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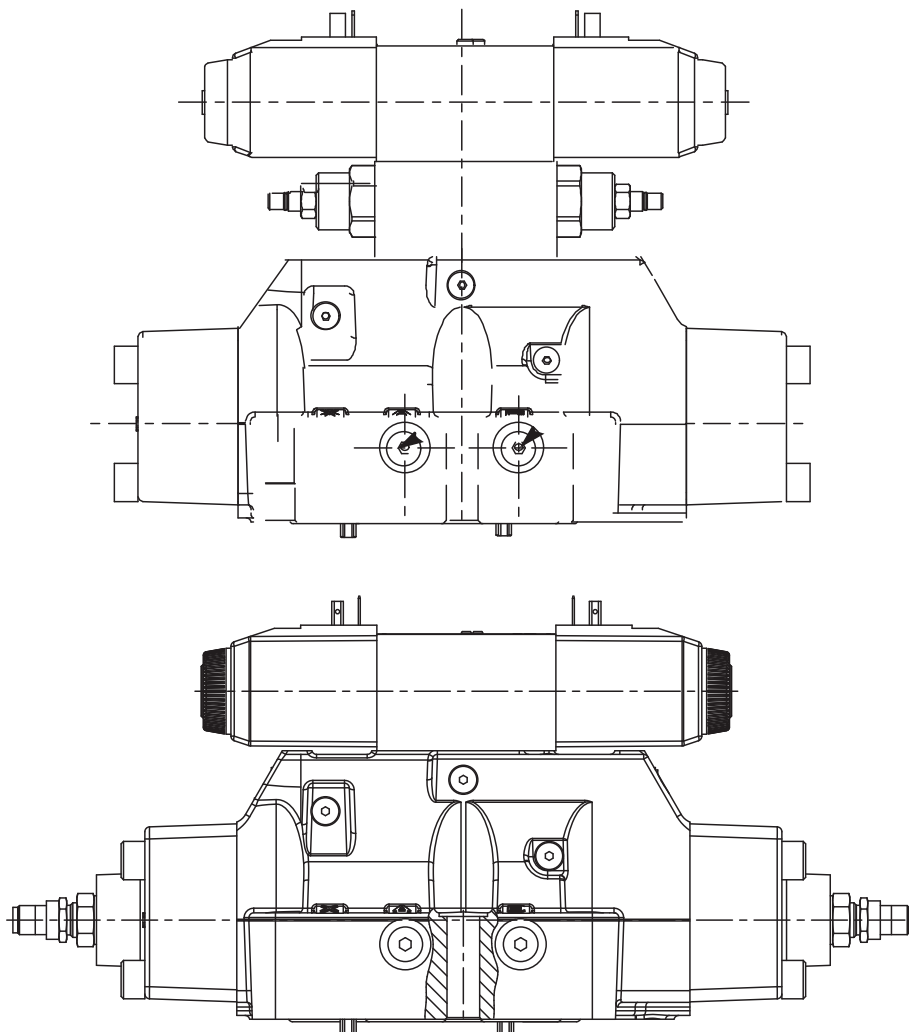
Vickers

Pilot Operated Directional Valves

Catalog

DG3V-8 700l/min (185
USgpm) 350 bar (5000 psi)

DG5V-8 700l/min (185
USgpm) 350 bar (5000 psi)
NFFA D08, ISO-4401-08,
CETOP 8



Introduction

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:

- DG 3V-8 - remote pilot operated valve.
- DG 5V-8-S - DG 4V-3S-60 standard performance DO3 pilot valve 100 bar (1450 psi) tank line rating.
- DG 5V-8-H - DG 4V-3-60 high performance DO3 pilot valve 210 bar (3000 psi) tank line rating.

Each valve contains a main-stage 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.
- The DG 3V and DG 5V are 100% interchangeable with previous H8 design valves.

Service Information

Refer to specific Eaton parts drawing for service parts information.

Order by literature number.

DG 3V-8	500703/EN/0196/S
DG 5V-8*S	500704/EN/0196/S
DG 5V-8*H	500704/EN/0196/S

Model Codes

DG 5V-8 Remote Pilot

Operated Directional Valves

(F*) - DG5V- 8 - * - (R) - (B) - ** - (L) - (***) - (X) - (*) - P** - (E) - (T) - (*) - (VM) - (S*) - * ** * * - (L) - (*) - ** - (***) - 10 - (EN***)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

1 Special Seals

(Omit if not required.)

F3 – Seals for fire resistant fluids.

F6 – Seals for water glycol.

2 Directional Control Valve

DG 5V – Subplate mounting; pilot operated. Pressure rating 350 bar (5000 psi) for all ports. (See minimum pilot pressure requirements on p. 15.)

3 Valve Size

8 – Valve size CETOP 3, NFPA D08

4 Pilot Valve Type

H – CETOP 3, High performance

S – CETOP 3, Standard performance

5 Reducer Module

See Fast Response restriction. (Omit if not required.)

6 Gauge Ports

Blank – .4375-20 UNF-2B Thread

B – 1/4 BSP Thread

7 Spool Types

0 – Open center (all ports)

1 – Open center (P to A & T) B blocked

2 – Closed center (all ports)

3 – Open center (P & B blocked) A to T

4 – Tandem center (P to T) closed crossover

6 – Closed center (P blocked) A & B to T

7 – Open center (P to A & B) T blocked

8 – Tandem center (P to T) open crossover

9 – Open center, partial to all ports

11 – Open center (P to B & T) A blocked

31 – Closed center (P & A blocked) B to T

33 – Closed center, bleed A & B to T

35 – Closed cross over (all ports) (ONLY 35A available)

52 – Closed center (All ports) regen. towards workport A

521 – Closed center (All ports) regen. towards workport B

8 Spool Spring Arrangement

A – Spring offset to 'A' port

B – Spring centered, with solenoid 'A' removed

C – Spring centered

D – Pressure centered

F – Spring offset to 'A' port, shift to center

N – No spring detented (pilot valve only)

9 Left Hand Build

L – Single solenoid models only, omit if not required.

10 Manual Override Options

Blank – Plain override in solenoid ends only

H – Waterproof override in solenoid ends only

H2 – Waterproof override in both ends of single solenoid

P2 – Plain override in both ends of single solenoid

Y – Lockable manual override in solenoid ends only (DC models only)

Z – No override in either end

11 Fast Response

X – Not recommended for pilot pressures above 210 bar (3000 psi). (Omit for standard low shock models.)

When the standard performance pilot is selected and pilot pressure is above 3000 psi, the reducer module is required to limit high drain line pressure transients generated during shifting.

12 Spool Control Modifications

(Omit if not required.)

1 – Stroke adjustment (both ends) (not available on D models)

2 – Pilot choke adjustment (available on all models)

3 – Pilot choke and stroke adjusters (both ends) (not available on D models)

7 – Stroke adjusters on A port end only (not available on D models)

8 – Stroke adjusters on B port end only (available on all models)

27 – 2 and 7 combined (not available on D models)

28 – 2 and 8 combined (available on all models)

13 Main Stage Spool Monitoring Switch

(Omit if not required.)

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)

* 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).

14 External Pilot Pressure

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

15 Internal Pilot Drain

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

16 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

(F*) - DG5V- 8 - * - (R) - (B) - ** - (L) - (***) - (X) - (*) - P** - (E) - (T) - (*) - (V)M - (S*) - * * * * - (L) - (*) - ** - (***) - 10 - (EN***)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

17 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 main-stage porting.

18 Heading Electrical Flag Symbol

M - Features and options for pilot valve.

19 Pilot Valve Monitoring Switch

S3 - Limit switch normally open, wired to electrical connector with PA/PB/PA5 (H piloted models only)

S4 - Limit switch normally closed, wired to electrical connector with PA/PB/PA5 (H piloted models only)

S5 - Limit switch normally closed, wired to electrical connector with PA/PB/PA5 (H piloted models only)

S6 - Position switch with U coils (H piloted models only)

20 Coil Type

F - Flying lead (required for wiring housing option)

KU - Top exit flying lead

P - Plug in

SP1 - Single 6.3mm spade

SP2 - Dual 6.3mm spade

U - ISO 4400 (DIN 43650)

X1 - Flameproof solenoids BASEEFA, CENELEC (S piloted models only)

X2 - Explosion proof solenoids CSA/UL (S piloted models only)

X3 - Explosion proof solenoids BASEEFA ExS (S piloted models only)

21 Electrical Connections

(F type coils only, omit if not required)

PA - Insta-plug, male receptacle only

PB - Insta-plug, male and female receptacle

PA3 - 3-pin connector

PA5 - 5-pin connector

T - Wired terminal block (wiring housing option also required)

23 Wiring Housing

W - 1/2" NPT threaded connection

J - 20mm threaded connection

G - 1/2" BSP threaded connection

23 Electrical Options

(Omit if not required)

U-type coils only

1 - Fitted connector

2 - Fitted connector and variable grommet

6 - Fitted connector with lights

24 Solenoid Indicator Lights

(Omit if not required)

25 Electrical Options

(DC voltages only, omit if not required)

D1 - Encapsulated diode (industrial applications)

D2 - Encapsulated diode (mobile applications)

D7 - Encapsulated transistor

26 Coil Identification Letter

See electrical information on page 25 for voltages available. Others available upon request.

27 Pilot Valve Port Orifices

(Omit if not required)

28 Design Number

29 Special Modifications

(Omit if not required)

Ratings

MAX. FLOW W/OUT MALFUNCTION*	MAX. FATIGUE PRESSURE (PORTS P, A, B & T)	MAX. OPERATING PRESSURE	MAX. OPERATING PRESSURE (PORTS T & Y)	MOUNTING PATTERN
L/min (USgpm)	bar (psi)	bar (psi)	bar (psi)	CETOP 8 ISO 4401 SIZE 8 NFPA D08
To 700 (185)	350 (5000)	350 (5000)	350 (5000)	

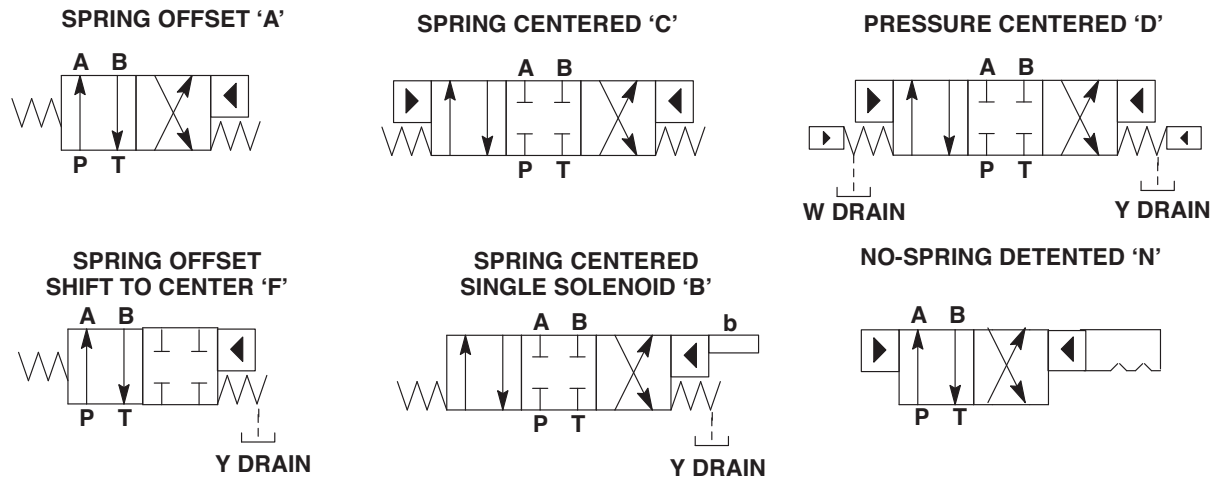
* See malfunction flow curves on page 16

Spool Type and Center Position

SPOOL TYPE AND CENTER POSITION

Spool Type	Center Position	Spool Type	Center Position	Spool Type	Center Position	Spool Type	Center Position	Spool Type	Center Position
0		3		7		11		35A	
1		4 (Closed Crossover)		8 (Open Crossover)		31		52	
2		6		9		33		521	

GRAPHICAL SYMBOLS



FLOW RATINGS

Maximum flow without malfunction	See malfunction flow curves on page 7.
Maximum fatigue pressure (P, A, B & T ports)*	350 bar (5000 psi)
Maximum operating pressure (P, A, B & X ports)	350 bar (5000 psi)
Maximum operating pressure (T & Y ports)§	350 bar (5000 psi)

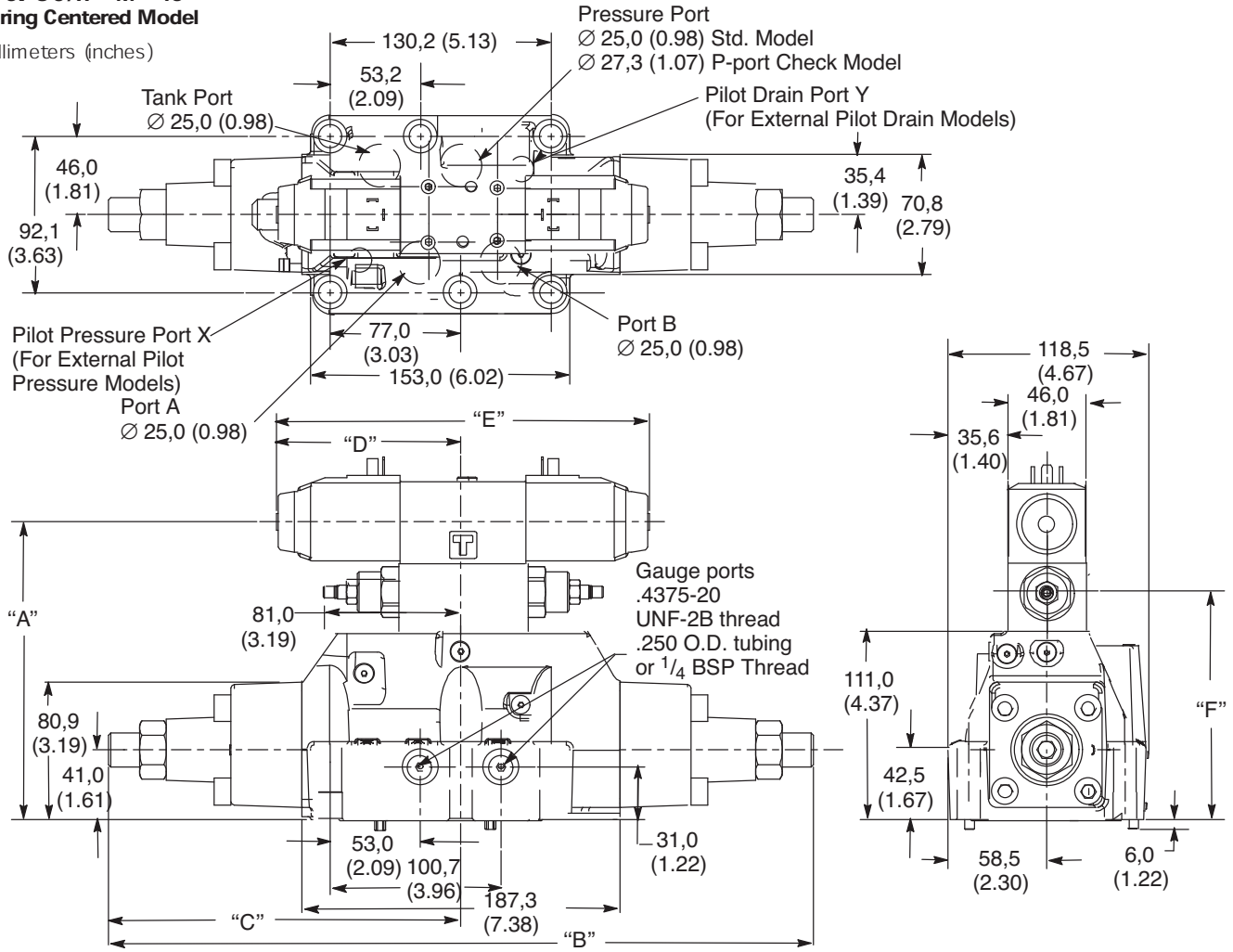
* The method for verifying the rated fatigue pressure of the complete unit conforms to NFPA/T2.61 R1-1991 (Catalog C/90), Fluid Power Systems and Products method for verifying the fatigue pressure rating of the pressure containing envelope.

§ 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.

Installation Dimensions

DG 5V-8-S/H-* -M-* -10 Spring Centered Model

Millimeters (inches)

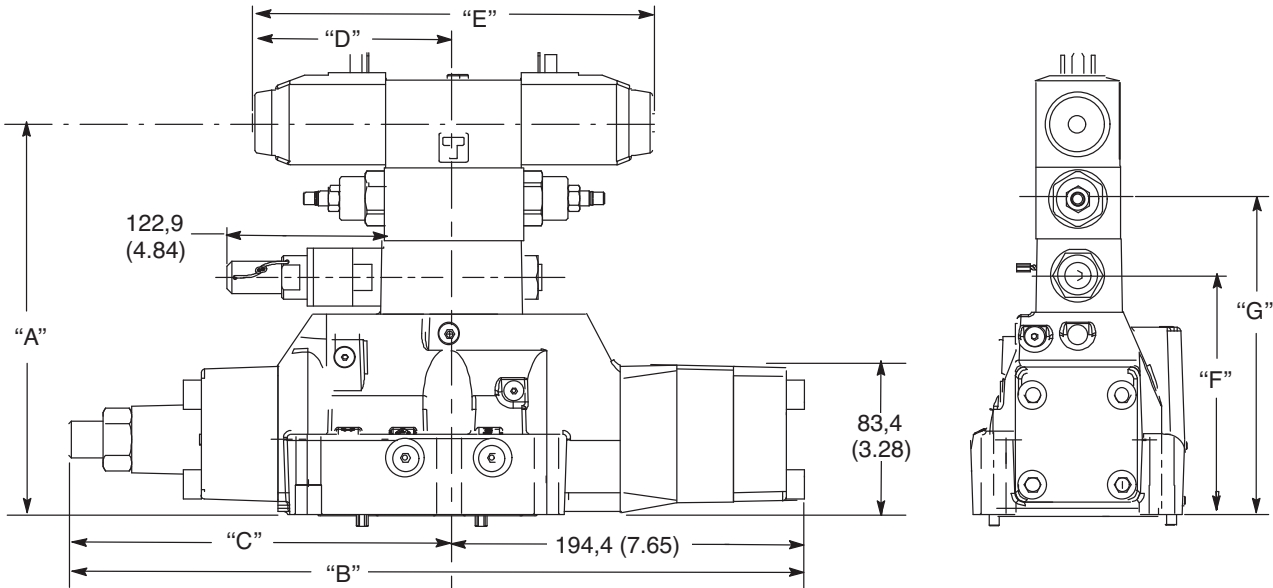


Spool Control Modifications	Dimensions									
	"A"	"B"	"C"	"D"		"E" pilot				"F"
				AC Sol.	DC Sol.	Dual Solenoid		Single Solenoid		
						AC Sol.	DC Sol.	AC Sol.	DC Sol.	
Without pilot choke or stroke adjustment	135,6 (5.33)	265,3 (10.44)	132,6 (5.22)							
Stroke adjustment (both ends)		415,9 (16.37)	208,0 (8.18)							-
Pilot choke adjustment	175,6 (6.91)	265,3 (10.44)	132,6 (5.22)							134,2 (5.28)
Stroke adjust. on cyl. 'A'	135,6 (5.33)		208,0 (8.18)	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'		340,6 (13.40)	132,6 (5.22)							
Pilot choke and stroke adjust. on cyl. 'A'			208,0 (8.18)							
Pilot choke and stroke adjust. on cyl. 'B'	175,6 (6.91)		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

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