



*Powering Business Worldwide*

# Remote Pilot Operated Directional Valve

DG3V-8 10 Design

# Solenoid Controlled Pilot Operated Directional Valve

DG5V-8 10 Design

## General description

The Size 8 Directional Control Valve serves as a control valve package. It offers directional control, pilot pressure reducers, pilot chokes, and main stage stroke adjustment to control the flow.

The valves are generally used to control large flows up to 700 l/min (185 USgpm) at 350 bar (5000 psi) and provide low pressure drops. The range includes:

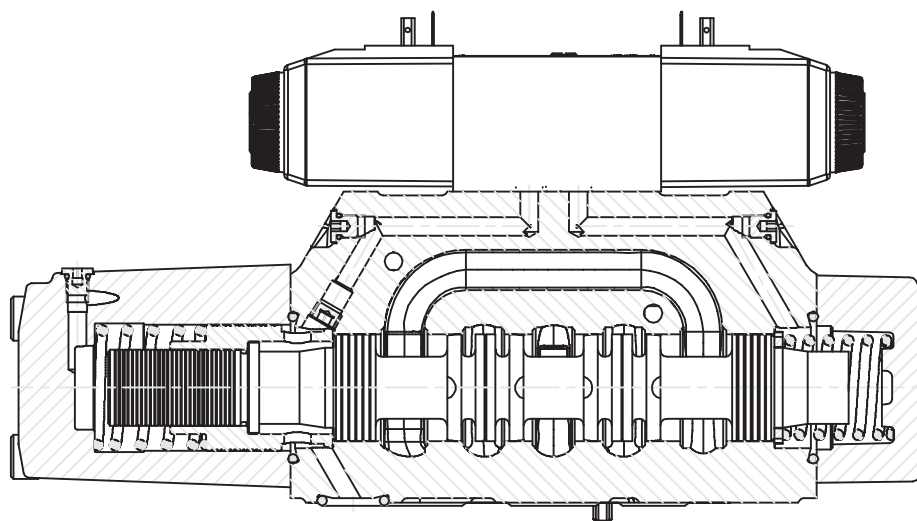
- DG3V-8 - remote pilot operated valve.
- DG5V-8-H - DG4V-3-60 high performance D03 pilot valve 210 bar (3000 psi) tank line rating.

Each valve contains a mainstage spool which is positioned in the valve by special arrangement. The four arrangements are:

- Spring offset - For single stage operation, one spring returns spool to an offset position. For two-stage operation, springs and washers are removed from main stage and offset action is obtained from pilot valve.
- Spring centered - Spring and washer are located on both ends of main stage spool to control centering.
- Pressure centered - Centering springs are used in addition to pilot pressure, to provide positive centering should pilot pressure fail.
- No-spring detented - Springs and washers are provided so that in the event of pilot pressure failure, the main spool will spring center.

## Features and Benefits

- A “mini-system” capability with wide variety of spool and spring arrangements, stroke and pilot choke adjustments, integral check valves and port orifices.
- High force solenoids and centering springs assure consistent shifting through a wide range of pressure and silting extremes.
- Optional Mainstage Spool Position Monitoring Switch (CE marked)
- Suitable for demanding industrial or mobile applications by providing for reliable operations.
- Endurance tested to 10 million cycles and fatigue tested without failure to ensure highest reliability.
- Fatigue testing performed to NFPA specifications to ensure the highest reliability in applications requiring high flows and pressure.
- Solid cast body and cored passages for maximum strength and minimal pressure drop.
- Electrical options including coil types, connections, and wiring housings allow full compatibility and reliable performance in any system application.
- Plain, waterproof, and lockable manual override options are available to facilitate system troubleshooting or servicing.

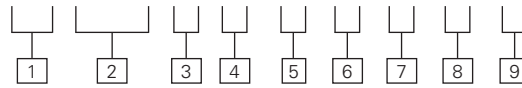


SECTION THROUGH SPOOL BORE CENTERLINE

# Model Codes

DG3V-8 Remote Pilot Operated Directional Valves

**(F\*) - DG3V - 8 - (B) - \*\* - (L) - (\*) - (\*) - 10**



## 1 Special Seals

- BLANK** – None
- F3** – Seals for fire resistant fluids.
- F6** – Seals for water glycol.

## 2 Directional Control Valve

- DG3V** – Subplate mounting; pilot operated-remote operator. Pressure rating 350 bar (5000 psi) for all ports. (See minimum pilot pressure requirements on page 6.

## 3 Valve Size

- 8** – Valve size CE TOP 8, NFPA D08

## 4 Gauge Ports

- Blank** – .4375-20 UNF-2B Thread
- B** – 1/4 B SP Thread

## 5 Spool Types

Please refer functional symbols on page 7 for spool types.

## 6 Spool Spring Arrangement

- BLANK** – No spring
- A** – Spring offset to cylinder 'A'
- C** – Spring centered
- D** – Pressure centered

## 7 Left Hand Build

- L** – A Models only, omit if not required.

## 8 Spool Control Modifications

- BLANK** – None
- 1** – Stroke adjustment (both ends ) (available on C & B lank (no spring) models )
- 2** – Pilot choke adjustment (available on all models )
- 3** – Pilot choke and stroke adjusters (both ends )

(available on C & B lank (no spring) models )

- 7** – Stroke adjusters on cylinder A end only (available on A, C & B lank (no spring) models )
- 8** – Stroke adjusters on cylinder 'B' end only (available on A, C, & B lank (no spring) models )
- 27** – If both are required (available on A, C, & B lank (no spring) models )
- 28** – If both are required (available on AL left hand

## 9 Check Valve in Pressure Port

- BLANK** – None
- K** – 0,35 bar (5 psi) check
- Q** – 2,42 bar (35 psi) check
- R** – 3,45 bar (50 psi) check
- S** – 5,20 bar (75 psi) check

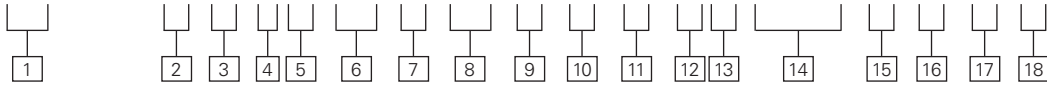
## 10 Design Number

Subject to change. Installation dimensions remain as shown for design numbers 10 through 19.

# Model Codes

## DG5V-8 Solenoid Controlled Pilot Operated Directional Valves

(F\*)-DG5V-8 - \* - (B) - \* \* \* - (\*\* ) - ( \* ) - P\*\* - (E) - (T) - ( \* ) - (V)M - \* \* \* \* \* - (L) - ( \* ) - \*\* - 10



### 1 Special Seals

(Omit if not required.)

**F3** – Seals for fire resistant fluids.

**F6** – Seals for water glycol.

### 2 Pilot Valve Type

**H** – CETOP 3, High performance

### 3 Gauge Ports

**Blank** – 4375-20 UNF-2B Thread

**B** – 1/4 BSP Thread

### 4 Spool Types

Please refer functional symbols on page 7 for spool types.

### 5 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

**N** – Two-position detented ■ DG5V option. Same function from DG3V-8-\*C valves by alternating pilot supply to one port (X or Y) and permanently draining the other.

### 6 Manual Override Option

**Blank** – Plain override in solenoid end(s) only ▲

**H** – Water-resistant manual override on solenoid end(s) ▲

**W** – Twist & lock override in solenoid ends

**Z** – No override at either end

▲ No override in non-solenoid end of single-solenoid valves.

### 7 Spool Control

**Blank** – None

**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 6

♦ Not applicable to models shown in the “Spring offset, end-to-center” section on page 6

■ Not applicable for spool “8” models

### 8 Main Stage Spool Monitoring Switch

**Blank** – None

**PCA** – Center sensing switch on “A” port end (not available on “D”, pressure centered, and 1/3/7/27, stroke adjust models)

**PCB** – Center sensing switch on “B” port end (not available on 1/3/8/28, stroke adjust models)

**PDA** – Double offset sensing switch on “A” port end (not available on “D”, pressure centered, and 1/3/7/27, stroke adjust models)

**PDB** – Double offset sensing switch on “B” port end (not available on 1/3/8/28, stroke adjust models)

**PCD** – Center sensing switch on “A” port end and double offset sensing

switch on “B” port end (not available on “D”, pressure centered, and 1/3/7/8/27/28, stroke adjust models)

**PPA** – Offset sensing proximity switch “A” port end (not available on “D”, pressure centered, and 1/3/7/27, stroke adjust models)

**PPB** – Offset sensing proximity switch “B” port end (not available on 1/3/8/28, stroke adjust models)

**PPD** – Offset sensing proximity switch both ends (not available on “D”, pressure centered, and 1/3/7/8/27/28, stroke adjust models)

Note: 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).

### 9 External Pilot Pressure

**E** – External pilot pressure. Omit for internal pilot pressure models.

### 10 Internal Pilot Drain

**T** – Internal pilot drain to ‘T’ port.

Omit for external pilot drain models.

### 11 Check Valve in Pressure Port

(Omit if not required.)

**K** – 0,35 bar (5 psi) check

**Q** – 2,42 bar (35 psi) check

**R** – 3,45 bar (50 psi) check

**S** – 5,20 bar (75 psi) check

### 12 Solenoid Energization Identity

**Blank** – Standard arrangement for ANSI B93.9 (i.e. energize solenoid A to follow flow P to A).

**V** – Solenoid identification determined by position of solenoid (i.e. solenoid A at port A end/solenoid B at port B end).

Note

4 and 8 type spools are always V. Solenoid energization identity is independent of mainstage porting.

### 13 Flag Symbol

**M** – Electrical options and features

### 14 Coil Type

**U** – ISO4400, DIN43650 connector

**U1** – ISO4400 fitted with PG11 plug

**U6** – ISO4400 with fitted DIN plug with lights

**KU** – Top exit flying lead (150mm)

**KUP4** – Junior timer (Amp) connector

**KUP5** – Integral Deutsch connector

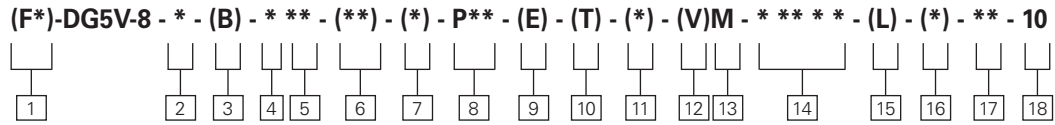
**FW** – Flying lead with 1/2” NPT thread wiring housing

**FTW** – Fly. lead wired terminal block & 1/2” NPT thread wiring housing

**FPA3W** – Fly. lead, 3 Pin connector & 1/2” NPT thread wiring housing

**FPA5W** – Fly. lead, 5 pin connector & 1/2” NPT thread wiring housing

# Model Codes (Contd.)



## 15 Indicator Lights

**Blank** – None

**L** – Solenoid indicator light•  
•Flying lead coil type only

## 16 Surge Suppressor damper

(DC voltages only, omit if not required)

**D1** – Diode positive bias

**D2** – Negative bias

**D7** – Transorb type

## 17 Coil Voltage

See electrical information on page 9 for voltages available. Others available upon request.

**B** – 110V AC 50Hz/120V AC 60 Hz

**BL** – 110V 50 Hz/120V 60 Hz

**D** – 220V AC 50 Hz/240V AC 60 Hz

**DS** – 28V DC 30 watt

**G** – 12V DC

**GL** – 12V DC

**H** – 24V DC

**HL** – 24V DC

**HM** – 24V DC 8 watt

## 18 Design Number

# Application Notes

## General Description

DG5V-8 models are two-stage directional control valves having an integrally mounted wet armature solenoid pilot valve. These valves are generally used to control the movement of a work cylinder or the rotation of a fluid motor.

## Pressure Centered Models

Designated by "D" under spring/spool arrangement in model code.

This option provides faster, more positive spring centering time by use of pilot pressure to center the spool. The valve spool is returned to center position when pilot pressure is applied at both ends of the spool. The centering springs are used in addition to pilot pressure to ensure positive centering of spool.

If pilot pressure fails or falls below the required minimum, the spool will spring return to the center position. Pilot pressure is not available through the use of an integral check valve. Pressure centered valves have a drain port "W" and must have provisions for this feature.

## Note

Pressure centered valves require a pilot valve which directs pilot oil to connections "X" and "Y" of the valve at the same time pressure centering is desired. The centering time depends on the rate of pressure rise in the pilot chamber.

## Spring Offset Models

Designated by "A" under spring/spool arrangement in model code.

Spring offset model has an internal spring which returns the spool to offset position when the pilot connection "X" is open to tank. Pilot

connection "Y" becomes a drain connection and must be piped directly to tank at atmospheric pressure through a surge-free tank line. Back pressure at this connection would cause valve to malfunction.



**Caution:** Spring offset models contain a high assembled spring load. Call Eaton Service for disassembly instructions.

## Spring Centered Models

Designated by "C" under spring/spool arrangement in model code.

A spring and washer arrangement is used on both ends of the spool. If control pressure is removed, the valve will go to center position due to spring force.

## No-Spring Models

Designated by a "Blank" under spring/spool arrangement in model code.

When the solenoid is de-energized, the spool returns to the last position attained.

## Performance Characteristics

Spring centered, pressure centered and spring offset models require continuous pilot pressure to maintain shifted position. Spring centered models return valve spool to center position by centering springs when pilot pressure fails or falls below minimum requirement.

## Shift Times

Shift times are defined as the time from pilot pressure application/removal to the point of the start of a pressure rise/decline in appropriate port.



**Caution:** Flow conditions of the spring centered position must be selected with care, both for the effect on the direction of the flow, and the pilot pressure. (The "9" main spool will not ensure sufficient pilot pressure in the center position for internal pilot pressure models).

## Pressure centered models:

Valve spool is returned to center position by pilot pressure, when pilot pressure is removed. If pilot pressure fails or falls below the required minimum, the valve spool will spring return to center position. (At spring centered valve flow rates).



**Caution:** Surges of oil in a common tank line serving these and other valves can be sufficient enough to cause inadvertent shifting of these valves. This is very critical in the no-spring detented valves. Separate tank lines or a vented manifold with a continuous downward path to tank is necessary.

## Note

Any sliding spool valve, if held for long periods of time, may stick and not spring return due to fluid residue formation and therefore, should be cycled periodically to prevent this from happening.

## Shifting Action

The pilot valve solenoids of spring centered, pressure centered, and spring offset models must be energized continuously to keep the main stage spool in the shifted position. No-spring detented models only need to be energized momentarily (for approximately 0.1 second).

Spring centered and pressure centered models return the valve spool to the center position when both solenoids are de-energized or pilot pressure fails or falls below minimum requirements. Spring offset models return the spool to the offset position by pilot pressure when the solenoid is de-energized.

When no-spring detented models are de-energized, the pilot and main spools remain in their last position as long as there are no unusual shock, vibration, or pressure transients, and the spool axis is horizontal. If pilot pressure fails or falls below minimum requirements, the main spool will spring center (at spring centered flow rates), but will not drift to a reversal of flow position. The pilot stage will remain in the detented position.

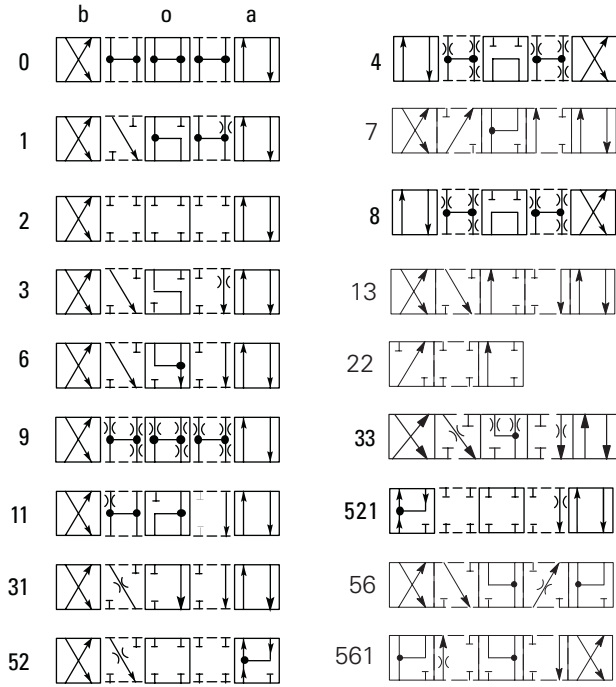
When used as other than a normal 4-way valve, consult your Eaton representative.

# Functional Symbols

## Spool Type and Center Position

### Spool Types

Shown in 3-position form, plus 2 transients.



### Notes:

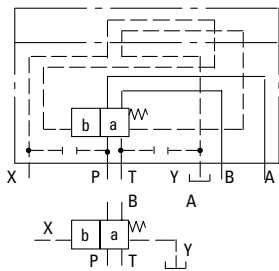
1. In the detailed and simplified symbols on this and the previous pages, the transient positions are omitted for simplicity.
2. In certain 2-position valves, the "o" position becomes an additional transient, i.e. in DG5V-8-\*A(L) and DG5V-8-\*N valves.

Your Eaton representative can provide further details.

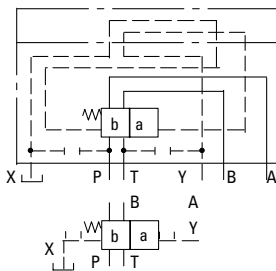
### DG3V-8 Pilot Operated Models

Comprehensive and simplified symbols.

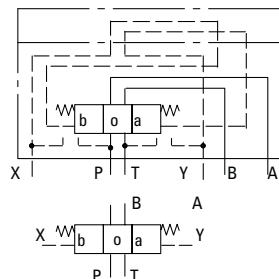
#### Spring Offset, End-to-End, DG3V-8-\*A



#### Spring Offset, End-to-End, Opposite Hand, DG3V-8-\*AL



#### Spring Centered, DG3V-8-\*C

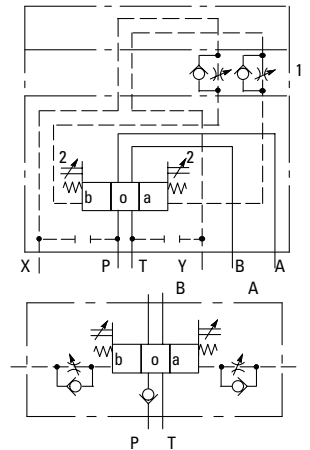


### DG3V-8 Options

The following are shown in a DG3V-8-\*C example:

1. Pilot choke module
2. 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.

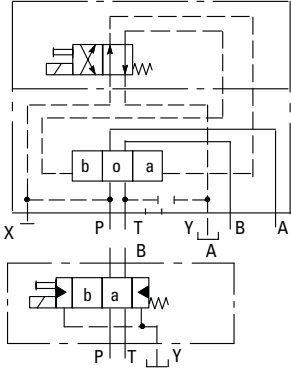


# Functional Symbols

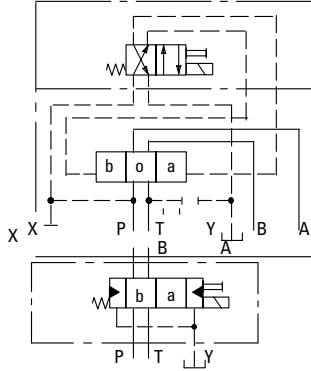
## DG5V-8, Solenoid Controlled, Pilot Operated Models

Comprehensive and simplified symbols shown configured for external pilot supply and internal drain

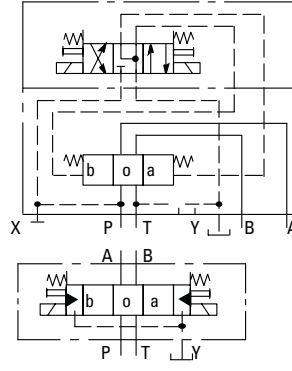
### Spring Offset, End-to-End, DG5V-8-\*A



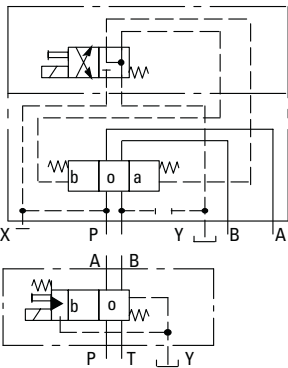
### Spring Offset, End-to-End, Opposite Hand, DG5V-8-\*AL



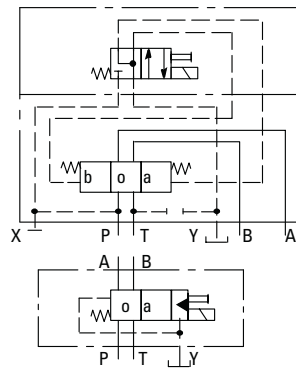
### Spring Centered, DG5V-8-\*C



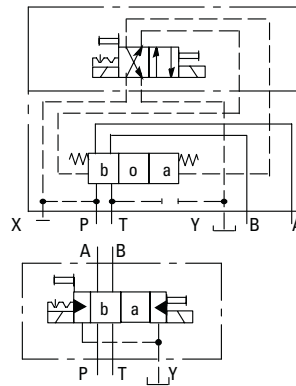
### Spring Offset, End-to-Center, DG5V-8-\*B



### Spring Offset, End-to-Center, Opposite Hand, DG5V-8-\*BL



### Detented, DG5V-8-\*N

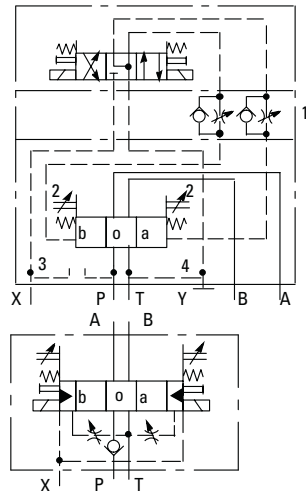


## DG5V-8 Options

The following are shown in a DG5V-8-\*C example:

1. Pilot choke module
2. Stroke adjusters, at either or at both ends (shown at both ends in example)
3. External pilot connection
4. Internal drain

One or more options can be built into any DG5 series valve.





# Operating Data

## MAXIMUM PRESSURES:

### DG3V-8 valves; ports:

P, A, B and T *	350 bar (5000 psi)
Y §	350 bar (5000 psi)

### DG5V-8 valves, (externally drained)

P, A, B, T and X *	350 bar (5000 psi) ▲
Y §	350 bar (5000 psi)

### DG5V-8 valves, (internally drained)

P, A, B and X	350 bar (5000 psi) ▲
T §	350 bar (5000 psi)

**Maximum flow without mal-function (DG3V-8 and DG5V-8)** 700 L/min (185 Usgpm)

**Pilot pressures** See "Pilot Pressures" on page 28

## ELECTRICAL INFORMATION:

**Voltage ratings, DG5V valves** See 17 in "Model Code" on page 5

### Voltage limits, DG5V valves:

Maximum voltage	See "Temperature limits", on page 10
Minimum voltage	90% of rated voltage

### Power consumption, DG5V valves with AC solenoids:

	Initial VA rms	Holding VA rms
Dual-frequency coils at 50 Hz, types "B" and "D"	265	49
Dual-frequency coils at 60 Hz, types "B" and "D"	260	48

**Power consumption, DG5V valves with DC solenoids** 30W at rated voltage and 20°C (68°F)

**Relative duty factor, DG5V valves** Continuous; ED = 100%

### Type of protection, DG5V valves:

ISO 4400 coils with plug fitted correctly	IEC 144 class IP65
Junction box	IEC 144 class IP65 (NEMA 4)
Coil winding	Class H
Lead wires (coil types "F****")	Class H
Coil encapsulation	Class F

Note: For information on pilot valves please refer segment B, C, D of the catalog.

▲ The DG5V, 10 design two-stage valves have been designed to satisfy the needs of most applications.

Consult your Eaton 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 350 bar (5000 psi).

\* The method for verifying the rated fatigue pressure of the complete unit conforms to NFPA/T2.6.1 R1-1991 (Catalog C/90), Fluid Power Systems and Products method for verifying the fatigue pressure rating of the pressure containing envelope.

§ Internal drain models drain the pilot valve through the tank port of the mainstage. External drain models drain the pilot valve through the "Y" port of the mainstage. To provide proper operation without malfunction, the pilot pressure must always exceed tank or drain line pressure by the minimum pilot pressure required per valve and spool type (see charts on page 16). Tank or drain line surges which would reduce this differential are to be avoided as they may cause the mainstage to shift. Mainstage tank pressure is limited to the tank line rating of the pilot valve on internally drained models (with "T" included in the model code). Internal drains may be used with all models except pressure centered "D" models. Pressure centered models must be externally drained through "Y" and "W" ports. To achieve the maximum tank line rating of 350 bar (5000 psi) of the mainstage, an external pilot drain must be used and it is recommended that a separate line be provided directly to the tank.

# Operating Data

## Pressure drop characteristics

See page 11, 12

## Response times, DG5V valves:

Typical values for a DG5V-8-2C-E spring centered, externally piloted valve under standard test conditions and operating with 150 L/min (40 USgpm) at 350 bar (5000 psi).

Coil rating:	Pilot pressure, bar (psi):	Energizing	Time, ms ♦ De-energizing
110V 50 Hz	15 (218)	75	40
	50 (730)	50	40
	150 (2180)	40	40
	210 (3000)	40	40
	250 (3600)	40	40
24V DC	15 (218)	90	45 ▲
	50 (730)	65	45 ▲
	150 (2180)	55	45 ▲
	210 (3000)	55	45 ▲
	250 (3600)	55	45 ▲

♦ From applying a signal at the solenoid until the main-stage spool completes its travel.

▲ In pure switched circuit conditions, devoid of the effects of any suppression diodes and full-wave rectifiers.

## TEMPERATURE LIMITS:

Fluid temperature limits	See appendix
Ambient temperature limits:	See appendix
Minimum ambient, all valves	-20°C (-4°F)

## Maximum ambients, DG5V valves with coils listed in 12 in "Model Code" two pages back, and under conditions stated below:

Dual-frequency coils:	
at 50 Hz and 107% of rated voltage	65°C (150°F)
at 50 Hz and 110% of rated voltage	65°C (150°F)
at 60 Hz and 107% of rated voltage	65°C (150°F)
at 60 Hz and 110% of rated voltage	65°C (150°F)
Single-frequency (50 Hz) coils at 50 Hz and 110% of rated voltage	65°C (150°F)
DC coils at 110% of rated voltage	70°C (158°F)

## INSTALLATION DIMENSIONS:

Valves	See page 16 to 25
--------	-------------------

Mass (weight), basic models:	kg (lb) approx.
DG3V-8-*A(L)	10,0 (22.0) ♦
DG3V-8-*/*B(L)/*C	7,3 (16.1) ♦
DG5V-8-*A/B (AC voltages)	8,4 (18.5) ♦
DG5V-8-*A/B (DC voltages)	8,5 (18.7) ♦
DG5V-8-*C/N (AC voltages)	8,7 (19.2) ♦
DG5V-8-*C/N (DC voltages)	9,1 (20.0) ♦

♦ Add 1,1 kg (2.4 lb) when pilot chock adjustment is fitted.

Note: For information on pilot valves please refer segment B, C, D of the catalog.

# Performance Data

## DG3V – 8 Models

Typical with mineral oil at 36 cSt (168.6 SUS) and a specific gravity of 0.87.

### Maximum flow rates

Performance based on full power solenoid coils warm and operating at 90% rated voltage.

### Pressure Drop & Malfunction Flow

The following table lists the appropriate pressure drop curve and malfunction flow curve between ports for each spool type. Use the following example to determine pressure drop for a selected spool.

Example: Find the pressure drop from P→B for type 7 spool. Using the table find numeral 7 in the spool type column. To the right of numeral 7 find the reference curve 2 (from pressure drop curve chart at bottom of page) under P→B column.

The pressure drop from P→B for type 7 spool would be obtained on curve 2. Likewise, the malfunction for numeral 7 would be found

Spool Type	Pressure Drop Curve Number				P→T in Center	Malfunction Flow Curve Number
	P→A	B→T	P→B	A→T		
0	2	2	2	2	3	1
1	1	2	1	3	2	3
11	1	3	1	1	3	3
2	1	2	1	1	–	2
3	1	2	1	4	–	2
31	1	3	1	1	–	2
4	4	3	4	2	5	3
6	1	3	1	4	–	1
7	2	2	2	1	–	1
8	4	3	4	2	5	1
9	2	3	2	2	28 bar 400 psid @ 189 L/min (50 USgpm)	4
33	1	3	1	2	–	2
35	See page 28					
52	2	–	4	4	–	1
521	2	4	4	–	–	1

on curve 1 (from malfunction flow curve chart at bottom of page).

- Figures in the pressure drop chart give approximate pressure drop ( $\Delta P$ ) when passing 473 l/min (125 USgpm) flow (Q) of 35 cSt (164 SUS) fluids(s) having .865 specific gravity.

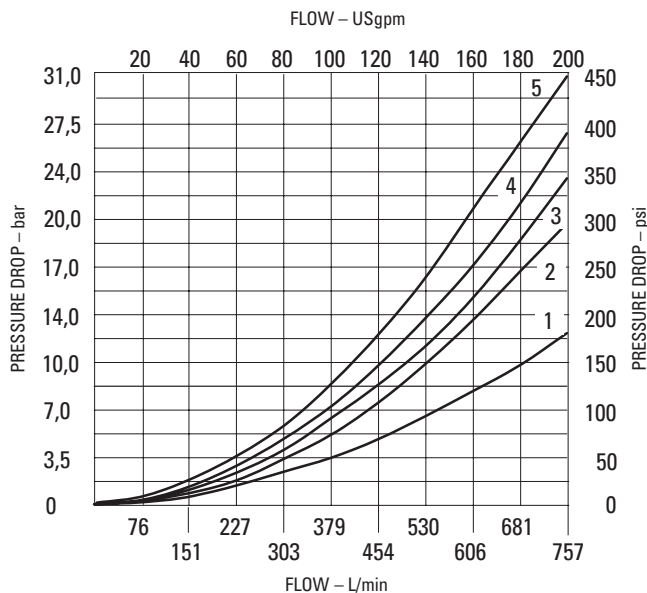
- For any other flow rate ( $Q_1$ ), the pressure drop ( $\Delta P_1$ ) will be approximately:  $\Delta P_1 = P(Q_1/Q)^2$ .

- For any other viscosity(s), the pressure drop ( $\Delta P$ ), will change as follows:

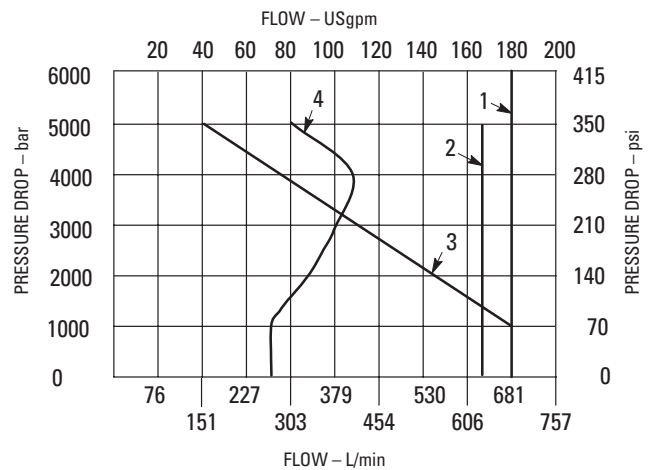
Viscosity cSt (SUS)	14 (17.5)	20 (97.8)	43 (200)	54 (251)	65 (302)	76 (352)	85 (399)
% of PΔ (Approx.)	81	88	104	111	116	120	124

- For any other specific gravity ( $G_1$ ), the pressure drop ( $\Delta P_1$ ) will be approximately:  $\Delta P_1 = \Delta P(G_1/G)$ .

### Pressure Drop Curves



### Malfunction Flow Curves



# Performance Data

## DG3V-8 Model

### Response Time

The response time shown in the charts are defined as the time between pilot pressurization/de-pressurization and the initial change in the inlet port pressure.

#### SPRING CENTERING TIMES @ RATED FLOW & PRESSURE

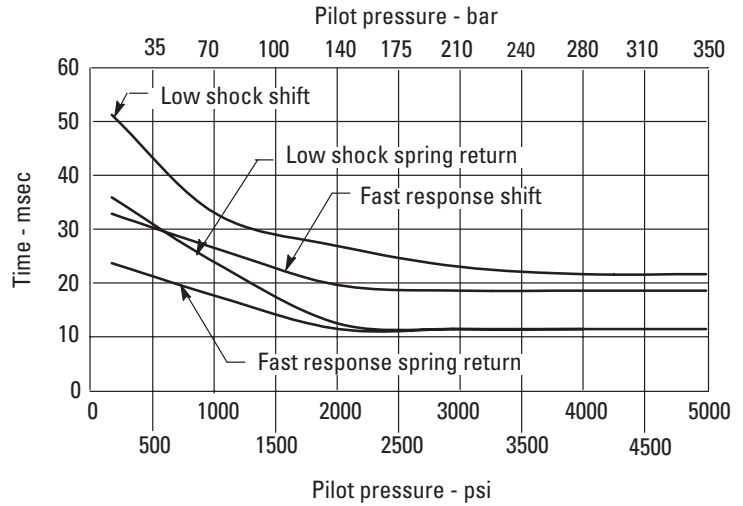
Spool Type	Time
Closed Center	.040 sec.
Open Center	.050 sec.

### Centering Times for Pressure Centered Valves @ Rated Pressure (A to P or B to P)

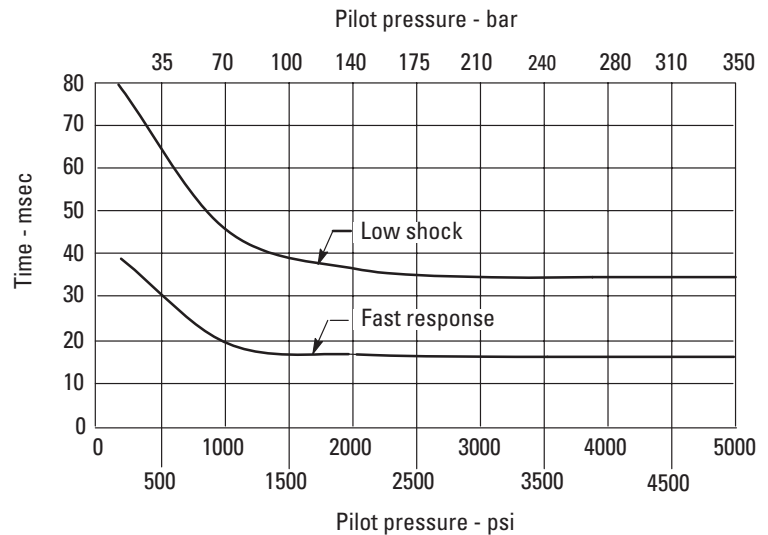
See malfunction flow curves on page 7.

350 bar (5000 psi)
350 bar (5000 psi)
350 bar (5000 psi)
Conforms to NFPA/T2.6.1 R1-1991
at the fatigue pressure rating of the

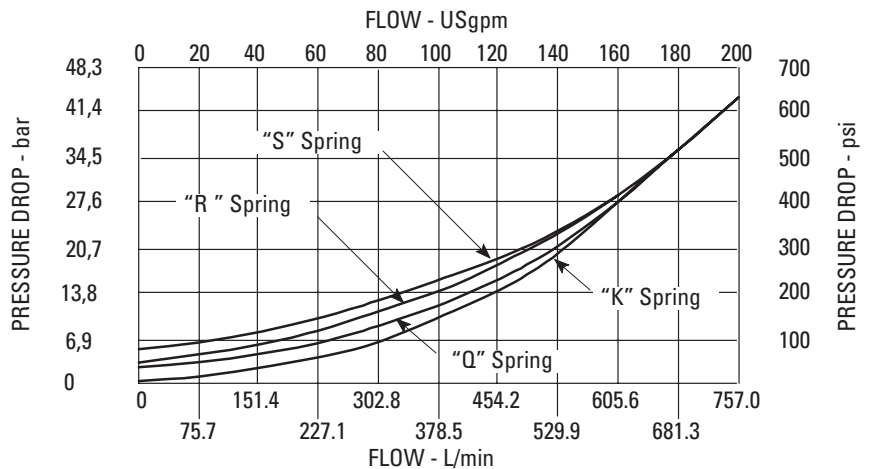
### Offset to Offset



### Center to Offset



### Pressure Drop Across Check Valve



### Integral Check Valves

For internal pilot pressure, an integral pressure port check valve is available. This back pressure will be present at the cylinder ports. The pilot pressure generated is the total of: P→T drop through the valve in center condition, pressure drop through the check valve, plus the pressure at the tank port.

To prevent load drop, a check valve in the pressure port can be used to prevent reverse flow from a cylinder port to the pressure port.

# Performance Data

DG5V-8 Model

## Pressure Drop & Malfunction Flow

The following table lists the appropriate pressure drop curve and malfunction flow curve between ports for each spool type. Use the following example to determine pressure drop for a selected spool.

Example: Find the pressure drop from P→B for type 7 spool. Using the table find numeral 7 in the spool type column.

To the right of numeral 7 find the reference curve 2 (from pressure drop curve chart at bottom of page) under P→B column.

The pressure drop from P→B for type 7 spool would be obtained on curve 2.

Likewise, the malfunction for numeral 7 would be found on curve 1 (from malfunction flow curve chart at bottom of page).

1. Figures in the pressure drop chart give approximate pressure drop ( $\Delta P$ ) when passing 473 l/min (125 USgpm) flow (Q) of 35 cSt (164 SUS) fluids(s) having .865 specific gravity.

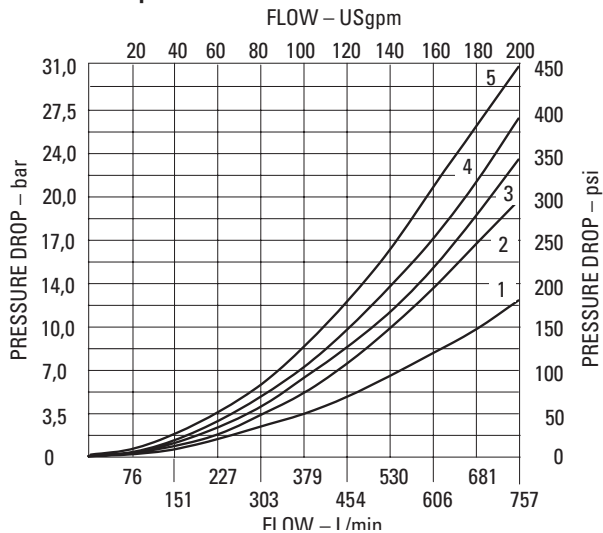
2. For any other flow rate ( $Q_1$ ), the pressure drop ( $\Delta P_1$ ) will be approximately  $\Delta P_1 = \Delta P(Q_1/Q)^2$ .

3. For any other viscosity(s), the pressure drop ( $\Delta P$ ), will change as follows:  
4. For any other specific gravity ( $G_1$ ), the pressure drop ( $\Delta P_1$ ) will be approximately:  $\Delta P_1 = \Delta P(G_1/G)$ .

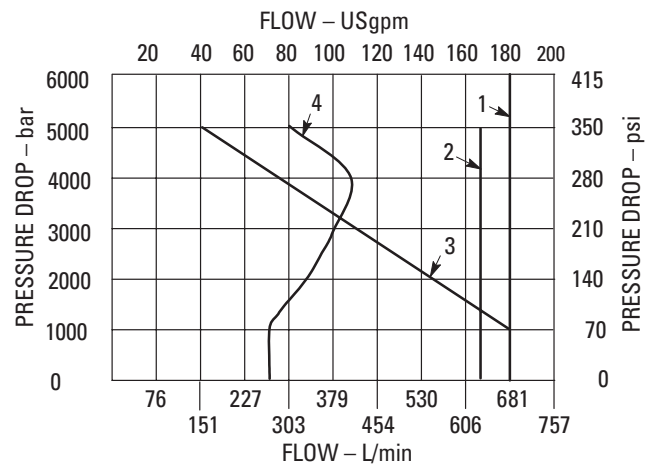
Viscosity	14	32	43	54	65	76	86
cSt	14	32	43	54	65	76	86
(SUS)	(75)	(150)	(200)	(250)	(300)	(350)	(400)
% of PΔ	93	111	119	126	132	137	141
(Approx.)							

SPOOL TYPE	PRESSURE DROP CURVE NUMBER					MALFUNCTION FLOW CURVE NUMBER
	P A	B T	P B	A T	P T In Center	
0	2 →	2 →	2 →	2 →	3 →	1
1	1	2	1	3	2	3
11	1	3	1	1	3	3
2	1	2	1	1	–	2
3	1	2	1	4	–	2
31	1	3	1	1	–	2
4	4	3	4	2	5	3
6	1	3	1	4	–	1
7	2	2	2	1	–	1
8	4	3	4	2	5	1
9	2	3	2	2	28 bar (400 psid) @ 189 L/min (50 USgpm)	4
33	1	3	1	2	–	2
35A	See page 28					
52	2	–	4	4	–	1
521	2	4	4	–	–	1

### Pressure Drop Curves



### Malfunction Flow Curves



# Performance Data

## DG5V-8 Model

### Response Times

Response times are defined as the time from solenoid energization/de-energization to the point of the start of a pressure rise/decline in appropriate port.

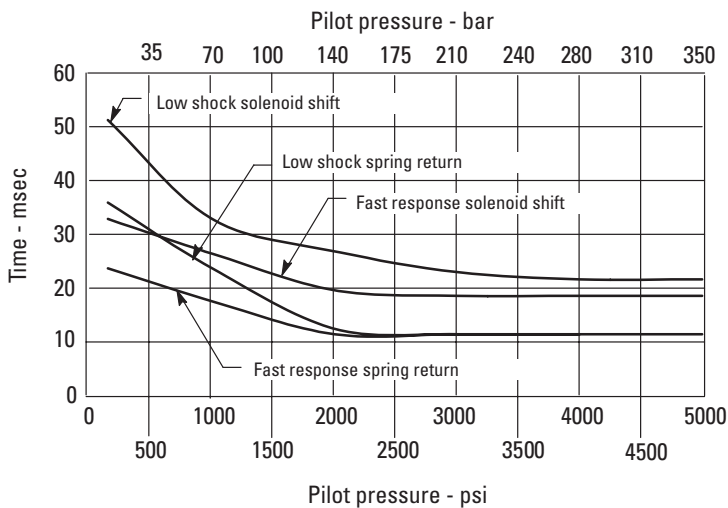
### Solenoid Energizing

Spring centered, pressure centered and spring offset DG5V-8 types must be energized continuously. No-spring detented DG5V-8 type may be energized momentarily. Pressure centered and spring centered DG5V-8 types return valve spool to center position when both solenoids are de-energized.

### Mounting Position

No-spring detented valves must be installed with the longitudinal axis horizontal for good machine reliability. The mounting position of spring centered and spring offset models is unrestricted provided that the pilot pressure supply is maintained as required. (Spring offset valves do not have a spring in the main spool section).

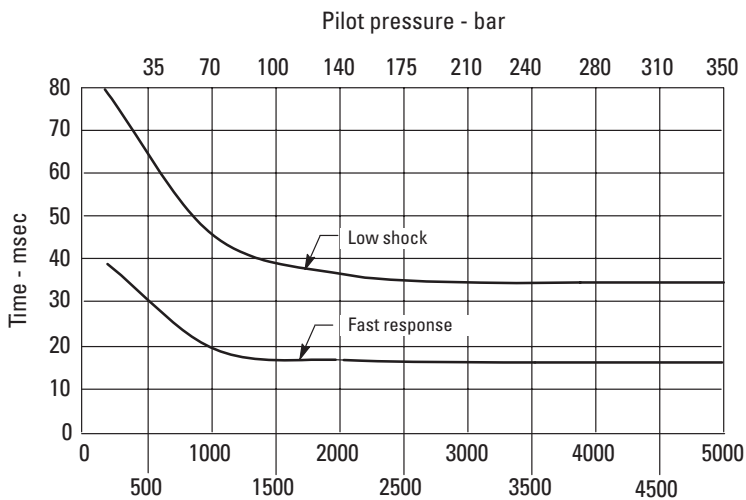
### Offset to Offset



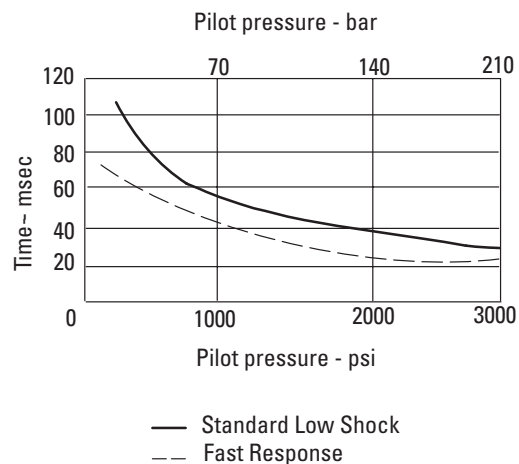
### SPRING CENTERING TIMES @ RATED FLOW & PRESSURE

Spool Type	Time
Closed Center	.040 sec.
Open Center	.050 sec.

### Center to Offset



### Centering Times for Pressure Centered Valves @ Rated Pressure (A to P or B to P)



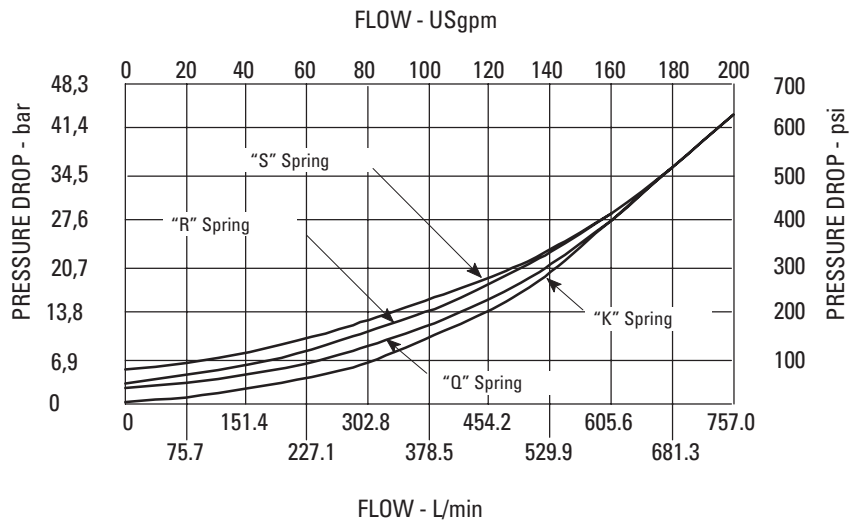
# Optional Features

## Integral Check Valves

For internal pilot pressure, an integral pressure port check valve is required for internally piloted valves with open center spools (0,1,4,8 & 9). The pilot pressure generated is the total of: P→T drop through the valve in center condition, pressure drop through the check valve, plus the pressure at the tank port.

For proper operation, total pressure drop must be greater than the minimum required pilot pressure (see chart). To prevent load drop, a check valve in the pressure port can be used to prevent reverse flow from a cylinder port to pressure port. If using as reverse flow check, maximum reverse pressure is limited to 210 bar (3000 psi).

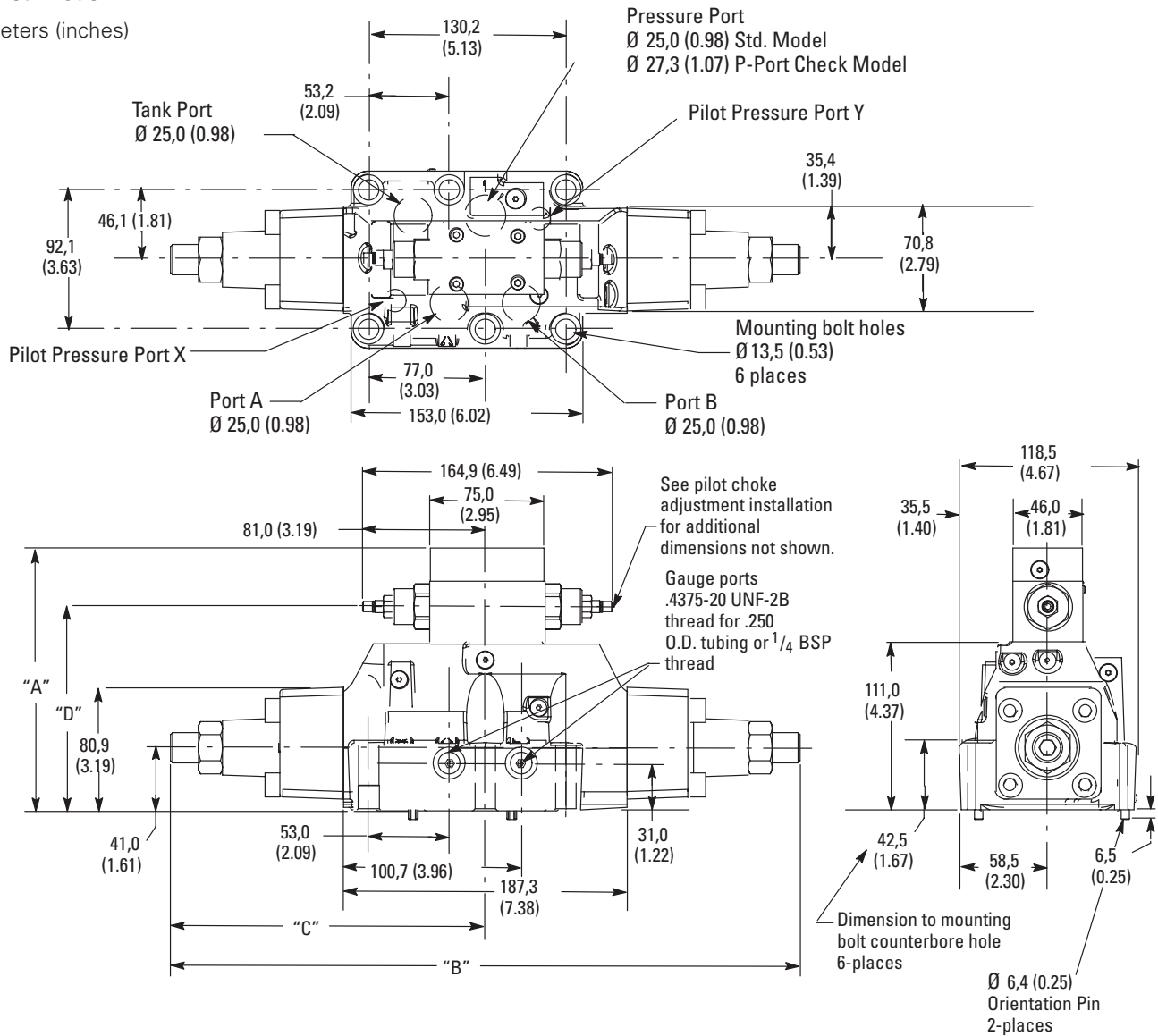
Pressure Drop Across Check Valve



# Installation Dimensions

## DG3V-8-(C)-\*-\*-10 Spring Centered Model

Millimeters (inches)



### SPOOL CONTROL MODIFICATIONS

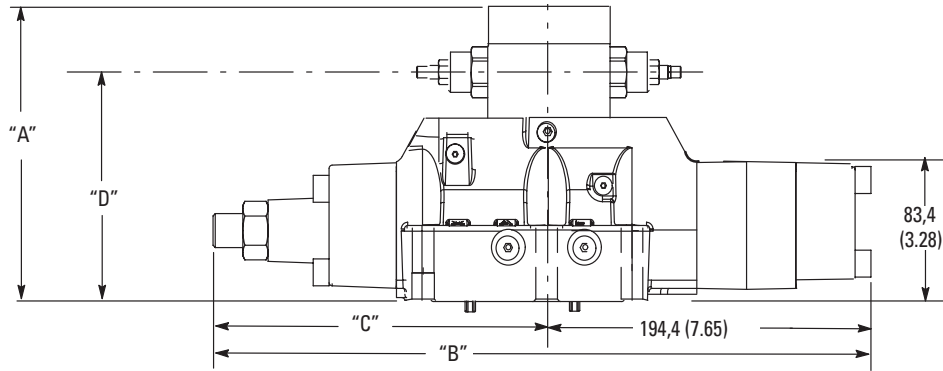
	"A" DIMENSION	"B" DIMENSION	"C" DIMENSION	"D" DIMENSION (PILOT CHOKE ADJUSTMENT)
Without pilot choke or stroke adjustment	133,0 (5.23)	265,3 (10.44)	132,6 (5.22)	–
Stroke adjustment (both ends)	133,0 (5.23)	415,9 (16.37)	208,0 (8.18)	–
Pilot choke adjustment	173,0 (6.81)	265,3 (10.44)	132,6 (5.22)	134,2 (5.28)
Stroke adjustment on cyl. 'A'	133,0 (5.23)	340,6 (13.40)	208,0 (8.18)	–
Stroke adjustment on cyl. 'B'	133,0 (5.23)	340,6 (13.40)	132,6 (5.22)	–
Pilot choke and stroke adjustment on cyl. 'A'	173,0 (6.81)	340,6 (13.40)	208,0 (8.18)	134,2 (5.28)
Pilot choke and stroke adjustment on cyl. 'B'	173,0 (6.81)	132,6 (5.22)	134,2 (5.28)	134,2 (5.28)
Pilot choke and stroke adjustment (both ends)	173,0 (6.81)	415,9 (16.37)	208,0 (8.18)	134,2 (5.28)



# Installation Dimensions

## DG3V-8-(L)-\*-\*-10 Spring Offset Model

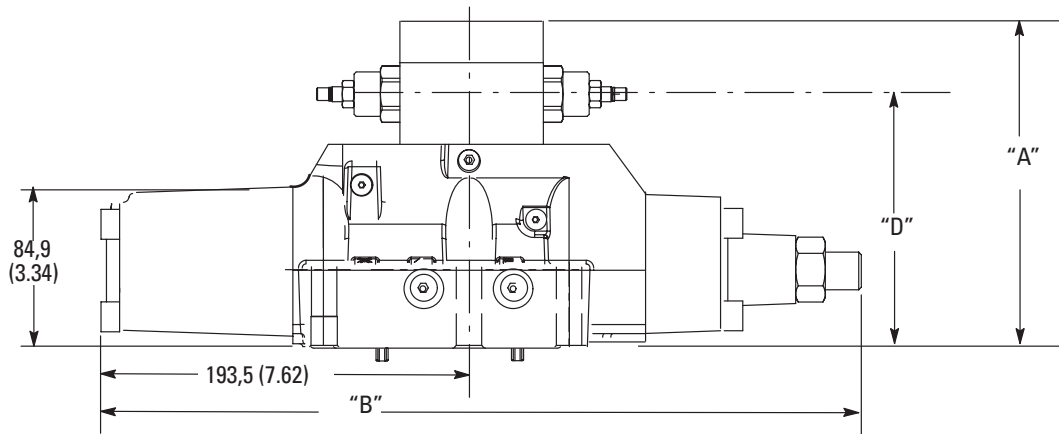
Millimeters (inches)



SPOOL CONTROL MODIFICATIONS	"A" DIMENSION	"B" DIMENSION	"C" DIMENSION	"D" DIMENSION (PILOT CHOKE ADJUSTMENT)
Without pilot choke or stroke adjustment	133,0 (5.23)	265,3 (10.44)	132,6 (5.22)	–
Without pilot choke or stroke adjustment (left-hand build)	133,0 (5.23)	326,9 (12.87)	194,4 (7.65)	134,2 (5.28)
Pilot choke adjustment	173,0 (6.81)	265,3 (10.44)	132,6 (5.22)	134,2 (5.28)
Stroke adjustment on cyl. 'A' (left-hand build)	133,0 (5.23)	402,3 (15.83)	208,0 (8.18)	–
Stroke adjustment on cyl. 'B'	133,0 (5.23)	340,6 (13.40)	132,6 (5.22)	–
Pilot choke and stroke adjustment on cyl. 'A' (left-hand build)	173,0 (6.81)	340,6 (13.40)	208,0 (8.18)	134,2 (5.28)
Pilot choke and stroke adjustment on cyl. 'B'	173,0 (6.81)	340,6 (13.40)	132,6 (5.22)	134,2 (5.28)

## DG3V-8-D-\*-\*-10 Pressure Centered Model

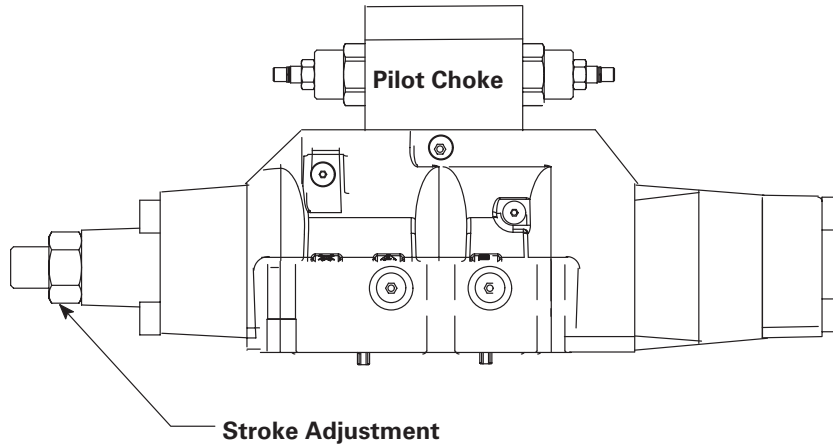
Millimeters (inches)



# Installation Dimensions

## **Pilot Choke DGMFN-3-Y-A2W-B2W-41**

Pilot choke increases the amount of time to shift the mainstage spool, lowering the possibility of large flow transients in the circuit. It is adjusted by backing off locknuts and turning adjusting screws inward to decrease rate of spool travel and outward to increase spool travel rate. See spool control modifications in model code.



## **Stroke Adjustment**

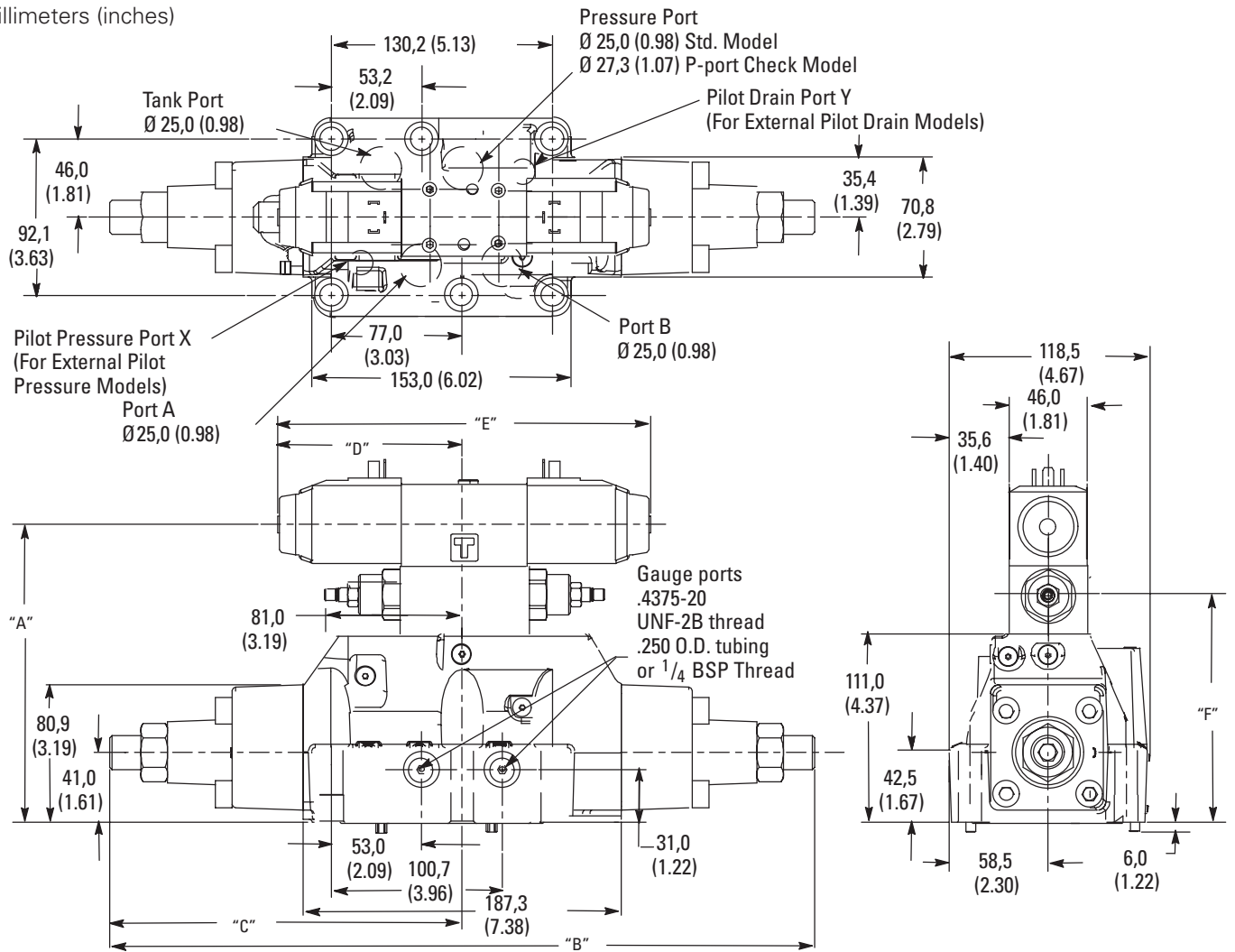
Stroke adjustment limits movement of the mainstage spool. Backing off the jamnut and turning the adjusting screw inward decreases spool stroke. See spool control modifications in model code.)

J

# Installation Dimensions

## DG5V-8 H-\*-M-\*-10 Spring Centered Model

Millimeters (inches)

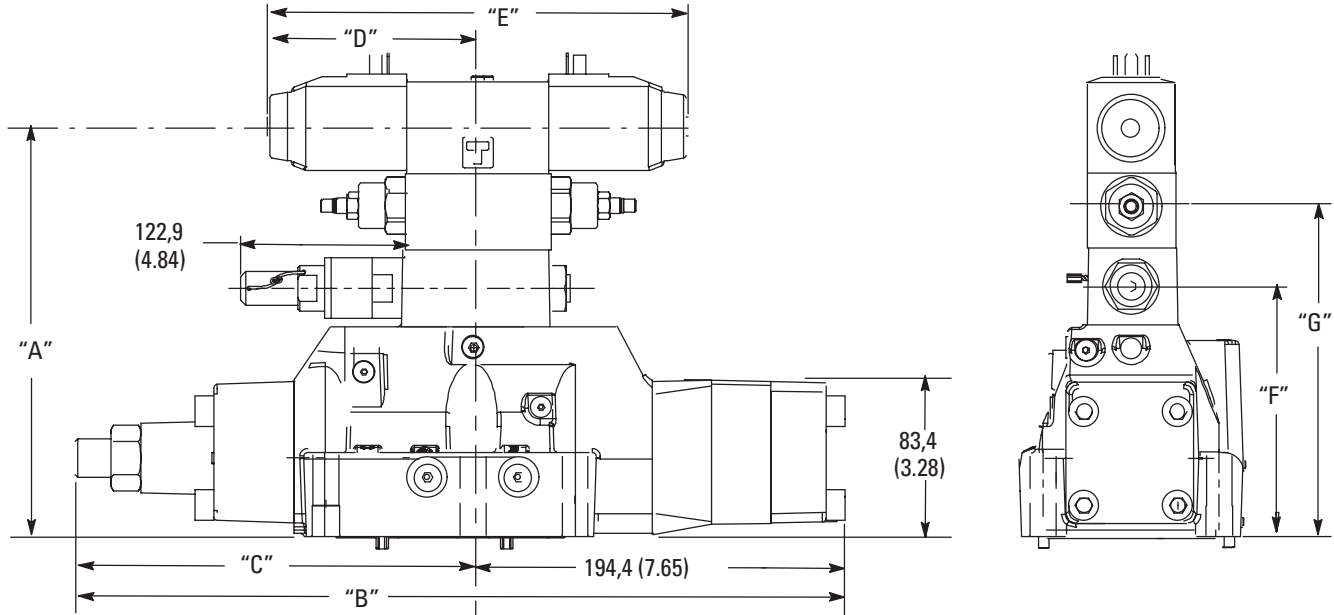


Spool Control Modifications	Dimensions									
	"A"	"B"	"C"	"D"		"E" pilot		"F"		
				AC Sol.	DC Sol.	Dual Solenoid AC Sol.	DC Sol.	Single Solenoid AC Sol.	DC Sol.	Pilot Choke
Without pilot choke or stroke adjustment	135,6	265,3	132,6							
Stroke adjustment (both ends)	(5.33)	(10.44)	(5.22)							
Pilot choke adjustment	175,6	265,3	132,6							134,2
	(6.91)	(10.44)	(5.22)							(5.28)
Stroke adjust. on cyl. 'A'	135,6		208,0	98,8	108,8	200,0	220,0	146,5	156,5	
	(5.33)		(8.18)	(3.88)	(4.28)	(7.87)	(8.66)	(5.76)	(6.16)	
Stroke adjust on cyl. 'B'		340,6	132,6							
		(13.40)	(5.22)							
Pilot choke and stroke adjust. on cyl 'A'			208,0							
			(8.18)							
Pilot choke and stroke adjust. on cyl. 'B'	175,6		132,6							134,2
	(6.91)		(5.22)							(5.28)
Pilot choke and stroke adjust. on both ends		415,9	208,0							
		(16.37)	(8.18)							

# Installation Dimensions

## DG5V-8-A(L)-\*-\*-10 Spring Offset Model

Millimeters (inches)

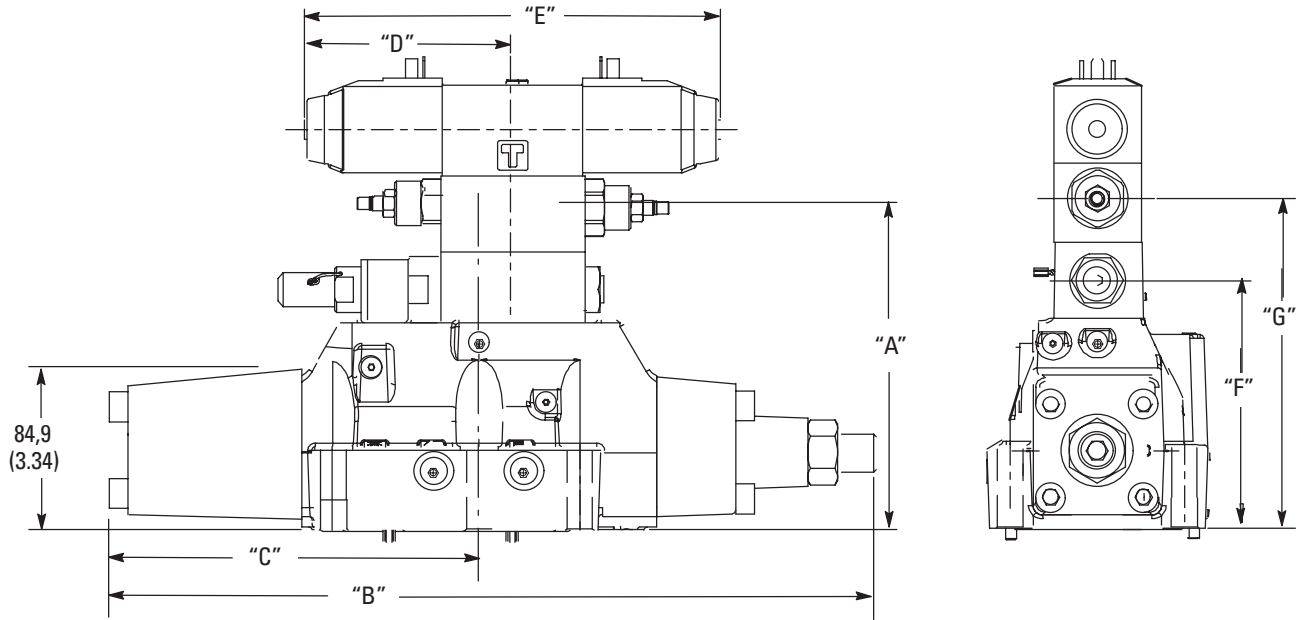


Spool Control Modifications	Dimensions									
	"A"	"B"	"C"	"D"		"E" pilot		"F"	"G"	
				AC Sol.	DC Sol.	Dual Solenoid AC Sol.	DC Sol.			Single Solenoid AC Sol.
Without pilot choke or stroke adjustment	175,6 (6.91)	265,3 (10.44)	132,6 (5.22)							
Stroke adjustment (both ends)		415,9 (16.37)	208,0 (8.18)							
Pilot choke adjustment	215,6 (8.48)	265,3 (10.44)	132,6 (5.22)							134,2 (5.28)
Stroke adjust. on cyl. 'A'	175,6		208,0 (8.18)	98,8	108,8	200,0	220,0	146,5	156,5	134,2
Stroke adjust on cyl. 'B'	(6.91)		132,6 (5.22)	(3.88)	(4.28)	(7.87)	(8.66)	(5.76)	(6.16)	(5.28)
Pilot choke and stroke adjust. on cyl 'A'		340,6 (13.40)	208,0 (8.18)							
Pilot choke and stroke adjust. on cyl. 'B'	215,6 (8.48)		132,6 (5.22)							134,2 (5.28)
Pilot choke and stroke adjust. on both ends		415,9 (16.37)	208,0 (8.18)							

# Installation Dimensions

## DG5V-8-D-\*-\*-10 Pressure Centered Model

Millimeters (inches)



Spool Control Modifications (without Reducer)	Dimensions									
	"A"	"B"	"C"	"D"		"E" pilot		"F" Reducer Module		"G" Pilot Choke
				AC Sol.	DC Sol.	Dual Solenoid AC Sol.	DC Sol.	Single Solenoid AC Sol.	DC Sol.	
Without pilot choke or stroke adjustment	135,6 (5.33)	326,1 (12.83)		98,8 (3.88)	108,8 (4.28)	200,0 (7.87)	220,0 (8.66)	146,5 (5.76)	156,5 (6.16)	-
Stroke adjust on cyl. 'B'		401,5 (15.80)	193,5 (7.61)	98,8 (3.88)	108,8 (4.28)	200,0 (7.87)	220,0 (8.66)	146,5 (5.76)	156,5 (6.16)	-
Pilot choke and stroke adjust. on cyl. 'B'	175,6 (6.91)									134,2 (5.28)
<b>(With reducer)</b>										
Without pilot choke or stroke adjustment	175,6 (6.91)	326,1 (12.83)		98,8 (3.88)	108,8 (4.28)	200,0 (7.87)	220,0 (8.66)	146,5 (5.76)	156,5 (6.16)	131,0 (5.15)
Stroke adjust on cyl. 'B'		401,5 (15.80)	193,5 (7.61)	98,8 (3.88)	108,8 (4.28)	200,0 (7.87)	220,0 (8.66)	146,5 (5.76)	156,5 (6.16)	131,0 (5.15)
Pilot choke and stroke adjust. on cyl. 'B'	215,6 (8.48)									134,2 (5.28)

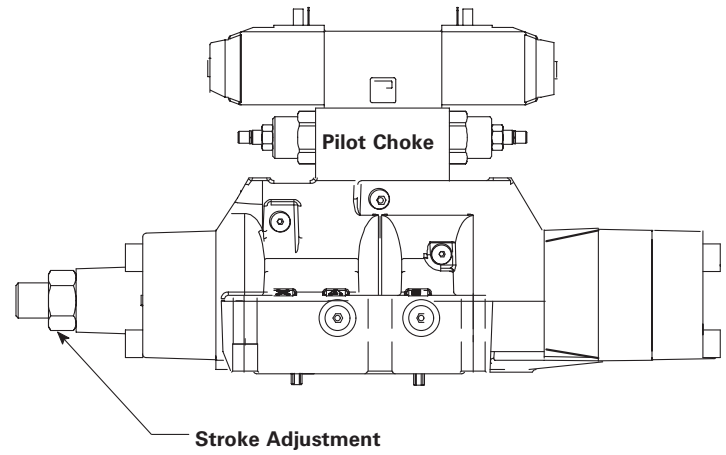
# Optional Features

## **Pilot Choke** **DGMFN-3-Y-A2W-B2W-41**

Pilot choke increases the amount of time to shift the mainstage spool, lowering the possibility of large flow transients in the circuit. It is adjusted by backing off locknuts and turning adjusting screws inward to decrease rate of spool travel and outward to increase spool travel rate. See spool control modifications in model code.

## **Stroke Adjustment**

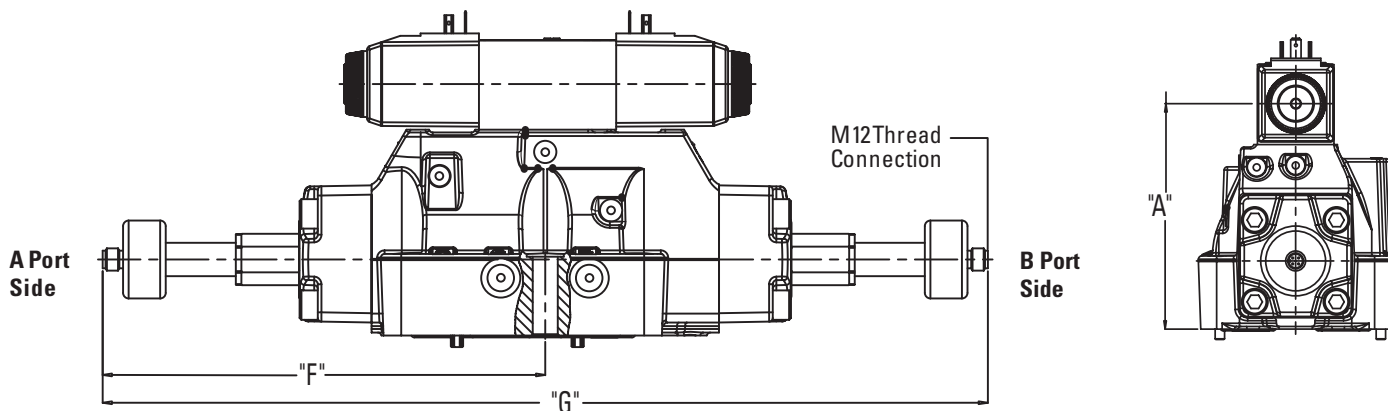
Stroke adjustment limits movement of the mainstage spool. Backing off the jamnut and turning the adjusting screw inward decreases spool stroke. See spool control modifications in model code.



# Installation Dimensions

## DG5V-8 with Main Stage Spool Monitoring Switch "PC\*" or "PD\*" Models (LVDT Style Switch)

Millimeters (inches)

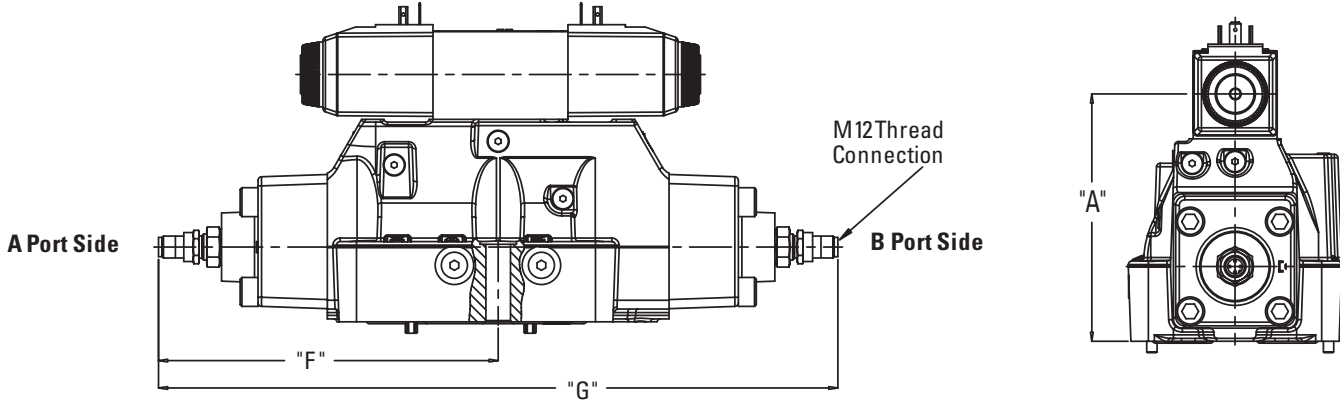


MODEL CODE	"A" DIMENSION	"F" DIMENSION	"G" DIMENSION
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-PCA/PDA-(*)-(V)M-*-10	135.6[5.34]	238.7[9.40]	371.3[14.62]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-PCA/PDA-(*)-(V)M-*-10	175.6[6.91]	238.7[9.40]	371.3[14.62]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-2-PCA/PDA-(*)-(V)M-*-10	175.6[6.91]	238.7[9.40]	371.3[14.62]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-2-PCA/PDA-(*)-(V)M-*-10	215.6[8.49]	238.7[9.40]	371.3[14.62]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-8-PCA/PDA-(*)-(V)M-*-10	135.6[5.34]	238.7[9.40]	446.6[17.58]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-8-PCA/PDA-(*)-(V)M-*-10	175.6[6.91]	238.7[9.40]	446.6[17.58]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-28-PCA/PDA-(*)-(V)M-*-10	175.6[6.91]	238.7[9.40]	446.6[17.58]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-28-PCA/PDA-(*)-(V)M-*-10	215.6[8.49]	238.7[9.40]	446.6[17.58]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-PCB/PDB-(*)-(V)M-*-10	135.6[5.34]	132.7[5.22]	371.3[14.62]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-PCB/PDB-(*)-(V)M-*-10	175.6[6.91]	132.7[5.22]	371.3[14.62]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-2-PCB/PDB-(*)-(V)M-*-10	175.6[6.91]	132.7[5.22]	371.3[14.62]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-2-PCB/PDB-(*)-(V)M-*-10	215.6[8.49]	132.7[5.22]	371.3[14.62]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-7-PCB/PDB-(*)-(V)M-*-10	135.6[5.34]	208.0[8.19]	446.6[17.58]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-7-PCB/PDB-(*)-(V)M-*-10	175.6[6.91]	208.0[8.19]	446.6[17.58]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-27-PCB/PDB-(*)-(V)M-*-10	175.6[6.91]	208.0[8.19]	446.6[17.58]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-27-PCB/PDB-(*)-(V)M-*-10	215.6[8.49]	208.0[8.19]	446.6[17.58]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-PCD-(*)-(V)M-*-10	135.6[5.34]	238.7[9.40]	477.3[18.79]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-PCD-(*)-(V)M-*-10	175.6[6.91]	238.7[9.40]	477.3[18.79]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-2-PCD-(*)-(V)M-*-10	175.6[6.91]	238.7[9.40]	477.3[18.79]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-2-PCD-(*)-(V)M-*-10	215.6[8.49]	238.7[9.40]	477.3[18.79]
DG5V-8-H-(B)-*D-(*)-PCB/PDB-(*)-(V)M-*-10	135.6[5.34]	193.5[7.62]	432.1[17.01]
DG5V-8-H-R-(B)-*D-(*)-PCB/PDB-(*)-(V)M-*-10	175.6[6.91]	193.5[7.62]	432.1[17.01]
DG5V-8-H-(B)-*D-(*)-2-PCB/PDB-(*)-(V)M-*-10	175.6[6.91]	193.5[7.62]	432.1[17.01]
DG5V-8-H-R-(B)-*D-(*)-2-PCB/PDB-(*)-(V)M-*-10	215.6[8.49]	193.5[7.62]	432.1[17.01]

# Installation Dimensions

## DG5V-8 with Main Stage Spool Monitoring Switch "PPA", "PPB" or "PPD" Models (Proximity Switch)

Millimeters (inches)

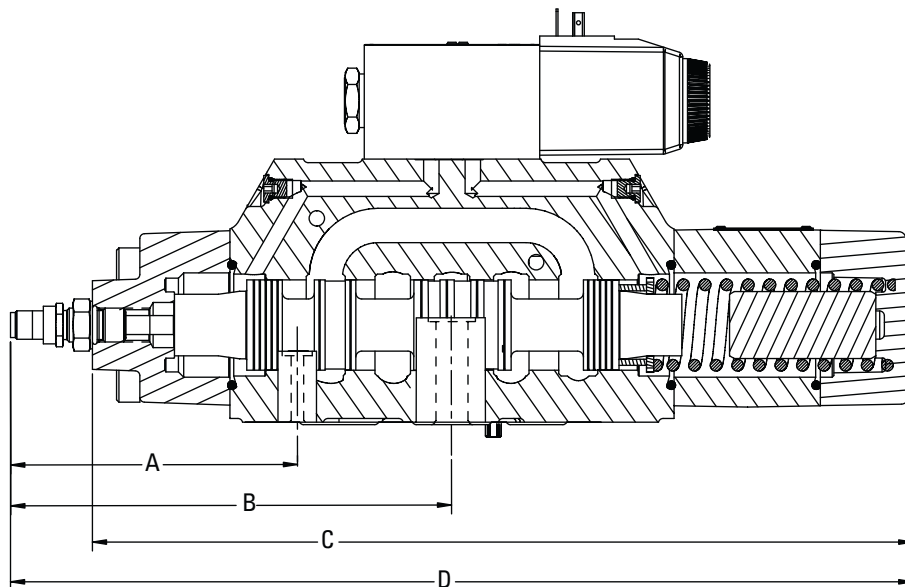


MODEL CODE	"A" DIMENSION	"F" DIMENSION	"G" DIMENSION
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-PPA-(*)-(V)M-*-10	135.6[5.34]	186.2[7.33]	318.8[12.55]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-PPA-(*)-(V)M-*-10	175.6[6.91]	186.2[7.33]	318.8[12.55]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-2-PPA-(*)-(V)M-*-10	175.6[6.91]	186.2[7.33]	318.8[12.55]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-2-PPA-(*)-(V)M-*-10	215.6[8.49]	186.2[7.33]	318.8[12.55]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-8-PPA-(*)-(V)M-*-10	135.6[5.34]	186.2[7.33]	394.2[15.52]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-8-PPA-(*)-(V)M-*-10	175.6[6.91]	186.2[7.33]	394.2[15.52]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-28-PPA-(*)-(V)M-*-10	175.6[6.91]	186.2[7.33]	394.2[15.52]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-28-PPA-(*)-(V)M-*-10	215.6[8.49]	186.2[7.33]	394.2[15.52]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-PPB-(*)-(V)M-*-10	135.6[5.34]	132.7[5.22]	318.8[12.55]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-PPB-(*)-(V)M-*-10	175.6[6.91]	132.7[5.22]	318.8[12.55]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-2-PPB-(*)-(V)M-*-10	175.6[6.91]	132.7[5.22]	318.8[12.55]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-2-PPB-(*)-(V)M-*-10	215.6[8.49]	132.7[5.22]	318.8[12.55]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-7-PPB-(*)-(V)M-*-10	135.6[5.34]	208.0[8.19]	394.2[15.52]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-7-PPB-(*)-(V)M-*-10	175.6[6.91]	208.0[8.19]	394.2[15.52]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-27-PPB-(*)-(V)M-*-10	175.6[6.91]	208.0[8.19]	394.2[15.52]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-27-PPB-(*)-(V)M-*-10	215.6[8.49]	208.0[8.19]	394.2[15.52]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-PPD-(*)-(V)M-*-10	135.6[5.34]	186.2[7.33]	372.4[14.66]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-PPD-(*)-(V)M-*-10	175.6[6.91]	186.2[7.33]	372.4[14.66]
DG5V-8-H-(B)-*A/B/C/F/N(L)-(*)-2-PPD-(*)-(V)M-*-10	175.6[6.91]	186.2[7.33]	372.4[14.66]
DG5V-8-H-R-(B)-*A/B/C/F/N(L)-(*)-2-PPD-(*)-(V)M-*-10	215.6[8.49]	186.2[7.33]	372.4[14.66]
DG5V-8-H-(B)-*D-(*)-PPB-(*)-(V)M-*-10	135.6[5.34]	193.5[7.62]	379.7[14.95]
DG5V-8-H-R-(B)-*D-(*)-PPB-(*)-(V)M-*-10	175.6[6.91]	193.5[7.62]	379.7[14.95]
DG5V-8-H-(B)-*D-(*)-2-PPB-(*)-(V)M-*-10	175.6[6.91]	193.5[7.62]	379.7[14.95]
DG5V-8-H-R-(B)-*D-(*)-2-PPB-(*)-(V)M-*-10	215.6[8.49]	193.5[7.62]	379.7[14.95]



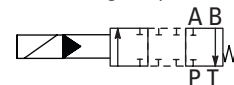
# Installation Dimensions

Valve for Safety Circuit Application (35A Spool)



DG5V with PPA Switch Option Shown

Main Stage Hydraulic Symbol



MODEL	A	B	C	D	LEAKAGE P-A	FLOW CURVE
	mm (in)	mm (in)	mm (in)	mm (in)	cc/min (in <sup>3</sup> /min)	
DG5V5-35A	118.5 (4.67)		234.7 (9.24)	262.1 (10.32)	Available upon request	Available upon request
DG5V7-35A		152.1 (5.99)	252.1 (9.92)	286.6 (11.28)	Available upon request	See DG5V7 catalog
DG5V8-35A		151.7 (5.97)	346.0 (13.62)	380.5 (14.98)	156 (9.5)	Available upon request
DG5V10-35A		230.7 (9.10)	443.4 (17.46)	476.3 (18.8)	Available upon request	Available upon request

# Electrical Information

## DG5V-8 with Main Stage Spool Monitoring Switch "PC\*" or "PD\*" Models (LVDT Style Switch)

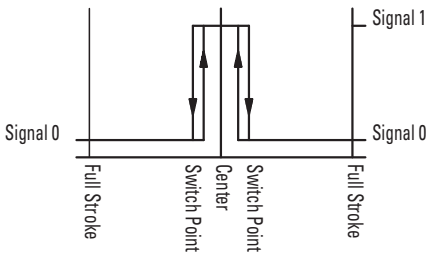
Millimeters (inches)

### SPECIFICATIONS

Supply Voltage (Vs) (Full Wave Bridge with Capacitor)	24VDC $\pm$ 20%
Reverse Polarity Protection	MAX. 300V Installed
Ripple Voltage	10%
Current Consumption	40mA Approx.
Outputs	NC Contact Positive (No Short Circuite Protection)
Sensing Distance (offset position)	5.85 to 6.15 mm
Sensing Distance (from center position)	$\pm$ 0.35 to 0.65 mm
Hysteresis	$\leq$ 0.06 mm
Output Voltage Signal 0 Signal 1	< 1.8V Vs - 2.5V
Output Current	<400mA at Input +20%
Environmental Protection	IP65 (With Mounted Plug)
Operating Temperature Range	-20°C to +85°C
Max. Operating Pressure	315 bar (4500 psi)
CE Declaration of Conformity No.	00 02 002 9 93
P-Channel, Contact Positive	

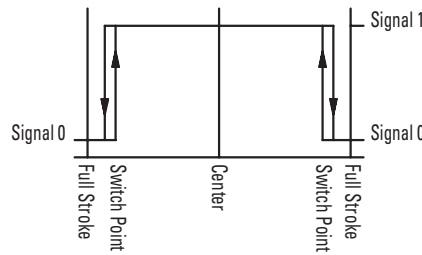
ATTENTION: EMC ONLY ENSURED WHEN USING SCREENED CABLES AND SCREENED PLUG CASING.

TYPICAL "PCA/PCB" OUTPUT  
(FOR SENSING CENTER POSITION)



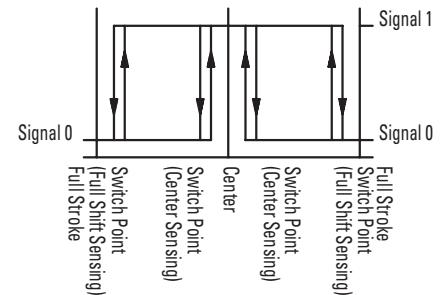
Signal 0 = Voltage at pin 2/4 < 1.8V  
Signal 1 = Voltage at pin 2/4 > (Vs - 2.5V)

TYPICAL "PDA/PDB" OUTPUT  
(FOR FULL SHIFT SENSING)



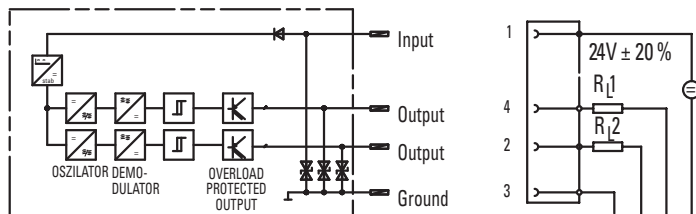
Signal 0 = Voltage at pin 2/4 < 1.8V  
Signal 1 = Voltage at pin 2/4 > (Vs - 2.5V)

TYPICAL "PCD" OUTPUT  
(FOR CENTER SENSING 'A' PORT END,  
FULL SHIFT SENSING 'B' PORT END)



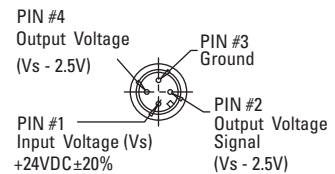
Signal 0 = Voltage at pin 2/4 < 1.8V  
Signal 1 = Voltage at pin 2/4 > (Vs - 2.5V)

### Electrical Schematic and Mating Connector Detail



$R_1, R_2 =$  e.g. Coil Resistance of the switch relay  $\geq$  60 OHMS

### Connector Detail



# Electrical Information

## DG5V-8 with Main Stage Spool Monitoring Switch "PPA", "PPB" or "PPD" Models (Proximity Switch)

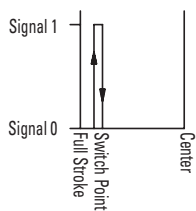
Millimeters (inches)

### SPECIFICATIONS

Supply Voltage (Vs):	10 to 30 Vdc
Supply Current (Is):	8mA at 24Vdc (Plug Load Current)
Supply Over-Voltage Rating:	35Vdc Continuous
Supply Reverse Polarity Rating:	-35Vdc (With No Shorts)
Short Circuit Tolerance:	Continuous Short Between any Two Pins
High Potential Test, Pin to Case:	300Vdc
Electromagnetic Compatibility:	ISO 7637 Parts 0 and 1 Worst Case and Immunity to Radiated Electromagnetic Fields, 10KHz to 1GHz per SAE J1113/25 SEP 95
Pins to Case Resistance:	> 50 MEGOHMS
Load Dump Tolerance:	80Vdc PEAK, 400ms Decay, with 1.5 OHM Source Impedance
Switching Frequency:	0 to 3K Hz
Output:	Open Collector PNP Sourcing, Normally Open
Sensing Distance (offset position):	1.27 ± 0.25 mm (.050" ± .010") of Full Stroke
Hysteresis:	0.25 mm (.010") Max.
Rise/Fall Time:	6.5/1.5 Microsec RI = 820 OHM, CI = 20 pF @ 8Vdc
Output Leakage Current:	10 mA Max
Output Voltage High:	+Vs - 2.2Vdc Min
Output Load Current:	200mA Max
Operating Pressure:	350 bar (5000 psi)
Operating Temperature:	-40° to 110°C
Humidity:	0% to 100%

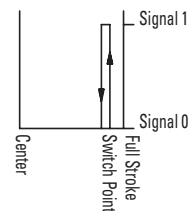
ATTENTION: EMC ONLY ENSURED WHEN USING SCREENED CABLES AND SCREENED PLUG CASING.

TYPICAL "PPA" OUTPUT



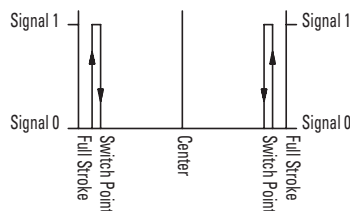
Signal 0 = Voltage at pin 4 = 0V  
Signal 1 = Voltage at pin 4 > (Vs - 2.2V)

TYPICAL "PPB" OUTPUT

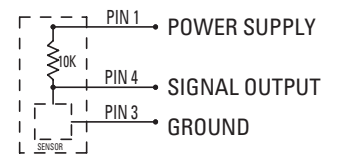


Signal 0 = Voltage at pin 4 = 0V  
Signal 1 = Voltage at pin 4 > (Vs - 2.2V)

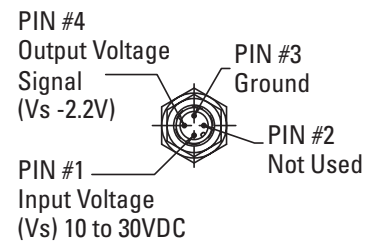
TYPICAL "PPD" OUTPUT



Output Circuit Wiring Instructions



Connector Detail



# Pilot Valves

## General description

Pilot valves are identified in the model code by the following letters: "S" Standard or "H" High Performance. The pilot valves can be ordered to match a variety of mainstage spool types and valve bodies.

The chart below shows ordering information for each pilot valve. For example, to order a High Performance pilot "H" with a Spring Offset mainstage "A", use the following model code: DG4V-3- 2A-M-\*-60

## MINIMUM PILOT PRESSURE REQUIREMENTS

Spool Type	Pilot Pressure bar (psi)	
	A, B, C, F, N Models	D Models
Closed center	10 (150)	P to A: 12 (175) P to B: 21 (300)
Open center	5 (75)	P to A: 10 (150) P to B: 10 (150)

VALVE MODEL CODE: HIGH PERFORMANCE/STANDARD	MAIN STAGE SPOOL TYPE	PILOT VALVE MODEL CODE
DG5V-8-H-*A-*-M-*-10	All except 4 & 8	DG4V-3-2A-M-*-60
	4A & 8A only	DG4V-3-2AL-VM-*-60
	4AL & 8AL only	DG4V-3-2A-VM-*-60
DG5V-8-H-*B-*-M-*-10	All except 4 & 8	DG4V-3-6B-M-*-60
	4B & 8B only	DG4V-3-6BL-VM-*-60
	4BL & 8BL only	DG4V-3-6B-VM-*-60
DG5V-8-H-*C-*-M-*-10	All except 4 & 8	DG4V-3-6C-M-*-60
	4C & 8C only	DG4V-3-6C-VM-*-60
DG5V-8-H-*D-*-M-*-10	All except 4 & 8	DG4V-3-7C-M-*-60
	4D & 8D only	DG4V-3-7C-VM-*-60
DG5V-8-H-*F-*-M-*-10	All except 4 & 8	DG4V-3-6F-M-*-60
	4F & 8F only	DG4V-3-6FL-VM-*-60
	4FL & 8FL only	DG4V-3-6F-VM-*-60
DG5V-8-H-*N-*-M-*-10	All except 4 & 8	DG4V-3-6N-M-*-60
	4N & 8N only	DG4V-3-6N-VM-*-60

J



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