PRESSURE COMPENSATED
ADJUSTABLE FLOW CONTROL VALVES

MODEL RD-100
TOP PORT FLOW CONTROL

The PRINCE valve models RD-100 and RD-1900 are pressure compensated adjustable flow control valves. By rotating the handle, the flow out the “CF”, or controlled flow port, can be varied from approximately 0 to the maximum controlled flow shown in the chart below. Any remaining flow is bypassed to the “EF” or excess flow port. This flow can be used to power another circuit or can be returned to tank. Once the controlled flow is set it will remain nearly constant with variations in pressure on either the controlled or excess flow ports.

Please note: If during operation the controlled flow port is blocked the valve will compensate in such a way as to shut off flow to the excess port.

These valves can also be used as a restrictive flow control by plugging the excess flow port.

The PRINCE valve models RDRS-100 and RDRS-1900 have a built in adjustable pressure relief. For these models the excess flow port must be connected to tank.

It should be noted that whenever these or any valve is used to bypass or restrict, flow heat will be generated. Steps may be required to keep oil temperature from becoming too high.

VALVE SPECIFICATIONS:
Capacity: 30 gpm max inlet flow
Pressure: 3000 psi max
Weight: RD-100 8 lbs.
RD-1900 9 lbs.

FIELD REPAIR KITS:
Handle hardware 660301002
Seal Kit 660501001

STANDARD MODELS AVAILABLE

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>PORT SIZES</th>
<th>CONTROLLED FLOW RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-137-8</td>
<td>3/8 NPTF</td>
<td>0-8 GPM</td>
</tr>
<tr>
<td>RD-150-8</td>
<td>1/2 NPTF</td>
<td>0-8 GPM</td>
</tr>
<tr>
<td>RD-150-16</td>
<td>1/2 NPTF</td>
<td>0-16 GPM</td>
</tr>
<tr>
<td>RD-175-16</td>
<td>3/4 NPTF</td>
<td>0-16 GPM</td>
</tr>
<tr>
<td>RD-175-30</td>
<td>3/4 NPTF</td>
<td>0-30 GPM</td>
</tr>
<tr>
<td>RD-108-8</td>
<td>#8 SAE</td>
<td>0-8 GPM</td>
</tr>
<tr>
<td>RD-112-30</td>
<td>#12 SAE</td>
<td>0-30 GPM</td>
</tr>
<tr>
<td>RDRS-150-16</td>
<td>1/2 NPTF</td>
<td>0-16 GPM</td>
</tr>
<tr>
<td>RDRS-175-30</td>
<td>3/4 NPTF</td>
<td>0-30 GPM</td>
</tr>
</tbody>
</table>

For Other Relief Settings Please Specify:

RDRS-150-16-20
Relief Pressure in Hundreds Example: 20=2000 PSI
RDRS-1950-16-20
Relief Pressure in Hundreds Example: 20=2000 PSI

These models have built in relief set at 1500 psi @ 10 GPM.

Special combinations of port size and controlled flow range are available in O E M quantities. Please consult your sales representative.

SYMBOL

<table>
<thead>
<tr>
<th>CF</th>
<th>EF</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN</td>
<td></td>
</tr>
</tbody>
</table>

RD-100 & RD-1900

RDRS-100 & RDRS-1900

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As illustrated in the circuit below the RD-100/RD-1900 adjustable flow control valves can be used to control the speed of a hydraulic motor. In this circuit oil from a source is directed into the inlet of the valve. By moving the handle the flow can be varied from approximately zero when handle is vertical to maximum when the handle is horizontal. Oil not going to the controlled flow port is bypassed to the excess flow port where it can be used to supply another circuit or returned to tank. Instead of the control flow directly supplying a motor it can be used as a adjustable priority divider and provide adjustable priority flow to a directional control valve bank. Also as illustrated the RD-100/RD-1900 can be used as a restrictive type flow control. In this circuit the excess flow port is blocked. This would normally be used with a pressure compensated pump or in a closed center system.

**APPLICATIONS:**

**BYPASS FLOW CIRCUIT**

- MOTOR
- TO TANK OR SECONDARY CIRCUIT
- (CONTROLLED FLOW PORT)
- (EXCESS FLOW PORT)

**RESTRICTIVE FLOW CIRCUIT**

- MOTOR
- (CONTROLLED FLOW PORT)
- (EXCESS FLOW PORT PLUGGED)
The PRINCE valve model RD-1400 is a double pilot-operated lock valve. This valve will lock a cylinder in place when a directional control valve is in the neutral position. In operation oil is directed to one of the valve ports and oil can free flow to the corresponding cylinder port. The pressure on this valve port will shift the pilot spool opening the opposite check valve. This will allow oil to return through the opposite check valve. This valve has a hardened steel seat and steel ball and therefore should not be used in applications requiring absolutely zero leakage. When using a pilot operated check to lower a heavy load the valve may chatter. An orifice in the line in some cases may be beneficial.

### STANDARD MODELS AVAILABLE

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>PORT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-1450</td>
<td>1/2 NPTF</td>
</tr>
<tr>
<td>RD-1475</td>
<td>3/4 NPTF</td>
</tr>
</tbody>
</table>

### VALVE SPECIFICATIONS:
- Capacity: 20 gpm max inlet flow
- Pressure: 3000 psi max
- Weight: 2 lbs.
- Pilot Ratio: 4:1
- Decompression Ratio: 16:1

The PRINCE valve model RD-1600 is a pilot operated check valve. This valve blocks oil from flowing from the cylinder port to the valve port until sufficient pressure is applied to the pilot port. Oil can free flow from the valve port to the cylinder port. The valve has a two stage poppet allowing smooth chatter free operation.

### STANDARD MODELS AVAILABLE

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>VALVE AND CYL. PORT</th>
<th>PILOT PORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-1637</td>
<td>3/8 NPTF</td>
<td>1/4 NPTF</td>
</tr>
<tr>
<td>RD-1650</td>
<td>1/2 NPTF</td>
<td>1/4 NPTF</td>
</tr>
<tr>
<td>RD-1608</td>
<td>#8 SAE (3/4-16)</td>
<td>#4 SAE (7/16-20)</td>
</tr>
</tbody>
</table>
### Pressure Compensated Proportional Flow Dividers

**Model RD-200**  
Proportional Divider  

The PRINCE model RD-200 valve is a pressure compensated proportional flow divider. The standard models of this valve will take one inlet flow and split it into two nearly equal outlet flows. The valve is also available with special ratio spools which will split the flow into two flows proportional to the ratio specified. Because the valve is pressure compensated the valve will maintain the divider ratio with quite different loads on the outlet ports as long as the inlet flow is within the range given in the chart below. **Flow through the RD-200 cannot be reversed.**

The PRINCE model RD-300 provides the same function as the RD-200 with the added feature of free reverse checks. This allows the reverse flow of oil from the outlet ports to the inlet port. **The reverse flow is not pressure compensated.**

**Valve Specifications:**  
- **Model:** RD-200  
- **Capacity:** 30 gpm max inlet flow  
- **Weight:** 7 lbs.

### Standard Models Available

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Divider Ratio</th>
<th>Port Size</th>
<th>Inlet Flow Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-237-8</td>
<td>50:50</td>
<td>3/8 NPTF</td>
<td>4-8 GPM</td>
</tr>
<tr>
<td>RD-250-16</td>
<td>50:50</td>
<td>1/2 NPTF</td>
<td>8-19 GPM</td>
</tr>
<tr>
<td>RD-275-30</td>
<td>50:50</td>
<td>3/4 NPTF</td>
<td>16-30 GPM</td>
</tr>
<tr>
<td>RD-208-8</td>
<td>50:50</td>
<td>3/4 16 SAE</td>
<td>4-8 GPM</td>
</tr>
<tr>
<td>RD-212-30</td>
<td>50:50</td>
<td>1-1/16-12 SAE</td>
<td>16-30 GPM</td>
</tr>
</tbody>
</table>

In OEM quantities the RD-200 and RD-300 valves are available with special divider ratios. Ratios available are: 2:1, 80:20, 70:30, 60:40, and others as required. When ordering specify the divider ratio after the model number. EXAMPLE: RD-250-16 (70:30)

**Model RD-500P**  
Proportional Divider with Adjustable Orifice  

The PRINCE model RD-500P is a pressure compensated proportional flow divider valve with one fixed and one adjustable orifice. This valve provides the same function as the RD-200 except the divider ratio can be changed in the field.

**Valve Specifications:**  
- **Model:** RD-500P  
- **Capacity:** 30 gpm max inlet flow  
- **Pressure:** 3000 psi max  
- **Weight:** 7 lbs.

### Standard Models Available

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Port Size</th>
<th>Inlet Flow Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-537P-8</td>
<td>3/8 NPTF</td>
<td>4-8 GPM</td>
</tr>
<tr>
<td>RD-550P-16</td>
<td>1/2 NPTF</td>
<td>8-16 GPM</td>
</tr>
<tr>
<td>RD-575P-30</td>
<td>3/4 NPTF</td>
<td>16-30 GPM</td>
</tr>
</tbody>
</table>

**Model RD-1000S**  
Internally Piloted Sequence Valve with External Drain  

The PRINCE valve model RD-1000S is an internally piloted adjustable sequence valve. This valve will prevent the flow of oil from going to the sequence port until the pressure on the inlet port reaches the sequence pressure. The sequence pressure is adjustable within the range given in chart below. A built in check valve allows flow from sequence port to inlet. To operate properly the **drain port must be connected to tank.** This valve is a spool type sequence valve and will provide smooth operation but should not be used in applications that require low leakage.

**Valve Specifications:**  
- **Model:** RD-1000S  
- **Capacity:** 30 gpm max inlet flow  
- **Pressure:** 3000 psi max  
- **Weight:** 7 lbs.

### Standard Models Available

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Port Size Inlet and Sequence</th>
<th>Drain Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-1050S</td>
<td>1/2 NPTF</td>
<td>3/8 NPTF</td>
</tr>
<tr>
<td>RD-1075S</td>
<td>3/4 NPTF</td>
<td>3/8 NPTF</td>
</tr>
</tbody>
</table>

To complete the model number fill in the blank with the spring letter that corresponds to desired counter balance pressure range. EXAMPLE: RD-1050SM for 350-1700 psi spring range.
MODEL RD-200, RD-300, RD-300AB, RD-500P, AND RD-1000S PARTS BREAKDOWN AND DIMENSIONS

**RD-200**

![Diagram of RD-200 valve](image)

- **DIVIDER SPOOL**
- **VALVE BODY**
- **INLET**
- **OUTLET**

**SEAL KIT NO. 660502001**

**RD-300**

![Diagram of RD-300 valve](image)

- **SEE DETAIL AT RIGHT**
- **INLET**
- **VALVE BODY**
- **DIVIDER SPOOL**

**SEAL KIT NO. 660503001**

**RD-500P**

![Diagram of RD-500P valve](image)

- **INLET**
- **DIVIDER SPOOL**
- **VALVE BODY**

**SEAL KIT NO. 660505001**

**RD-1000S**

![Diagram of RD-1000S valve](image)

- **VALVE BODY**
- **SPOOL**
- **METERING SPRING**
- **INLET**
- **SECONDARY PORT**
- **TANK PORT**
- **ADJUSTMENT SCREW**

**SEAL KIT NO. 660510001**

The RD-300AB valve has a built-in automatic bypass. This allows oil to crossover from one outlet to the other when the pressure difference between the two outlet reaches 750 PSI.
**MODEL RD-400**  
**FIXED FLOW PRIORITY DIVIDER**

The PRINCE model RD-400 is a constant volume priority divider. It can be used in applications where two circuits are to be supplied by a single pump such as power steering systems. In operation the flow of oil supplied to the inlet is divided into two flows, the priority flow and the excess flow. The priority flow will remain nearly constant with variations in pressure on either the priority or excess flow port and will also remain nearly constant with variations in the inlet flow.

The priority flow GPM is determined by a fixed orifice inside the main spool. The desired priority GPM must be specified with model number, see below. The PRINCE model RD-400R provides the same function as described above with the addition of a built in pressure relief for the priority port only. This relief is internally adjustable and requires a separate line to tank. The relief is factory set at 1500 PSI.

**VALVE SPECIFICATIONS:**

- **Capacity:** 30 gpm max inlet flow  
- **Weight:** RD-400 7 lbs.  
- **Pressure:** 3000 psi max  
- **Weight:** RD-400-R 7.5 lbs.

**STANDARD MODELS AVAILABLE**

<table>
<thead>
<tr>
<th>VALVE MODEL NUMBER</th>
<th>PORT SIZE</th>
<th>PRIORITY GPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-400-___</td>
<td>3/4 NPTF</td>
<td>1.5</td>
</tr>
<tr>
<td>RD-405-___</td>
<td>3/4 NPTF</td>
<td>2</td>
</tr>
<tr>
<td>RD-412-___</td>
<td>3/4 NPTF</td>
<td>3</td>
</tr>
<tr>
<td>RD-450-___</td>
<td>#12 SAE</td>
<td>4</td>
</tr>
<tr>
<td>RD-455-___</td>
<td>3/8 NPTF</td>
<td>5</td>
</tr>
<tr>
<td>RD-477-___</td>
<td>3/4 NPTF</td>
<td>6</td>
</tr>
<tr>
<td>RD-400R-___</td>
<td>3/8 NPTF</td>
<td>7</td>
</tr>
<tr>
<td>RD-405R-___</td>
<td>1/2 NPTF</td>
<td>8</td>
</tr>
<tr>
<td>RD-412R-___</td>
<td>#8 SAE</td>
<td>9</td>
</tr>
<tr>
<td>RD-450R-___</td>
<td>1/2 NPTF</td>
<td>10</td>
</tr>
<tr>
<td>RD-455R-___</td>
<td>1/2 NPTF</td>
<td>11</td>
</tr>
<tr>
<td>RD-477R-___</td>
<td>3/4 NPTF</td>
<td>12</td>
</tr>
</tbody>
</table>

To complete the model number fill in the blank with the desired priority GPM from the list at right.

**EX:** RD-400-3 for 3 GPM priority flow; RD-405R-6 for 6 GPM priority flow.

**MODEL RD-500**  
**ADJUSTABLE FLOW PRIORITY DIVIDER**

The PRINCE model RD-500 is an adjustable constant volume priority divider. This valve provides the same function as the PRINCE model RD-400 except the priority flow is adjustable from 2 GPM to 12 GPM. The priority flow is set using the adjusting screw and is then locked in place to maintain setting. This allows setting to be fine tuned in the field to the exact flow needed.

**VALVE SPECIFICATIONS**

- **Capacity:** 30 gpm max inlet flow  
- **Pressure:** 3000 psi max  
- **Weight:** 7 lbs.

**STANDARD MODELS AVAILABLE**

<table>
<thead>
<tr>
<th>VALVE MODEL NUMBER</th>
<th>PORT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-537</td>
<td>3/8 NPTF</td>
</tr>
<tr>
<td>RD-550</td>
<td>1/2 NPTF</td>
</tr>
<tr>
<td>RD-575</td>
<td>3/4 NPTF</td>
</tr>
</tbody>
</table>
MODEL RD-400, RD-400R AND RD-500
PARTS BREAKDOWN AND DIMENSIONS

**RD-400**

**SYMBOL**

**SEAL KIT NO. 660504001**

**RD-400R**

**SYMBOL**

**SEAL KIT NO. 660504002**

**RD-500**

**SYMBOL**

**SEAL KIT NO. 660505001**

**NOTE:** spools are not available separately