

EAT•N

Vickers

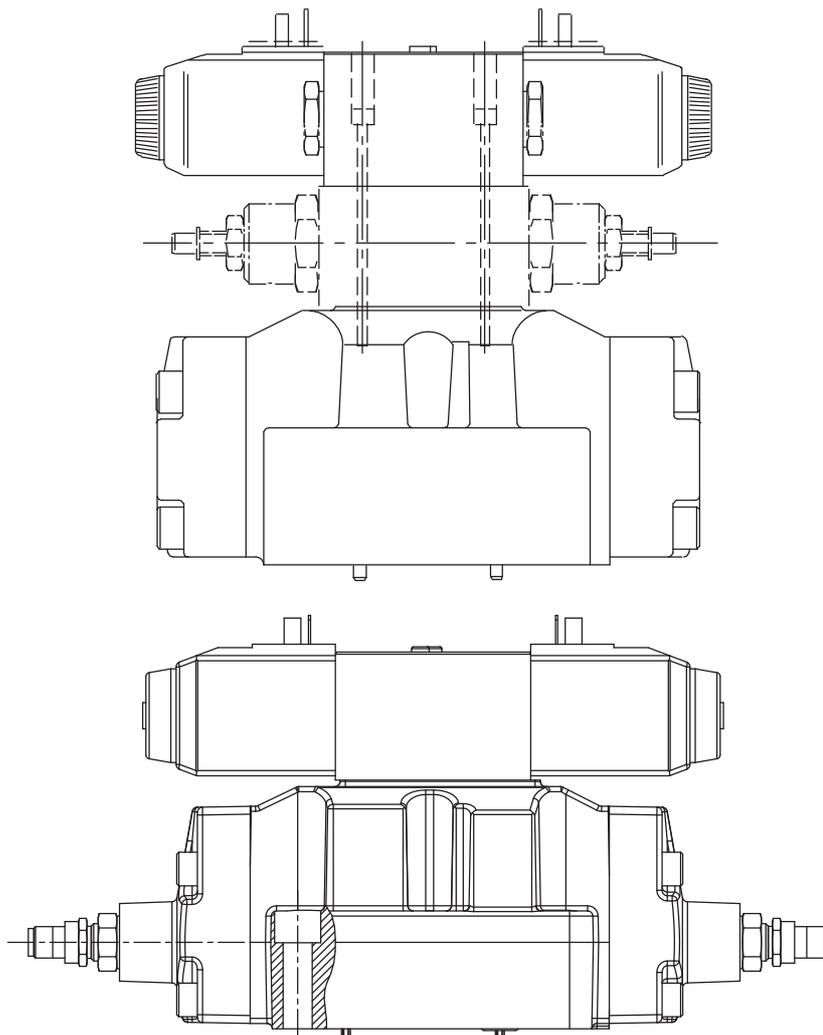
Pilot Operated Directional Valves

Catalog

DG3V-7, 20 Series,
Pilot Operated

DG5V-7, 40 Series, Solenoid
Controlled, Pilot Operated

ISO 4401 Size O7

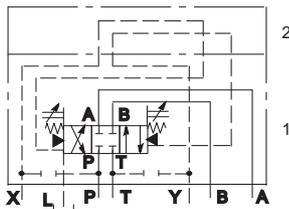


Functional Symbols

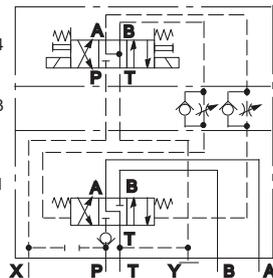
Symbols on Nameplates

Typical illustrations for:

DG 3V-7-2D-1

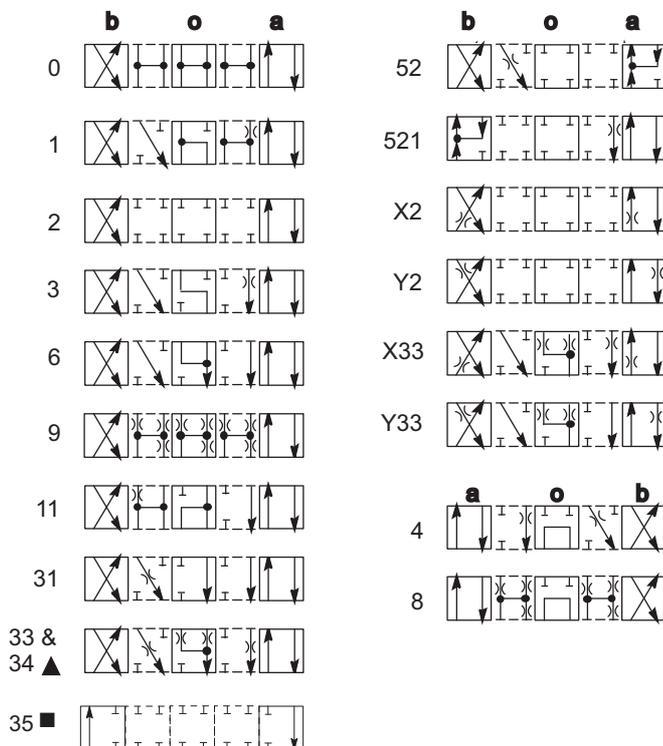


DG 5V-7-3C-2-E-T-K



Spool Types

Shown in 3-position form, plus 2 transients.



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 DG 5V-7-*A (L) and DG 5V-7-*N valves.

▲ The performance of the "33" and "34" spools differ only in the center position.

Your Eaton representative can provide further details.

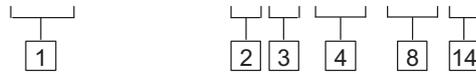
■ Only 35A available.

Model Codes

DG 3V-7 20 Series, Pilot
Operated Directional Valves

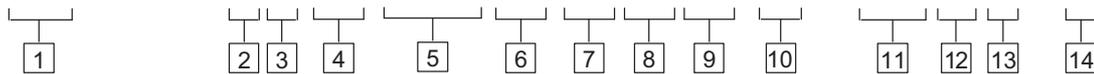
For pilot operated valves:

(F3-) DG3V-7-* ** (-) (-K)-2***



For solenoid controlled, pilot operated valves:

(F3-) DG5V-7-* ** (-) (-P**) (-E)(-T)(-K) (-*)-(V) M-***** (L) -* 5-4***



1 Fluid Compatibility

Blank =

Antiwear hydraulic oil (class LHM),
invert emulsion (class LHFB),
or water glycol (class LHFC)

F3 = As above or phosphate ester (class LHFD)

Note: For further information see "Hydraulic Fluids" section on page A.12

2 Spool Type

See "Functional Symbols" section on pages 3-4.

3 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

■ DG5V option. Same function from DG3V-7-*C valves by alternating pilot supply to one port (X or Y) and permanently draining the other.

4 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 DG5V-7*(B/L) models.

▼ Not applicable to models shown in the "Spring offset, end-to-center, opposite hand" section on page A.3

◆ Not applicable to models shown in the "Spring offset, end-to-center" section on page A.3

5 Main Stage Spool Monitoring Switch

(Omit if not required.)

PCA - Center sensing switch on "A" port end

PCB - Center sensing switch on "B" port end

PDA - Double offset sensing switch on "A" port end

PDB - Double offset sensing switch on "B" port end

PCD - Center sensing switch on "A" port end and double offset sensing switch on "B" port end

PPA - Offset sensing proximity switch "A" port end

PPB - Offset sensing proximity switch "B" port end

PPD - Offset sensing proximity switch both ends

* The spool position monitoring switch shown on this technical document is CE marked and certified and complies to European Standard EN 61000-6-4: 2001 (Emissions) for Class A and European Standard EN 61000-6-2: 2001 (Immunity).

6 External Pilot Supply, DG 5V Valve Option

Omit for internal pilot supply

7 Internal Pilot Drain, DG 5V Valve Option

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 = Q 35 bar (5 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.

11 Solenoid Type/Connection(s)

U = ISO 4400 (DIN 43650) mounting ■

FW = 1/2 NPT thread junction box

FTW = 1/2 NPT thread junction box and terminal strip

FJ = M20 thread junction box

FTJ = M20 thread junction box and terminal strip

FPA 3W = Junction box with 3-pin male connector ◆ to NFPA T3.5.29-1980 for single-solenoid valves

FPA 5W = Junction box with 5-pin male connector ◆ to NFPA T3.5.29-1980 for single

or double-solenoid valves

■ Some female plug connector options available separately from Vickers Systems (see "Plugs for ISO 4400" on page A.16). Others available from electrical stockists.

◆ Female connector to be supplied by user.

12 Indicator Lights, Option for Codes FTJ, FTW, FPA 3W and FPA 5W in item 10.

L = Lights fitted

Omit if lights not required

For U-code solenoids use plug with integral light, see page A.16

13 Coil Rating

See "Operating Data" on page XX 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.

14 Design Number

20 series for DG 3V valves.
40 series for DG 5V valves.

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

For Mounting Subplate and Fastener Kit Options

See "Supporting products" on page A.10

For ISO 4400 (DIN 43650) Electrical Plugs to Suit DG 5V---(V)M-J Valves

See "Installation Dimensions" and "Electrical Plugs and Connectors" on page A.13

Application Notes

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 (Q 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 DG5V-7-*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 minimum pilot pressure differential of Q 35 bar (5 psi) where internal pilot pressure is required with open-centered spools, i.e. Q 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 #4.)

Pilot Choke Adjustment Options

These provide a meter-out flow control system to the fluid in the pilot chambers of main-stage valves. It 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 on this page.

Installation Dimensions

Millimeters (inches)

Solenoid Controlled Models with ISO 4400 (DIN 43650)

Electrical Connections and Pilot Choke

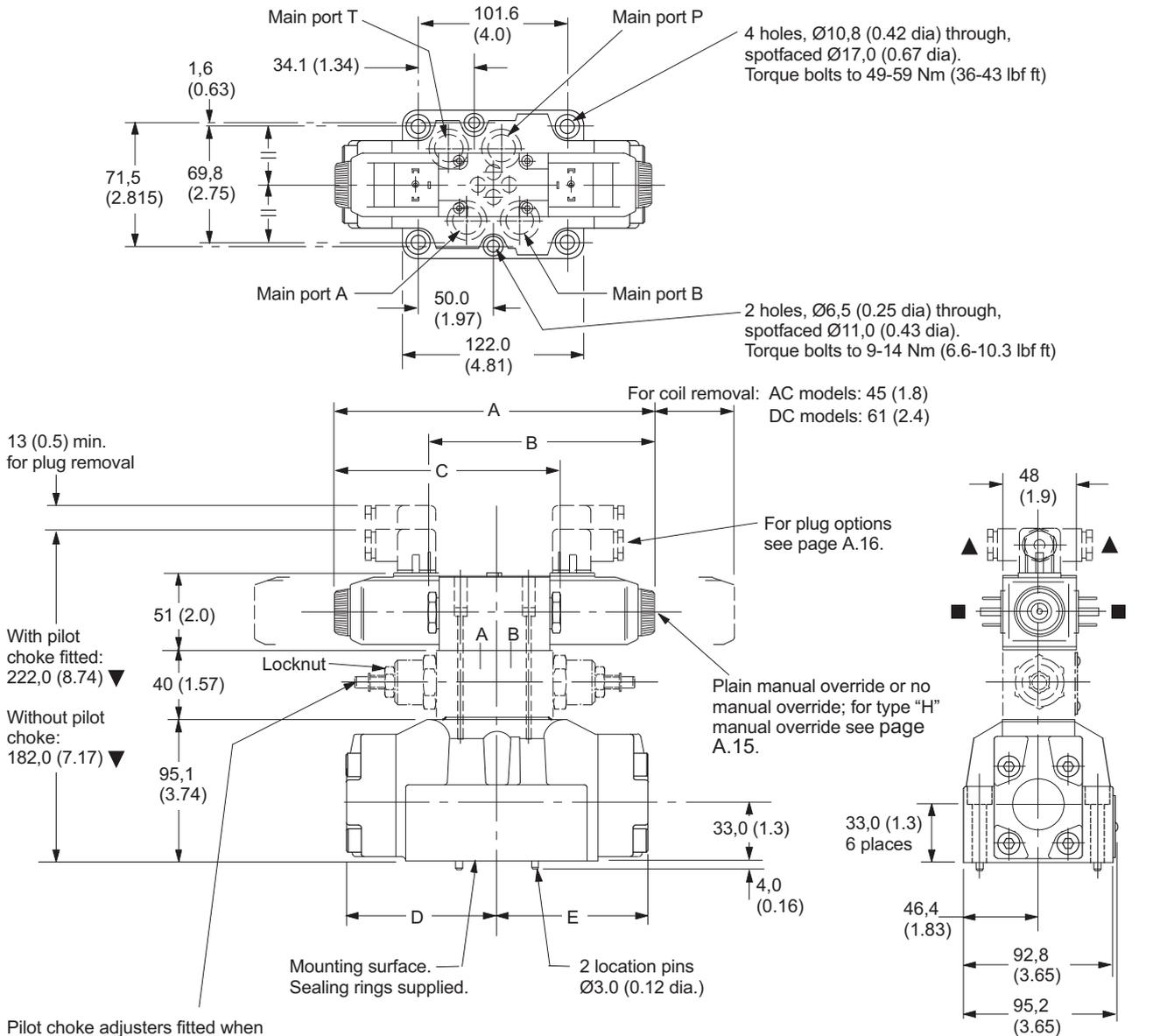
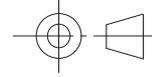
DG5V-7-**(L)(-2)(-E)(-T)(-K)(-*)(-V)M-U example

For dimensions A, B, C, D and E see page A.15.

For solenoid identification see page A.15.

For stroke adjusters see page A.14.

3rd angle
projection



Pilot choke adjusters fitted when Model Code [4] = 2, 3, 27 or 28. To adjust, turn locknut counter-clockwise, then turn screw clockwise to slow down rate of spool travel, or counter-clockwise to increase the rate. Retighten locknut to 25-30 Nm (18-22 lbf ft).

▼ May vary according to plug source.
 ■ Alternative plug positions by loosening knurled nut counter-clockwise, turning coil and re-tightening nut.

▲ Cable entry can be positioned at 90° either way from position shown, by re-assembling the contact holder into the appropriate position inside the plug connector housing.