DG3V-10 11 Design and DG5V-10 11 Design

ISO4401 Size 10;
ANSI/B93.7M-D10

Powering Business Worldwide

Solenoid Controlled Pilot Operated Directional Valve

DG5V-10 11 Design

General Description

The Eaton size 10 Directional Control Valve serves as a control valve package. This package is generally used to control large flows, to 1100 l/min (290 USgpm).

Each valve contains a mainstage spool which is positioned by one of three arrangements:

- Spring offset - For single stage operation, one spring returns the spool to an offset position. For two–stage operation, the spring and washer are removed from the main stage and offset action is obtained from the pilot valve.
- Spring centered - The spring and washer are located on both ends of the main stage spool to control centering.
- Detented - Spool position is determined by a detent in the pilot valve. Should pilot pressure be lost, the main stage spool will spring to center.

Features and Benefits

- The size 10 Directional Valve is designed and manufactured by Eaton, which has over 70 years of experience as the global leader in fluid power and motion control.
- Endurance tested to 10 million cycles and fatigue tested to NFPA specifications without failure to ensure the highest reliability in applications requiring high flows and pressure.
- This control valve package offers a wide variety of spools and spring, pilot choke adjustments, integral check valves and port orifices to meet most system requirements. High force solenoids and centering springs assure consistent shifting through a wide range of pressure and silting extremes.
- 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.The DG5V models are functionally interchangeable with previous size 10 design valves. Should size constraints prevent physical interchangeability (along length axis), an EN503 option is available.

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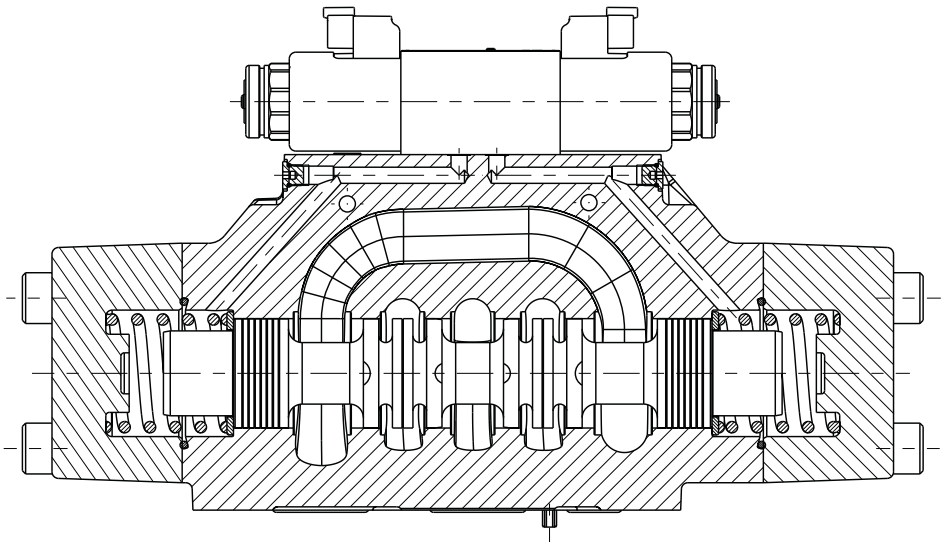

Model Codes

DG3V-10

(F*) - DG3V - 10 - (B) - * * - (L) - (*) - (*) - 11

1 2 3 4 5 6 7 8 9 10

1 Special Seals

(Omit if not required)

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 P, A & B ports. (See pressure tabulation below.)

3 Valve Size

10 – Valve size CETOP 10, ISO 4401-10, NFPA D10

4 Gauge Ports

Blank – 4375-20 UNF-2B Thread

B – 1/4 BSP Thread

5 Spool Types

Please refer functional symbols of page 6 for spool types.

6 Spool/Spring Arrangement

Blank – No spring

A – Spring offset to cylinder 'A'

C – Spring centered

(See spool/spring combinations below)

7 Left Hand Build

L – 'A' Models only, omit if not required.

8 Spool Control Modifications

(Omit if not required)

1 – Stroke adjustment (both ends) available on C & Blank (no spring) models)

2 – Pilot choke adjustment (available on all models)

3 – Pilot choke and stroke adjusters (both ends) (available on C & Blank (no spring) models)

7 – Stroke adjusters on cylinder 'A' end only (available on AL, C & Blank (no spring) models)

8 – Stroke adjusters on cylinder 'B' end only (available on AL, C, & Blank (no spring) models)

27 – If both are required (available on A, C, & Blank (no spring) models)

28 – If both are required (available on AL left hand build, C & Blank (no spring) models)

9 Check Valve in Pressure Port

Omit if not required.

K – 0.3 bar (5 psi) check

Q – 2.4 bar (35 psi) check

R – 3.4 bar (50 psi) check

S – 5.2 bar (75 psi) check

10 Design Number

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

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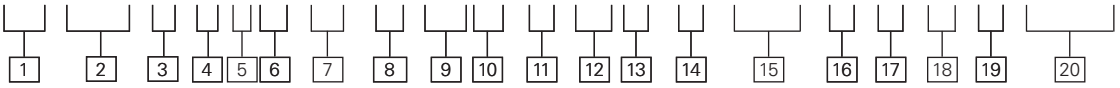
Model Codes

DG5V-10

(F*) - DG5V -10 - * - * ** - (**) - (*) - * (E) - (T) - (*) - (V) M - ***** - (L) - (*) - ** - 11 - (EN***)**



1 Special Seals

(Omit if not required)

F3 – Seals for fire resistant fluids.

F6 – Seals for water glycol.

2 Directional Control Valve

DG5V – Subplate mounting; solenoid controlled; pilot operated. Pressure rating 350 bar (5000 psi) for P, A, & B ports.

3 Valve Size

10 – Valve size CETOP 10, ISO 4401-10, NFPA D10

4 Pilot Valve Type

H – Cetop 3 mounting pattern, High performance

M - Cetop 3 mounting pattern, Environment specified solenoid

5 Spool Types

Please Refer functional Symbols on page 6 for Spool types

6 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 centered, single solenoid (P to B when operated) ■

BL – As "B" but left-hand build (P to A when operated) ■

C – Spring centered

N – Two-position detented

7 Manual Override Options

omit if not required.

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.

8 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

9 Spool Monitoring Switch

Blank – None

PCA – Center sensing switch on "A" port end (not available on 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)

PPA – Offset sensing proximity switch "A" port end (not available on 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 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).

10 External Pilot Pressure

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

11 Internal Pilot Drain

T – Internal pilot drain to 'T' port. Omit for external pilot drain models.

12 Check Valve in Pressure Port

Blank – None

K – 0.3 bar (5 psi) check

Q – 2.5 bar (35 psi) check

R – 3.5 bar (50 psi) check

S – 5.0 bar (75 psi) check

13 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.

14 Heading Electrical Flag Symbol

M – Features and options for pilot valve.

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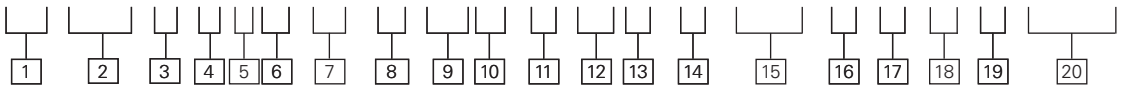
Model Codes (Contd.)

DG5V-10

(F*) - DG5V -10 - * - * ** - (**) - (*) - * (E) - (T) - (*) - (V) M - ***** - (L) - (*) - ** - 11 - (EN***)**



15 Coil Type

U – ISO 4400 (DIN 43650)
U1 – ISO4400 fitted with PG11 plug
U6 – ISO4400 with fitted DIN plug with lights
FPA3W – Flying lead, 3 pin connector & 1/2" NPT thread wiring housing
FPA5W – Flying lead, 5 pin connector & 1/2" NPT thread wiring housing
FTW – Flying lead, wired terminal block & 1/2" NPT thread wiring housing
FW – Flying lead with 1/2" NPT thread wiring housing
KU – Top exit flying lead
KUP4 – Junior timer (AMP) connector
KUP5 – Moulded deutsch connector

16 Solenoid Indicator Lights

Omit if not required

L – Solenoid indicator lights▲

▲Flying lead coil type only)

17 Surge Suppressor/ Damper

DC voltages only, omit if not required.

D – Bi-directional Zener diode ("M" pilot only)
D1 – Diode Positive Bias
D2 – Diode Negative Bias
D7 – Transzorb type

18 Coil Voltage Identification Letter

B – 110V AC 50Hz/120V AC 60 Hz
BL – 110V 50Hz/120V 60 Hz
D – 220V AC 50Hz/240V AC 60 Hz
ER – 120V AC 60 Hz ▲
ES – 240V AC 60 Hz ▲
G – 12V DC
GL – 12V DC
H – 24V DC
HL – 24V DC 18 watt
HM – 24V DC 8 watt
DS – 28V DC

19 Design Number

Subject to change.
Installation dimensions same for -10 thru -19 design.

20 Special Modification

Blank – None

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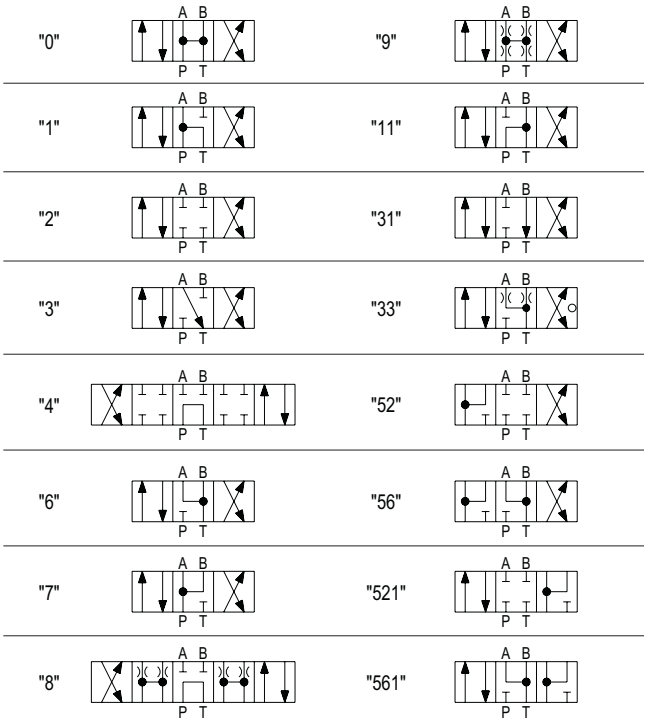
Functional Symbols

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-10-*A(L) and DG5V-10-*N valves.

Your Eaton representative can provide further details.

Spool/Spring Arrangement

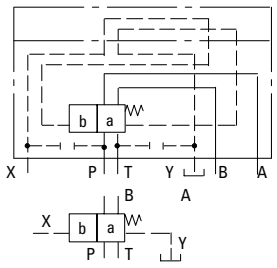
The table below provides spool/spring arrangements that are available on all DG3V-10 and DG5V-10 valves.

Spool/Spring Arrangement	Spool Type
A-Spring Offset	0,2,6,9,33
B-Spring Centered with sol. ''A'' removed	0,1,2,3,4,6,7,8,9,11,31,33
C-Spring Centered **N**-No Spring Detented	0,1,2,3,4,6,7,8,9,11,31,33, 52,56,521,561

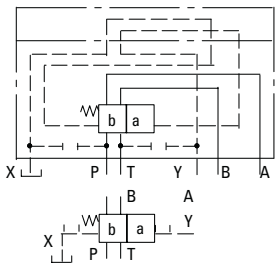
DG3V-10 Pilot Operated Models

Comprehensive and simplified symbols.

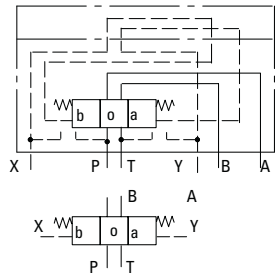
Spring Offset, End-to-End, DG3V-10-*A



Spring Offset, End-to-End, Opposite Hand, DG3V-10-*AL



Spring Centered, DG3V-10-*C

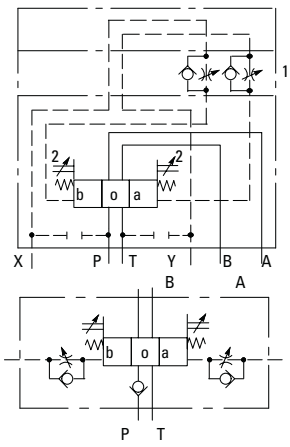


DG3V-10 Options

The following are shown in a DG3V-10-*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.



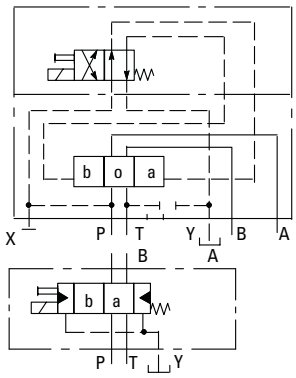
Functional Symbols

DG5V-10

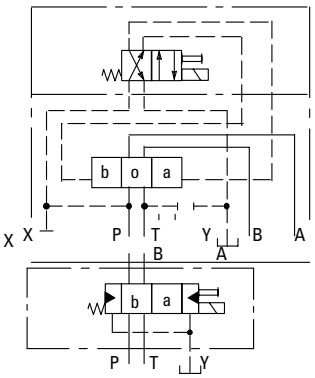
DG5V-10, Solenoid Controlled, Pilot Operated Models

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

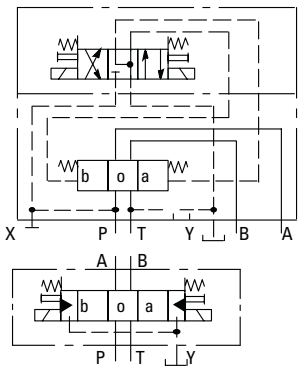
Spring Offset, End-to-End, DG5V-10-*A



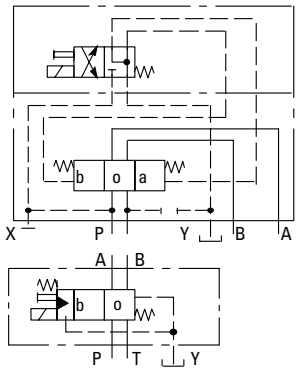
Spring Offset, End-to-End, Opposite Hand, DG5V-10-*AL



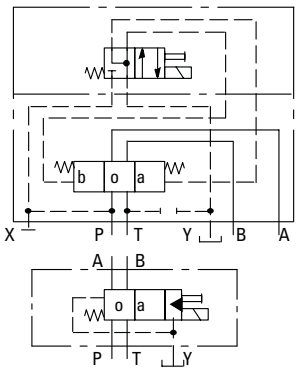
Spring Centered, DG5V-10-*C



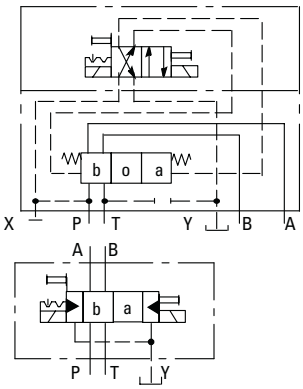
Spring centered - single solenoid DG5V-10-*B



Spring centered - single solenoid Opposite Hand DG5V-10-*BL



Detented, DG5V-10-*N

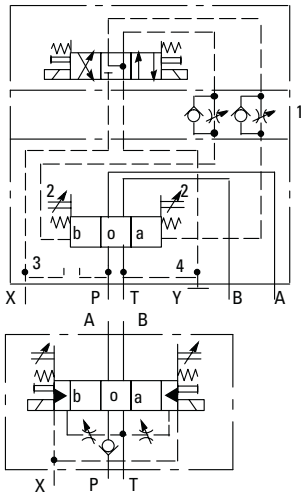


DG5V-10 Options

The following are shown in a DG5V-10-*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.



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Operating Data

Maximum pressures:

DG3V-10 valves; ports:	
P, A, B*	350 bar (5000 psi)
X, Y & T	210 bar (3000 psi)
DG5V-10 valves, (externally drained)	
P, A, B and X *****	350 bar (5000 psi) ▲
T & Y §	210 bar (3000 psi)
DG5V-10 valves, (internally drained)	
P, A, B and X	350 bar (5000 psi) ▲
T & Y §	210 bar (3000 psi)
Maximum flow without mal-function (DG3V-10 and DG5V-10)	1100 L/min (290 Usgpm)
Pilot pressures	See "Pilot Pressures" on page 20

Electrical information:

Voltage ratings, DG5V valves	See 22 in "Model Code" on page 5	
Voltage limits, DG5V valves:		
Maximum voltage	See "Temperature limits", on page 9	
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^{0}C (68^{0}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 210 bar (3000 psi).

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* 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). To achieve the maximum tank line rating of 210 bar (3000 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, 13 and 14

Response times, DG5V valves:

Typical values for a DG5V-10-2C-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
AC	10 (145)	50	50
	100 (1450)	45	50
	210 (3000)	35	50
DC	10 (145)	80	75 ▲
	100 (1450)	65	75 ▲
	210 (3000)	55	75 ▲

◆ 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 15 to 20
Mass (weight), basic models:	**kg (lb) approx.**
DG3V-10-*A(L)	10.0 (22.0)
DG3V-10-*/*B(L)/*C	7.3 (16.1)
DG5V-10-H/M-*C-M-*-11 SERIES	42 (95)
ADDED FOR STROKE ADJUSTMENT(S)	0.7 (1.5)

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

Power Limits/Performance Characteristics

Power Limits @ 10 bar (150 psi) Pilot Pressure

3 Position Valve & Spring Centered

	Pressure - bar (psi)				
Spool Types	70 (1000)	140 (2000)	210 (3000)	280 (4000)	350 (5000)
	L/min (USgpm)				
2, 3, 6, 7, 33 & 52	1100 (290)	1078 (285)	1022 (270)	832 (220)	757 (200)
9	1100 (290)	1040 (275)	719 (190)	662 (175)	473 (125)
0, 4 & 8	946 (250)	889 (235)	851 (225)	757 (200)	662 (175)
1 & 11	946 (250)	681 (180)	454 (120)	321 (85)	321 (85)
2 Position (Spring Offset Mainstage)					
0, 2, 6, 9 & 33	1100 (290)	1078 (285)	1022 (270)	832 (220)	757 (200)
1, 11	946 (250)	681 (180)	454 (120)	321 (85)	321 (85)

Performance Characteristics

Shifting Action

Spring centered and spring offset models must be piloted continuously to maintain the shifted position. Detent no-spring models may be energized momentarily (approximately 0.1 second).

Spring centered models return valve spool to center position when solenoids are de-energized.

Spring offset models return spool to offset position by pilot pressure when solenoids are de-energized.

CAUTION: Spring offset models contain no offset springs in the main stage and are hydraulically offset via spring offset pilots. When pilot pressure falls below the minimum shift pressure, the main stage spool is free to float.

When detented models are de-energized, the pilot and main spools remain in the last position attained, provided there is no shock, vibration, unusual pressure transients and the spool axis is horizontal.

If pilot pressure fails or falls below the minimum, the main spool will spring center (at spring centered flow rates) and cannot drift to reversal of flow (pilot stage remains in detented position).

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.)

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 type 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.

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

Performance Data

DG3V-10 Model

Pressure Drop

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

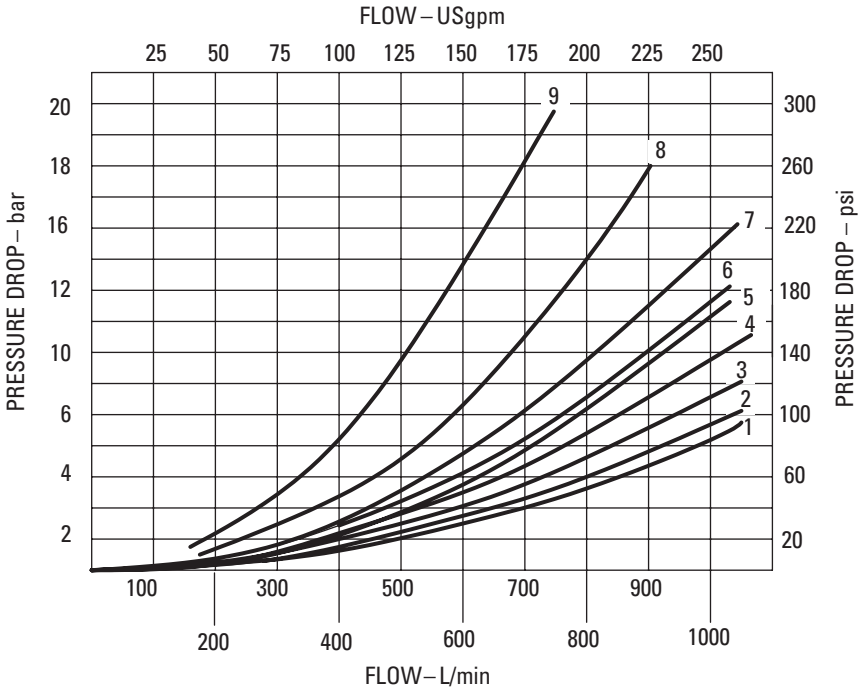
Example: Find the pressure drop from P→B for type 7 spool. Using the table find numeral 7 in the spool type column. To the right of numeral 7 find the reference curve 5 (from pressure drop curve chart at bottom of page) under P→B column.

The pressure drop from P→B for type 7 spool would be obtained on curve 5.

Spool Type	Pressure Drop Curve Number				
	P→A	B→T	P→B	A→T	P→T On Center
0	5	5	5	6	4
1	2	2	5	6	7
2	1	2	1	1	–
3	2	2	5	1	–
4	7	9	7	9	8
6	1	5	1	5	–
7	5	3	5	3	–
8	3	3	3	3	6
9	1	2	1	1	–
33	1	2	1	1	–
52	3	■	3	3	–

■ Contact your Eaton representative.

Pressure Drop Curves



1. Figures in the pressure drop chart give approximate pressure drop (△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 ($\triangle P_1$) will be approximately: $\triangle P_1 = \triangle P(Q_1/Q)^2$.
3. For any other viscosity(s), the pressure drop (△P), will change as follows:

Viscosity

cSt (SUS)	14 (17.5)	32 (97.8)	43 (200)	54 (251)	65 (302)	76 (352)	86 (399)
% of ΔP (Approx.)	81	88	104	111	116	120	124

4. For any other specific gravity (G1)*, the pressure drop ($\triangle P_1$) will be approximately: $\triangle P_1 = \triangle P(G_1/G)$.

K

Performance Data

DG5V-10 Model

Pressure Drop

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

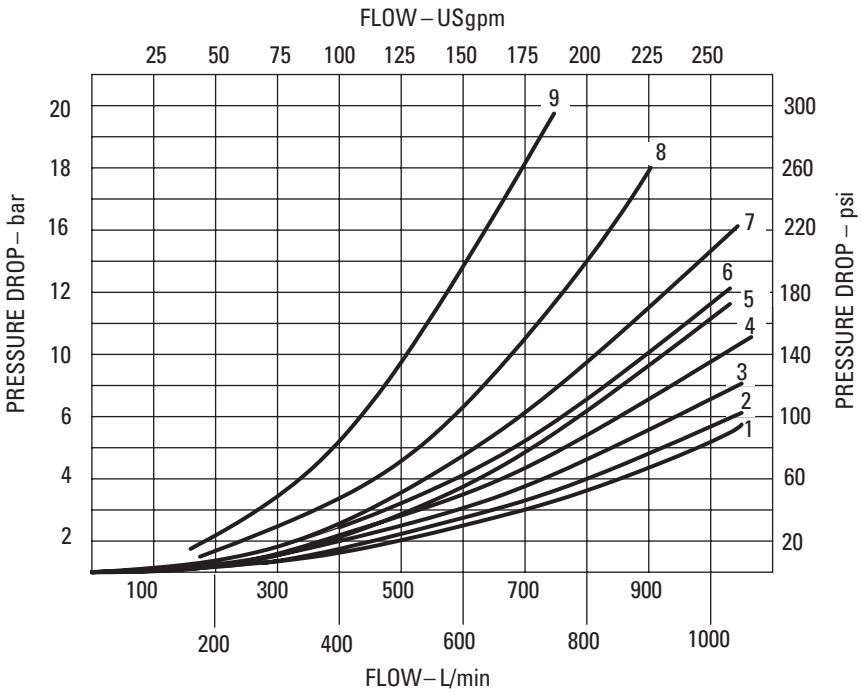
Example: Find the pressure drop from P→B for type 7 spool. Using the table find numeral 7 in the spool type column. To the right of numeral 7 find the reference curve 5 (from pressure drop curve chart at bottom of page) under P→B column.

The pressure drop from P→B for type 7 spool would be obtained on curve 5.

Spool Type	Pressure Drop Curve Number				
	P→A	B→T	P→B	A→T	P→T On Center
0	5	5	5	6	4
1	2	2	5	6	7
2	1	2	1	1	–
3	2	2	5	1	–
4	7	9	7	9	8
6	1	5	1	5	–
7	5	3	5	3	–
8	3	3	3	3	6
9	1	2	1	1	–
33	1	2	1	1	–
52	3	■	3	3	–

■ Contact your Eaton representative.

Pressure Drop Curves



1. Figures in the pressure drop chart give approximate pressure drop (△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 ($\triangle P_1$) will be approximately: $\triangle P_1 = \triangle P(Q_1/Q)^2$.
3. For any other viscosity(s), the pressure drop (△P), will change as follows:

Viscosity

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

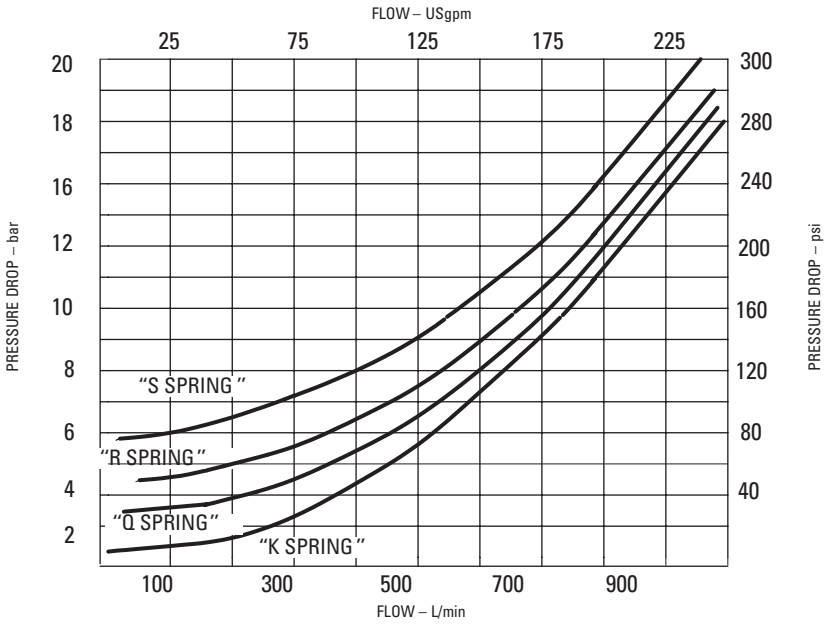
4. For any other specific gravity (G1)*, the pressure drop ($\triangle P_1$) will be approximately: $\triangle P_1 = \triangle P(G_1/G)$.

Integral Check Valves for DG5V-10

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,the pressure drop through the check valve, plus the pressure at the tank port.

For proper operation, the 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



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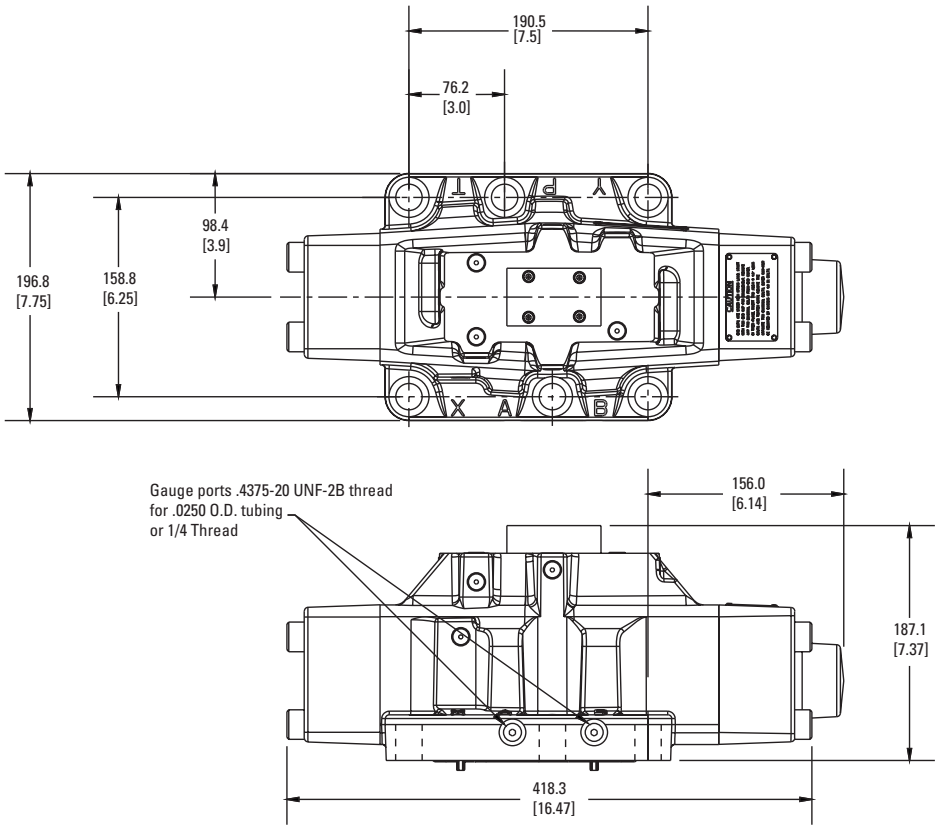
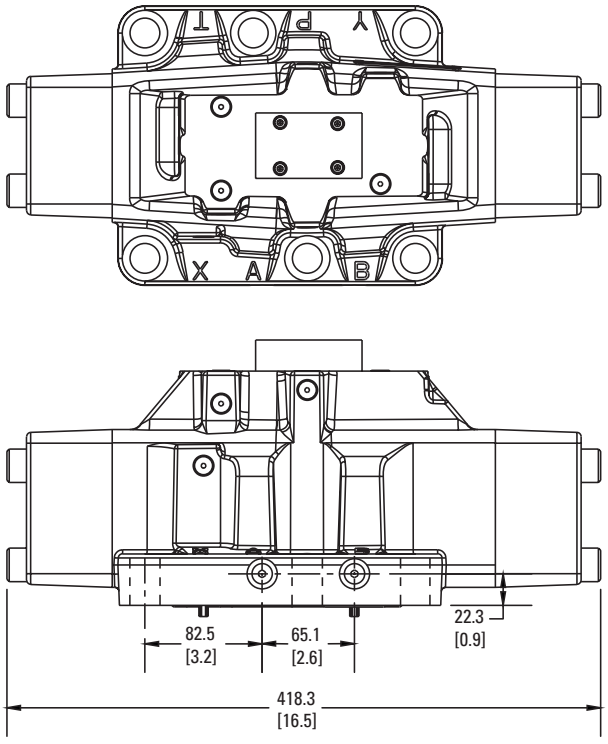
Installation Dimensions

DG3V-10 Spring Centered & Spring Offset Models

Millimeters (inches)



DG3V-10-*A-11 Series



DG3V-10-*C-11 Series

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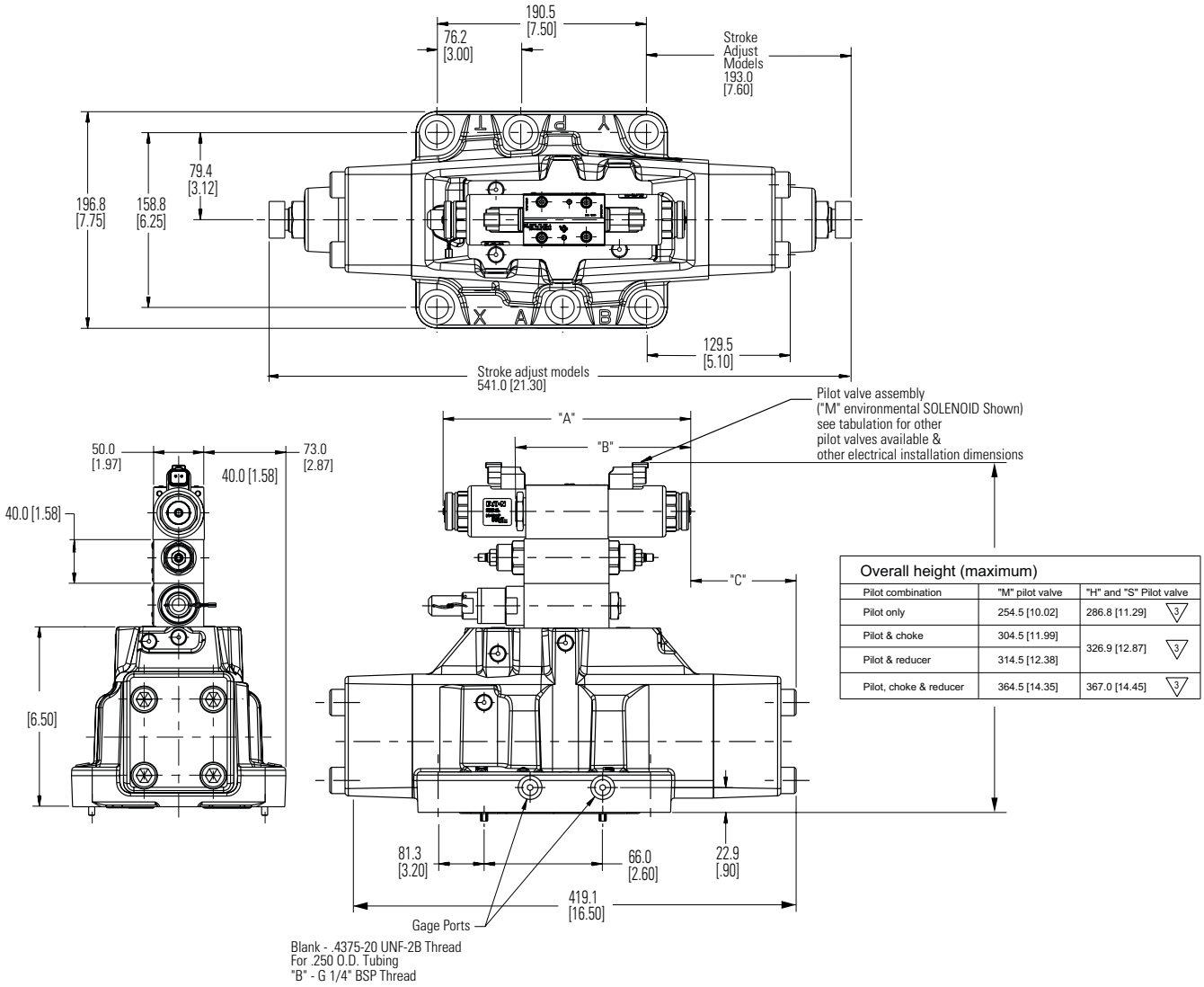
Installation Dimensions

DG5V–10–*–(R)–**
Spring Centered Models

Millimeters (inches)



Overall height (maximum)		
Pilot combination	"M" pilot valve	"H" and "S" Pilot valve
Pilot only	254.5 [10.02]	286.8 [11.29] ▽3
Pilot & choke	304.5 [11.99]	326.9 [12.87] ▽3
Pilot & reducer	314.5 [12.38]	
Pilot, choke & reducer	364.5 [14.35]	367.0 [14.45] ▽3

DG5V-10-*-11 Models

Installation Dimension Table

"B" Dimension		"C" Dimension		"D" Dimension	
''AC''	''DC''	''AC''	''DC''	''AC''	''DC''
200.0 (7.87)	220.0 (8.66)	146.0 (5.75)	156.0 (6.14)	107.8 (4.24)	97.8 (3.85)

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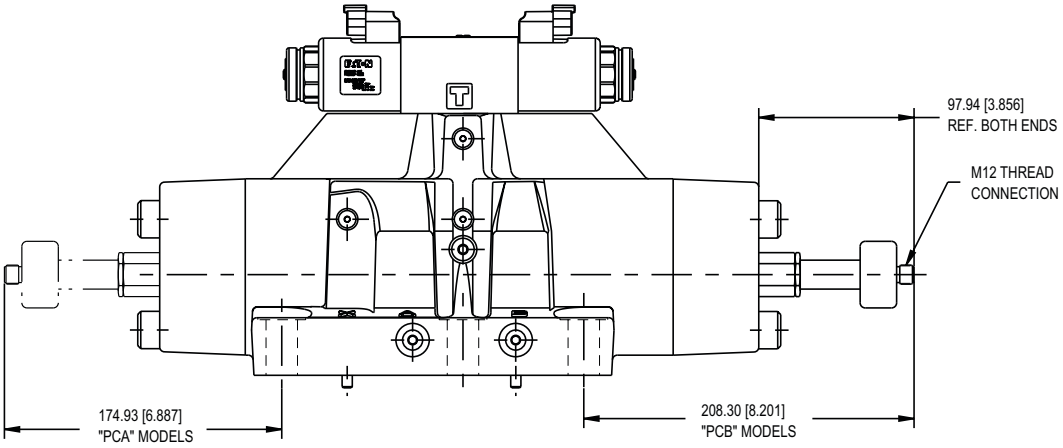
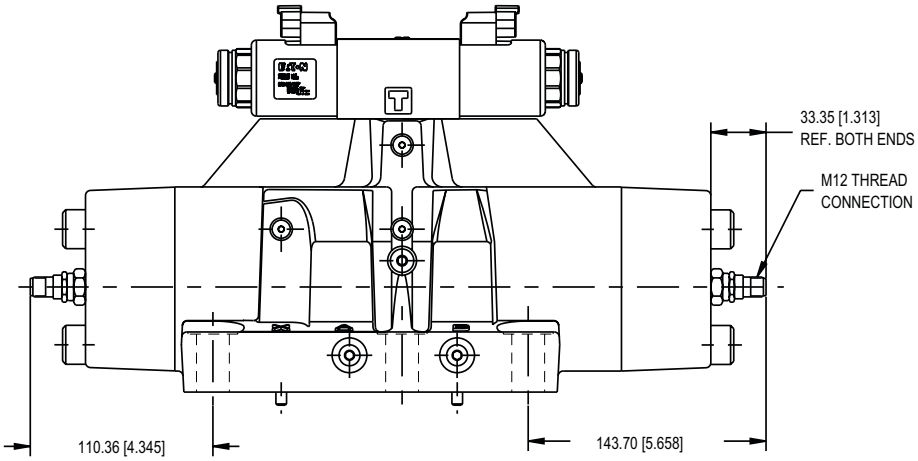
Installation Dimensions

Valves with spool position monitoring (PCA/PCB/PPA/PPB/PPD)



Center sensing switch on "B" port end shown



Offset Sensing Proximity Switch
("PPD" Model Shown)

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DG5V-10 with Main Stage Spool Monitoring Switch "PC*" or "PD*" Models (LVDT Style Switch)

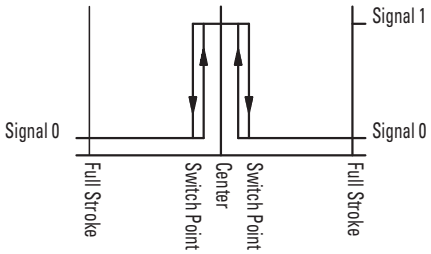
Millimeters (inches)

Specifications

Supply Voltage (Vs) (Full Wave Bridge with Capacitor)	24VDC ± 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)	± 0.35 to 0.65 mm
Hysteresis	≤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	

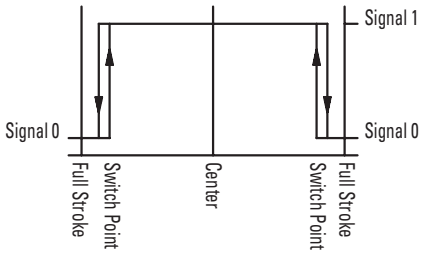
ATTENTION: EMC ONLY ENSURED WHEN USING SCREENED CABLES AND SCREENED PLUG CASING.

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



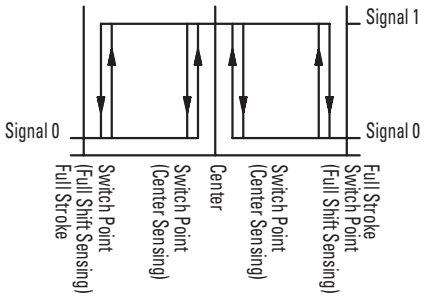
Signal 0 = Voltage at pin 2/4 < 1.8V
Signal 1 = Voltage at pin 2/4 > (Vs – 2.5V)

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



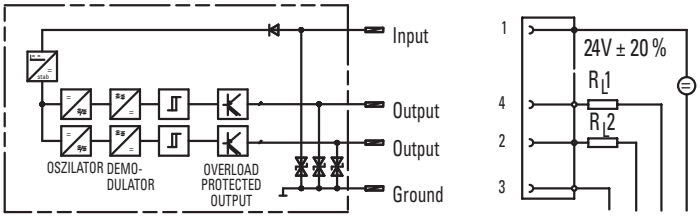
Signal 0 = Voltage at pin 2/4 < 1.8V
Signal 1 = Voltage at pin 2/4 > (Vs – 2.5V)

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



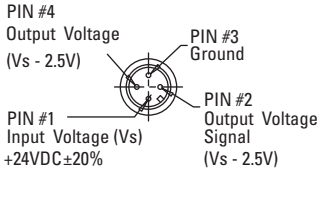
Signal 0 = Voltage at pin 2/4 < 1.8V
Signal 1 = Voltage at pin 2/4 > (Vs – 2.5V)

Electrical Schematic and Mating Connector Detail



R_L1,R_L2 = e.g. Coil Resistance of the switch relay >/ = 60 OHMS

Connector Detail



DG5V-10 with Main Stage Spool Monitoring Switch "PPA", "PPB" or "PPD" Models (Proximity Switch)

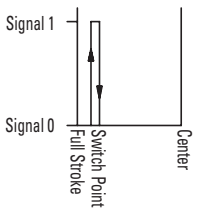
Millimeters (inches)

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%

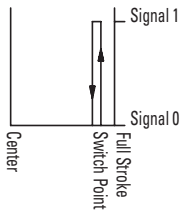
ATTENTION: EMC ONLY ENSURED WHEN USING SCREENED CABLES AND SCREENED PLUG CASING.

TYPICAL "PPA" OUTPUT



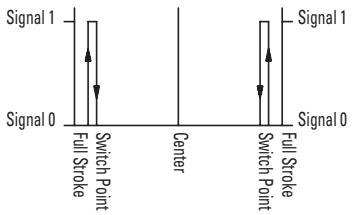
Signal 0 = Voltage at pin 4 = 0V
Signal 1 = Voltage at pin 4 > (Vs – 2.2V)

TYPICAL "PPB" OUTPUT

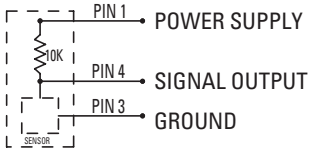


Signal 0 = Voltage at pin 4 = 0V
Signal 1 = Voltage at pin 4 > (Vs – 2.2V)

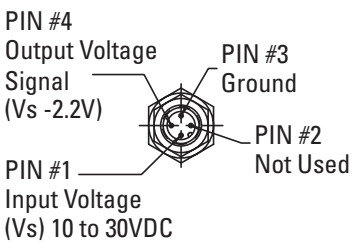
TYPICAL "PPD" OUTPUT



Output Circuit Wiring Instuctions



Connector Detail



Pilot Valves Data

General Description

Pilot valves are identified in the model code by the following letters: "M" Mobile style - high performance and "H" High Performance. The pilot valves can be ordered to match a variety of mainstage spool types and valve bodies.

The charts below shows ordering information for each pilot valve. For example, to order a "H" - high performance pilot with a spring centered mainstage ''C'', use the following model code: DG4V-3-6C

Valve Model Code: High Performance	Main Stage Spool Type	Pilot Valve Model Code
DG5V-10-H/M-(R)-*A-*	All except 4 & 8	DG4V-3(M)-2A-*
	4 & 8 only	DG4V-3(M)-2AL-VM-*
DG5V-10-H/M-(R)-*AL-*	All except 4 & 8	DG4V-3(M)-2AL-*
	4 & 8 only	DG4V-3(M)-2A-VM-*
DG5V-10-H/M-(R)-B-*	All except 4 & 8	DG4V-3(M)-6B-*
	4 & 8 only	DG4V-3(M)-6BL-VM-*
DG5V-10-H/M-(R)-*BL-*	All except 4 & 8	DG4V-3(M)-6BL-*
	4 & 8 only	DG4V-3(M)-6B-VM-*
DG5V-10-H/M-(R)-*C-*	All except 4 & 8	DG4V-3(M)-6C-*
	4 & 8 only	DG4V-3(M)-6C-VM-*
DG5V-10-H/M-(R)-*N-*	All except 4 & 8	DG4V-3(M)-6N-*
	4 & 8 only	DG4V-3(M)-6N-VM-*

Minimum Pilot Pressure Requirements (when operating at 210 bar (3000 psi) maximum)

Spool Type	Flow l/min (USgpm)	Shifting P to A bar (psi)		Shifting P to B bar (psi)	
		Pressure Centered Models	All Other Models	Pressure Centered Models	All Other Models
All Spools	0	5 (75)	5 (75)	14 (200)	5 (75)
0, 4, 8 & 9	946 (250)	5 (75)	5 (75)	14 (200)	5 (75)
2, 3, 6 & 33	946 (250)	10 (150)	10 (150)	27,5 (400)	10 (150)

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

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Notes

Notes

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