3.3 Energy Elements

Pressure Source

Air Service Unit

Figure 3.4 Symbols for Energy Elements

3.4 Port Marking of Direction Control Valve

<table>
<thead>
<tr>
<th></th>
<th>As per IS 1219</th>
<th>As per IS 5599</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Port</td>
<td>A</td>
<td>Supply Port</td>
</tr>
<tr>
<td>Exhaust Ports</td>
<td>R &amp; S</td>
<td>Exhaust Ports</td>
</tr>
<tr>
<td>Output Ports</td>
<td>A &amp; B</td>
<td>Output Ports</td>
</tr>
<tr>
<td>Pilot Port [Set]</td>
<td>Z</td>
<td>Pilot Port [Set]</td>
</tr>
<tr>
<td>Pilot Port [Reset]</td>
<td>Y</td>
<td>Pilot Port [Reset]</td>
</tr>
</tbody>
</table>

3.6 Design and Construction Features of D.C. Valves

Directional Control Valves are available in the following types of constructions:

Poppet type of Valves
- Ball Seat Type [Pneumatic/ Solenoid actuation]
- Disc Seat Type [Pneumatic/ Solenoid actuation]

Slide Valves [Pneumatic/ Solenoid actuation]
Suspended Disc type of Valve [Pneumatic/ Solenoid actuation]
Plate of Valve [Manual actuation]
3.7 Selection Criteria of D.C. Valves

Selection of a particular design of D.C. valve depends on the following factors:
• Actuation force
• Leak tightness
• Ease of servicing
• Sensitive to contamination by dirt
• Travel length of the valve stem
• Size
• Cost

3.8 3/2 Way- D.C. Valve N.C-Ball Seat Type

• These type of valves are often used as signal input valves, operated either with push button or with limit switches rollers, to interrogate the cylinder position.
• A spring loaded ball initially blocks the supply ports 1. Output port 2 is connected to exhaust port 3.
• On actuation, the plunger first isolates the exhaust port 3 and further descending of the plunger, the ball is pushed downwards, thereby opening the supply port 1 to output port 2.

![Ball Seat Type Directional Control Valve [NC]](image)
• These type of valves are often used as signal input valve either push button operation or as limit switches to interrogate the cylinder position.
• A spring loaded ball initially blocks the supply port 1 and output port 2 is connected to exhaust port 3.
• On actuation, the supply port 1 is connected to output port 2. The exhaust port 3 is isolated.

3.9 3/2 Way Disc Seat Valve [Normally Closed]

![Figure 3.6 3/2 Way Disc Seat Valve [Normally Closed]](image)

Comparison of Ball Seat and Disc Seat Valves

**Ball Seat Valves**
• They are inexpensive
• Relatively small size
•Insensitive to dirt
• Operated manually or mechanically

**Disc Seat Valve**
• Offers large area and hence lift required is very small
• Time of response is good
• Insensitive to dirt
• Can be actuated manually, mechanically, electrically or pneumatically