**DG5*-H8-2C Spring-Centered Valve Example**

**Directional Control Valves**

**DG3*-H8; 30 and 10 Series, Pilot Operated**

**DG17*-H8; 30 and 10 Series, Manually Operated**

**DG5*-H8; 50 and 30 Series, Solenoid Controlled, Pilot Operated**

**ISO 4401 Size 08**

---

**General Description**

DG**-H8 valves are used primarily for controlling the starting, stopping and direction of fluid flow.

Basically, six series of valves are available grouped into DG*S moderate pressure versions and DG*V high pressure versions. There is a choice of up to 18 different spools, dependent on valve configuration. These include meter-in and meter-out spools, and regeneration types that can obviate extra valves essential in traditional circuit arrangements. All spools have been designed to provide good low shock, fast response characteristics which can be enhanced by optional stroke and/or pilot choke adjustments.

Models include spring offset, spring centered, pressure centered and detented versions. All are available with the option of an integral P-port minimum-pilot-pressure generator. DG5* valves can be arranged for internal or external pilot pressure and/or drain connections.

---

**Basic Characteristics**

- Mounting: Surface mounting
- Max. pressure:
  - DG*S: 210 bar (3000 psi)
  - DG*V: 350 bar (5000 psi)
- Max. flow: 700 L/min (185 USgpm)

---

**Features and Benefits**

- High pressure and flow capability for maximum cost-effectiveness.
- Low headloss to minimize power wastage.
- Low shock characteristics to maximize machine life.
- Facility to change solenoid coils without disturbing the hydraulic envelope.
- The many optional features, particularly for DG5* valves, permit matching to virtually every application within the valve’s power capacity.
Functional Symbols

DG3*-H8 Pilot Operated Models
Comprehensive and simplified symbols.

Spring Offset, End-to-End,
DG3*-H8-*A
Spool types: 0, 2, 6, 9, 52, 521, X2\textsuperscript{\textcircled{A}}, Y2\textsuperscript{\textcircled{A}}

Spring Offset, End-to-End,
Opposite Hand, DG3*-H8-*AL
Spool types: 0, 2, 6, 9, 52, 521, X2\textsuperscript{\textcircled{A}}, Y2\textsuperscript{\textcircled{A}}

DG3-H8 Options
The following are shown in a DG3*-H8-*C example:
1. Pilot choke module
2. Minimum pilot pressure generator
3. Stroke adjusters at either or at both ends (shown at both ends in example)

One or more options can be built into any DG3 series valve.

DG5*-H8, Solenoid Controlled, Pilot Operated Models
Comprehensive and simplified symbols, shown configured for external pilot supply and internal drain.

Spring Offset, End-to-End,
DG5*-H8-*A
Spool types: 0, 2, 6, 9, 52, 521, X2\textsuperscript{\textcircled{A}}, Y2\textsuperscript{\textcircled{A}}

Spring Offset, End-to-End,
Opposite Hand, DG5*-H8-*AL
Spool types: 0, 2, 6, 9, 52, 521, X2\textsuperscript{\textcircled{A}}, Y2\textsuperscript{\textcircled{A}}

\textbullet{} "a" and "b" interchanged for spool types 4 and 8.
\textbullet{} "X" and "Y" spools require a stroke adjuster at one or both ends, dependent on the application, to limit stroke towards "a" and/or "b".
Spring Offset, End-to-Center,
Opposite Hand
Models: DG5*-H8-*B 4, 8
DG5*-H8-*BL 0, 2, 521, X2▲, Y2▲

Pressure Centered, DG5*-H8-*D
Spool types: All

Detented, DG5*-H8-*N
Spool types: 0, 2, 6, 9, 52, 521, X2▲, Y2▲

DG5*-H8 Options
The following are shown in a
DG5*-H8-*C example:
1. Pilot choke module
2. Minimum pilot pressure generator
3. Stroke adjusters, at either or at both ends (shown at both ends in example)
4. External pilot connection
5. Internal drain
One or more options can be built into any DG5 series valve, the only exception being that the internal drain option is not available with DG5*-H8-*D (pressure centered) valves.

“a” and “b” interchanged for spool types 4 and 8.
▲ “X” and “Y” spools require a stroke adjuster at one or both ends, dependent on the application, to limit stroke towards “a” and/or “b”.

Spool types: All
DG17*-H8 Hand-Lever Operated Models

Comprehensive and simplified symbols.

Spring Offset, End-to-End, DG17*-H8-*A
Spool types: 0, 2, 6

Spring Centered, DG17*-H8-*C
Spool types: 0, 2, 4, 6, 8, 33

Spring Offset, End-to-End, Opposite Hand, DG17*-H8-*AL
Spool types: 0, 2, 6

Detented, DG17*-H8-*N
Spool types: 0, 2, 4, 6, 8, 33

• “a” and “b” interchanged for spool types 4 and 8.

Symbols on Nameplates
Typical illustrations for:

DG3*-H8-2D-1

DG5*-H8-3C-2-E-T*

Notes:
1. In the detailed and simplified symbols on this and the previous pages, the transient positions are omitted for simplicity.
2. In certain 2-position valves, the “o” position becomes an additional transient, i.e. in DG5*-H8-*A(L) and DG5*-H8-*N valves.

The performance of the “33” and “34” spools differ only in the center position. Your Vickers representative can provide further details.
Pilot Pressure
a. Pilot pressure must always exceed tank line pressure by at least the requisite minimum pilot pressure. This also applies when combining open-center spools (0, 1, 4, 8, 9 and 11) with internal pilot pressure, but they should be used only with externally drained valves.

b. Internally drained valves may be used only when surges in the tank line cannot possibly overcome the minimum pilot pressure differential referred to above. When the possibility of pressure surges in the tank line exist, externally drained valves are recommended.

c. When DG5*-H8-*N valves are de-energized the pilot and main spools remain in the last selected position, provided that pilot pressure is maintained. If pilot pressure fails, or falls below the minimum, the main spool will spring center.

Caution: Because of this in-built feature the flow conditions of the center position must be selected with care, for the effect on both the direction of flow and the pilot pressure.

Minimum-Pilot-Pressure Generator Option
Can be built into the P-port to create a specific minimum pilot pressure differential where internal pilot pressure is required with open-centered spools, i.e. 0, 1, 4, 8, 9 and 11.

Stroke Adjustment Options
These control the maximum opening of the main spool/body passages by adjusting the limits of spool stroke. By this means, the response time and the pressure drop across the valve for any particular flow rate can be controlled. Stroke adjusters can be fitted at either or both ends of the main-stage valve for adjusting the stroke in one or both directions. One use of stroke adjusters is for controlling the metering characteristics of “X” or “Y”-type spools. (See model code [5].)

Pilot Choke Adjustment Options
These provide a meter-out flow control system to the fluid in the pilot chambers of main-stage valves. This allows the velocity of the main-stage spool to be controlled, thereby reducing transient shock condition. For optimum results, a constant reduced pilot pressure is recommended.

Control Data, General
a. Dependent on the application and the system filtration, any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not move readily due to fluid residue formation. It may therefore need to be cycled periodically to prevent this from happening.

b. Surges of fluid in a common drain line serving two or more valves can be of sufficient magnitude to cause inadvertent shifting of the spools. It is recommended that circuit protection be used, such as separate drain lines.

c. Control by stroke adjusters, pilot chokes and minimum-pilot-pressure generator options is described far left.
Model Code

For pilot operated valves:
(F3-) DG3* -H8- *** ** (-**) (-*) -**

For hand-lever operated valves:
(F3-) DG17* -H8- ** -**

For solenoid controlled, pilot operated valves:
(F3-) DG5* -H8- *** ** (-**)(-E)(-T)(-*)(-V) M- ***** (L) -* 5-**

1 Fluid compatibility
Blank = Antiwear hydraulic oil  
(class L-HM), invert emulsion  
(class L-HFB), or water glycol  
(class L-HFC)
F3 = As above or phosphate ester  
(class L-HFD)
Note: For further information see “Hydraulic Fluids” section seven pages on.

2 Pressure rating
S = 210 bar (3000 psi)
V = 350 bar (5000 psi)

3 Spool type
See “Functional Symbols” section commencing four pages back

4 Spool spring arrangement
A = Spring offset, end-to-end  
(P to B when operated)
AL = As “A” but left-hand build  
(P to A when operated)
B = Spring offset, end-to-center  
(P to B when operated) ▲
BL = As “B” but left-hand build  
(P to A when operated) ▲
C = Spring centered
D = Pressure centered ▼
N = Two-position detented
▲ DG5* option. Same function from DG3*-H8-*C valves by alternating pilot supply to one port (X or Y) and 
permanently draining the other.
▼ Option for DG3* and DG5* models only.

5 Spool control
1 = Stroke adjustment at both ends▼
2 = Pilot choke adjustment both ends
3 = “1” and “2” combined▼
7 = Stroke adjustment, port A end only▼
8 = Stroke adjustment, port B end only▼
27 = “2” and “7” combined▼
28 = “2” and “8” combined▼
Omit if not required▼
Not applicable to DG5*-H8-*B(L) models.
Not applicable to models shown in the “DG5*-H8-*BL spring offset, end-to-center, opposite hand” section three 
pages back.
Not applicable to models shown in the “DG5*-H8-*B spring offset, end-to-center” section three pages back.

6 External pilot supply
Omit for internal pilot supply

7 Internal pilot drain
Omit for external drain, which is also mandatory for 1, 4, 8 and 9 spool-type valves

8 Minimum-pilot-pressure generator (“P” port option)
K = 0.35 bar (5 psi) cracking pressure
S = 5.2 bar (75 psi) cracking pressure
Omit if not required

9 Manual override option
Blank = Plain override in solenoid end(s) only▼
H = Water-resistant manual override on solenoid end(s)▼
Z = No override at either end▼
No override in non-solenoid end of single-solenoid valves.

10 Solenoid energization identity
V = Solenoid “A” is at port A end of pilot valve and/or solenoid “B” at port B end independent of main-stage valve port locations or 
spool type; German practice.
Omit (except as noted below) for US ANSI B93.9 standard whereby solenoid “A” is that which when energized 
connects P to A in main-stage valve, and/or solenoid “B” connects P to B.
Note: Energization identities on valves with type 4 or 8 spools are identical under US and 
German practices. In such cases the “V” code is used.
### Solenoid type/connection(s)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>ISO 4400 (DIN 43650) mounting</td>
</tr>
<tr>
<td>FW</td>
<td>1/2” NPT thread junction box</td>
</tr>
<tr>
<td>FTW</td>
<td>1/2” NPT thread junction box and terminal strip</td>
</tr>
<tr>
<td>FJ</td>
<td>M20 thread junction box</td>
</tr>
<tr>
<td>FTJ</td>
<td>M20 thread junction box and terminal strip</td>
</tr>
<tr>
<td>FPA3W</td>
<td>Junction box with 3-pin male connector to NFPA T3.5.29-1980 for single-solenoid valves</td>
</tr>
<tr>
<td>FPA5W</td>
<td>Junction box with 5-pin male connector to NFPA T3.5.29-1980 for single or double-solenoid valves</td>
</tr>
</tbody>
</table>

■ Some female plug connector options available separately from Vickers Systems (see “Plugs to ISO 4400” eleven pages on).

▲ Female connector to be supplied by user.

### Indicator lights, option for codes FTJ, FTW, FPA3W and FPA5W

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Lights fitted</td>
</tr>
</tbody>
</table>

Omit if lights not required

For U-code solenoids use plug with integral light, see eleven pages on.

### Coil rating

See “Operating Data” for further information.

- **A** = 110V AC 50 Hz
- **B** = 110V AC 50 Hz/120V AC 60 Hz
- **C** = 220V AC 50 Hz
- **D** = 220V AC 50 Hz/240V AC 60 Hz
- **G** = 12V DC
- **H** = 24V DC

◆ For 60 Hz or dual frequency.

### Design number

- 10 series for DG3/17V valves
- 30 series for DG3/17S valves
- 30 series for DG5V valves
- 50 series for DG5S valves

Subject to change. Installation dimensions unaltered for design numbers *0 to *9 inclusive.

### Supporting Products

See under that heading three pages on.
Performance data typical under standard test conditions which use antiwear hydraulic oil (Class L-HM) at 21 cSt (105 SUS) and 50°C (122°F).

**Maximum pressures**

Maximum flow rates, in L/min (USgpm) at the minimum pilot pressures (see “Pilot Pressures” three pages on)

<table>
<thead>
<tr>
<th>Model Spool type</th>
<th>Max. flow rate, L/min (USgpm) at:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>210 bar (3000 psi)</td>
</tr>
<tr>
<td></td>
<td>350 bar (5000 psi)</td>
</tr>
<tr>
<td>DG3*-H8-*A(L)</td>
<td></td>
</tr>
<tr>
<td>0, 2, 6, 9, 52 &amp; 521 &amp; X2 &amp; Y2</td>
<td>500 (132)</td>
</tr>
<tr>
<td>0</td>
<td>700 (185)</td>
</tr>
<tr>
<td>1</td>
<td>650 (172)</td>
</tr>
<tr>
<td>DG5*-H8-A(L)</td>
<td></td>
</tr>
<tr>
<td>2 &amp; 3</td>
<td>700 (185)</td>
</tr>
<tr>
<td>DG3*-H8-*C</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>350 (92)</td>
</tr>
<tr>
<td>DG5*-H8-*B(L)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>650 (172)</td>
</tr>
<tr>
<td>DG5*-H8-*C</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>700 (185)</td>
</tr>
<tr>
<td>DG5*-H8-*N</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>350 (92)</td>
</tr>
<tr>
<td>11</td>
<td>650 (172)</td>
</tr>
<tr>
<td>31, 33, 34, 52 &amp; 521 &amp; X2, X33, Y2 &amp; Y33</td>
<td>700 (185)</td>
</tr>
<tr>
<td>300 (80)</td>
<td>300 (80)</td>
</tr>
<tr>
<td>DG3*-H8-*D</td>
<td></td>
</tr>
<tr>
<td>0, 1, 2, 3</td>
<td>700 (185)</td>
</tr>
<tr>
<td>4</td>
<td>350 (92)</td>
</tr>
<tr>
<td>DG5*-H8-*D</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>650 (172)</td>
</tr>
<tr>
<td>8</td>
<td>650 (172)</td>
</tr>
<tr>
<td>9</td>
<td>400 (106)</td>
</tr>
<tr>
<td>11, 31, 33, 52 &amp; 521 &amp; X2, X33, Y2 &amp; Y33</td>
<td>700 (185)</td>
</tr>
<tr>
<td>300 (80)</td>
<td>300 (80)</td>
</tr>
<tr>
<td>DG17*-H8-*A(L)</td>
<td></td>
</tr>
<tr>
<td>0, 2 &amp; 6</td>
<td>530 (140)</td>
</tr>
<tr>
<td>DG17*-H8-*N</td>
<td></td>
</tr>
<tr>
<td>DG17*-H8-*C</td>
<td></td>
</tr>
<tr>
<td>0, 2, 6, 8 &amp; 33</td>
<td>530 (140)</td>
</tr>
<tr>
<td>4</td>
<td>350 (92)</td>
</tr>
</tbody>
</table>

▲ Higher flow rates possible at higher pilot pressures; consult your local Vickers sales engineer.

Minimum pilot pressures, DG3/5* valves

<table>
<thead>
<tr>
<th>Control (swept) volume(s), DG3* and main-stage of DG5* valves:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center-to-end</td>
</tr>
<tr>
<td>End-to-end</td>
</tr>
<tr>
<td>11.6 cm³ (0.70 in³)</td>
</tr>
<tr>
<td>23.2 cm³ (1.42 in³)</td>
</tr>
</tbody>
</table>

Hand movement, DG17* valves:

- DG17*-H8-*A(L)*N models                                    196 mm (7.72 in) nominal
- DG17*-H8-*C models                                       98 mm (3.86 in) nominal

Operating force by hand, DG17* valves, at 280 bar and under standard test conditions:

- DG17*-H8-*A(L) models                                   190N at 265 L/min (70 USgpm)
- DG17*-H8-*C models                                     120N at 265 L/min (70 USgpm)
- DG17*-H8-*N models                                      125N at 530 L/min (140 USgpm)

Voltage ratings, DG5* valves

See in “Model Code” on previous page

Continued on next page
<table>
<thead>
<tr>
<th>Voltage limits, DG5V valves:</th>
<th>See “Temperature limits” below.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum voltage</td>
<td>90% of rated voltage</td>
</tr>
<tr>
<td>Minimum voltage</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power consumption, DG5* valves with AC solenoids:</th>
<th>Initial VA rms</th>
<th>Holding VA rms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-frequency coils, 50 Hz types “A” and “C”</td>
<td>225</td>
<td>39</td>
</tr>
<tr>
<td>Dual-frequency coils at 50 Hz, types “B” and “D”</td>
<td>265</td>
<td>49</td>
</tr>
<tr>
<td>Dual-frequency coils at 60 Hz, types “B” and “D”</td>
<td>260</td>
<td>48</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power consumption, DG5* valves with DC solenoids</th>
<th>30W at rated voltage and 20°C</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Relative duty factor, DG5* valves</th>
<th>Continuous; ED = 100%</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Type of protection, DG5* valves:</th>
<th>ISO 4400 coils with plug fitted correctly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junction box</td>
<td>IEC 144 class IP65</td>
</tr>
<tr>
<td>Coil winding</td>
<td>IEC 144 class IP65 (NEMA 4)</td>
</tr>
<tr>
<td>Lead wires (coil types “E****”)</td>
<td>Class H</td>
</tr>
<tr>
<td>Coil encapsulation</td>
<td>Class F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure drop characteristics, including metering characteristics of X* and Y* spools</th>
<th>See two pages on</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Response times, DG3* and DG5* valves</th>
<th>See “Response Times” section three pages on</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Temperature limits:</th>
<th>See four pages on.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid temperature limits</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature limits:</td>
<td>–20°C (–4°F)</td>
</tr>
</tbody>
</table>

Maximum ambients, DG5* valves with coils listed in [13] in “Model Code” two pages back, and under conditions stated below:

<table>
<thead>
<tr>
<th>Dual-frequency coils:</th>
<th>65°C (150°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>at 50 Hz and 107% of rated voltage</td>
<td></td>
</tr>
<tr>
<td>at 50 Hz and 110% of rated voltage</td>
<td></td>
</tr>
<tr>
<td>at 60 Hz and 107% of rated voltage</td>
<td></td>
</tr>
<tr>
<td>at 60 Hz and 110% of rated voltage</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Single-frequency (50 Hz) coils at 50 Hz and 110% of rated voltage</th>
<th>65°C (150°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC coils at 110% of rated voltage</td>
<td>70°C (158°F)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installation dimensions:</th>
<th>Commence five pages on.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valves</td>
<td></td>
</tr>
<tr>
<td>Mounting surface</td>
<td>See catalog 2425.</td>
</tr>
</tbody>
</table>

Continued on next page
Mass (weight), basic models:

<table>
<thead>
<tr>
<th>Model</th>
<th>kg (lb)approx.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DG3*-H8-*A/D</td>
<td>16.4 (36)</td>
</tr>
<tr>
<td>DG3*-H8-*C</td>
<td>17.0 (37.4)</td>
</tr>
<tr>
<td>DG5*-H8-*A/B (AC voltages)</td>
<td>17.6 (38.7)</td>
</tr>
<tr>
<td>DG5*-H8-*A/B (DC voltages)</td>
<td>17.8 (39.1)</td>
</tr>
<tr>
<td>DG5*-H8-*C/N (AC voltages)</td>
<td>18.0 (39.6)</td>
</tr>
<tr>
<td>DG5*-H8-*C/N (DC voltages)</td>
<td>18.5 (40.7)</td>
</tr>
<tr>
<td>DG5*-H8-*D (AC voltages)</td>
<td>18.6 (40.9)</td>
</tr>
<tr>
<td>DG5*-H8-*D (DC voltages)</td>
<td>19.1 (42.0)</td>
</tr>
<tr>
<td>DG17*-H8-*A</td>
<td>20.7 (45.5)</td>
</tr>
<tr>
<td>DG17*-H8-*C/N</td>
<td>20.1 (44.2)</td>
</tr>
</tbody>
</table>

Add 1.1 kg (2.4 lb) when pilot choke adjustment is fitted.

Supporting products:
- Subplate: See catalog 2425.
- Fastener kit: See catalog 2314 and select appropriate M12 or 1/2-13UNC 6-bolt kit from length options.

Installation and commissioning:
- Mounting attitudes, DG3* series
- Mounting attitudes, DG5* series
- Mounting attitudes, DG17* series

Optional for models shown. Optional for DG5*-H8-*B(L)/C/D models, but horizontal mounting is recommended for DG5*-H8-*A(L)/N models
Optional for DG17*-H8-*A(L)/C, but horizontal mounting is recommended for DG17*-H8-*N models
DG5/17*-H8-*A(L)/N models may be adversely affected by excessive shock, vibration and/or unusual pressure transients.

After-sales service:
- Spare-parts data for DG3/17 and main-stages of DG5 valves, and pilot choke modules
- Spare-parts data for DG4V-3S pilot stages of DG5 valves

Consult your local Vickers representative.
Ask for spares catalog I-3886-S (minimal text, in English).

Maximum Operating Pressures

<table>
<thead>
<tr>
<th>Model</th>
<th>Ports</th>
<th>Max. pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>DG*S models 30-series</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>0,5</td>
</tr>
<tr>
<td>DG5*-H8-<strong>(L)</strong>(-**)(-E)(-*) (externally drained)</td>
<td>P, A, B, T &amp; X</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td>–</td>
</tr>
<tr>
<td>DG17*-H8</td>
<td>P, A, B &amp; T</td>
<td>210</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>2</td>
</tr>
</tbody>
</table>

▲ Internal drain option available for all except pressure centered versions
● Important: DG5S, 50 series and DG5V, 30 series two-stage valves have been designed to satisfy the needs of most applications. Consult your Vickers representative about an alternative model if:
  a) Valves are required to remain pressurized for long periods without frequent switching, and /or
  b) Back pressure on the drain port of externally drained models (or the tank port of internally drained models) is required to rise above 100 bar.
Minimum Pilot Pressures, DG3* and DG5* Valves
Typical values:

<table>
<thead>
<tr>
<th>Flow rate</th>
<th>Pressure drop characteristics</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Flow rate</th>
<th>Pressure drop characteristics</th>
</tr>
</thead>
</table>

Minimum pilot pressure

Pressure Drop Characteristics
Typical under standard test conditions, i.e. with oil at 21 cSt (105 SUS) and of 0.865 specific gravity. For other viscosities the pressure drops shown below will change approximately as follows:

Other viscosities (cSt)

<table>
<thead>
<tr>
<th>Other viscosities (cSt)</th>
<th>% of pressure drop from above table</th>
</tr>
</thead>
</table>

A change to another specific gravity will yield an approximately proportional change in pressure drop.

The specific gravity of a fluid may be obtained from its producer. Fire-resistant fluids usually have higher specific gravities than oil.

All Spools at Full Stroke and Centered Positions

<table>
<thead>
<tr>
<th>Spool type</th>
<th>Flow-direction curve ref.</th>
</tr>
</thead>
</table>

Note: Consult your local Vickers sales engineer regarding pressure drops in the regenerative position of type “52” spool and in all positions of type “521” spool, not listed here.
Minimum-Pilot-Pressure Generator Options ("P" port)
Additive to "Pressure Drop Characteristics" graph on previous page.

Metering Characteristics of X2, X33, Y2 and Y33 Spools Used with Stroke Adjusters

Response Times, DG3* and DG5* Valves
Taken from when the signal is first applied at the valve until the main-stage spool completes its travel. Signals are electric for DG5 models or hydraulic for DG3 models.

All are typical under standard test conditions.

<table>
<thead>
<tr>
<th>Model</th>
<th>Signal</th>
<th>Response time (ms) at stated pilot pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>13 bar (190 psi)</td>
</tr>
<tr>
<td>DG3*-H8-2A(L)</td>
<td>Select</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Return</td>
<td>–</td>
</tr>
<tr>
<td>DG5*-H8-2D</td>
<td>Select AC</td>
<td>185</td>
</tr>
<tr>
<td></td>
<td>Return AC</td>
<td>110</td>
</tr>
<tr>
<td>DG5*-H8-2C</td>
<td>Select AC</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>Select DC</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td>Return AC</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>Return DC</td>
<td>90</td>
</tr>
</tbody>
</table>

Note: Response times are dependent on adequate pilot flow. For control (swept) volumes see four pages back
Hydraulic Fluids
Materials and seals used in these valves are compatible with antiwear hydraulic oils, water-glycols, water-in-oil emulsions and non-alkyl-based phosphate esters. The extreme operating range is 500 to 13 cSt (2270 to 70 SUS) but the recommended running range is 54 to 13 cSt (245 to 70 SUS). For further technical information about fluids see leaflet B-920 or I-286S.

Contamination Control Requirements
Recommendations on contamination control methods and the selection of products to control fluid condition are included in Vickers publication 9132 or 561, “Vickers Guide to Systemic Contamination Control”. The book also includes information on the Vickers concept of “ProActive Maintenance”. The following recommendations are based on ISO cleanliness levels at 2 μm, 5 μm and 15 μm. For products in this catalog the recommended levels are:

Up to 210 bar (3000 psi) . . . . . . . 20/18/15
Above 210 bar (3000 psi) . . . . . . . 19/17/14

Fluid Temperatures
For petroleum oil:
Min. . . . . . . . . . . . . . . . . . . −20°C (−4°F)
Max.* . . . . . . . . . . . . . . . . . . +70°C (+158°F)

* To obtain optimum service life from both fluid and hydraulic system, 65°C (150°F) normally is the maximum temperature.

For other fluids where limits are outside those of petroleum oil, consult fluid manufacturer or Vickers representative. Whatever the actual temperature range, ensure that viscosities stay within those specified under “Hydraulic Fluids”.
Installation Dimensions in mm (inches)

Solenoid Controlled Models with ISO 4400 (DIN 43650) Electrical Connections and Pilot Choke
DG5*-H8-**(L)(-*)(-E)(-T)(-*)(-*)(-*)(-*)-(V)M-U example

For stroke adjusters see next page.
For solenoid identification see two pages on.
For dimensions A, B, C, D and E see two pages on.

Notes:
- May vary according to plug source.
- Alternative plug positions by loosening knurled nut counter-clockwise, turning coil and retightening nut.
- Cable entry can be positioned at 90° either way from the position shown by reassembling the contact holder into the appropriate position inside the plug connector housing.
**Solenoid Controlled Models with Stroke Adjusters**

DG5*-H8-**(L)(-*)(-E)(-T)(-*)(-*)(-*)-(V)M-U example

For solenoid identification see next page.

![Diagram of solenoid controlled models with stroke adjusters](image1)

To adjust:
- Turn locknut counter-clockwise, then turn screw clockwise to shorten stroke, or counter-clockwise to increase stroke.
- Retighten locknut.

**Solenoid Controlled Models with Junction Box**

having Optional Terminal Strip and Indicator Lights

DG5*-H8-**(L)(-*)(-E)(-T)(-*)(-*)(-*)(-V)M-****(L) example

For solenoid identification see next page.

Available also with other options shown above and on previous page.

M20-6H x 1.5 thread for F(T)J options, or 1/2" NPT for F(T)W options at both ends.
Closure plug fitted at one end.
For other options see in “Model Code”, eight pages back, and under “NFPA Connector---” and “Terminal Strip and Lights” sections, three pages on.

**Pilot Operated Models with Optional Pilot Choke and/or Stroke Adjusters**

DG3*-H8-**(**)(**) example

For dimensions D and E see next page.
Solenoïd Identification

Model (see also [in “Model Code” ten pages back) | Spool types | Solenoïd identity at: Main port “A” end | Main port “B” end
--- | --- | --- | ---
DG5*-H8-*A/B(-*)(-E)(-T)(-K)(-*)-M | All except “4” & “8” | – | B
DG5*-H8-*A/B(-*)(-E)(-T)(-K)(-*)-VM | All except “4” & “8” “4” & “8” only | – | A
DG5*-H8-*AL/BL(-*)(-E)(-T)(-K)(-*)-M | All except “4” & “8” | A | –
DG5*-H8-*AL/BL(-*)(-E)(-T)(-K)(-*)-VM | All except “4” & “8” “4” & “8” only | B | –
DG5*-H8-*C/D/N(-*)(-E)(-T)(-K)(-*)-M | All except “4” & “8” | A | B
DG5*-H8-*C/D/N(-*)(-E)(-T)(-K)(-*)-VM | All spools | B | A

Dimensions

<table>
<thead>
<tr>
<th>Basic model designation</th>
<th>AC models</th>
<th></th>
<th>DC models</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
</tbody>
</table>
| DG3*-H8-*C | – | – | – | – | – | – | 135 (5.3) | 135 (5.3)
| DG3*-H8-*A | – | – | – | – | – | – | 135 (5.3) | 198 (7.8)
| DG3*-H8-*A(L) | – | – | – | – | – | – | 198 (7.8) | 135 (5.3)
| DG3*-H8-*D | – | 147 (5.8) | – | – | 157 (6.2) | – | 135 (5.3) | 135 (5.3)
| DG5*-H8-*A | – | – | 147 (5.8) | – | – | 157 (6.2) | 135 (5.3) | 135 (5.3)
| DG5*-H8-*B | – | – | 147 (5.8) | – | – | 157 (6.2) | 135 (5.3) | 135 (5.3)
| DG5*-H8-4/8BL | 200 (7.8) | – | – | 220 (8.7) | – | – | 135 (5.3) | 135 (5.3)
| DG5*-H8-*C | 200 (7.8) | – | – | 220 (8.7) | – | – | 198 (7.8) | 135 (5.3)

■ Not types “4” or “8” spools.

Water-Resistant Manual Override on Solenoids
DG5*-H8-*(-*)(-E)(-T)(-*)H valves

Application:
General use where finger operation is required (standard manual overrides can only be operated by using a small tool).

Manual actuation must be applied within this diameter: approximately 20 (0.8). Spacer prevents actuation by larger device.

Note: “H” feature is not field convertible from other models; specify with order.
Hand-Lever Operated Models
DG17*-H8-*A illustrated.
DG17*-H8-*AL models differ by
interchange of end caps, and of direction
of flow between positions 1 and 3.

Hand-Lever Operated Models

---

Model:
Two-position detented

<table>
<thead>
<tr>
<th>Model</th>
<th>Spring centered</th>
<th>Spring offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>DG17*-H8-0N</td>
<td>DG17*-H8-0C</td>
<td>DG17*-H8-0A</td>
</tr>
<tr>
<td>DG17*-H8-2N</td>
<td>DG17*-H8-2C</td>
<td>DG17*-H8-2A</td>
</tr>
<tr>
<td>DG17*-H8-4N</td>
<td>DG17*-H8-4C</td>
<td></td>
</tr>
<tr>
<td>DG17*-H8-6N</td>
<td>DG17*-H8-6C</td>
<td>DG17*-H8-6A</td>
</tr>
<tr>
<td>DG17*-H8-8N</td>
<td>DG17*-H8-8C</td>
<td></td>
</tr>
<tr>
<td>DG17*-H8-33N</td>
<td>DG17*-H8-33C</td>
<td></td>
</tr>
</tbody>
</table>

Flow direction at lever positions:

Position 1 (Normal for DG17*-H8-*A models):
- P → B and A → T
- P, A and B → T

Position 1 (Normal for DG17*-H8-*AL models):
- P → A and B → T
- P, A and B blocked

Position 2 (Applies to:
- a. Spring centered or two-position detented models.
- b. Spring offset models at center crossover.):
- P → B and A → T
- P → T, A and B blocked
- P blocked. A and B → T

Position 3 (Normal for DG17*-H8-*AL models):
- P → B and A → T
- P → A and B → T
- P blocked. A and B → T
- P → A and B → T
Electrical Plugs and Connectors for DG5 Valves

Plugs for ISO 4400 (DIN 43650) Type
Coil Connection
For valves with type “U” coils

The cable entry on these plugs can be
repositioned at 90° intervals by
reassemble of the contact holder relative
to the plug housing.

The cable entry is Pg.11, for cable
Ø 6-10 mm.

Order separately by part number.
Plugs without indicator lights

Part no. Color Use on solenoid coil
710775 Black Sol. B
710776 Gray Sol. A

Plugs with indicator lights

Voltage Part no. Color Use on solenoid coil
Gray (sol. A) Black (sol. B)
12-24V 977467 977466 Sol. B
100-125V 977469 977468 Sol. A
200-240V 977471 977470 Sol. B

NFPA Connector T3.5.29-1980
DG5*-H8-**(**)---FP3W(L) and
DG5*-H8-**(**)---FP5W(L) models

The receptacle is a standard three or
five-pole connector with shortened leads
and terminals added. The five-pole plug
has four leads 101,6 mm long and one
of 177,8 mm length. All wires have US
Underwriters Laboratory-recognized
non-solder insulated eyelet terminals.
The green wire is used for the ground
(earth) connection (No. 8-size screw
furnished). Valves are supplied
prewired.
Terminal Strip and Light Options
When fitted in solenoid controlled valves DG5*-H8-**(L)---F****(L).

1. For DC coils the +ve lead(s) must be connected to the terminal(s) marked +. When using 3-wire incoming leads to double solenoid valves (i.e. common neutral) the inner pair of terminals must be linked.

2. For correct light indication of energized solenoid ensure that solenoid leads are correctly connected: light terminals are common with each outer pair of solenoid terminals according to the side with + mark.