct Acting
- P - 4-Way Series Motor
- R - Metering Work Section (Use E, F, or M Spool)
- S - Series Section (Use G Spool)
- U - Relief 500-1500 PSI
- V - Adjustable Direct Acting
- W - 4-Way Series Motor
- X - Non-Adjustable Direct Acting
- Y - 4-Way Series Motor
- Z - Non-Adjustable Direct Acting

#### PORT RELIEF “B” OPTION

- A - Relief Cavity Plugged
- B - Non-Adjustable Direct Acting
- C - Non-Adjustable Direct Acting

#### PORT RELIEF “A” OPTION

- A - Relief Cavity Plugged
- B - Non-Adjustable Direct Acting
- C - Non-Adjustable Direct Acting

*See page V48 for Coil details*
SV (8 SERIES) SOLENOID WORK SECTION (SOLENOID ON BOTH ENDS) 
DESCRIPTION OF OPERATION

The Type “-D” SV Solenoid Work Section allows remote electrical on-off control. The “-D” sections are 8 series work sections which use screw in cartridges with a #8 thread size. The screw in cartridges provide a robust platform for the higher tank pressures often seen in mobile applications and the #8 size allows for a more compact section size. Cartridges and coils on the 8 series are not interchangeable with the Prince 10 series solenoid sections or sections manufactured prior to November 2014. Any of the standard “-S”, “-T”, “-C” or “-D” style Prince SV solenoid operated work sections may be used in any combination within a stack valve assembly.

The Type “-D” SV Solenoid Section contains two 3-way 2-position, #8 solenoid cartridge valves, one at each end of the main valve body. When both solenoids are de-energized, both ends of the control valve spool are open to tank pressure and the spool remains spring centered. When solenoid “A” is energized, pilot pressure is applied to one end of the control valve spool causing the spool to shift from the neutral position to full stroke which directs flow to work port “A”. When solenoid “B” is energized, pilot pressure is applied to the other end of the control valve spool, causing the spool to shift to full stroke which directs flow to work port “B”. An optional manual override feature is available for the solenoid cartridges.

Internal pilot lines provide pilot pressure to the solenoid actuator. Pilot pressure is generated by a “Pressure Build-Up Valve” that is installed in the standard outlet section. Two versions of the pressure build-up valve are offered, the open center pressure build-up valve and power beyond pressure build-up valve. Both versions supply 150-200 PSI pilot pressure can also be provided by an in manifold, which can provide filtered pilot flow.

ORDER CODE MATRIX - TYPE “-D” SOLENOID OR MANUAL WORK SECTIONS

8 SERIES SOLENOID OPERATED SVW, SVM AND SVL WORK SECTIONS

SECTION TYPE
W - Standard Work Section
L - Lock Section (Use C Spool)

PORT SIZE
1. #8 SAE

SPOOL TYPE
A - 3-Way 3-Position
B - 4-Way 3-Position
C - 4-Way 3-Position Motor
K - 4-Way 3-Position Counterbalance Drain (SVW only)

SPOOL ACTIONS
A - Spring Center

8 SERIES SOLENOID OPERATED PORT RELIEF WORK SECTION

SECTION TYPE
H - Port Relief Section
S - Series Section (Use G Spool)

PORT SIZE
1. #8 SAE

SPOOL TYPE
A - 3-Way 3-Position
B - 4-Way 3-Position
C - 4-Way 3-Position Motor
G - 4-Way Series
H - 4-Way Series Motor
K - 4-Way 3-Position Counterbalance Drain (SVH only)

SPOOL ACTIONS
A - Spring Center

PORT RELIEF “A” OPTION
A - Relief Cavity Plugged
B - Non-Adjustable Direct Acting Relief 1500-3000 PSI
C - Non-Adjustable Direct Acting Relief 500-1500 PSI
G - Adjustable Direct Acting Relief 1500-3000 PSI
H - Adjustable Direct Acting Relief 500-1500 PSI

PORT RELIEF “B” OPTION
A - Relief Cavity Plugged
B - Non-Adjustable Direct Acting Relief 1500-3000 PSI
C - Non-Adjustable Direct Acting Relief 500-1500 PSI
G - Adjustable Direct Acting Relief 1500-3000 PSI
H - Adjustable Direct Acting Relief 500-1500 PSI

COIL VOLTAGE & TERMINATION *
12Q, 12 VDC Double Spade
12L, 12 VDC Double Wire
12H, 12 VDC DIN 43650
12D 12 VDC Integral Deutsch
24Q, 24 VDC Double Spade
24L, 24 VDC Double Wire
24H, 24 VDC DIN 43650
24D 24 VDC Integral Deutsch
11H, 120 VAC Din 43650

Solenoid Operation
D - Standard Solenoid Cartridge
DM - Solenoid Cartridge w/Manual Override

* See page V48 for coil details
SV “8 SERIES” TYPE C
Solenoid or manual work section dimensions

PART NUMBER WILL BE STAMPED IN THIS LOCATION

SV “8 SERIES” TYPE D
Solenoid work section dimensions
SV (10 SERIES) SOLENOID OR MANUAL WORK SECTIONS
(Both Solenoids on One End) Description of Operation

The Type “-S” SV Solenoid Work Section allows remote electrical on-off or manual control. The “-S” sections are 10 series work sections which use screw in cartridges with a #10 thread size. Cartridges and coils on the 10 series will be interchangeable with the components on Prince solenoid operated valves manufactured prior to November 2014 was well as current production 10 series valves. Any of the standard “-S”, “-T”, “-C” or “-D” style Prince SV solenoid operated work sections may be used in any combination within a stack valve assembly.

The Type “-S” SV Solenoid Section contains two 3-way 2-position, #10 solenoid cartridge valves and a pilot operated piston attached to the main control spool. When both solenoids are de-energized, both sides of the pilot piston are open to tank pressure and the spool remains spring centered. When solenoid “A” is energized, pilot pressure is applied to one side of the pilot piston, causing the spool to shift from the neutral position and direct flow to work port “A”. When solenoid “B” is energized, pilot pressure is applied to the other side of the pilot piston, causing the spool to shift and direct flow to work port “B”.

Internal pilot lines provide pilot pressure to the solenoid actuator. Pilot pressure is generated by a “Pressure Build-Up Valve” that is installed in the standard outlet section. Two versions of the pressure build-up valve are offered, the open internal pilot lines and power beyond pressure build-up valve. Both versions supply 150-200 PSI pilot pressure to the solenoid actuator. A closed center assembly does not require a pressure build-up valve. For an open center system, the pilot pressure can also be provided by an in inlet manifold, which can provide filtered pilot flow.

ORDER CODE MATRIX - TYPE “-S” SOLENOID OR MANUAL WORK SECTIONS

### 10 SERIES SOLENOID Operated Port Relief Work Sections

#### SECTION TYPE
- W - Standard Work Section
- L - Lock Section (Use C Spool)
- M - Metering Work Section (Use E, F or M spool)

#### PORT SIZE
- 1. #8 SAE

#### SPOOL TYPE
- A - 3-Way 3-Position
- B - 4-Way 3-Position
- C - 4-Way 3-Position Motor
- E - 4-Way 3 Position Metering (SV only)
- F - 3-Way 3 Position Metering (SV only)
- K - 4-Way 3 Position Counterbalance Drain (SVM only)
- M - 4-Way 3 Position Counterbalance Drain (SVM only)

#### SPOOL ACTIONS
- A - Spring Center

#### HANDLE OPTION
- 1. Std. Lever Handle
- 2. Less Handle Only
- 3. Less Complete Handle Assembly
- 4. Adjustable Handle
- 5. Tang Spool End Only
- 6. Clevis Spool End Only
- 7. Vertical Handle
- 8. Straight Handle
- 9. Adjustable Handle
- 10. Extended Enclosed Handle
- 11. Enclosed Handle

### 10 SERIES SOLENOID OPERATED PORT RELIEF WORK SECTIONS

#### SECTION TYPE
- H - Port Relief Section
- S - Series Section (Use G & H Spools)
- R - Metering Work Section (Use E, F or M spool)

#### PORT SIZE
- 1. #8 SAE

#### SPOOL TYPE
- A - 3-Way 3-Position
- B - 4-Way 3-Position
- C - 4-Way 3-Position Motor
- E - 4-Way 3 Position Metering (SV only)
- F - 3-Way 3 Position Metering (SV only)
- K - 4-Way 3 Position Counterbalance Drain (SVM only)
- G - 4-Way Series
- H - 4-Way Series Motor
- M - 4-Way 3 Position Counterbalance Drain (SVM only)

#### SPOOL ACTIONS
- A - Spring Center

#### HANDLE OPTION
- 1. Std. Lever Handle
- 2. Less Handle Only
- 3. Less Complete Handle Assembly
- 4. Adjustable Handle
- 5. Tang Spool End Only
- 6. Clevis Spool End Only
- 7. Vertical Handle
- 8. Adjustable Handle
- 9. Extended Enclosed Handle

*See page V48 for Coil details*
The Type “-T” SV Solenoid Work Section allows remote electrical on-off control. The “-T” sections are 10 series work sections which use screw in cartridges with a #10 thread size. Cartridges and coils on the 10 series will be interchangeable with the components on Prince solenoid operated valves manufactured prior to November 2014 as well as current production 10 series valves. Any of the standard “-S”, “-T”, “-C” or “-D” style Prince SV solenoid operated work sections may be used in any combination within a stack valve assembly.

The Type “-T” SV Solenoid Section contains two 3-way 2-position, #10 solenoid cartridge valves, one at each end of the main valve body. When both solenoids are de-energized, both ends of the control valve spool are open to tank pressure and the spool remains spring centered. When solenoid “A” is energized, pilot pressure is applied to one end of the control valve spool causing the spool to shift from the neutral position to full stroke which directs flow to work port “A”. When solenoid “B” is energized, pilot pressure is applied to the other end of the control valve spool, causing the spool to shift to full stroke which directs flow to work port “B”.

Internal pilot lines provide pilot pressure to the solenoid actuator. Pilot pressure is generated by a “Pressure Build-Up Valve” that is installed in the standard outlet section. Two versions of the pressure build-up valve are offered, the open center pressure build-up valve and power beyond pressure build-up valve. Both versions supply 150-200 PSI pilot pressure to the solenoid actuator. A closed center assembly does not require a pressure build-up valve. For an open center system, the pilot pressure can also be provided by an in-line manifold, which can provide filtered pilot flow.

**ORDER CODE MATRIX - TYPE “-T” SOLENOID OR MANUAL WORK SECTIONS**

### 10 SERIES SOLENOID OPERATED SWV AND SVL WORK SECTIONS

<table>
<thead>
<tr>
<th>SECTION TYPE</th>
<th>S V W X X X — T XX X</th>
</tr>
</thead>
<tbody>
<tr>
<td>W - Standard Work Section</td>
<td></td>
</tr>
<tr>
<td>L - Lock Section (Use C Spool)</td>
<td></td>
</tr>
<tr>
<td>PORT SIZE</td>
<td>1. #: SAE</td>
</tr>
<tr>
<td>SPOOL TYPE</td>
<td></td>
</tr>
<tr>
<td>A - 3-Way 3-Position</td>
<td></td>
</tr>
<tr>
<td>B - 4-Way 3-Position</td>
<td></td>
</tr>
<tr>
<td>C - 4-Way 3-Position Motor</td>
<td></td>
</tr>
<tr>
<td>K - 4-Way 3 Position Counterbalance Drain (SVW only)</td>
<td></td>
</tr>
</tbody>
</table>

| SPOOL ACTIONS |  |
| A - Spring Center |  |

**PORT RELIEF “A” OPTION**
- A - Relief Cavity Plugged
- B - Non-Adjustable Direct Acting Relief 1500-3000 PSI
- C - Non-Adjustable Direct Acting Relief 500-1500 PSI
- G - Adjustable Direct Acting Relief 1500-3000 PSI
- H - Adjustable Direct Acting Relief 500-1500 PSI

**COIL VOLTAGE & TERMINATION**
- 12Q, 12 VDC Double Spade
- 12L, 12 VDC Double Wire
- 12H, 12 VDC DIN 43650
- 12D, 12 VDC Deutsch
- 24Q, 24 VDC Double Spade
- 24 L, 24 VDC Double Wire
- 24H, 24 VDC DIN 43650
- 24D, 24 VDC Deutsch
- 11L, 120VAC Lead Wires

**SOLENOID OPERATION**

### 10 SERIES SOLENOID OPERATED PORT RELIEF WORK SECTION

<table>
<thead>
<tr>
<th>SECTION TYPE</th>
<th>S V H X X X X — T XX X</th>
</tr>
</thead>
<tbody>
<tr>
<td>H - Port Relief Section</td>
<td></td>
</tr>
<tr>
<td>S - Series Section (Use G &amp; H Spools)</td>
<td></td>
</tr>
<tr>
<td>PORT SIZE</td>
<td>1. #: SAE</td>
</tr>
<tr>
<td>SPOOL TYPE</td>
<td></td>
</tr>
<tr>
<td>A - 3-Way 3-Position</td>
<td></td>
</tr>
<tr>
<td>B - 4-Way 3-Position</td>
<td></td>
</tr>
<tr>
<td>C - 4-Way 3-Position Motor</td>
<td></td>
</tr>
<tr>
<td>G - 4-Way Series</td>
<td></td>
</tr>
<tr>
<td>H - 4-Way Series Motor</td>
<td></td>
</tr>
<tr>
<td>K - 4-Way 3 Position Counterbalance Drain (SVH only)</td>
<td></td>
</tr>
</tbody>
</table>

| SPOOL ACTIONS |  |
| A - Spring Center |  |

**PORT RELIEF “B” OPTION**
- A - Relief Cavity Plugged
- B - Non-Adjustable Direct Acting Relief 1500-3000 PSI
- C - Non-Adjustable Direct Acting Relief 500-1500 PSI
- G - Adjustable Direct Acting Relief 1500-3000 PSI
- H - Adjustable Direct Acting Relief 500-1500 PSI

**SOLENOID OPERATION**

* See page V48 for coil details

SEE PAGE 11 & 12 OF THE STANDARD PRODUCT PRICE LIST FOR PRICING
PART NUMBER WILL BE STAMPED IN THIS LOCATION

*WHEN EXTERNAL PILOT OR DRAIN IS USED THE INTERNAL LINES MUST BE PLUGGED

RESTRICTOR ORIFICE
LOAD CHECK
INTERNAL PILOT LINES

SV “10 SERIES” TYPE T SOLENOID WORK SECTION DIMENSIONS

SV “10 SERIES” TYPE S SOLENOID OR MANUAL WORK SECTION DIMENSIONS
SV SOLENOID OPERATED WORK SECTION - APPLICATION INFORMATION

For over center or light load applications if the required work port load pressure drops below 200 PSI, the pilot pressure to the spool will drop to the same pressure causing the spring to move the control spool back towards the neutral position. The spool will end up in an intermediate position between neutral and fully shifted. A restrictor installed in the work port or line may be required for this type of application.

For closed center applications the Pressure Build-Up Valve is not required. However, a system pressure of 200 PSI must be maintained in the closed center position to actuate the valve properly.

Proper operation of the solenoid actuators requires a pressure differential of 150-200 PSI above tank pressure. **The maximum tank port pressure should not exceed 150 PSI.** On “C” and “S” solenoid sections, excessive tank pressure will increase “Seal Drag” and may prohibit the spool from shifting.

The solenoid operated SV section may be converted to accept an external hydraulic pilot supply to the solenoid actuators. Please consult a Sales Representative for more information.

SERIES 8 SOLENOID COILS ALL “C”, “D”, AND “DP” WORK SECTIONS

<table>
<thead>
<tr>
<th>COIL PART NUMBERS</th>
<th>COIL SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>12H – 671302168 - 12 VDC DIN-43650</td>
<td></td>
</tr>
<tr>
<td>12L – 671302160 - 12 VDC DUAL LEAD WIRES</td>
<td></td>
</tr>
<tr>
<td>12D – 671302163 - 12 VDC INTEGRAL DEUTSCH</td>
<td></td>
</tr>
<tr>
<td>24H – 671302169 - 24 VDC DIN-43650</td>
<td></td>
</tr>
<tr>
<td>24L – 671302167 - 24 VDC DUAL LEAD WIRES</td>
<td></td>
</tr>
<tr>
<td>24Q – 671302166 - 24 VDC DUAL SPADE</td>
<td></td>
</tr>
<tr>
<td>24D – 671302164 - 24 VDC INTEGRAL DEUTSCH</td>
<td></td>
</tr>
<tr>
<td>11H – 671302170 - 110 VAC DIN-43650</td>
<td></td>
</tr>
</tbody>
</table>

SERIES 10 SOLENOID COILS ALL “S” AND “T” WORK SECTIONS

<table>
<thead>
<tr>
<th>COIL PART NUMBERS</th>
<th>COIL SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>12H – 671302221 - 12 VDC COIL DIN 43650</td>
<td></td>
</tr>
<tr>
<td>12L – 671302220 - 12 VDC COIL DOUBLE WIRE</td>
<td></td>
</tr>
<tr>
<td>12D – 671302226 - 12 VDC COIL DOUBLE SPADE</td>
<td></td>
</tr>
<tr>
<td>12D – 671302222 - 12 VDC COIL DEUTSCH</td>
<td></td>
</tr>
<tr>
<td>24H – 671302224 - 24 VDC COIL DIN 43650</td>
<td></td>
</tr>
<tr>
<td>24L – 671302223 - 24 VDC COIL DOUBLE WIRE</td>
<td></td>
</tr>
<tr>
<td>24Q – 671302227 - 24 VDC COIL DOUBLE SPADE</td>
<td></td>
</tr>
<tr>
<td>24D – 671302225 - 24 VDC COIL DEUTSCH</td>
<td></td>
</tr>
<tr>
<td>11H – 671302228 - 120 VAC LEAD WIRES</td>
<td></td>
</tr>
</tbody>
</table>

SYMBOL SCHEMATIC OF A 3 SECTION, SOLENOID OPERATED STACK VALVE ASSEMBLY

<table>
<thead>
<tr>
<th>SYMBOL SCHEMATIC</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVI25</td>
<td>SVW1BA1 – C12Q OR SVW1BA1 – S12Q</td>
</tr>
<tr>
<td>SVW1BA – C12Q</td>
<td>OR SVW1BA – D12Q OR SVW1BA – T12Q</td>
</tr>
<tr>
<td>SVH1BA1GB – C12Q</td>
<td>OR SVH1BA1GB – S12Q</td>
</tr>
<tr>
<td>SVE26</td>
<td></td>
</tr>
</tbody>
</table>
In the SV proportional work sections, varying pilot pressure is applied to the end of the spools to shift the spool against spring bias. Proportional pressure reducing cartridges are used to vary the pressure on the spools. As the current through the cartridge coil increases, the amount of the available pilot pressure applied to the ends of the spools also, proportionally increases. There will be a threshold pressure/current (dead band) to overcome the initial spring centering force and initial land coverage. Once this pressure/current has been exceeded, increasing the current through the coil will increase the flow from the work ports.

Current to the coils is typically provided by a PWM current control module and a joystick or other input device. The coils require a maximum current of approximately 1300 mA (@ 12 volts), and for reduced hysteresis, a dither frequency of approximately 100 Hz and a dither amplitude of 50 to 100 mA. The controller should have adjustable minimum current and maximum current settings to minimize the dead band before work port flow starts and to maximize the control resolution. See page V38 for examples of control module and joystick components.

The proportional work sections require pilot pressure to shift the spools. Approximately 325 psi pilot pressure will fully shift the spool in Prince proportional sections. With open center valve assemblies, the pilot pressure is typically supplied by a compensator inlet (SVIC).

The SV proportional work sections are open center sections based on the SVM family. The open center sections, which are typically used with a fixed displacement (gear) pump, provide for a cost effective circuit. The open center sections will provide controlled starts and stops of the work port flow, however, the metering band is not as wide as the other proportional families and metering is somewhat pressure dependent. Using current minimum and current maximum settings on the controller will enhance the metering control.

All SV proportional work sections require pilot supply passageways. All SVM-DPxxx proportional sections will automatically have pilot passageways, however, any non-proportional sections in the assembly will also have to have pilot passageways. To designate SVW, SVH, SVM, SVF, SVR or SVG non-proportional sections with pilot passageways, add a “P” after the three letter model prefix. For instance a SVW1BA1 section with pilot passageways would be called out as a SVWP1BA1. An example of a SVH with passageways would be a SVHP1BA1GG. An example of a non-proportional solenoid section to be included in a proportional assembly would be a SVWP1BA1-C12D. Please contact sales at Prince Manufacturing for additional assistance in configuring assemblies.
**SVM / SVR PROPORTIONAL SOLENOID OPERATED WORK SECTIONS**

**WORK SECTION TYPE**
M - Standard Metering Section  
R - Port Relief Metering Section

**PORT SIZE**
1. #8 SAE ORB (3/4-16 Thread)

**SPOOL TYPE**
E - 4-Way 3-Position Metering  
M - 4-Way 3-Position Counterbalance Drain/Motor

**SPOOL ACTION**
S - Spring Center (Metering sections)

**PORT RELIEF “A” OPTIONS (OMIT FOR SVM)**
A - Relief Cavity Plugged  
B - Non-Adjustable Direct Acting Relief 1500-3000 PSI set at 2000  
C - Non-Adjustable Direct Acting Relief 500-1500 PSI set at 1000  
G - Adjustable Direct Acting Relief 1500-3000 PSI set at 2000  
H - Adjustable direct Acting Relief 500-1500 PSI set at 1000

**PORT RELIEF “B” OPTION (OMIT FOR SVM)**
A - Relief Cavity Plugged  
B - Non-Adjustable Direct Acting Relief 1500-3000 PSI set at 2000  
C - Non-Adjustable Direct Acting Relief 500-1500 PSI set at 1000  
G - Adjustable Direct Acting Relief 1500-3000 PSI set at 2000  
H - Adjustable direct Acting Relief 500-1500 PSI set at 1000

*See Page V48 Series 8 Coils for Coil Information.

**COIL VOLTAGE & TERMINATION**
12Q, 12 VDC Double Spade  
12L, 12 VDC Double Wire  
12H, 12 VDC Din 43650  
24Q, 24 VDC Double Spade  
24L, 24 VDC Double Wire  
24H, 24 VDC Din 43650  
11H, 120 VAC Din 43650

**SOLENOID OPERATION**
DP - Solenoid on each end of section – no lever

**APPLICATION NOTES:**

The SVIC2F is an inlet assembly used with “SVM” (open center) proportional solenoid assemblies. It is used with fixed displacement pumps (typically gear pumps) and has a compensator cartridge in the manifold that provides approximately 350 psi pilot pressure for the proportional solenoids. It also incorporates a pressure reducing cartridge to limit pressure to the solenoid cartridges, and a 10 µ filter cartridge to filter the pilot flow. The SVIC2F requires a tie rod kit for one extra section. Any non-proportional “SV” work sections in the assembly require pilot passageways. A standard “SVE” open center outlet with conversion plug should be used in the assembly.

The SVIC2F has other applications such as low flow systems. The inlet can provide a constant pilot pressure regardless of flow, guaranteeing a shift in either on/off or proportional solenoids. Likewise, systems that also have little to no load induced pressure can benefit from the constant pilot pressure the SVIC2F provides, guaranteeing a shift regardless of work port pressure.

The 10 micron filter included in the inlet helps keep the pilot lines clean. This helps eliminate contamination in the oil being sent to the solenoid cartridges.

To configure work sections to use with this inlet, refer to the text on page V49 that talks about adding a ‘P’ to the model codes.
SV PROPORTIONAL WORK SECTIONS PERFORMANCE CURVES

SV OPEN CENTER PROPORTIONAL (SVM-DP12D)
WORK PORT FLOW vs. CURRENT

EXAMPLES OF TYPICAL SV SOLENOID OPERATED SECTIONS AND ASSEMBLIES

ON – OFF SOLENOID ASSEMBLIES

SV COMMON WORK SECTIONS:
- SVW1BA1-C12D (8 series solenoids)
- SWV1BA-DM12D (8 series-manual override solenoids)
- SVW1BA1-S12L (10 series solenoids)
- SVW1BA-T12L (10 series solenoids)

SV common assembly:
- SVI25; SVW1BA1-C12D; SVE26

OPEN CENTER PROPORTIONAL (fixed displacement pump)

SV COMMON WORK SECTION
- SM1ES-DP12D (proportional solenoids)

SV common assembly: (note: non-solenoid sections require solenoid passageways)
- SVIC2F (compensator inlet); SM1ES-DP12D; SVE21

<table>
<thead>
<tr>
<th>ON – OFF SOLENOID</th>
<th>PUMP TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Sect.</td>
<td>Inlet</td>
</tr>
<tr>
<td>SV(W/L/M)</td>
<td>SVIxx</td>
</tr>
<tr>
<td>SV(H/S/R)</td>
<td>SVIxx</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPEN CENTER PROPORTIONAL SOLENOID</th>
<th>PUMP TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV(M/R)</td>
<td>SVIC2F</td>
</tr>
</tbody>
</table>
RADIO REMOTE OFFERINGS FOR ON/OFF SOLENOID OPERATED VALVES

MACRO TRANSMITTERS

- 4 buttons (2 section valve) #671303111
- 6 buttons (3 section valve) #671303112
- 8 buttons (4 section valve) #671303113

RECEIVERS

- 4 outputs (up to 2 section valve) #671303001
- 8 outputs (up to 4 section valve) #671303002

CHARGER (MICRO USB)

- 12 VDC car charger #671303003
- Wall charger #671303005

FEATURES:
- Palm sized transmitter (4.7" x 2.6" x .9" typical)
- Rechargeable transmitter - micro USB (20 hr of active transmitting battery life)
- Range of up to 300 ft
- Two way communication with real time feedback
- Easy sync with receiver
- 900 Hz
- Ingress protection IP66
- Receiver input voltage (9 - 30VDC)

PROPORTIONAL CONTROLLERS & WIRING HARNESES

Prince proportional operators are often controlled with a thumb or handle control and a PWM control module. Prince offers a small thumb control joystick and a larger handle control joystick, as well as a PWM control module that can be used in conjunction with these joysticks. The control module provides a performance enhancing dither to the current. The minimum and maximum current from the module can also be set to minimize the dead band before work port flow starts and to maximize the control resolution.

The connector on the thumb joystick is a Molex #CGRID/SL (7 male pins). The connector on the handle joystick is a Deutsch #HD14-9-16P (9 male pins). The connector on the PWM control module is a Deutsch #DT04-8P (8 male pins).

Prince offers a harness to connect the joystick, PWM module, and coils with Deutsch connectors. The harness system consists of a coil harness (approximately 60" long) to connect the PWM to the coils, to the power, etc. (671300108). The second part of the harness is a jumper harness that connects either the thumb control joystick or the handle control joystick to the PWM module. The standard length of the jumper harness is 10 feet, but other lengths are available. The 10 foot jumper harness for the thumb control joystick is 671304110. The 10 foot jumper harness for the handle control joystick is 671304210.

Additional controls such as multi spool proportional controllers as well as proportional RF controllers (belly packs) can be quoted upon request. Please contact sales at Prince Manufacturing for additional information.