

Vickers®

Directional Controls



Solenoid Operated Directional Valves

DG4V-3 flows to 80 l/min (21 USgpm), 6* design

DG4V-3S flows to 40 l/min (10.5 USgpm), 6* design

ISO 4401, size 03; ANSI/B93.7M-D03



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Introduction

General description

These solenoid operated directional control valves are for directing and stopping flow at any point in a hydraulic system. This 60-design series has been specially designed and developed to cover expanded demands in the industry as well as the many traditional uses of the earlier designs. Some of the more important benefits to users are outlined.

- Efficient control of greater hydraulic powers without increasing solenoid power consumption.
- Installed cost and space savings from higher power/weight-and-size ratios.

- Increases system efficiency; the result of improved manufacture of spools and bores.
- Installation flexibility resulting from choice of numerous combinations of solenoid connectors and locations.
- Multi-fluid capability without need to change seals.
- Higher sustained machine productivity and higher uptime because of proven fatigue life and endurance, tested over 20 million cycles.
- Solenoid coils can be changed quickly and easily without leakage from hydraulic system.
- Compact, cost effective system design when used with Vickers SystemStak™ valves and subplates.

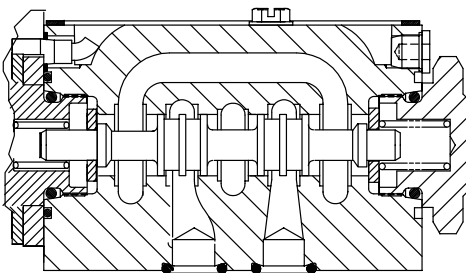
DG4V-3 and DG4V-3S High and standard performance models:

- Up to 80 l/min (21 USgpm) and up to 40 l/min (10.5 USgpm) respectively at 350 bar (5000 psi).
- Builds on Vickers experience as the major supplier of size 03 valves worldwide.
- Offers designers the opportunity to select the optimum value package for each application.
- International standard interface. The valve mounting face conforms to ISO 4401, size 03 and is compatible with related international standards.

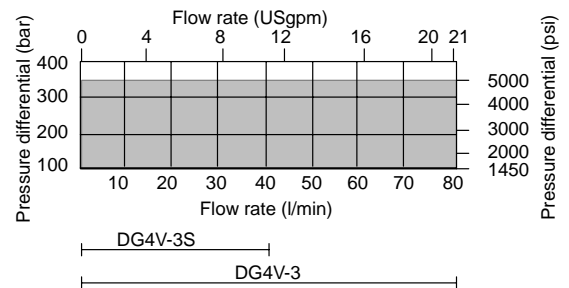
Features and Benefits

- **High pressure and flow capabilities, thanks to special design features**

Highly reliable operation up to 80 l/min (21 USgpm) at 350 bar (5000 psi). Establishes new market standards and opens new possibilities to design engineers on valve size selection.



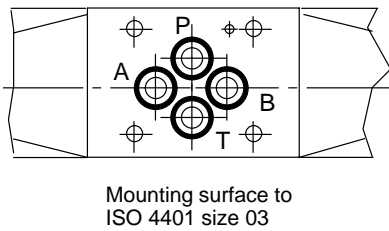
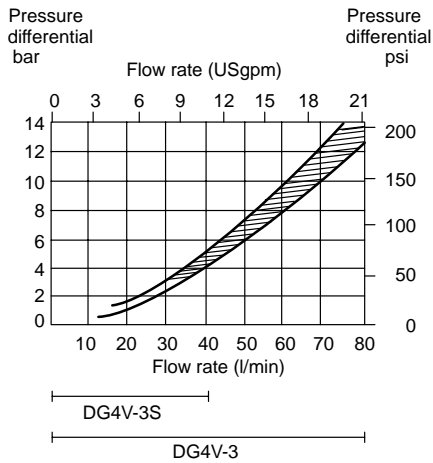
Typical maximum pressure differential (P-A-B-T) flow envelope, blocked center spool.



Features and Benefits

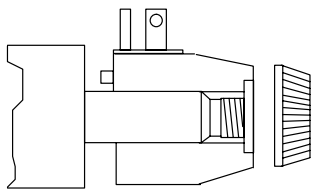
- **Minimal pressure drop, i.e. 2,5 bar (36 psi) at 30 l/min (7.9 USgpm)**

Achieved by optimization of the valve body, spool and spool-stroke design. The results: low energy consumption and improved efficiency.



- **Ease of servicing**

Wet-armature solenoid, screw-in core tube design allows coils to be changed without removing valve from installation and without oil spillage or risk of contaminating system fluid.

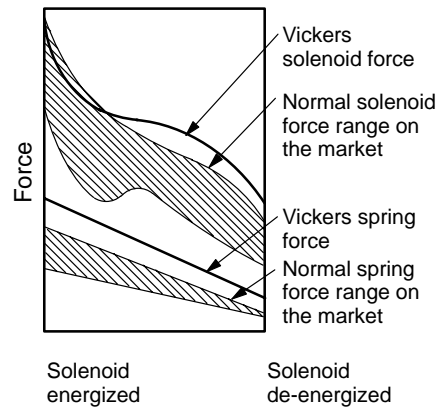


ISO4400 (DIN 43650) coil shown

- **High reliability**

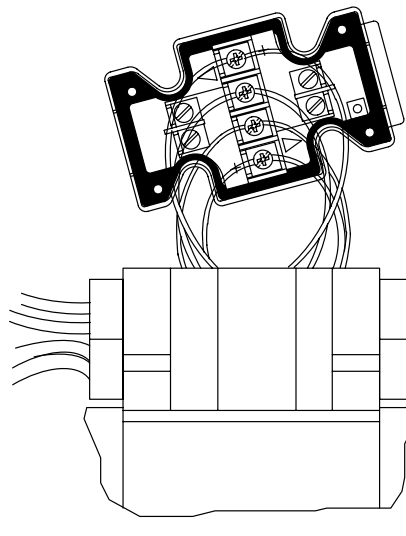
Design of spring forces and profile of DC solenoid force characteristics ensure spool position selection under extreme operating conditions. Result is a valve with high reliability when being energized or de-energized.

Performance leader



- **Electrical connections**

Conduit box design that simplifies electrical wiring connections to solenoids. Orientation tabs prevent incorrect positioning.



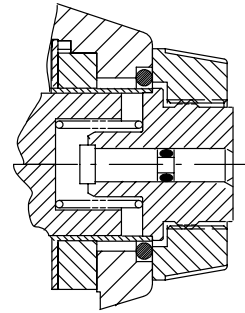
- **Scratch-proof manual override seal**

Internal seals are located such that they are beyond reach of any bore damage caused by small tools used to operate the manual override.

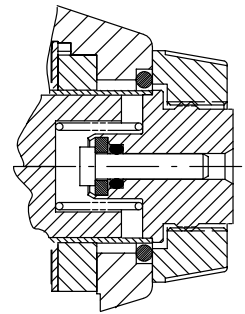
Result is no messy oil drips from the manual overrides.

Small diameter manual overrides prevent inadvertent operation.

DG4V-3 – High Performance



DG4V-3S – Standard Performance



- **Surge suppression for DC valves**

Surge suppression is used to prevent coil damage by reducing contact burnoff – increasing switch life – and protecting electrical controllers from inductive spikes.

Three coil options are available:

- D1 – Encapsulated diode (Industrial application)
- D2 – Encapsulated diode (Mobile application)
- D7 – Transzorb type

Characteristics

High performance DG4V-3, 6* design Standard performance DG4V-3S, 6* design

Mounting interface

ISO 4401 size 03
ANSI/B93.7M size D03
CETOP RP65H, size 3
DIN 24340, NG6

Basic characteristics

Maximum pressure:
DG4V-3 350 bar (5075 psi)
DG4V-3S 350 bar (5075 psi)
Maximum flow:
DG4V-3 up to 80 l/min (21 USgpm)
DG4V-3S up to 40 l/min (10.5 USgpm)

DG4V-3 models are direct solenoid operated four-way directional control valves. Their primary function in a hydraulic circuit is to direct fluid flow. This, in turn, would determine the direction of movement of a fluid cylinder, or the direction of rotation of a fluid motor.

Port connections are made by mounting the valve on a subplate or manifold. The valve has wet armature type solenoids.

Electrical connections to the valve are made in the electrical wiring housing or thru various plug-in connectors such as a DIN 43650 type coil

Good hydraulic design practice suggests that detented models be mounted with longitudinal axis horizontal. Other models may be mounted in any position.

Operating considerations

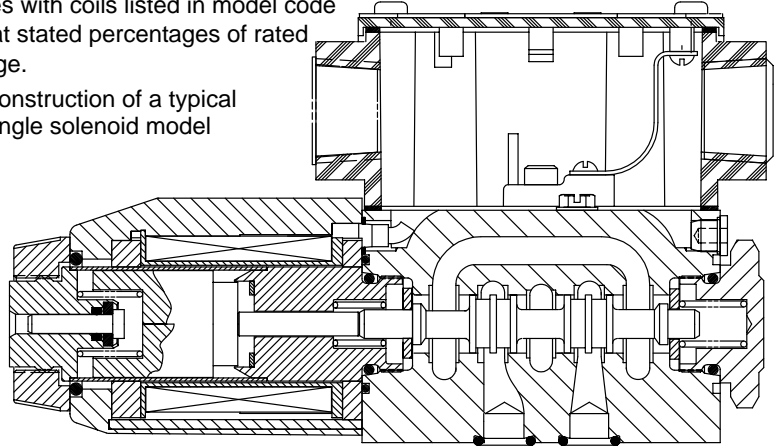
1. Dependent on the application and the system filtration, any sliding spool valve if held shifted under pressure for long periods of time, may stick and not move readily due to fluid residue formation. It may therefore need to be cycled periodically to prevent this from happening.
2. Surges of fluid in a common tank line serving two or more valves can be of sufficient magnitude to cause inadvertent shifting of these valves. This is particularly critical in no-spring detented models, separate drain lines are necessary.

Temperature limits

Minimum ambient -20°C (-4°F)

Maximum ambient
Valves with coils listed in model code and at stated percentages of rated voltage.

Construction of a typical single solenoid model



Fluid temperature

Fluid Temp.	Mineral oil	Water-containing
Min	-20°C (-4°F)	+10°C (+50°F)
Max.*	+70°C (+158°F)	+54°C (+129°F)

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

Coil type and frequency	Percentage voltage	Maximum ambient temperature	
		DG4V-3	DG4V-3S
Dual frequency coils			
@ 50 Hz	107%	40°C (104°F)	65°C (149°F)
@ 50 Hz	110%	30°C (86°F)	65°C (149°F)
@ 60 Hz	107%	50°C (122°F)	65°C (149°F)
@ 60 Hz	110%	40°C (104°F)	65°C (149°F)
Single frequency (50 Hz) coils			
@ 50 Hz	110%	40°C (104°F)	65°C (149°F)
DC coils	110%	70°C (158°F)	70°C (158°F)

For synthetic fluids consult manufacturer or Vickers representative where limits are outside those for mineral oil.

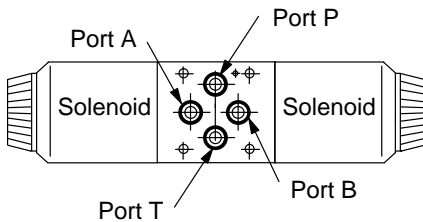
Whatever the actual temperature range, ensure that viscosities stay within the limits specified in the "Hydraulic fluids" section.

Functional Symbols

Spool types shown represent the highest proportion of market requirements. For other spool functions that may be required, consult your Vickers sales representative.

Solenoids identified to U.S. standards

Functional symbols related to solenoid identity "A" and/or "B" according to NFPA/ANSI standards, i.e. energizing solenoid "A" gives flow P to A, solenoid "B" gives flow P to B (as applicable).

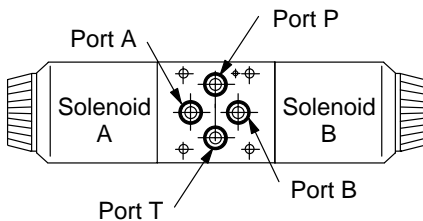


Solenoid	For spool type	Solenoid
B	All except "8"	A
A	"8" only	B

For valves with type "8" spools, solenoid identity to U.S. convention is the same as for European convention.

Solenoids identified to European standards (specify "V" in model code)

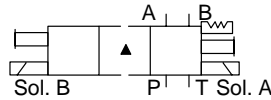
Functional symbols related to solenoid identity "A" and/or "B" according to European convention i.e. solenoid "A" adjacent to "A" port, solenoid "B" adjacent to "B" port of valve.



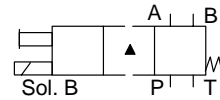
- For differences in valve function, refer to Performance Data page 11.
- ◇ F build spools.

U.S. solenoid standard

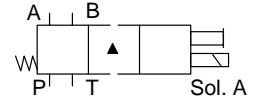
Double solenoid valves, two position, detented



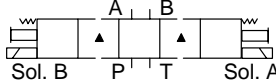
Single solenoid valves, solenoid at port A end



Single solenoid valves, solenoid at port B end



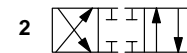
Double solenoid valves, spring centered



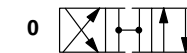
▲ Transient condition only

The valve function schematics apply to both U.S. and European valves.

DG4V-3(S)-*N(V)



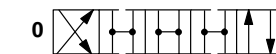
DG4V-3(S)-*A(V)



DG4V-3(S)-*AL(V)



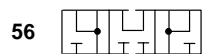
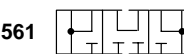
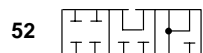
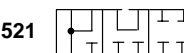
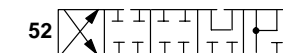
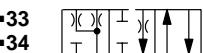
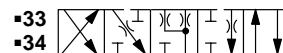
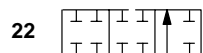
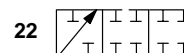
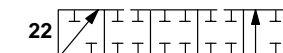
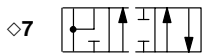
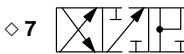
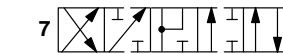
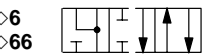
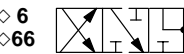
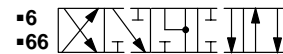
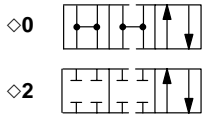
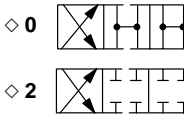
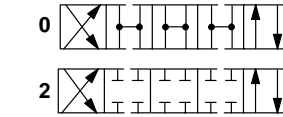
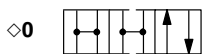
DG4V-3(S)-*C(V)



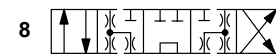
DG4V-3(S)-*B/F(V)



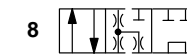
DG4V-3(S)-*BL/FL(V)



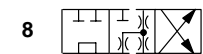
DG4V-3(S)-8C(V)



DG4V-3(S)-8BL(V)

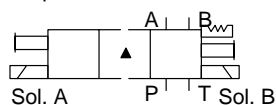


DG4V-3(S)-8B(V)

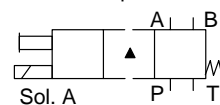


European solenoid standard

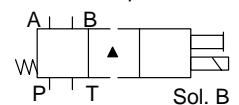
Double solenoid valves, two position, detented



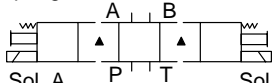
Single solenoid valves, solenoid at port A end



Single solenoid valves, solenoid at port B end



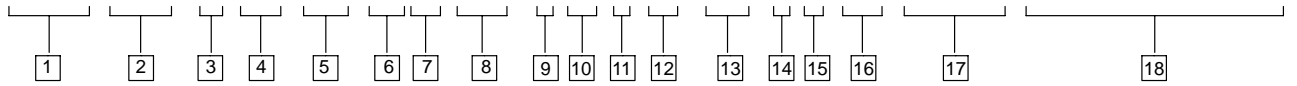
Double solenoid valves, spring centered



▲ Transient condition only

Model Code

DG4V-3(S) -***(L)-(**)-(V)M-(S*)- * ** * D* (L)- ** -6* -(EN***)-(P**-A**-B**-T**)



1 Model series

D – Directional valve
 G – Subplate/manifold mounted
 4 – Solenoid operated
 V – Pressure rating 350 bar (5075 psi) on P, A & B ports

2 Standard or high performance

3 – High performance specification: up to 80 l/min (21 USgpm) at 350 bar (5075 psi)
 3S – Standard performance specification: up to 40 l/min (10.5 USgpm) at 350 bar (5075 psi)

3 Spool type

See “Functional symbols” section.

4 Spool spring arrangement

A – Spring offset, end-to-end
 AL – Same as “A” but left hand build
 B – Spring offset, end to center
 BL – Same as “B” but left hand build
 C – Spring centered
 F – Spring offset, shift to center
 FL – Same as “F” but left hand build
 N – No-spring detented

5 Manual override option

No symbol – Plain override(s) in solenoid end(s) only▲
 H – Water-resistant override(s) on solenoid end(s)▲
 H2 – Water-resistant override both ends of solenoid.
 P2 – Plain override both ends of single solenoid.
 Y● – Latching manual override on solenoid ends (includes “H” feature seal)▲
 Z – No overrides at either end

▲ No override in non-solenoid end of single solenoid valves
 ● Not available on DG4V-3S, AC models

6 Solenoid energization identity

V – Solenoid “A” is at port “A” end and/or solenoid “B” is at port “B” end, independent of spool type

Omit for U.S. ANSI B93.9 standard requiring solenoid “A” energization to connect P to A and/or solenoid “B” to connect P to B, independent of solenoid location.

NOTE: Type “8” spool valves conform to both U.S. and European solenoid designations. When ordering an “8” spool, designate a “V” in the model code.

7 Flag symbol

M – Electrical options and features

8 Spool indicator switch

Available on high performance models, DG4V-3, only. Omit when not required.

DG4V-3-*A(L)-(V)M models with type U (ISO4400) electrical connector to solenoid; spool type 0, 2 or 22 only:
 S6 – LVDT type DC switch with Pg7 connector plug.

DG4V-3-*A(L)-(Z)-(V)M-S*-FPA5W valves with mechanical type AC (~) switch, wired to 5-pin receptacle:
 S3 – Switch, wired normally open
 S4 – Switch, wired normally closed

DG4V-3-*A(L)-(Z)-(V)M-S5-F(T)W/J valves with mechanical type AC (~) switch:
 S5 – Switch, free leads

9 Coil type

U – ISO 4400 (DIN 43650) mounting◆
 U1 – Connector fitted
 U6 – Connector fitted w/lights
 U11 – Connector fitted w/rectifier & lights**
 U12 – Connector fitted w/rectifier**
 F – 1/2” NPT thread conduit box
 KU – Top exit flying leads*
 SP1 – Single 6,3 mm spade*◆
 SP2 – Dual 6,3 mm spade*◆
 X1 – Flame resistant solenoids TP EEx-d-11B-T4
 X2 – Hazardous location solenoids to meet UL & CSA approval
 X3 – Special protection solenoids to BASEEFA standar SFA009:1972, protection class EX-S-11-T4
 ◆ Female connector to be supplied by customer
 * DC service only
 ** AC service only

10 Electrical connector

T – Wired terminal block
 PA – Instaplug male receptacle only
 PB – Instaplug male & female receptacle
 PA3 – Three pin connector
 PA5 – Five pin connector

11 Housing (F type coils only)

W – 1/2” NPT thread wiring housing
 J – 20 mm thread wiring housing

12 Surge suppressor/damper

D1 – Encapsulated diode (Industrial applications)
 D2 – Encapsulated diode (Mobile applications)
 D7 – Transzorb type (F,KU,U,SP1,SP2 only)

13 Solenoid indicator lights

Not available on PA, KU, U, SP1 & SP2

14 Coil rating

Full power coils, see “Operating Data”.
 A – 110V AC 50Hz
 B◇ – 110V AC 50Hz/120V AC 60 Hz
 C – 220V AC 50 Hz
 D◇ – 220V AC 50 Hz/240V AC 60 Hz
 G – 12V DC
 H – 24V DC

For DG4V-3 only (not usable with DG4V-3S):

Low power coils, see “Operating Data”. (Not available with “N” – No-spring detented models)
 BL – 110V 50 Hz/120V 60 Hz
 DL – 220V AC 50 Hz/240V AC 60 Hz
 GL – 12V DC
 HL – 24V DC

◇ For 60 Hz or dual frequency

Contact your Vickers representative for additional coil voltage options

15 Port T code

Refer to “Operating Data” for port T pressure ratings.
 2 – 10 bar (150 psi) for spool position indicator models S3, S4 and S5.
 4 – 70 bar (1000 psi)
 5 – 100 bar (1500 psi) for standard performance models, DG4V-3S, with AC or DC solenoids.
 6 – 207 bar (3000 psi) for AC high performance models, DG4V-3, including spool position indicator type S6.
 7 – 207 bar (3000 psi) for DC high performance models, DG4V-3, including spool position indicator type S6.

16 Design number

60 – Basic design
 61 – Type 8 spool

17 Special features

“EN***” code number assigned as required.
 EN21 – CSA approved models with 1/2” NPT entry conduit box, type FW and solenoid coil letter B,D,G, or H.

18 Port restrictor plugs

For details of plug orifice sizes and how to specify in model code see page 15. May be fitted to valves by agreement with your Vickers representative.

Omit – No restrictor plugs fitted

Operating Data

Performance data is typical with fluid at 36cSt (168 SUS) and 50°C (122°F).

Feature	Standard performance valve DG4V-3S		High performance valve DG4V-3	
Pressure limits: P, A and B ports T port: Spool indicator switch models Types S3, S4, S5 Type S6 All other models	350 bar (5075 psi) ■		350 bar (5075 psi)	
	N/A		10 bar (145 psi)	
	N/A		210 bar (3045 psi)	
	100 bar (1450 psi)		210 bar (3045 psi)	
Flow rating	See performance data		See performance data	
Relative duty factor	Continuous; ED = 100%		Continuous; ED = 100%	
Type of protection: ISO 4400 coils with plug fitted correctly SP1 – Single spade 6,3 mm SP2 – Dual spade 6,3 mm Coil winding Lead wires (coils type F***) Coil encapsulation	IEC 144 class IP65 IEC 760 IEC 760 Class H Class H Class F		IEC 144 class IP65 IEC 760 IEC 760 Class H Class H Class F	
Permissible voltage fluctuation: Maximum Minimum	Refer to temperature limits. 90% rated		Refer to temperature limits. 90% rated	
Typical response times at 100% rated volts measured from application/removal of voltage to full spool displacement of “2C” spool at: Flow rate P-A, B-T Pressure AC (~) energizing AC (~) de-energizing DC (=) energizing DC (=) de-energizing	20 l/min (5.3 USgpm) 175 bar (2537 psi) 18 ms 32 ms 60 ms 40 ms		40 l/min (10.6 USgpm) 175 bar (2537 psi) 15 ms 23 ms 45 ms 28 ms	
Power consumption, AC solenoids (for coils listed in model code).	Initial ▲ VA (RMS)	Holding VA (RMS)	Initial ▲ VA (RMS)	Holding VA (RMS)
Full power coils: Single frequency coils AC 50 Hz Dual frequency coils at 50 Hz Dual frequency coils at 60 Hz	225 265 260	39 49 48	265 280 300	54 61 58
Low power coils, “BL” and “DL”: (Not available with “N” – No-spring detented models) Dual frequency coils at 50 Hz Dual frequency coils at 60 Hz	Low power coils not usable with DG4V-3S valves.		170 190	37 37
Power consumption, DC solenoids at rated voltage and 20°C (68°F).				
Full power coils: 12V, model type “G” 24V, model type “H”	30W 30W	– –	30W 30W	– –
Low power coils: 12V, model type “GL” 24V, model type “HL”	Low power coils not usable with DG4V-3S valves.		18W 18W	– –

■ For applications where valves are to remain pressurized (either energized or de-energized) at pressures over 210 bar (3045 psi) without frequent switching, it is recommended to use the high performance model, DG4V-3.

▲ 1st half cycle; armature fully retracted.

Operating Data

Spool Position Indicator Models, high performance valve DG4V-3 ONLY

Spool/spring arrangement types 0A (L), 2A(L), 22A(L)

DC model type "S6" (see page 15 for Installation Dimension)



This product has been designed and tested to meet specific standards outlined in the European Electromagnetic Compatibility Directive (EMC) 89/336/EEC, amended by 91/263/EEC, 92/31/EEC and 93/68/EEC, article 5. For instructions on installation requirements to achieve effective protection levels see this leaflet and the Installation Wiring Practices for Vickers Electronic Products leaflet 2468. Wiring practices relevant to this Directive are indicated by Electromagnetic Compatibility (EMC) .

Input:

Supply voltage	10 to 35V DC inclusive of a maximum 4V pk-to-pk ripple
Current, switch open	5 mA
Current, switch closed	255 mA

Output:

Voltage	1V below input at maximum load
Maximum continuous current	250 mA
Maximum load impedance	136Ω at maximum input volts
Maximum switching frequency	10 Hz

Plug connections:

Pin 1 (output 1)	Normally open (ie. not connected to pin 3)
Pin 2	Supply +ve
Pin 3	0V
Pin 4 (output 2)	Normally closed (ie. connected to pin 3)
Switching point	Within the spool spring offset condition ●
Connector	Pg7 plug (supplied with valve)
Protection	Overload and short-circuit protected; self re-setting. IEC 144 class IP65 with connector correctly fitted.

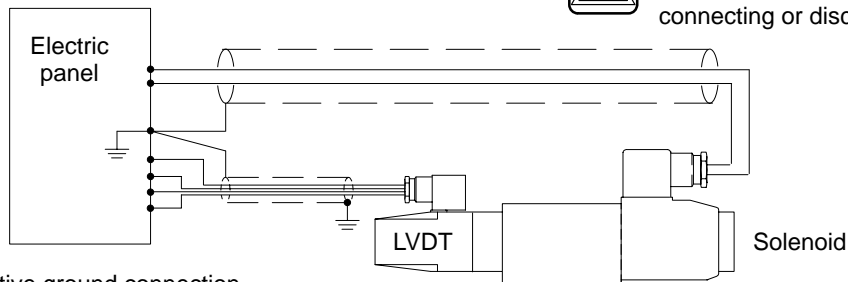
● Factory setting ensures this condition under all combinations of manufacturing tolerance and of temperature drift (see "Temperature Limits").

Wiring Connections



Warning

All power must be switched off before connecting or disconnecting any plugs



Customer's protective ground connection



WARNING: Electromagnetic Compatibility (EMC)

It is necessary to ensure that the unit is wired up in accordance with the connection arrangements shown above. For effective protection the user's electrical cabinet, the valve subplate or manifold and the cable screens should be connected to efficient ground points.

In all cases both valve and cable should be kept as far away as possible from any sources of electromagnetic radiation such as cables carrying heavy current, relays and certain kinds of portable radio transmitters, etc. Difficult environments could mean that extra screening may be necessary to avoid the interference.

Micro-switch type "S3", "S4" and "S5"

Voltage	250V maximum 50/60 Hz
Maximum current	5A

Performance Data

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

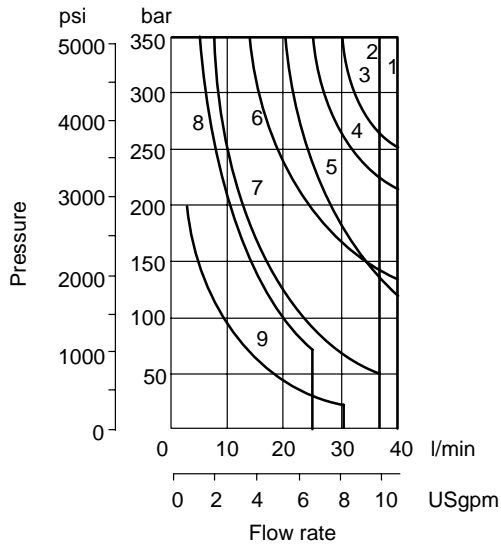
Maximum flow rates

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

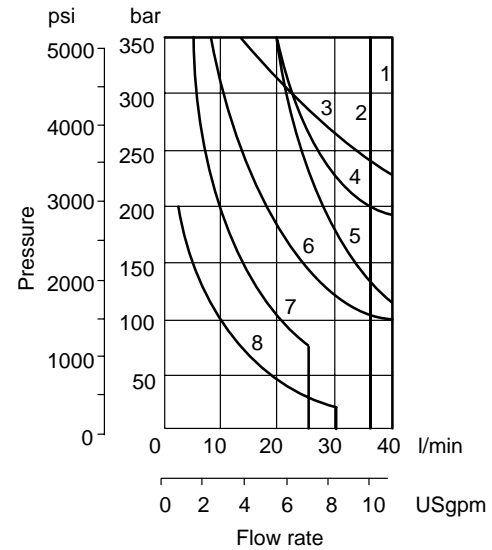
See note at bottom of next page when using low power coils (DG4V-3 models only).

DG4V-3S models (standard performance)

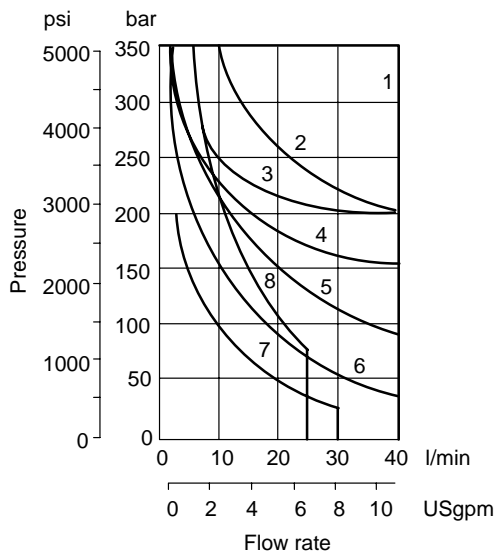
Graph 1
AC solenoid valves with dual frequency coils operating at 50 Hz



Graph 2
AC solenoid valves with
– Dual frequency coils operating at 60 Hz
– Single frequency (50 Hz) coils operating at 50 Hz



Graph 3
DC solenoid valves



Spool/spring code	Graph 1 curve	Graph 2 curve	Graph 3 curve
0A(L)	1	1	3
0B(L) & 0C, 0F	1	1	1
2A(L)	5	5	3
2B(L) & 2C, 2F	2	2	3
2N	1	1	1
6B(L) & 6C, 6F	6	6	5
7B(L) & 7C, 7F	6	6	2
8B(L) & 8C	8▲	7▲	8▲
22A(L)	9	8	7
22B(L) & 22C	7	7	6
24A(L)	6	6	5
33B(L) & 33C	4	4	4
34B(L) & 34C	6	6	5
52BL, 52C, 56BL & 56C	6	6	5
66B(L) & 66C	3	3	5
521B & 561B	6	6	5

▲ Consult Vickers regarding each application that will jointly have flow rates approaching this curve **and** a pressurized volume exceeding 2000 cm³ (122 cu.in.)

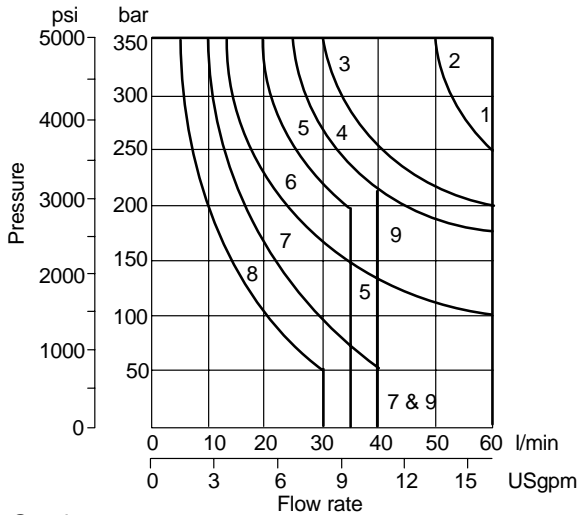
Performance Data

DG4V-3 models (high performance)

Graph 4

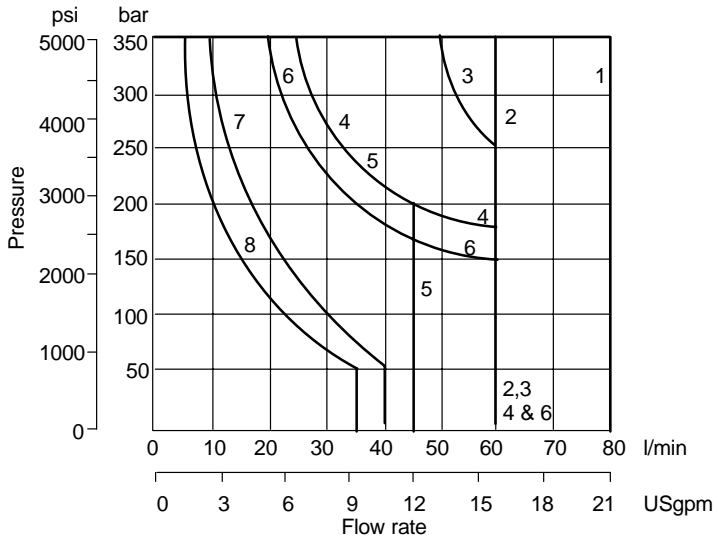
AC solenoid valves with:

- Single-frequency coils
- Dual-frequency coils operating at 50 Hz



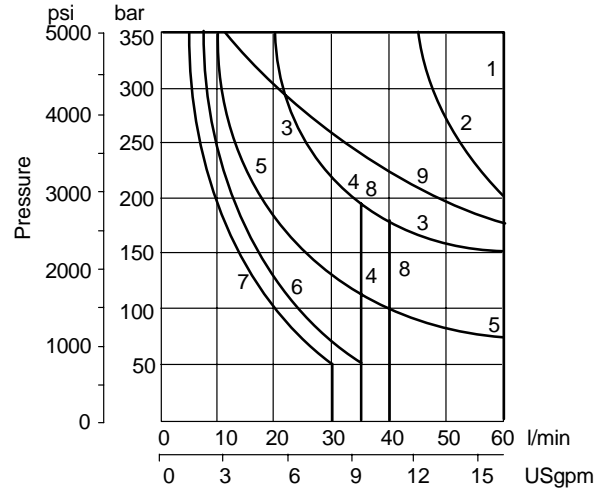
Graph 6

DC solenoid valves



Graph 5

AC solenoid valves with dual-frequency coils operating at 60 Hz



Spool/ spring code	Graph 4 curve	Graph 5 curve	Graph 6 curve
0A(L)	2	2	3
0B(L) & 0C, 0F	1	1	2
2A(L)	2	2	3
2B(L) & 2C, 2F	1	1	1
2N	1	1	2
6B(L) & 6C, 6F	6	5	6
7B(L) & 7C, 7F	1	1	2
8B(L) & 8C	5▲	4▲	5▲
22A(L)	8	7	8
22B(L) & 22C	7	6	7
24A(L)	9	8	5
33B(L) & 33C	4	3	4
34B(L) & 34C	4	3	6
52BL, 52C,	6	5	6
56BL & 56C	6	5	6
66B(L) & 66C	3	9	6
521B & 561B	6	5	6

▲ Consult Vickers regarding each application that will jointly have flow rates approaching this curve and a pressurized volume exceeding 2000 cm³ (122 cu.in.)

Flow limits applicable to the following usages:

1. All valves except types 22 and 52 spools having simultaneous equal flow rates from P to A or B and from B or A to T and S3, S4, S5 (limit switch) models.
2. Valves with type 22 spools having flow from P to A or B, the other being plugged. T is drained at all times.
3. Valves with type 52 spools having one service port (A or B as appropriate) connected to the full bore end of a 2:1 area ratio double-

acting cylinder and the other to the annulus end.

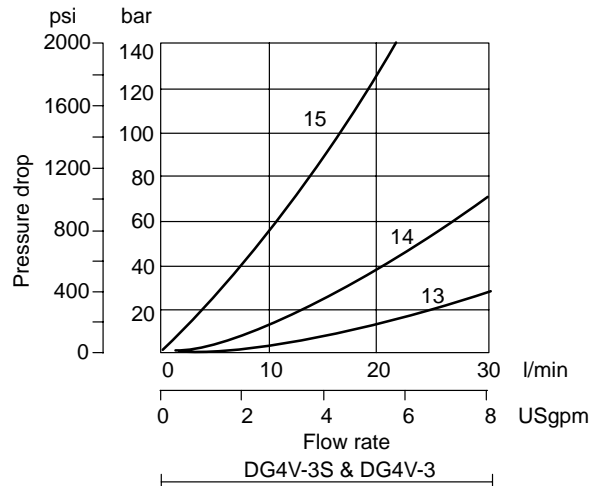
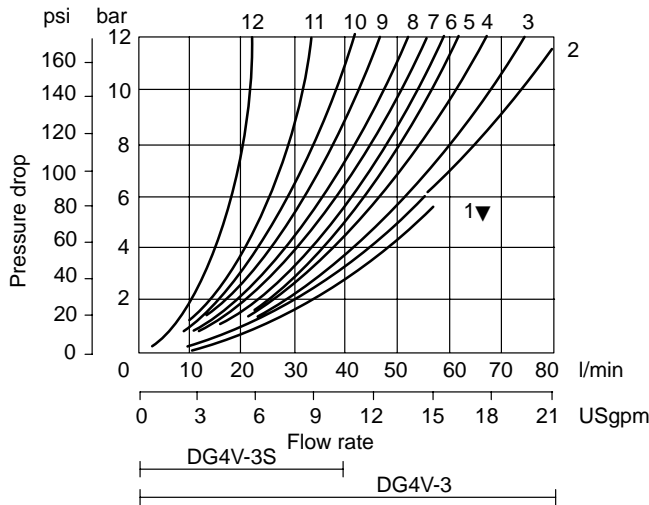
4. Consult Vickers, with application details, if either of the following usages are required:
 - (a) Single flow path, i.e. P to A, P to B, A to T or B to T.
 - (b) Substantially different simultaneous flow rates between P to A or B and B or A to T, e.g. when A and B are connected to a cylinder having a large differential area.

Low Power Coils (DG4V-3 models only)

When using low power coils (coil designations *L in model code) the maximum flow is reduced from values given on this page (graphs 4, 5 and 6) by up to:
 70% – for DC coils
 50% – for AC coils
 depending on spool type. Consult your Vickers representative relative to specific applications for low power coils.

Performance Data

Pressure drops



▼ Curve for spool type 6: not recommended for flows in excess of 60 l/min (15.8 USgpm).

Pressure drops in offset positions except where otherwise indicated

Spool/spring code	Spool positions covered	P to A	P to B	A to T	B to T	P to T	B to A or A to B
0A(L)	Both	5	5	2	2	-	-
0B(L) & 0C, 0F	De-energized Energized	- 4	- 4	- 2	- 2	4▲▲ -	- -
2A(L)	Both	6	6	5	5	-	-
2B(L) & 2C, 2F	Energized	5	5	2	2	-	-
2N	Both	6	6	3	3	-	-
6B(L) & 6C, 6F	De-energized Energized	- 6	- 6	3▲ 1	3Δ 1	- -	- -
7B(L) & 7C, 7F	De-energized Energized	6▲ 4	6Δ 4	- 3	- 3	- -	7○ -
8B(L) & 8C	All	9	9	5	5	3	-
22A(L), 22B(L) & 22C	All	6	6	-	-	-	-
24A(L)	De-energized	6	6	2	2	-	-
33B(L) & 33C	De-energized Energized	- 5	- 5	15▲ 2	15Δ 2	- -	- -
34B(L) & 34C	De-energized Energized	- 5	- 5	14▲ 2	14Δ 2	- -	- -
52BL & 52C	Energized	6▲	6Δ	2	-	-	10○
56BL	Both	6▲	6Δ	11▲	10Δ	-	10○
56C	De-energized Energized	- 6▲	- 6Δ	11▲ 2	10Δ -	- -	10○ 10○
66B(L) & 66C	De-energized Energized	- 6	- 6	12 2	12 2	- -	13 -
521B	All	6▲	6Δ	-	-	-	10○
561B	De-energized Energized	- 6	- 6Δ	10▲ -	11Δ -	- -	10○ 10○

▲ "B" plugged Δ "A" plugged ○ "P" plugged

For other viscosities, pressure drops approximate to:

Viscosity cSt (SUS)

14	20	43	54	65	76	85
(17.5)	(97.8)	(200)	(251)	(302)	(352)	(399)

% of Δp

81	88	104	111	116	120	124
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A change to another specific gravity will yield an approximately proportional change in pressure drop.

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

Installation Dimensions

Models for use with ISO 4400 (DIN 43650) connectors



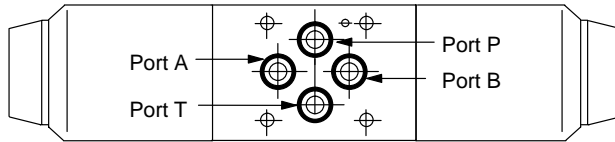
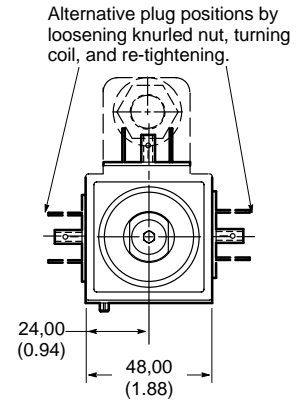
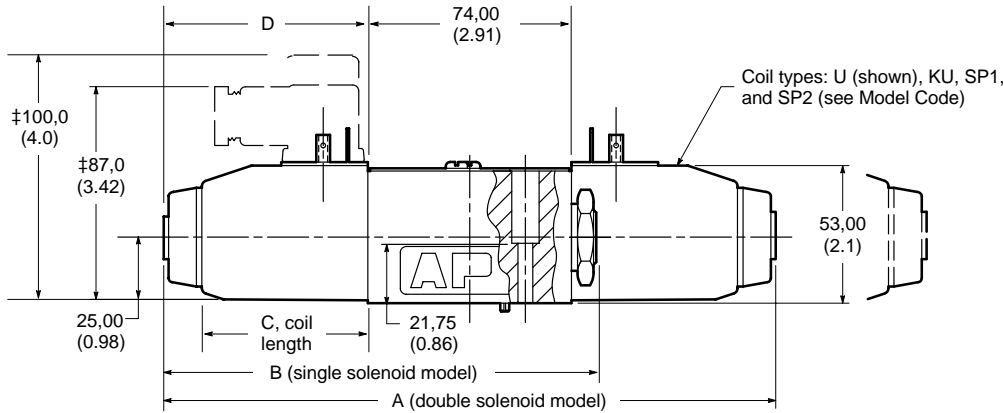
Double solenoid models ▲
 DG4V-3(S)-*C**-(V)M-U-**-60
 DG4V-3(S)-*N**-(V)M-U-**-60

Single solenoid models ▲
 DG4V-3(S)-*A(-)**■
 DG4V-3(S)-*B(-)**■
 DG4V-3(S)-8BL(-)**
 DG3V-3(S)-*F■

DG4V-3(S)-*AL(-)**■
 DG4V-3(S)-*BL(-)**■
 DG4V-3(S)-8B(-)**
 DG4V-3(S)-*FL(-)**■

As shown } Solenoid and end cap interchangeable

Dim mm (in.)



- Not applicable to type "8" spool.
- ▲ See page 25 for solenoid information.
- ‡ Can vary dependent on source of plug.

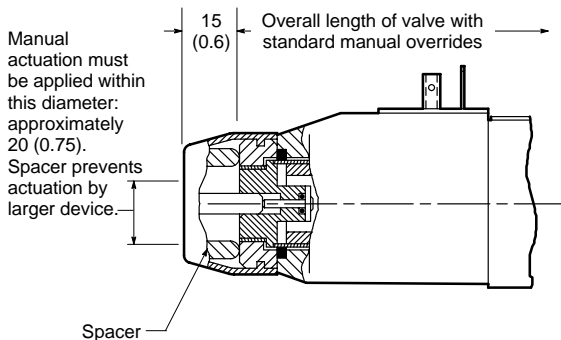
Model type	AC or DC	A Dim.	B Dim.	C Dim.	D Dim.
All	DC =	220 (8.66)	156 (6.14)	61 (2.5)	73 (2.87)
DG4V-3	AC ~	200 (7.87)	146 (5.75)	51 (2.1)	63 (2.48)
DG4V-3S	AC ~	200 (7.87)	146 (5.75)	45 (1.7)	63 (2.48)

Water-resistant manual override on solenoid

DG4V-3(S)-****(L)-H-(V)M-**-**-60

Application

General use where finger operation is required (standard manual overrides cannot be operated without using small tool).



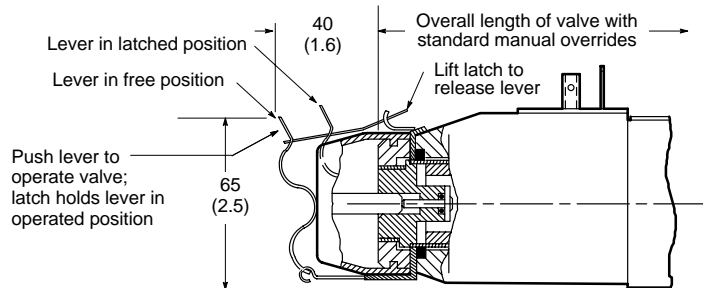
Note:
 "H" feature is not field convertible from other models; specify with order.

Latching manual override on solenoid

DG4V-3-****(L)-Y-(V)M-**-**-60
 DG4V-3S-****(L)-Y-(V)M-**-**-60, DC coil models only

Application

Stainless steel lever/latch mechanism and water-resistant seal make this feature ideal for vehicle-mounted and exposed applications requiring emergency selection of valve for a period of time in the event of electrical failure.



Notes:

1. Opposite solenoid (on "C" and "N" double solenoid models) should not be energized while the valve is latched in selected position; AC solenoid coils will burn out under this improper usage.
2. "Y" feature is field-convertible from "H" type manual override (omitting spacer), but is not field-convertible from other models.

Installation Dimensions

Models with “F” type coils (lead wires) and conduit box.

Double solenoid models ▲
 DG4V-3(S)-*C-**-*(V)M-E-**-60
 DG4V-3(S)-*N-**-*(V)M-E-**-60

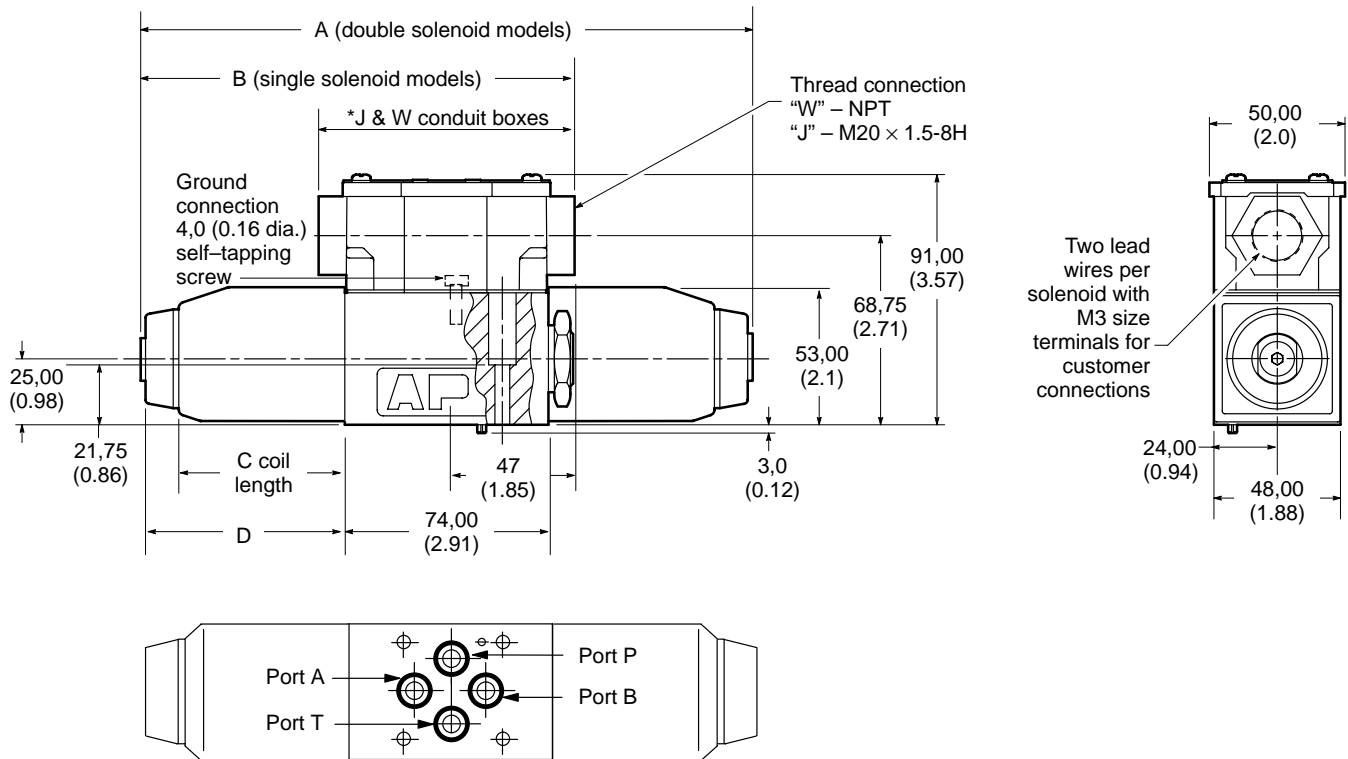
Single solenoid models ▲
 DG4V-3(S)-*A(-**)
 DG4V-3(S)-*B(-**)
 DG4V-3(S)-8BL(-**)
 DG3V-3(S)-*F●

As shown

DG4V-3(S)-*AL(-**)
 DG4V-3(S)-*BL(-**)
 DG4V-3(S)-8B(-**)
 DG4V-3(S)-*FL(-**)

Solenoid and end cap interchanged

Dim mm (in.)



* 89 (3.5) for FPB – J & W conduit boxes
 104 (4.0) All plug-in conduit boxes

Model type	AC or DC	A Dim.	B Dim.	C Dim.	D Dim.
All	DC =	220 (8.66)	156,5 (6.14)	61 (2.5)	73 (2.87)
DG4V-3	AC ~	200 (7.87)	146,5 (5.75)	51 (2.1)	63 (2.48)
DG4V-3S	AC ~	200 (7.87)	146,5 (5.75)	45 (1.7)	63 (2.48)

● Not applicable to type “8” spool.

▲ See page 25 for solenoid information.

Codes “FJ” and “FW”:
 2 lead wires for each solenoid, approximately 150,00 (6.00) long.
 M3 (#6) terminals provided for customer connection.

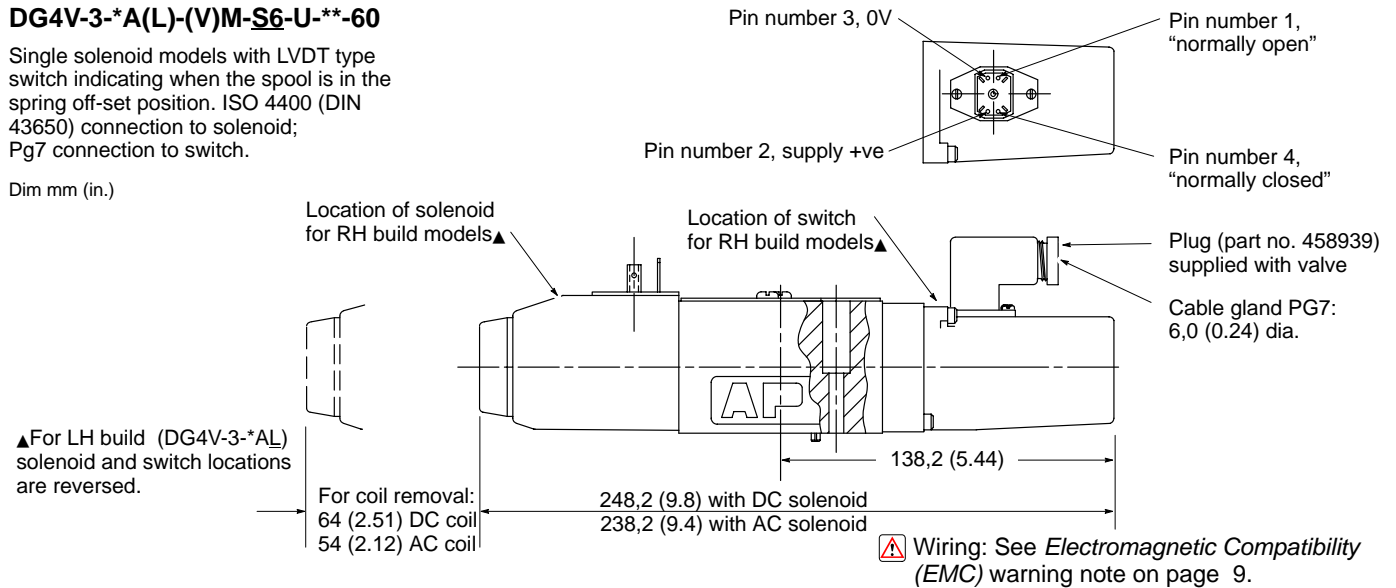
Codes “FTJ” and “FTW”:
 Valve supplied with lead wires connected into terminal strip suitable
 for M3 (#6) terminals for customer connection.

Installation Dimensions

DG4V-3-*A(L)-(V)M-S6-U-**-60

Single solenoid models with LVDT type switch indicating when the spool is in the spring off-set position. ISO 4400 (DIN 43650) connection to solenoid; Pg7 connection to switch.

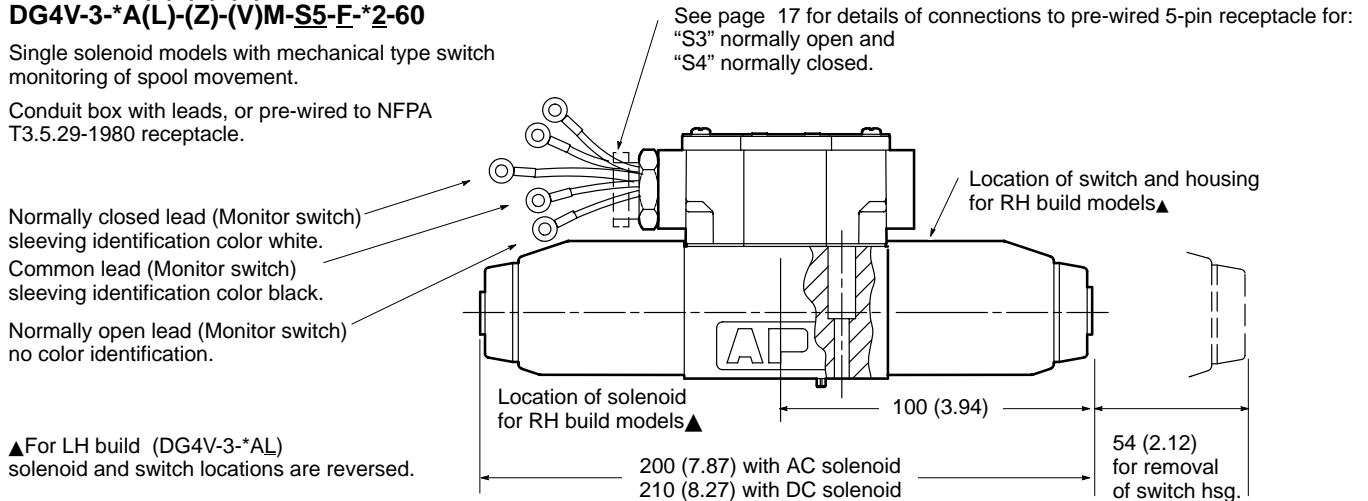
Dim mm (in.)



DG4V-3-*A(L)-(Z)-(V)M-S3-FPA5W-*2-60 DG4V-3-*A(L)-(Z)-(V)M-S4-FPA5W-*2-60 DG4V-3-*A(L)-(Z)-(V)M-S5-F-*2-60

Single solenoid models with mechanical type switch monitoring of spool movement.

Conduit box with leads, or pre-wired to NFPA T3.5.29-1980 receptacle.



Port restrictor plugs

Restrictor plugs are available for use in ports P, T, A or B. These can be used for restricting flow or for circuit dampening. Restrictor plugs are not recommended for use above 210 bar (3000 psi) system pressure.

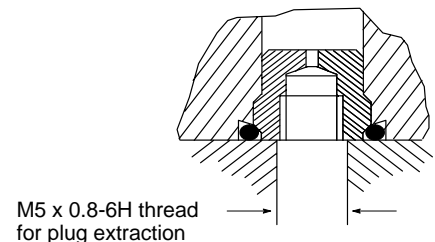
Typical model codes:
DG4V-3(S)-**-M-**-60-P08
(0.8 mm dia orifice in port P)

DG4V-3(S)-**-M-**-60-P10-A10
(1.0 mm dia orifice in ports P and A)

Restrictor plug selection table

Code	Orifice diameter	Part number■
*00	Blank	694353
*03	0,30 (0.012)	694341
*06	0,60 (0.024)	694342
*08	0,80 (0.030)	694343
*10	1,00 (0.040)	694344
*13	1,30 (0.050)	694345
*15	1,50 (0.060)	694346
*20	2,00 (0.080)	694347
*23	2,30 (0.090)	694348

* = P, T, A or B, as required
■ Order in multiples of 25 per part number



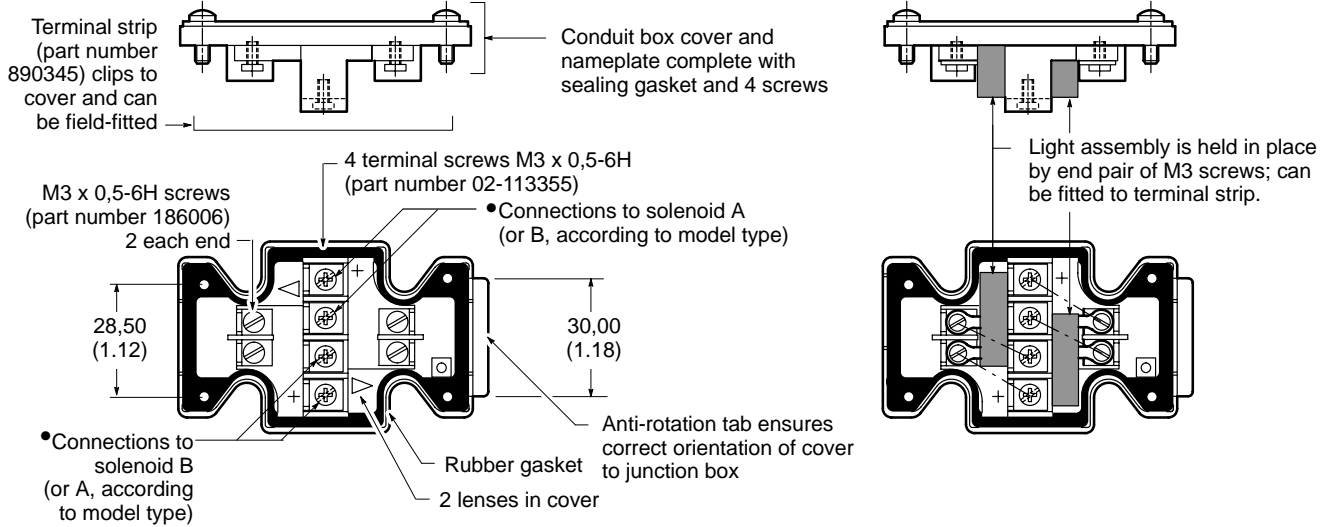
Maximum port dia in subplate/manifold block:
For steel and SG (ductile) iron: 7,0 (0.3)
For gray iron: 6,5 (0.25)

Electrical Plugs and Connectors

Terminal strip and lights

For valves with type "F" coils.

Dim mm (in.)



- 1. For DC coils the +ve lead(s) must be connected to the terminal(s) marked +. When using 3-wire incoming leads to double solenoid valves (i.e. common neutral) the inner pair of terminals must be interconnected
- 2. For correct light indication of energized solenoid ensure that solenoid leads are correctly connected: light terminals are common with each outer pair of solenoid terminals according to the side with + mark.

Insta-Plug

DG4V-3(S)---FPA---60
DG4V-3(S)---FPBW---60

Vickers 2-part "Insta-Plug" eliminates breaking electrical inputs for valve disconnect. A male half is pre-wired to the valve body. The mating plug is inside

a wire housing with external terminals for machine wire connections.

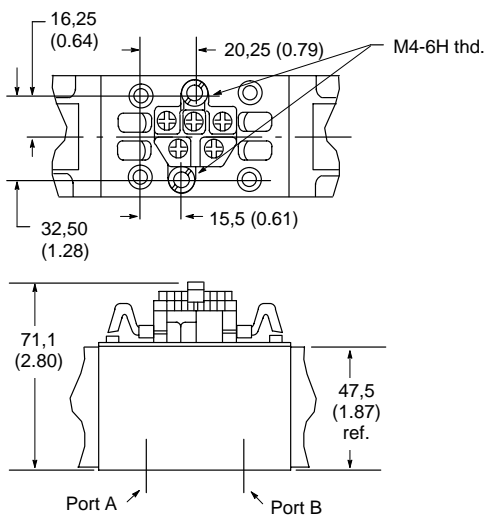
Captive thumb screws, when loosened, permit the wire housing to be pulled clear of the valve for disconnect. A longer ground post provides first make/last break ground connection.

The **PBW** configuration combines both male and female plugs in the wiring housing for a self-contained plug-in unit.

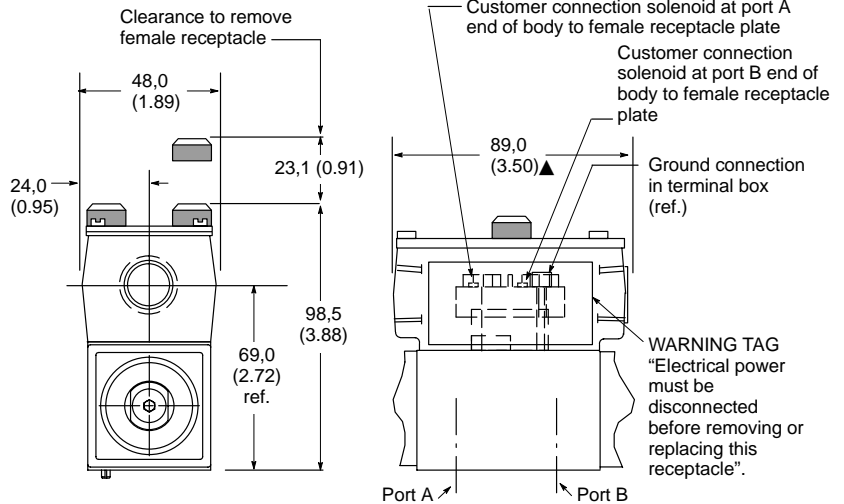
Optional solenoid indicator lights are pre-wired to the female plug. Solenoids "A" and/or "B" are identified on the wiring housing.

PA configuration

Dim mm (in.)



PBW configuration



▲ The conduit box dimensions used for the PA/PBW type connector are different from those on the other "F" type coil models.

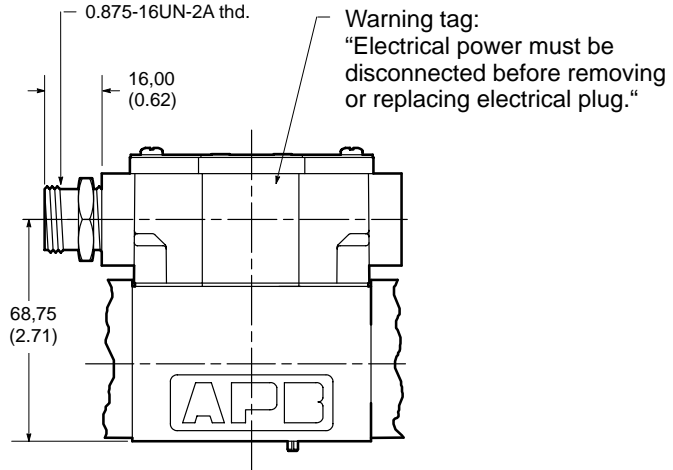
Electrical Plugs and Connectors

NFPA Connector T3.5.29-1980

DG4V-3(S)---FPA3W(L)-**-60
 DG4V-3(S)---FPA5W(L)-**-60
 DG4V-3---S3-FPA5W(L)-**-60
 DG4V-3---S4-FPA5W(L)-**-60

The receptacle is a standard three or five pole connector with shortened leads and terminals added. The five pole plug has four leads 101,6 (4.0) long and one 177,8 (7.0) long. The three pole plug has two leads 101,6 (4.0) long and one 177,8 (7.0). All wires have underwriters recognized non-solder insulated eyelet terminals. The green wire is used for the ground (earth) connection (No. 8 screw furnished). Valves are supplied pre-wired.

Connection details and model type/model code references

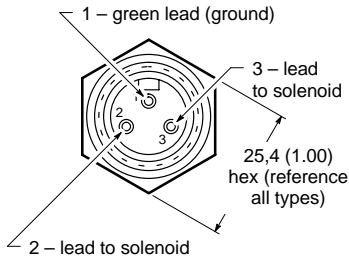


3 pin connector

Use with single solenoid valve

Key model code designations:

DG4V-3(S)-*A(L)(-**-)(V)M-FPA3W(L)
 DG4V-3(S)-*B(L)(-**-)(V)M-FPA3W(L)

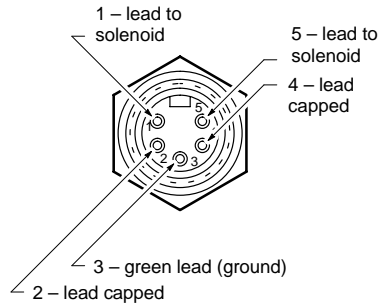


5 pin connector

Use with single solenoid valve

Key model code designations:

DG4V-3(S)-*A(L)(-**-)(V)M-FPA5W(L)
 DG4V-3(S)-*B(L)(-**-)(V)M-FPA5W(L)

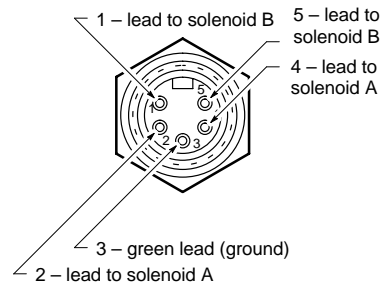


5 pin connector

Use with double solenoid valve

Key model code designations:

DG4V-3-*C/N(L)(-**-)(V)M-S4-FPA5W(L)

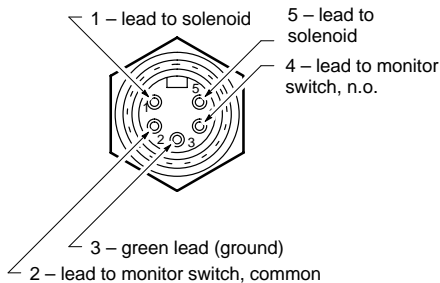


5 pin connector

Use with single solenoid valve with S3 spool position monitor switch

Key model code designations:

DG4V-3-*A(L)(-**-)(V)M-S3-FPA5W(L)

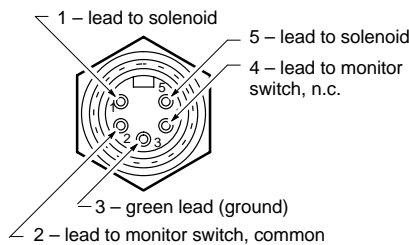


5 pin connector

Use with single solenoid valve with S4 spool position monitor switch

Key model code designations:

DG4V-3-*A(L)(-**-)(V)M-S4-FPA5W(L)



Female 3 & 5 pin connectors are available from a Daniel Woodhead Co., Brad Harrison Div. Distributor (847-272-7990)

40903 – Female connector with 12' lead for PA3 conn.

41308 – Female connector with 12' lead for PA5 conn.

These are Brad Harrison #'s.

Electrical Plugs and Connectors

DIN 43650 Connector

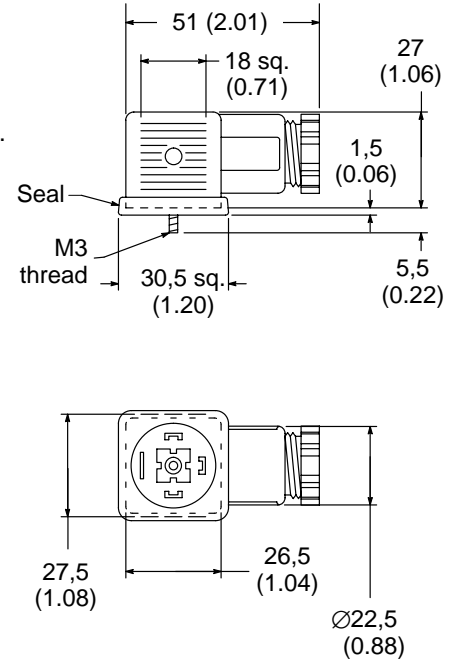
Cable diameter range . . . Ø6–10 mm (0.24–0.40)
 Wire section range Ø,5–1,5 mm² (0.0008–0.0023 in²)
 Terminals Screw type
 Type of protection IEC144 class IP65, when plugs are fitted correctly to the valves with interface seals (supplied with plugs) in place.

Connector can be positioned at 90° intervals on valve by re-assembling contact holder into appropriate position inside connector housing.

Use U12 or U11 type connectors with 12 and 24V DC coils if rectification is required.

Connectors with and without indicator lights are available (order separately):

Receptacle	Voltage (AC or DC)	Part Numbers Gray – Black – "A" sol. "B" sol.
U1 Coils without lights	—	710776 710775
U6 Coils with lights	12-24 100-125 200-240	977467 977466 977469 977468 977471 977470
U11 Rectified coils with lights	12 DC 24 DC 98-240 VDC 200-240 VDC	02-141358 02-141359 02-141360 02-141361
U12 Rectified coils without lights		02-141357

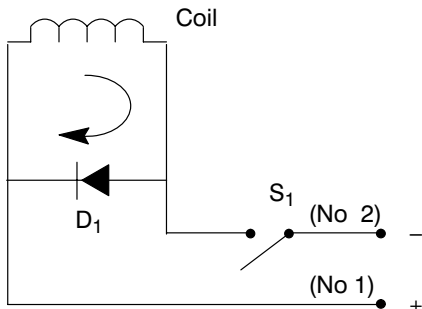


Surge Suppression Devices (For DC Valves)

Standard diode

Diode in parallel with coil. When switch (S₁) is opened, the energy stored in the coil is trapped and dissipated by the diode (D₁).

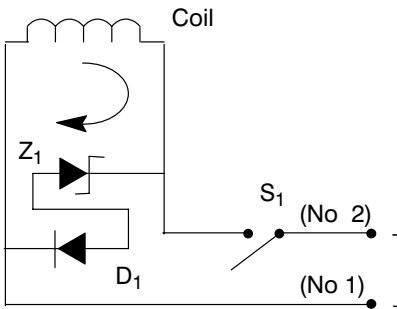
- Works only with DC voltage
- Polarity dependent
- Increases drop out time



Transzorb

Diode and Zener diode in parallel with coil. When switch (S₁) is opened, the energy stored in the coil is trapped and dissipated by the diode (D₁) and Zener diode (Z₁) and the coil resistance.

- The Zener makes exact limitation of inductive spikes.
- Works only with DC voltage
- Polarity dependent



NOTE: These surge suppression devices are "Polarity Dependent." Proper biasing conditions must be met when installing/connecting a coil in a system.

Valve Shift and Dropout Times With and Without Surge Suppression

	Shift	Dropout
CETOP 3		
No Diode	23	60
Diode Alone	23	141
Diode/Zener	23	78
CETOP 5		
No Diode	70	50
Diode Alone	70	158
Diode/Zener	70	100

Times represent cessation/application of voltage to coil versus velocity (start/stop) of a cylinder using a single solenoid, spring offset valve (time in milliseconds).

Subplates, Connection Plates and Mounting Surfaces

General description

This range of subplates and auxiliary connection plates are for use with size 3 valves. Optional BSPF or SAE/UNF pipe thread connections are available.

The subplates fall into five groups:

- Single station subplates with either side or rear entry ports for connecting to the main system.
- Multi-station manifolds having from two to six stations. The two service ports per station are arranged along one side but the pressure and tank lines are internally connected in parallel to each station.
- Tapping plates for insertion under modules or valves to provide access to service lines, e.g. for pressure gage connection.
- Cross-over plates for inter-connecting two sets of service lines at the top of module stacks when directional valves are not fitted.
- Blanking plate for terminating a valve station e.g. when the station is not to be used until later.

The 2 to 6 multi-station subplates, when used together with Vickers SystemStak valves, provide very compact control assemblies.

Plates having machined trapezoidal O-ring recesses are supplied complete with Viton O-rings.

On all models, the size 03 mounting face includes a drilled hole (for a location pin) in conformance with ANSI/B93.7M and (NFPA) size 03. All Vickers size 3 valves and auxiliary plates contain a matching location pin to ensure correct orientation of the mounting faces.

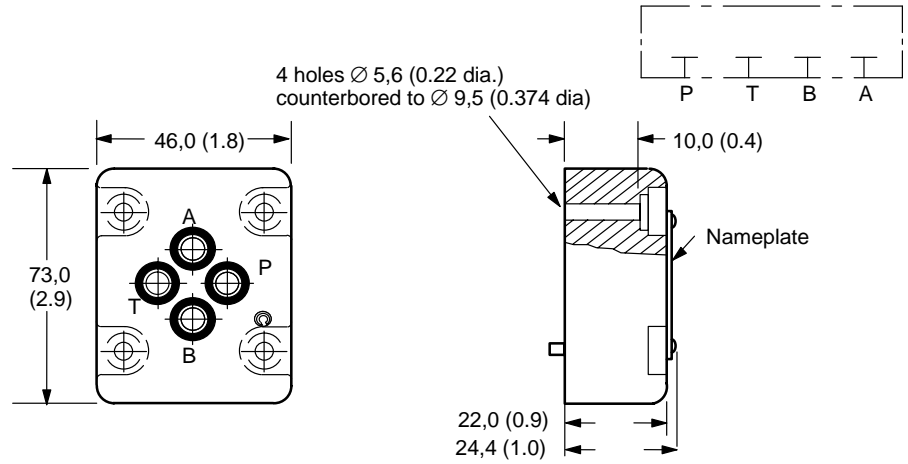
Design number subject to change. No change of installation dimensions for designs 10 thru 19.
 "R" (or "B") suffix – ISO 228 (BSPF) ports and/or metric attaching bolt tappings.
 "S" suffix – SAE/UNC ports and/or UNC attaching bolt tappings.

Description and maximum pressure	Functional symbol	Model code
Blanking plate 250 bar (3600 psi)		DGMA-3-B-1*
Crossover plate P-A, B-T 250 bar (3600 psi)		DGMA-3-C1-1*
Crossover plate P-B, A-T 250 bar (3600 psi)		DGMA-3-C2-1*
Tapping plate Ports A and B 250 bar (3600 psi)		DGMA-3-T1-1*-B DGMA-3-T1-1*-S
Tapping plate Ports P and T 250 bar (3600 psi)		DGMA-3-T2-1*-B DGMA-3-T2-1*-S
Adaptor size 05 to 03 207 bar (3000 psi)		DGAM-3-01-1*-R DGAM-3-01-1* (UNC valve mtg. bolts)
Single station subplate/manifold Rear ports P,T,A,B 250 bar (3600 psi)		DGVM-3-1*-R DGVM-3-1*-S
Single station subplate/manifold Side ports P,T,A,B 250 bar (3600 psi)		DGMS-3-1E-1*-R DGMS-3-1E-1*-S
Multi-station subplate/ manifold; side ports P,T,A ₁ ,B ₁ ,A ₂ ,B ₂ , etc. 250 bar (3600 psi) 2 station 3 station		DGMS-3-2/3E-1*-R DGMS-3-2/3E-1*-S
Multi-station subplate/ manifold; side ports P,T,A ₁ ,B ₁ ,A ₂ ,B ₂ , etc. 250 bar (3600 psi) 4 station 5 station 6 station		DGMS-3-4/5/6E-1*-R DGMS-3-4/5/6E-1*-S

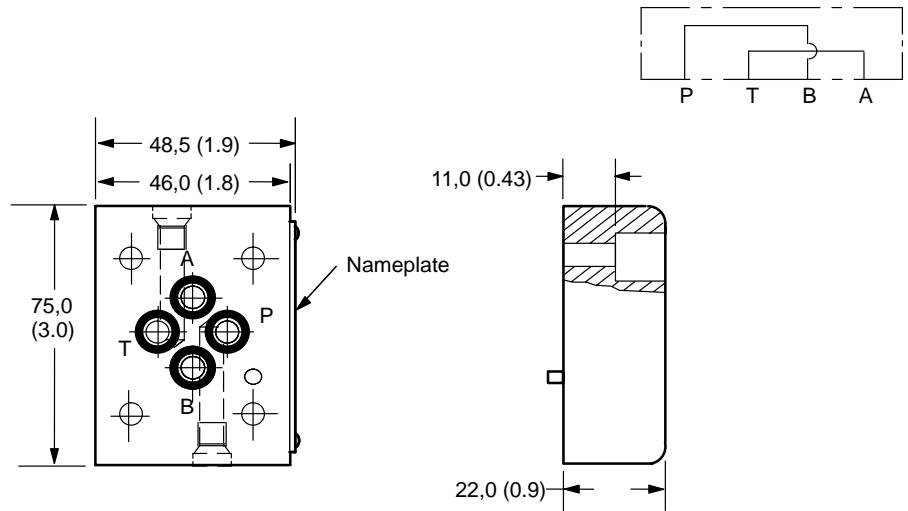
Installation Dimensions

DGMA-3-B-1* Blanking Plate

All dimensions shown in mm (inches)

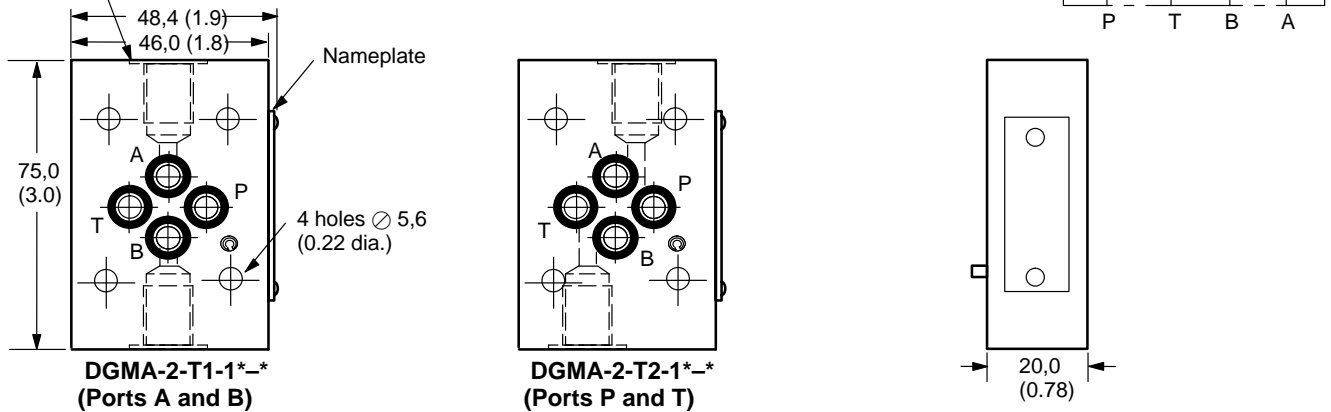


DGMA-3-C2-11 Crossover Plate



DGMA-3-T*-1*-* Tapping Plate

2 tapped ports for DGMA-3-T*-1*-B, G 1/8 (1/8" BSPF)
for DGMA-3-T*-2*-S, 7/16"-20 UNF-2B (SAE)
(for 1/4" O.D. tubing)



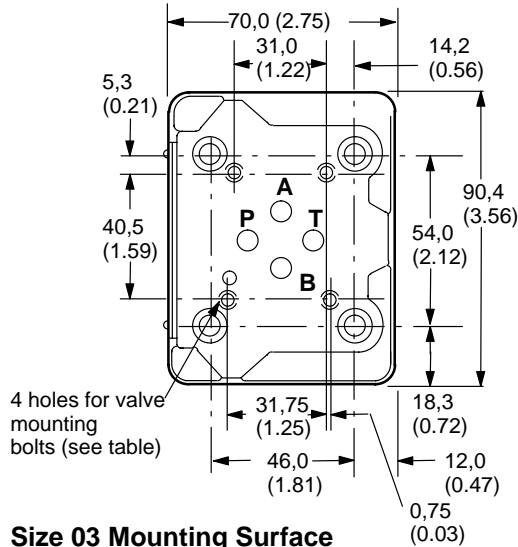
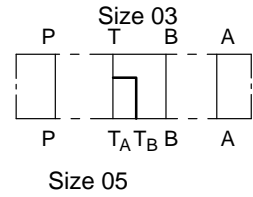
Installation Dimensions

DGAM-3-01-1*-R (Metric bolt tapping) DGAM-3-01-1* (UNC bolt tapping) Adaptor plate, Size 05 to 03 for pressure up to 210 bar (3000 psi)

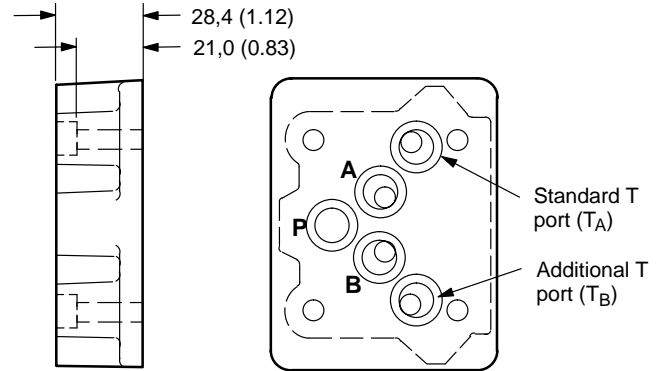
Dimensions shown
in mm (inches)

Size 3 valves can frequently be used in place of size 5 valves, typically for pilot control functions, or generally where the system flow rate is within that of size 3 valves.

The DGAM-3 adaptor bolts to an existing size 5 interface and provides a size 3 mounting face for the smaller valves.



Size 03 Mounting Surface

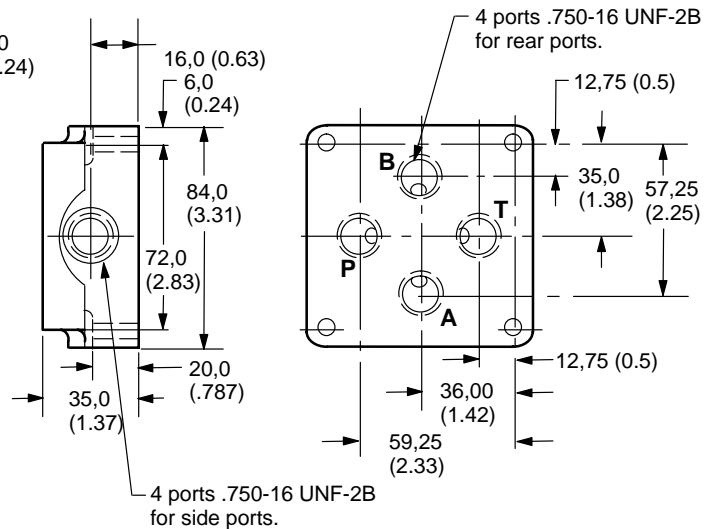
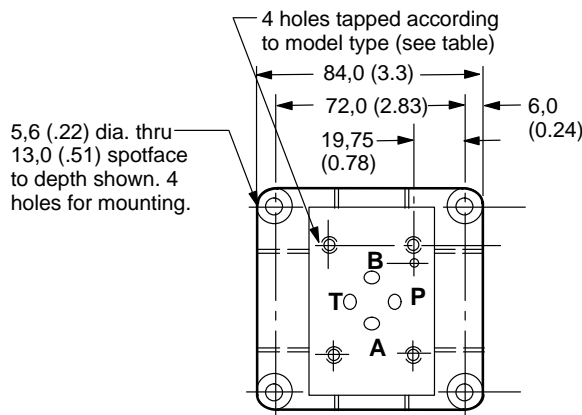
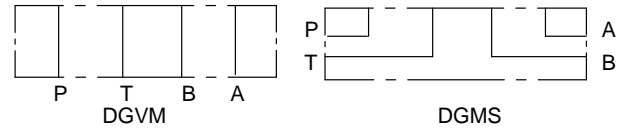


**Size 05 Mounting Surface
(seals included)**

Model	Tappings for valve mounting bolts
DGAM-3-01-1*-R	M5-6H x 12 (0.47) deep
DGAM-3-01-1*	#10-24 UNC-2B x 12,7 (0.5) deep

Adaptor is supplied complete with bolts for mounting to size 5 interface:
M6 bolts with type DGAM-3-01-1*-R
1/4"-20 UNC bolts with type DGAM-3-01-1*

DGVM-3-1*-* DGMS-3-1E(Y)-1*-* Single station subplate, rear and side tapped port



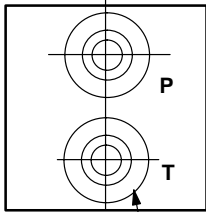
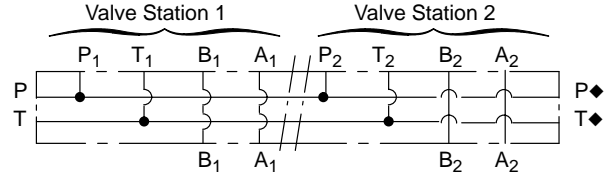
Model	Ports P, A, T, B at rear or side	Thread
DGVM-3-1*-R	Rear	G3/8 (3/8" BSPF) x 12,0 (0.47) deep
DGMS-3-1E-1*-R	Side	3/4" 16 UNF-2B x 14,3 (0.56) deep (SAE)
DGVM-3-1*-S	Rear	5/8" 18 UNF-2B x 12,7 (0.5) deep (SAE)
DGMS-3-1EY-1*-S	Side	3/4" 16 UNF-2B x 14,3 (0.56) deep (SAE)

Installation Dimensions

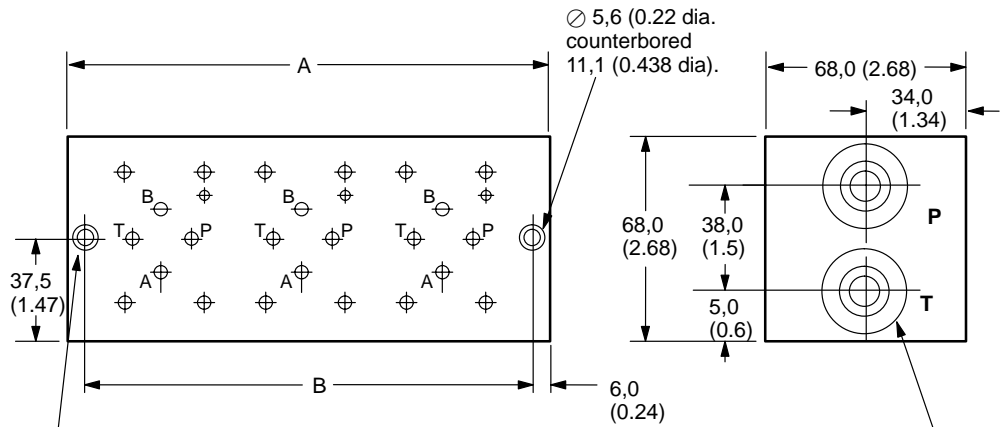
DGMS-3-3E-1*-*

Multi-station subplate (3 station shown)

Dimensions shown in mm (inches)

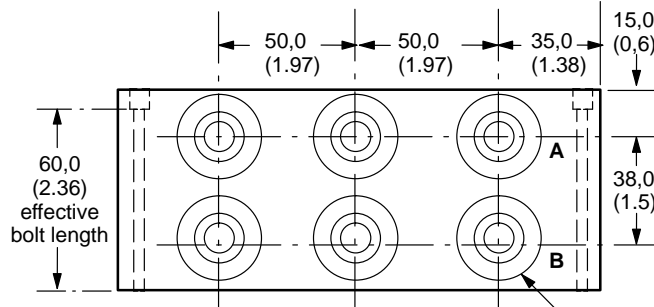


These two ports are present in 4, 5, and 6 station models. Optional in 2 and 3 station models, specify DGMS-3-2EX-1*-* or DGMS-3-3EX-1*-*



4 holes per model type
BSPF ports: M5-6H x 12,0 (0.47) deep
SAE ports: #10-24 UNC-2B x 12,5 (0.5) deep

P and T ports tapped according to model type:
DGMS-*E(X)-1*-R:
G1/2 (1/2" BSPF)
DGMA-*E(X)-1*-S:
3/4:-16 UNF-2B (SAE)



A and B ports tapped according to model type:
DGMS-*E(X)-1*-R:
G3/8 (3/8" BSPF)
DGMA-*E(X)-1*-S:
3/4:-16 UNF-2B (SAE)

Model	A Dim.	B Dim.
DGMS-3-2E(X)-1*-*	121 (4.8)	108 (4.25)
DGMS-3-3E(X)-1*-*	171 (6.8)	158 (6.22)
DGMS-3-4E-1*-*	221 (8.7)	208 (8.19)
DGMS-3-5E-1*-*	271 (10.7)	258 (10.15)
DGMS-3-6E-1*-*	321 (12.7)	308 (12.12)

◆ Thru connection P and T ports on types DGMS-3-2EX-1*-* and DGMS-3-3EX-1*-*

Installation Dimensions

Mounting Surface

Dimensions shown in mm (inches ▲)

When a subplate is not used, a machined pad must be provided for mounting. The pad must be flat within 0,01 mm per 100 mm (0.0001" per 1") and smooth within 0,8 µm (32 µin).

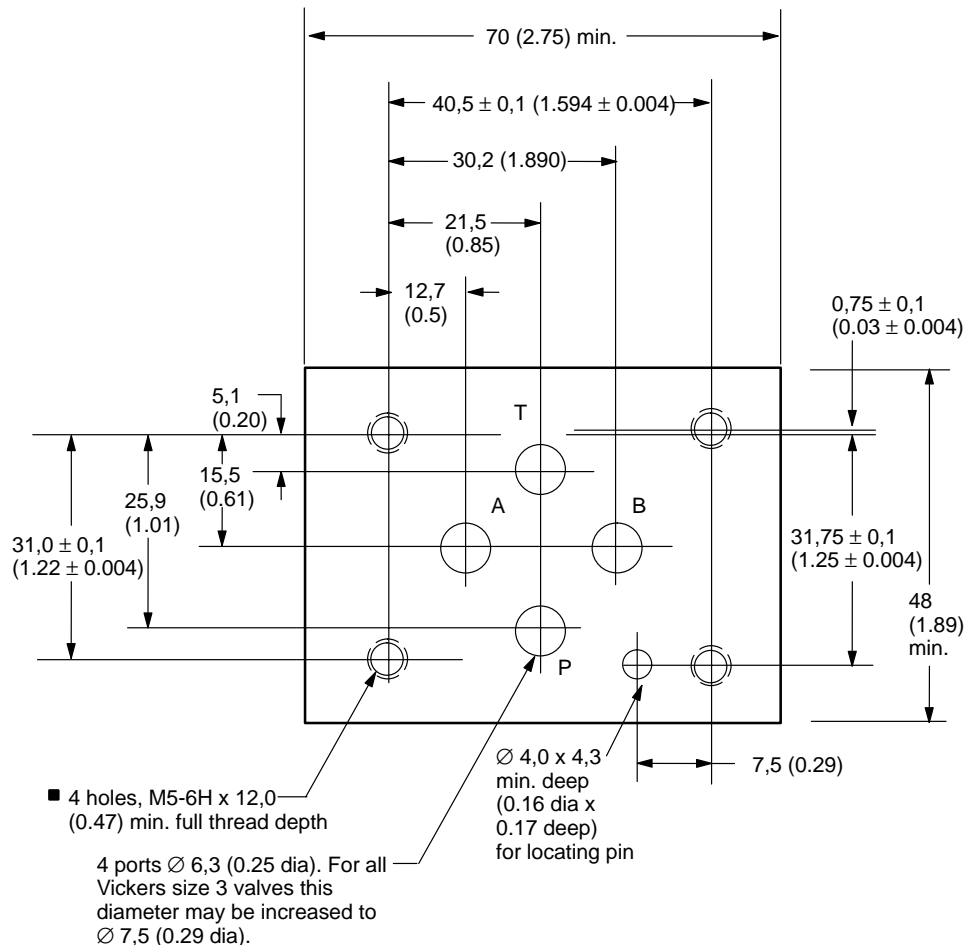
The interface conforms to ISO 4401-AB-03-4A (size 03) plus location pin hole
ANSI/B93.7M (and NFPA) size 03 CETOP R35H4.2-03, plus location pin hole
DIN 24340 Form A6, plus location pin hole

Dimensional tolerance = $\pm 0,2$ (± 0.008) except where otherwise stated.

Prior to installing a valve, ensure that both valve and mounting surface are clean and free from burrs.

▲ ISO 4401 gives dimensions in mm. Inch conversions are accurate to 0.01" unless stated.

■ #10-24 UNC-2B optional



Appendix

Mounting Bolts

Inch bolt kits, #10–24 UNC–2B

Size x length, in (mm)

#10-24 x 12,7 (0.50)	BK590715
#10-24 x 19,05 (0.75)	BK466847
#10-24 x 25,4 (1.00)	BK304
#10-24 x 31,8 (1.25)	BK590716
#10-24 x 38,1 (1.50)	BK306
#10-24 x 44,4 (1.75)	BK02-156494
#10-24 x 50,8 (2.00)	BKDG3698
#10-24 x 57,2 (2.25)	BK02-139165
#10-24 x 60,3 (2.38)	BK466849
#10-24 x 69,9 (2.75)	BK870017
#10-24 x 69,9 (2.75)	BKDGFNL694M◆
#10-24 x 76,2 (3.00)	BK02-156496
#10-24 x 79,4 (3.13)	BK466850
#10-24 x 88,9 (3.50)	BK466851
#10-24 x 95,3 (3.75)	BK869704
#10-24 x 100 (3.94)	BK466852
#10-24 x 101,6 (4.00)	BK02-156497
#10-24 x 109,5 (4.31)	BK466853
#10-24 x 120,7 (4.75)	BK466854
#10-24 x 127,0 (5.00)	BK02-156499
#10-24 x 130,2 (5.13)	BK466855
#10-24 x 133,4 (5.25)	BK02-156498
#10-24 x 139,7 (5.50)	BK466856
#10-24 x 150,9 (5.94)	BK466857
#10-24 x 160,3 (6.31)	BK466858
#10-24 x 170,0 (6.69)	BK466859
#10-24 x 177,8 (7.00)	BK890325

Metric bolt kits, M5

Size x length, mm (in)

M5 x 20 (0.79)	BK466834M
M5 x 25 (0.98)	BK465723M
M5 x 30 (1.18)	BK616452M
M5 x 40 (1.57)	BK02–156493M
M5 x 50 (1.97)	BKDG3699M
M5 x 55 (2.17)	BK986135M
M5 x 60 (2.36)	BK466836M
M5 x 70 (2.76)	BK464125M
M5 x 75 (2.95)	BK869720M
M5 x 80 (3.15)	BK466837M
M5 x 90 (3.54)	BK466838M
M5 x 95 (3.74)	BK869721M
M5 x 100 (3.94)	BK466839M
M5 x 110 (4.33)	BK466840M
M5 x 120 (4.72)	BK466841M
M5 x 130 (5.12)	BK466842M
M5 x 140 (5.51)	BK466843M
M5 x 150 (5.91)	BK466844M
M5 x 160 (6.30)	BK466845M
M5 x 170 (6.69)	BK466846M
M5 x 200 (7.87)	BK464468M

Metric bolt kits, M6

Size x length, mm (in)

M6 x 16 (0.63)	BK534564M
M6 x 20 (0.79)	BK534565M
M6 x 25 (0.98)	BK534566M
M6 x 30 (1.18)	BK534567M
M6 x 40 (1.57)	BKDG01633M◆
M6 x 45 (1.77)	BK534569M
M6 x 50 (1.97)	BK534570M
M6 x 55 (2.17)	BK534571M
M6 x 65 (2.56)	BK534572M
M6 x 70 (2.76)	BK534573M
M6 x 75 (2.95)	BK534574M
M6 x 80 (3.15)	BK638873M
M6 x 80 (3.15)	BKDGFN01637M◆
M6 x 85 (3.35)	BK978478M
M6 x 90 (3.54)	BK534576M
M6 x 100 (3.94)	BK978479M
M6 x 110 (4.33)	BK978480M
M6 x 115 (4.53)	BK534580M
M6 x 120 (4.72)	BK534581M
M6 x 140 (5.51)	BK638878M

Note: If not using Vickers bolt kits, bolts must be to Grade 12.9 (ISO 898) or better.

The required bolt length should allow 0.40" (10 mm) thread engagement in the subplate/manifold block. Bolts should be torqued to 5–7 N.m (44–62 lbf. in.) with threads lubricated. Prior to installation of DG4V-3 valve, ensure that both the face of the valve and the face on which it is being mounted (i.e subplate, manifold, SystemStak valve or plate) is as clean as possible. Do not over tighten hold-down bolts beyond recommended values.

Appendix

Spare parts data

Refer to service drawing I-3886-S for spare parts and kit information.

Seal kits

For valves with spool indicator switch, model types DG4V-3-*A---M-S*---60
..... kit no. 859049

For other models seal kits vary according to type of coil fitted:
For "U" type coil kit no. 858995
For "F" type coil kit no. 858996

Note: Each seal kit covers a variety of models and may have redundant seals for a particular model.

Solenoid Coils

AC coils

Code	Voltage/ frequency	Standard performance		High performance	
		"U" type	"F" type	"U" type	"F" type
Full power coils:					
A	110V/50 Hz	02-101725	02-101730	507825	508166
B	110/120V/50/60 Hz	02-101726	02-101731	507833	508169
C	220V/50 Hz	02-101727	02-101732	507826	508167
D	220/240V/50/60 Hz	02-101728	02-101733	507834	508170
Low power coils:					
BL	110/120V/50/60 Hz	N/A	N/A	598562	698563
DL	220/240V/50/60 Hz	N/A	N/A	866455	866457

DC coils (Standard and high performance)

Code	Voltage	"U" type	"F" type	"SP1" type	"SP2" type	"KU" type
Full power coils:						
G	12V	507847	508172	02-111246	02-111166	02-140394
H	24V	507848	508173	02-111248	02-111168	02-140395
Low power coils:						
GL	12V	507855	508175	N/A	N/A	N/A
HL	24V	507852	508174	N/A	N/A	N/A

Mass, approx. kg (lb)

DG4V-3 and DG4V-3S (DC)	"U" coils	"F" coils
Single sol. valve	1,6 (3.5)	1,8 (4.0)
Double sol. valve	2,2 (4.8)	2,3 (5.0)
DG4V-3 and DG4V-3S (AC)	"U" coils	"F" coils
Single sol. valve	1,5 (3.3)	1,6 (3.5)
Double sol. valve	1,8 (4.0)	2,0 (4.4)
Single sol. valve w/ position switch	2,0 (4.4)	2,0 (4.4)

Mounting Attitude

No restrictions except for no-spring, detented models DG4V-3-*N and DG4V-3S-*N which should be mounted with the spool axis horizontal. These model types may be affected by severe vibration or shock, especially if a solenoid is not held energized.

Appendix

Temperature Limits

Ambient range -20°C to 70°C
(-4°F to +158°F)

Fluid Temperature

Fluid Temp.	Mineral oil	Water containing
Minimum	-20°C (-4°F)	+10°C (+50°F)
Maximum*	+70°C (+158°F)	+54°C (+129°F)

* To obtain optimum service life from both fluid and hydraulic system, 65°C (150°F) is the recommended maximum fluid temperature, except for water-containing fluids.

For synthetic fluids, consult fluid manufacturer or Vickers representative where limits are outside those for mineral oil.

Whatever the actual temperature range, ensure that fluid viscosities stay within the limits specified in "Hydraulic Fluids".

Fluid Cleanliness

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials and additives for protection against wear of components, elevated viscosity and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Vickers publication 561; "Vickers Guide to Systemic Contamination Control," available from your local Vickers distributor or by contacting Vickers, Incorporated. Recommendations on filtration and the selection of products to control fluid condition are included in 561.

Recommended cleanliness levels, using petroleum oil under common conditions, are based on the highest fluid pressure levels in the system and are coded in the chart below. Fluids

other than petroleum, severe service cycles or temperature extremes are cause for adjustment of these cleanliness codes. See Vickers publication 561 for exact details.

Vickers products, as any components, will operate with apparent satisfaction in fluids with higher cleanliness codes than those described. Other manufacturers will often recommend levels above those specified.

Experience has shown, however, that life of any hydraulic components is shortened in fluids with higher cleanliness codes than those listed below. These codes have been proven to provide a long trouble-free service life for the products shown, regardless of the manufacturer.

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

Product	System Pressure Level bar (psi)		
	<70 (<2000)	70–207 (2000–3000)	207+ (3000+)
Vane pumps, fixed	20/18/15	19/17/14	18/16/13
Vane pumps, variable	18/16/14	17/15/13	
Piston pumps, fixed	19/17/15	18/16/14	17/15/13
Piston pumps, variable	18/16/14	17/15/13	16/14/12
Directional valves	20/18/15	20/18/15	19/17/14
Proportional valves	17/15/12	17/15/12	15/13/11
Servo valves	16/14/11	16/14/11	15/13/10
Pressure/Flow controls	19/17/14	19/17/14	19/17/14
Cylinders	20/18/15	20/18/15	20/18/15
Vane motors	20/18/15	19/17/14	18/16/13
Axial piston motors	19/17/14	18/16/13	17/15/12

Ordering Procedure

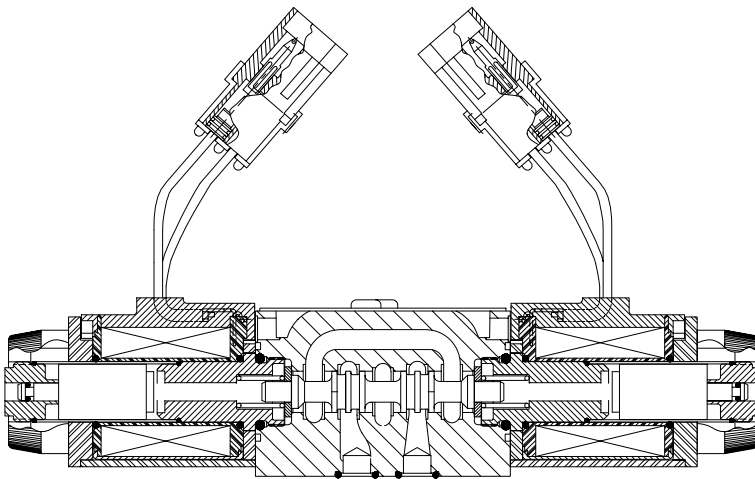
When placing an order, please specify full model designations of valves, subplates and kits. Refer to relevant "Model Code" sections.

Solenoid Operated Directional Valve

DG4V-3S, EN 490 For Mobile Equipment

Flows to 40 l/min (10.5 USgpm), 6* Design

P, A & B Pressures to 350 bar (5000 psi), T Pressures to 210 bar (3000 psi)



- Variety of manual override options are available: plain, water-resistant and latching.
- High performance features including minimal pressure drop, scratch-proof override seals, high reliability, multiple electrical connections and ease of servicing.

Characteristics

Maximum Operating Pressure

“A”, “B” and “P” ports: 350 Bar
(5000 psi)

Maximum Tank Line Pressure

210 bar (3000 psi)

Mounting Interface

ISO 4401-AB-03-4-A
CETOP 3 or NFPA D03 (formerly D01)
ANSI B93.7

General Description

This solenoid operated directional control valve is for directing and stopping flow at any point in a hydraulic system. Its primary function is to determine the direction of fluid flow in a work cylinder or control the direction of rotation of a fluid motor.

Port connections are made by mounting the valve on a subplate or manifold. The valve has wet armature type solenoids. It is derived from the standard model series DG4V-3S-60.

It is distinguished as a special by the EN490 designation. Electrical connections to the valve are typically made directly to the solenoid by various plug-in devices. Solenoids are available in DC voltages only.

Features and Benefits

- Special design for high tank line rating. Tank line can withstand pressures up to 210 bar (3000 psi). Ideal replacement for DG4V-3 for high tank line pressure applications.
- Meets key OEM specifications regarding temperature, vibration, heat rise/drop, impact test, water dunk (thermal shock and hermetic seal), salt spray and dielectric strength test.
- High thermal shock and impact resistance due to new coil design. Frame around coil ensures high strength and allows frame to expand/contract without added stress.
- Available with molded-in surge suppressor/diodes to protect PLCs or circuit boards from back electro-magnetic force (EMF).

Weights (approximate)

Single solenoid models: 1,6 kg (3.5 lb)
Double solenoid models: 2,2 kg (4.8 lb)

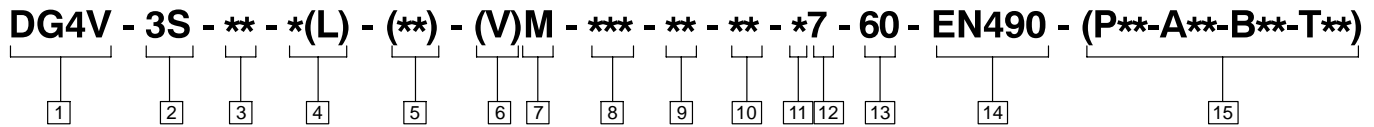
Reference

GB-C-2015 Solenoid Operated
Directional Valves

Contents

Model Code	3
Performance Data	4
Installation Dimensions	6
Electrical Plugs & Connectors	7
Mounting Bolts	10
Mounting Interface	11

Model Code



1 Directional Control Valve

DG4V - Subplate mounting; solenoid operated. Pressure rating 350 bar (5000 psi) for ports P, A & B.

2 Pilot Valve

3S - Standard performance; up to 40 l/min (10.5 USgpm) at 350 bar (5000 psi)

3 Spool Type

- 0** - Open center (all ports)
- 2** - Closed center (all ports)
- 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
- 22** - Closed center (two way)
- 33** - Closed center, bleed A & B to T
- 34** - Closed center, bleed A & B to T
- 52** - Closed center (all ports) regen. towards workport A
- 56** - A&B to T, P blocked, regen. by solenoid A
- 66** - Closed center (P blocked) A & B to T
- 521** - Closed center (all ports) regen. towards workport B
- 561** - A&B to T, P blocked, regen. by solenoid B

4 Spool/Spring Arrangement

- A** - Spring offset, end-to-end
- AL** - Same as "A" but left hand build
- B** - Spring offset, end to center
- BL** - Same as "B" but left hand build
- C** - Spring centered
- F** - Spring offset, shift to center
- FL** - Same as "F" but left hand build

5 Manual Override Options

No symbol - Plain override(s) in solenoid end(s) only▲

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

H2 - Water resistant overrides on both ends

P2 - Standard overrides on both ends

Y - Latching manual override(s) on solenoid end(s) (includes "H" feature seal)▲

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

6 Solenoid Energization Identity

V - Solenoid "A" is at port "A" end/or solenoid "B" is at port "B" end, independent of spool type.

Omit for U.S. ANSI B93.9 standard requiring solenoid "A" energization to connect P to A and/or solenoid "B" to connect P to B, independent of solenoid location.

7 Flag Symbol

M - Electrical options and features

8 Coil Type

U - ISO 4400 (DIN 43650) mounting◆

U1 - ISO 4400 (DIN 43650) mounting, with connector

U6 - ISO 4400 (DIN 43650) mounting, with connector and lights

KU - Top exit flying leads

SP1- Single 6.3mm (0.25 in) spade connector to IEC 760 (NFPA, SAE J858a, Type 1A) (Internal ground)

SP2- Dual 6.3mm (0.25 in) spade connector to IEC 760 (NFPA, SAE J858a, Type 1A)

◆ *Female connector to be supplied by customer.*

9 Top Exit Connectors (KU type only)

Omit for no connector.

P1 - Packard Weatherpak Connector (female)

P6 - Deutsch Connector (male)

P7 - Packard Weatherpak Pins (male)

P12- Packard Weatherpak Connector (male)

10 Surge Suppressor/Damper

Omit for not fitted.

D2 - Encapsulated diode –ve to right; +ve to left when facing retaining nut

11 Coil Rating

G - 12 VDC

H - 24 VDC

12 Port "T" Rating

7 - 210 bar (3000 psi)

13 Design Number

Subject to change, installation dimensions remain as shown for design numbers 60 through 69.

14 Special Version

Standard performance version with 210 bar (3000 psi) tank rating. Solenoid with external frame for improved thermal stability, improved hermetic seal.

15 Port Restrictor Plugs

Omit if no restrictor plugs are fitted.

For details of plug orifice sizes and how to specify in model code, see page 8.

Performance Data

Feature	
Pressure limits: P, A and B ports T port	350 bar (5000 psi) 210 bar (3000 psi)
Flow rating	See performance data
Relative duty factor	Continuous; ED = 100%
Type of protection: ISO 4400 coils with plug fitted correctly SP1 – Single spade 6,3 mm SP2 – Dual spade 6,3 mm Coil winding Lead wires (coils type KU) Coil encapsulation	IEC 144 class IP67 (depending on connector) IEC 760 IEC 760 Class H Class H Class F
Permissible voltage fluctuation: Maximum Minimum	Refer to temperature limits. 90% rated
Typical response times at 100% rated volts measured from application/removal of voltage to full spool displacement of "2C" spool at: Flow rate P-A, B-T Pressure DC (=) energizing DC (=) de-energizing	20 l/min (5.3 USgpm) 175 bar (2537 psi) 60 ms 40 ms

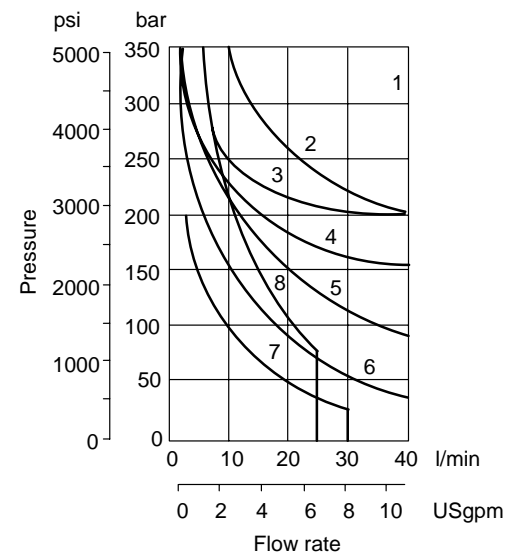
Power Consumption	
DC solenoids at rated voltage and 20°C (68°F).	
Full power coils: 12V, model type "G" 24V, model type "H"	30W 30W

Maximum flow rates

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

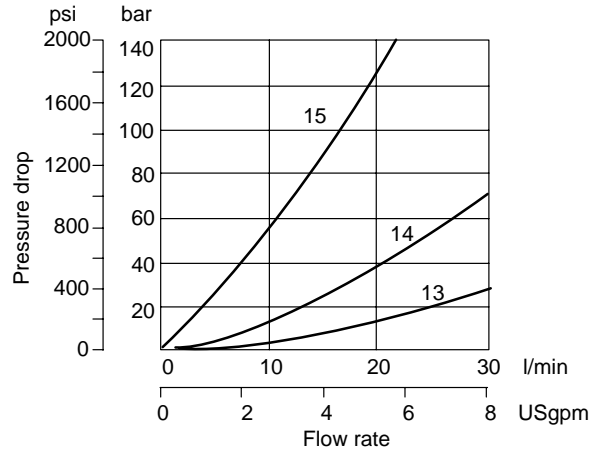
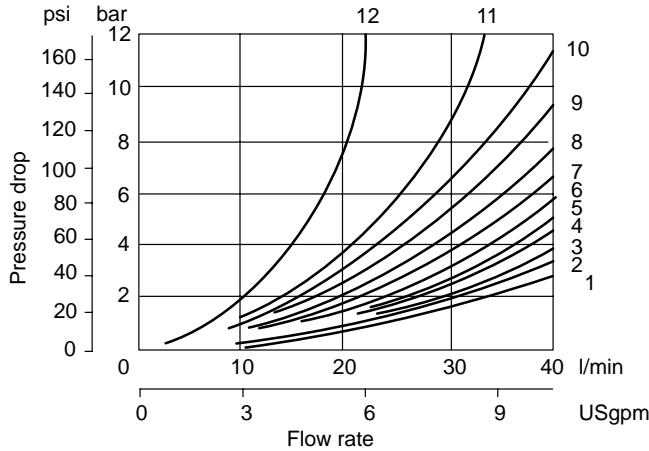
Typical with mineral oil at 36 cSt (168.6 SUS) and a specific gravity of 0.87.

Spool/Spring Code	Curve
0A(L)	3
0B(L) & 0C, 0F	1
2A(L)	3
2B(L) & 2C, 2F	3
6B(L) & 6C, 6F	5
7B(L) & 7C, 7F	2
8B(L) & 8C	8▲
22A(L)	7
22B(L) & 22C	6
33B(L) & 33C	4
34B(L) & 34C	5
52BL, 52C, 56BL & 56C	5
66B(L) & 66C	5
521B & 561B	5



▲ Consult Vickers regarding each application that will jointly have flow rates approaching this curve **and** a pressurized volume exceeding 2000 cm³ (122 cu.in.).

Pressure drops



Pressure drops in offset positions except where otherwise indicated

Spool/spring code	Spool positions covered	P to A	P to B	A to T	B to T	P to T	B to A or A to B
0A(L)	Both	5	5	2	2	—	—
0B(L) & 0C, 0F	De-energized	—	—	—	—	4▲△	—
	Energized	4	4	2	2	—	—
2A(L)	Both	6	6	5	5	—	—
2B(L) & 2C, 2F	Energized	5	5	2	2	—	—
6B(L) & 6C, 6F	De-energized	—	—	3▲	3△	—	—
	Energized	6	6	1	1	—	—
7B(L) & 7C, 7F	De-energized	6▲	6△	—	—	—	7○
	Energized	4	4	3	3	—	—
8B(L) & 8C	All	9	9	5	5	3	—
22A(L), 22B(L) & 22C	All	6	6	—	—	—	—
33B(L) & 33C	De-energized	—	—	15▲	15△	—	—
	Energized	5	5	2	2	—	—
34B(L) & 34C	De-energized	—	—	14▲	14△	—	—
	Energized	5	5	2	2	—	—
52BL & 52C	Energized	6▲	6△	2	—	—	10○
56BL	Both	6▲	6△	11▲	10△	—	10○
56C	De-energized	—	—	11▲	10△	—	10○
	Energized	6▲	6△	2	—	—	10○
66B(L) & 66C	De-energized	—	—	12	12	—	13
	Energized	6	6	2	2	—	—
521B	All	6▲	6△	—	—	—	10○
561B	De-energized	—	—	10▲	11△	—	10○
	Energized	6	6△	—	—	—	10○

▲ "B" plugged △ "A" plugged ○ "P" plugged

For other viscosities, pressure drops approximate to:

Viscosity cSt (SUS)

14	20	43	54	65	76	85
(17.5)	(97.8)	(200)	(251)	(302)	(352)	(399)

% of Δp

81	88	104	111	116	120	124
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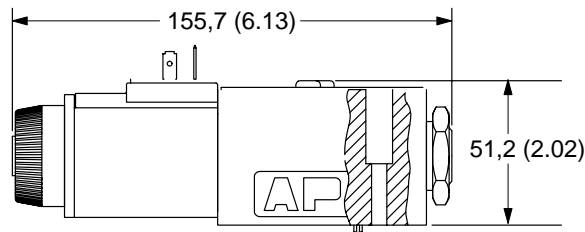
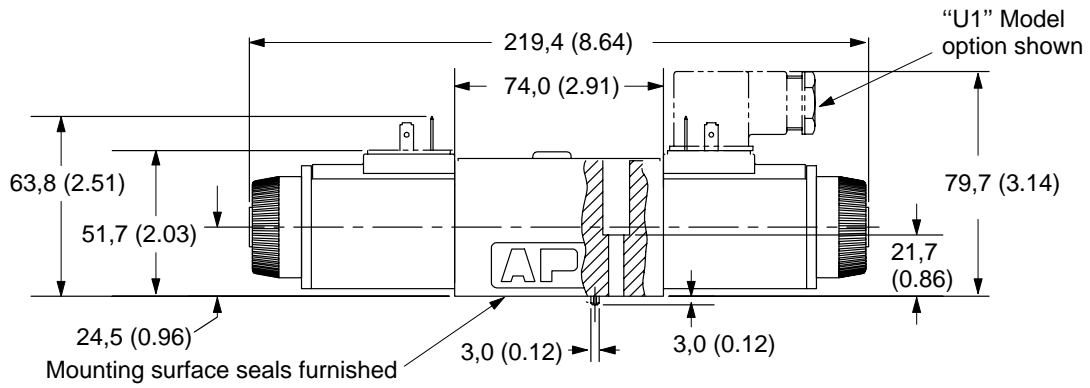
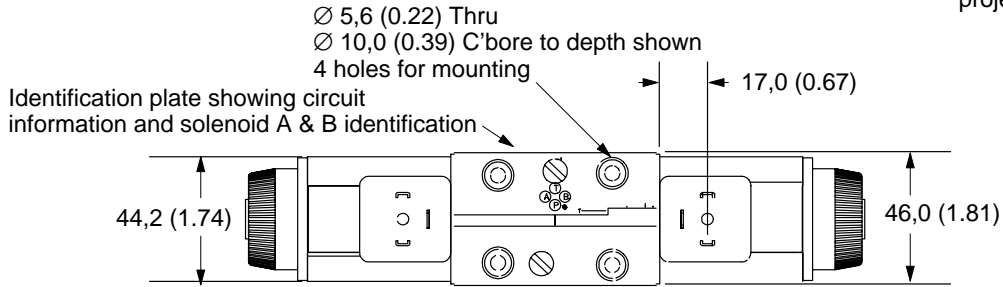
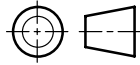
A change to another specific gravity will yield an approximately proportional change in pressure drop.

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

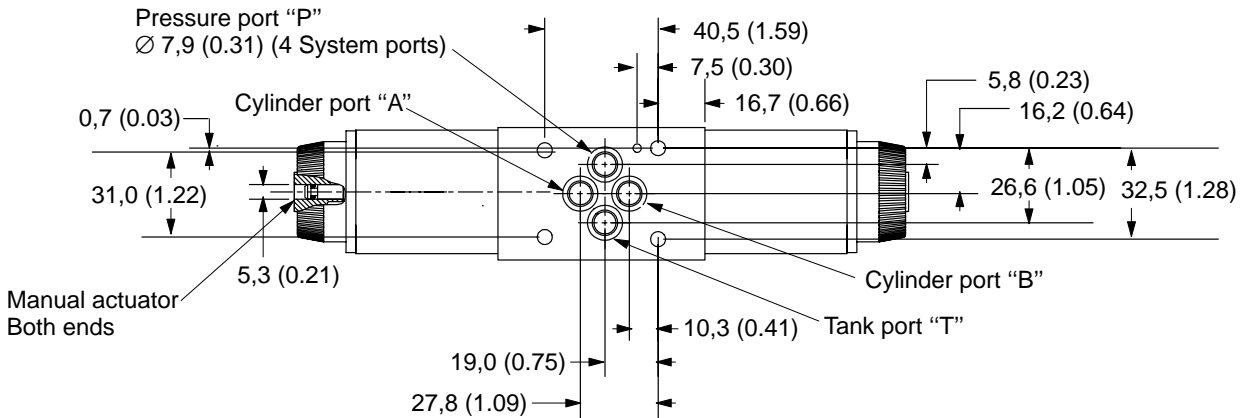
Installation Dimensions

mm (inch)

3rd angle projection

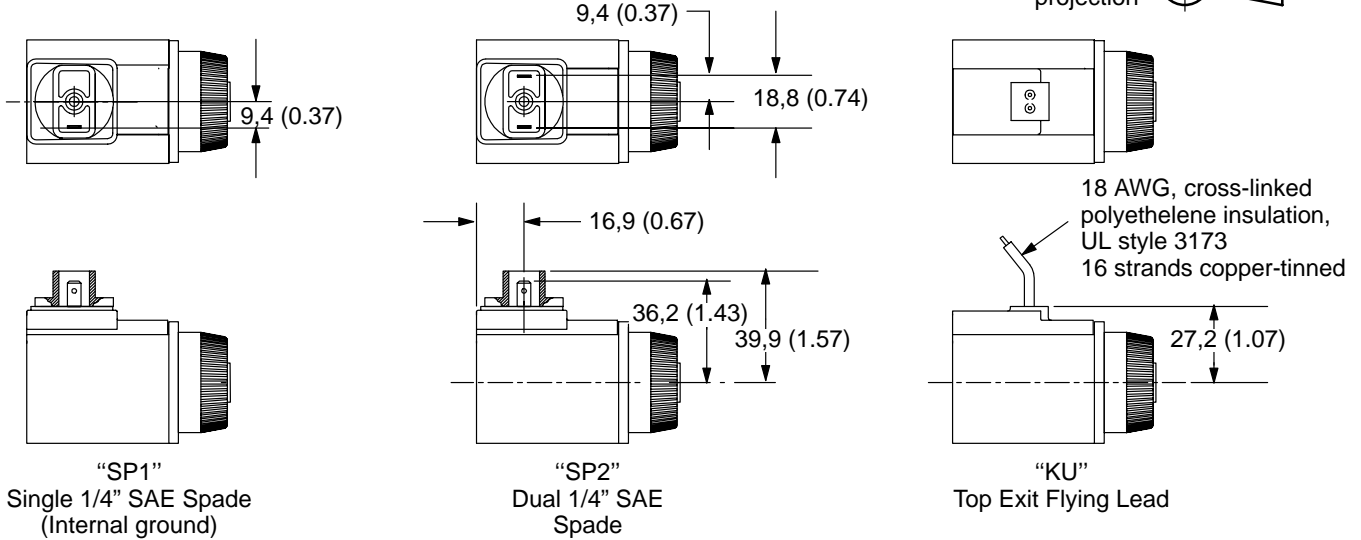


"U" DIN 43650

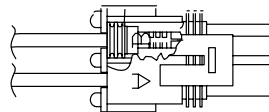
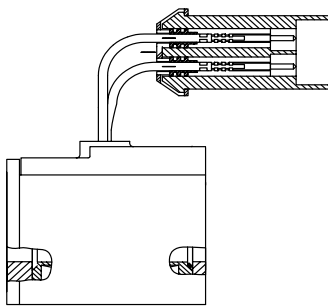


Electrical Plugs & Connectors

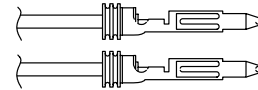
Solenoid Connections
mm (inch)



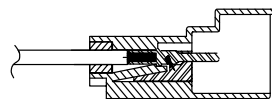
Typical Connector Assembly
& Connectors



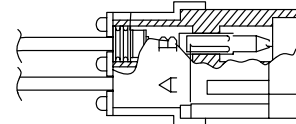
P1 Packard Connector (Female)



P7 Packard Connector Pins (Male)



P6 Deutsch Connector (Male)



P12 Packard Connector (Male)

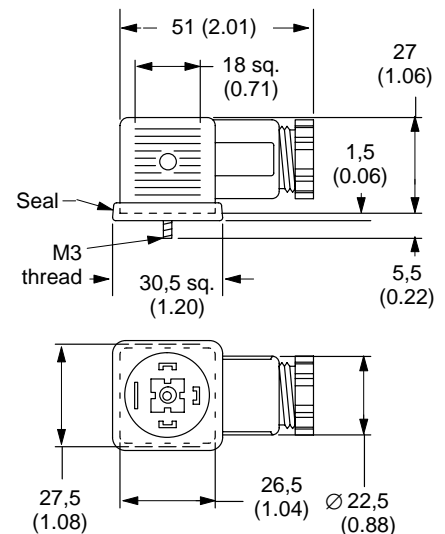
DIN 43650 Connector

Cable diameter range . . . Ø6–10 mm (0.24–0.40)
Wire section range Ø,5–1,5 mm² (0.0008–0.0023 in²)
Terminals Screw type
Type of protection IEC144 class IP65, when plugs are fitted correctly to the valves with interface seals (supplied with plugs) in place.

Connector can be positioned at 90° intervals on valve by re-assembling contact holder into appropriate position inside connector housing.

Connectors with and without indicator lights are available (order separately):

Receptacle	Voltage	Part Numbers Gray – Black – “A” sol. “B” sol.
U1 Coils without lights	—	710776 710775
U6 Coils with lights	12-24	977467 977466



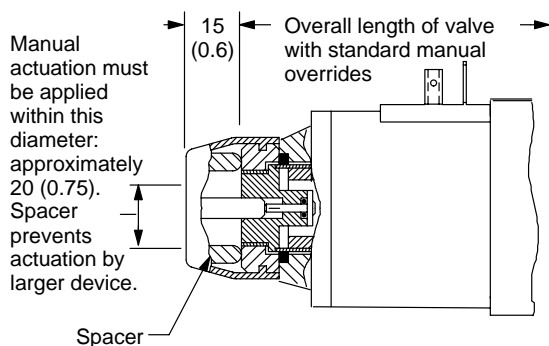
Electrical Plugs & Connectors (continued)

Manual Overrides

Water-resistant manual override on solenoid DG4V-3S-****(L)-H-(V)M-**-**-60-EN490

Application

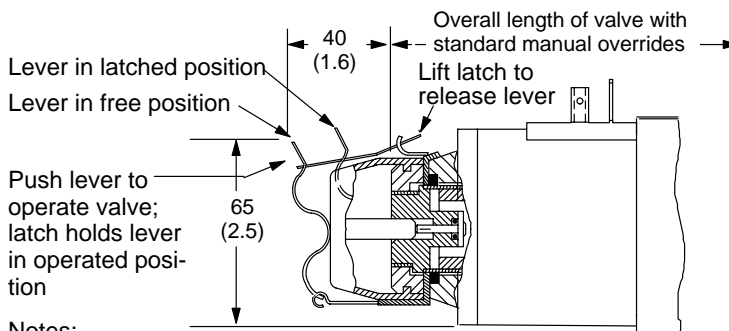
General use where finger operation is required (standard manual overrides cannot be operated without using small tool).



Latching manual override on solenoid DG4V-3S-****(L)-Y-(V)M-**-**-60-EN490

Application

Stainless steel lever/latch mechanism and water-resistant seal make this feature ideal for vehicle-mounted and exposed applications requiring emergency selection of valve for a period of time in the event of electrical failure.



Notes:

1. Opposite solenoid (on "C" and "N" double solenoid models) should not be energized while the valve is latched in selected position.
2. "Y" feature is field-convertible from "H" type manual override (omitting spacer), but is not field-convertible from other models.

Port Restrictor Plugs

Restrictor plugs are available for use in ports P, T, A or B. These can be used for restricting flow or for circuit dampening. Restrictor plugs are not recommended for use above 210 bar (3000 psi) system pressure.

Typical model codes:
DG4V-3S-**-M-**-**-60-P08
(0.8 mm dia orifice in port P)

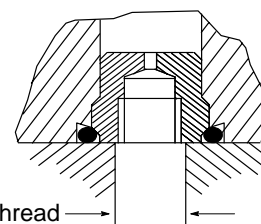
DG4V-3S-**-M-**-**-60-P10-A10
(1.0 mm dia orifice in ports P and A)

Restrictor plug selection table

Code	Orifice diameter	Part number■
*00	Blank	694353
*03	0,30 (0.012)	694341
*06	0,60 (0.024)	694342
*08	0,80 (0.030)	694343
*10	1,00 (0.040)	694344
*13	1,30 (0.050)	694345
*15	1,50 (0.060)	694346
*20	2,00 (0.080)	694347
*23	2,30 (0.090)	694348

* = P, T, A or B, as required

■ Available in multiples of 25 per part number



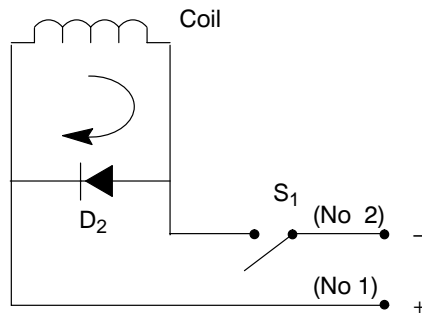
Maximum port dia in subplate/manifold block:
For steel and SG (ductile) iron: 7,0 (0.3)
For gray iron: 6,5 (0.25)

Surge Suppression Devices (For DC Valves)

Standard diode (D2)

Diode in parallel with coil. When switch (S₁) is opened, the energy stored in the coil is trapped and dissipated by the diode (D₂).

- Works only with DC voltage
- Polarity dependent
- Increases drop out time



NOTE: These surge suppression devices are "Polarity Dependent." Proper biasing conditions must be met when installing/connecting a coil in a system.

Valve Shift and Dropout Times With and Without Surge Suppression

	Shift	Dropout
CETOP 3		
No Diode	23	60
Diode	23	141

Times represent cessation/application of voltage to coil versus velocity (start/stop) of a cylinder using a single solenoid, spring offset valve (time in milliseconds).

Spare parts data

Refer to service drawing I-3886-S for spare parts and kit information.

Seal kits

Kit No. 858995

Note: Each seal kit covers a variety of models and may have redundant seals for a particular model.

Solenoid Coils

DC Coils

Code	Voltage	"U" Type	"SP1" Type	"SP2" Type	"KU" Type
Full Power Coils:					
G	12V	02-309454	02-309460	02-309456	02-309452
H	24V	02-309455	02-309461	02-309457	02-309453
		"KUP1" Type	"KUP6" Type	"KUP7" Type	"KUP12" Type
Full Power Coils:					
G	12V	TBD	02-309468	02-316209	02-309466
H	24V	TBD	02-309469	TBD	02-309467

Mounting Bolts

Inch bolt kits, #10–24 UNC–2B

Size x length, in (mm)	
#10-24 x 12,7 (0.50)	BK590715
#10-24 x 19,05 (0.75)	BK466847
#10-24 x 25,4 (1.00)	BK304
#10-24 x 31,8 (1.25)	BK590716
#10-24 x 38,1 (1.50)	BK306
#10-24 x 44,4 (1.75)	BK02-156494
#10-24 x 50,8 (2.00)	BKDG3698
#10-24 x 57,2 (2.25)	BK02-139165
#10-24 x 60,3 (2.38)	BK466849
#10-24 x 69,9 (2.75)	BK870017
#10-24 x 69,9 (2.75)	BKDGFN1694M
#10-24 x 76,2 (3.00)	BK02-156496
#10-24 x 79,4 (3.13)	BK466850
#10-24 x 88,9 (3.50)	BK466851
#10-24 x 95,3 (3.75)	BK869704
#10-24 x 100 (3.94)	BK466852
#10-24 x 101,6 (4.00)	BK02-156497
#10-24 x 109,5 (4.31)	BK466853
#10-24 x 120,7 (4.75)	BK466854
#10-24 x 127,0 (5.00)	BK02-156499
#10-24 x 130,2 (5.13)	BK466855
#10-24 x 133,4 (5.25)	BK02-156498
#10-24 x 139,7 (5.50)	BK466856
#10-24 x 150,9 (5.94)	BK466857
#10-24 x 160,3 (6.31)	BK466858
#10-24 x 170,0 (6.69)	BK466859
#10-24 x 177,8 (7.00)	BK890325

Metric bolt kits, M5

Size x length, mm (in)	
M5 x 20 (0.79)	BK466834M
M5 x 25 (0.98)	BK465723M
M5 x 30 (1.18)	BK616452M
M5 x 40 (1.57)	BK02–156493M
M5 x 50 (1.97)	BKDG3699M
M5 x 55 (2.17)	BK986135M
M5 x 60 (2.36)	BK466836M
M5 x 70 (2.76)	BK464125M
M5 x 75 (2.95)	BK869720M
M5 x 80 (3.15)	BK466837M
M5 x 90 (3.54)	BK466838M
M5 x 95 (3.74)	BK869721M
M5 x 100 (3.94)	BK466839M
M5 x 110 (4.33)	BK466840M
M5 x 120 (4.72)	BK466841M
M5 x 130 (5.12)	BK466842M
M5 x 140 (5.51)	BK466843M
M5 x 150 (5.91)	BK466844M
M5 x 160 (6.30)	BK466845M
M5 x 170 (6.69)	BK466846M
M5 x 200 (7.87)	BK464468M

Metric bolt kits, M6

Size x length, mm (in)	
M6 x 16 (0.63)	BK534564M
M6 x 20 (0.79)	BK534565M
M6 x 25 (0.98)	BK534566M
M6 x 30 (1.18)	BK534567M
M6 x 40 (1.57)	BKDG01633M
M6 x 45 (1.77)	BK534569M
M6 x 50 (1.97)	BK534570M
M6 x 55 (2.17)	BK534571M
M6 x 65 (2.56)	BK534572M
M6 x 70 (2.76)	BK534573M
M6 x 75 (2.95)	BK534574M
M6 x 80 (3.15)	BK638873M
M6 x 80 (3.15)	BKDGFN01637M
M6 x 85 (3.35)	BK978478M
M6 x 90 (3.54)	BK534576M
M6 x 100 (3.94)	BK978479M
M6 x 110 (4.33)	BK978480M
M6 x 115 (4.53)	BK534580M
M6 x 120 (4.72)	BK534581M
M6 x 140 (5.51)	BK638878M

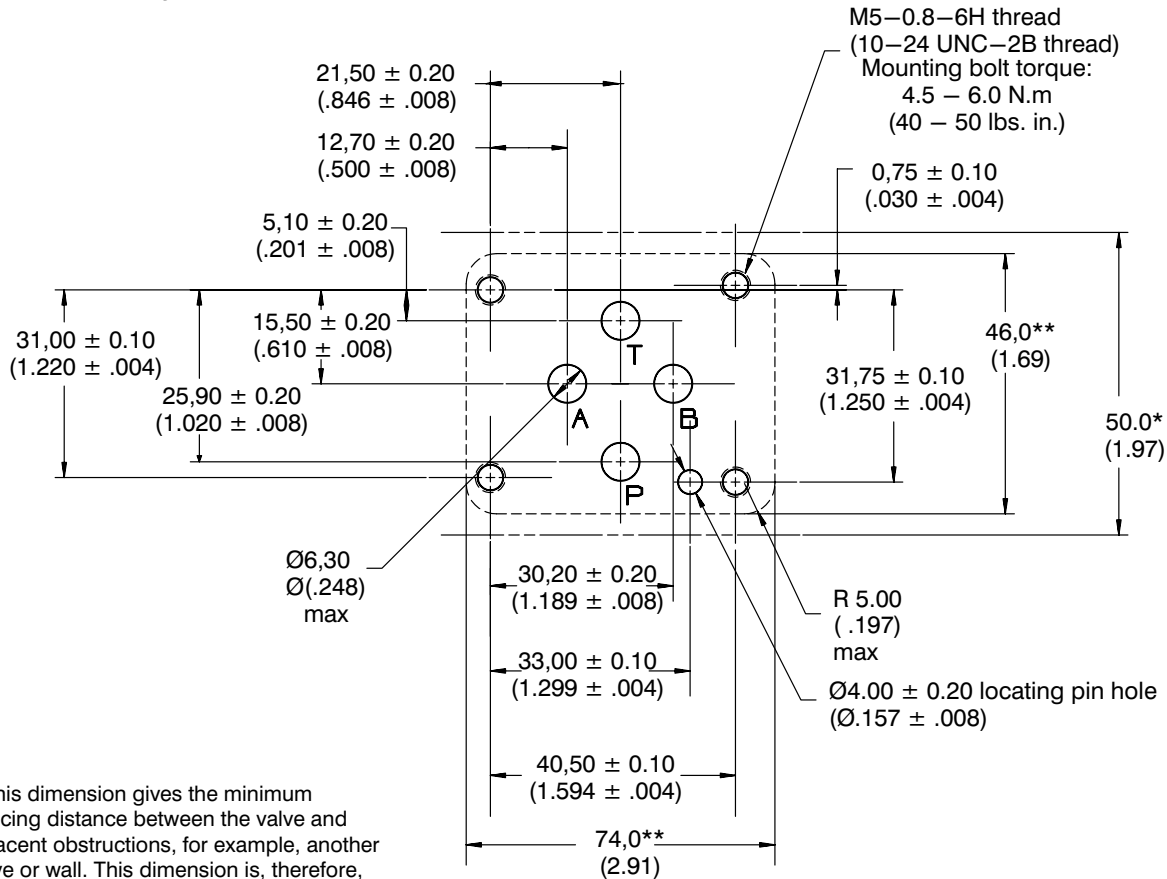
Note: If not using Vickers bolt kits, bolts must be to Grade 12.9 (ISO 898) or better.

The required bolt length should allow 0.40" (10 mm) thread engagement in the subplate/manifold block. Bolts should be torqued to 5–7 N.m (44–62 lbf. in.) with threads lubricated. Prior to installation of DG4V-3S valve, ensure that both the face of the valve and the face on which it is being mounted (i.e subplate, manifold, SystemStak valve or plate) is as clean as possible. Do not over tighten hold-down bolts beyond recommended values.

Mounting Interface

The minimum thread depth is 1.5 times bolt diameter. The recommended full thread depth is $2 \times D + 6\text{mm}$ to aid interchangeability of valves and to reduce the number of mounting bolt lengths. The recommended engagement of the mounting bolt thread for ferrous mounting is $1.25 \times D$.

Mounting surface must be flat within 0.013mm (.0005) and smooth within 1.1 micrometer (45 microinch). Mounting bolts when provided by customer should be grade 12.9 (SAE grade 7) or better. Dimensions shown in millimeters (inches).



* This dimension gives the minimum spacing distance between the valve and adjacent obstructions, for example, another valve or wall. This dimension is, therefore, the minimum distance from centerline to centerline of two similar mounting surfaces placed on a manifold block. The mounting holes are at equal distance to this dimension.

**The dimensions specifying the area within the dotted lines are the minimum dimensions for the mounting surface. The corners of the rectangle may be radiused as shown.

Fluid Cleanliness

Essential information on the correct methods for treating hydraulic fluid is included in Vickers publication 561 "Vickers Guide to Systemic Contamination Control" available from your local Vickers distributor or by contacting Vickers, Incorporated. Recommendations on filtration and the selection of products to control fluid condition are included in 561.

Recommended cleanliness levels, using petroleum oil under common conditions, are based on the highest fluid pressure levels in the system. Fluids other than petroleum, severe service cycles, or temperature extremes are cause for adjustment of these cleanliness codes. See Vickers publication 561 for exact details.

Filtration Requirements

19/17/14

Vickers Systems,
Division TRINOVA Ltd
P.O. Box 4
New Lane
Havant PO9 2NB
UK

Vickers Systems
Zweigniederfassung
der TRINOVA GmbH
Am Josef 16
D-61273 Wehrheim
Germany

Vickers Systems,
Division TRINOVA Ltd
2/F Chiaphua Centre
Yuen Shun Circuit
Siu Lek yuen, Shatin
N.T. Hong Kong

Vickers, Incorporated
5445 Corporate Drive
P.O. Box 302
Troy, Michigan
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USA

VICKERS
A TRINOVA Company

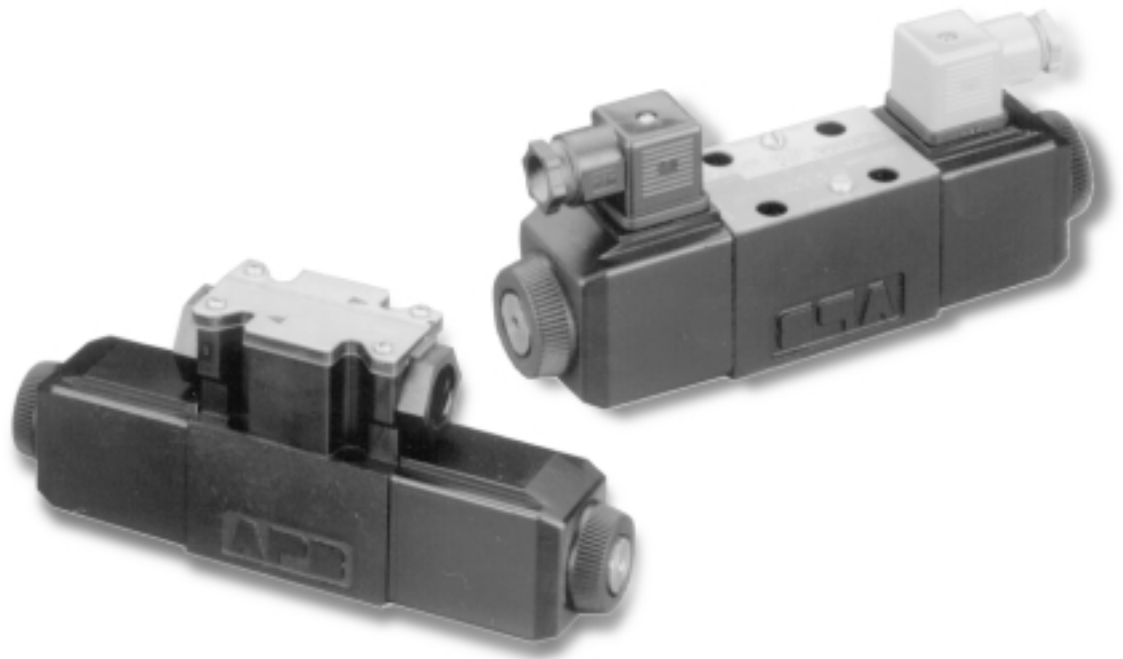
Vickers®

Solenoid Operated Directional Valves

No. 06-05-0001
EN-0301

EATON

Parts Information



VICKERS

Optimized - Soft Shift Function

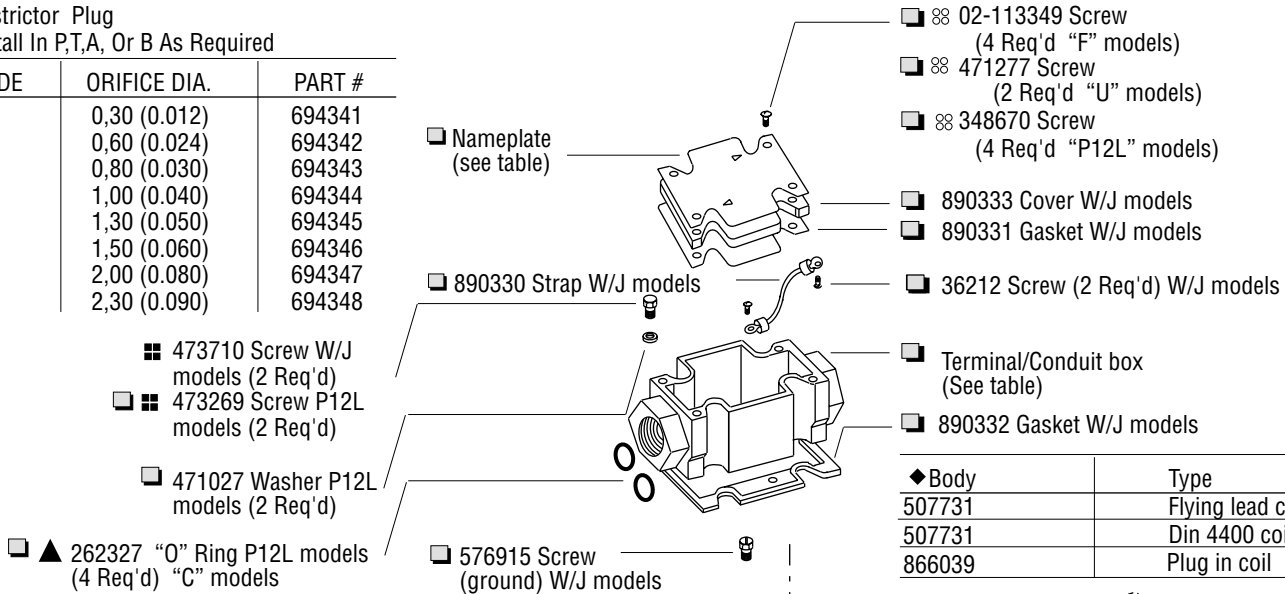
DG4V-3 - ** (L) 3 - (P2) - (V) M - ** (L) - ** H * - 60 - (P* - A* - B* - T*)**

ISO 4401, Size 03; ANSI/B93.7M-D03

Model	Knob	* Core Tube S/A
DG4V-3-**(L) 3	998330	02-344643

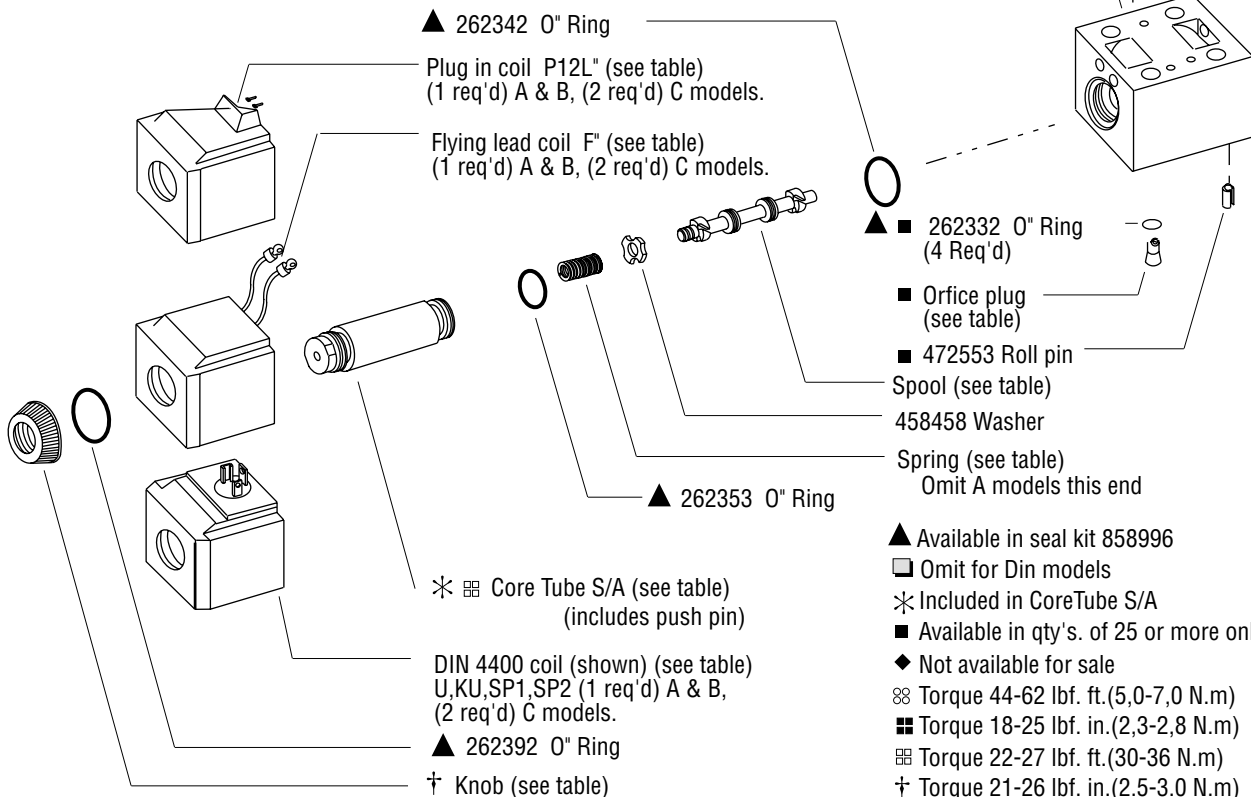
Restrictor Plug
Install In P,T,A, Or B As Required

CODE	ORIFICE DIA.	PART #
03	0,30 (0.012)	694341
06	0,60 (0.024)	694342
08	0,80 (0.030)	694343
10	1,00 (0.040)	694344
13	1,30 (0.050)	694345
15	1,50 (0.060)	694346
20	2,00 (0.080)	694347
23	2,30 (0.090)	694348



Body	Type
507731	Flying lead coil
507731	Din 4400 coil
866039	Plug in coil

◆ Body (See table)



- ▲ Available in seal kit 858996
- Omit for Din models
- * Included in CoreTube S/A
- Available in qty's. of 25 or more only
- ◆ Not available for sale
- ∞ Torque 44-62 lbf. ft.(5,0-7,0 N.m)
- Torque 18-25 lbf. in.(2,3-2,8 N.m)
- ∞ Torque 22-27 lbf. ft.(30-36 N.m)
- † Torque 21-26 lbf. in.(2.5-3.0 N.m)

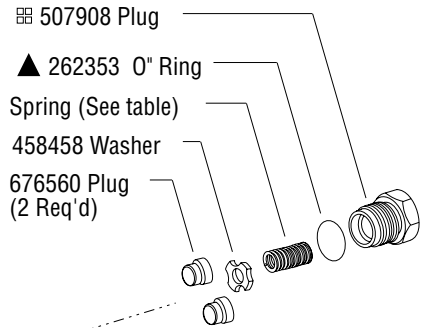
DG4V-3 -60 Design



Blank Nameplates (DG4V-3-60 High Performance Valve)

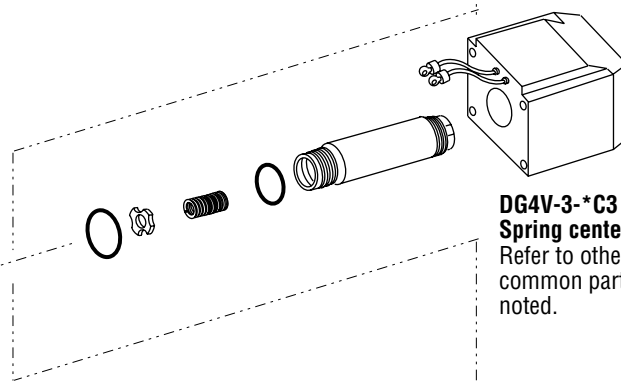
Model Code	Nameplate
DG4V-3-***-**-M-U-*7-60	694303
DG4V-3-***-**-M-U-*2/*6-60	694451
DG4V-3-***-**-M-F/FPA3/FPA5-*7-60	694387
DG4V-3-***-**-M-FPB-**-60	865929
DG4V-3-***-**-M-FPBL-**-60	865930
DG4V-3-C/N***-**-M-P-**-60	865933
DG4V-3-A/B/F***-**-M-P-**-60	865934
DG4V-3-AL/BL/FL***-**-M-P-**-60	865935

For more information on options refer to service drawing I-3886-S.



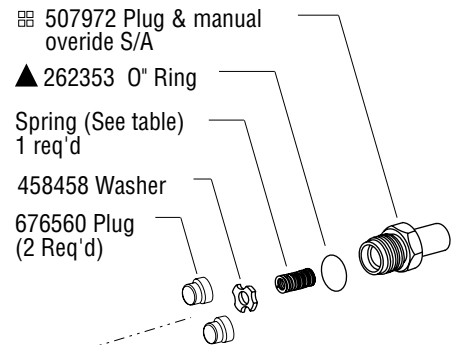
DG4V-3-*A3 -(V)M-FW-60
Spring offset to CYL. "A", shift to center.

DG4V-3-*B3 -(V)M-FW-60
Spring centered, Sol. "A" removed. Refer to other end of valve for common part numbers except as noted.



DG4V-3-*C3 -(V)M-FW-60
Spring centered, dual solenoid.

Refer to other end of valve for common part numbers except as noted.



DG4V-3-*A3 -*P2-(V)M-FW-60
Manual override in end cover.

Refer to other end of valve for common part numbers except as noted.

NOTE

Right hand assembly shown for all single solenoid valves, for left hand assembly all parts reversed except body (& spool on "B" builds) and electrical connectors (where applicable).

Model Code Coil Identification Letter

Coil letter	Coil S/A Voltage DC	Coil S/A "F" models	Coil S/A "U" models	Coil S/A "SP1" models	Coil S/A "SP2" models	Coil S/A "KU" models	Coil S/A "P12L" models
GH	12 VDC	02-123958	02-123938	02-123950	02-123942	02-140393	02-124274
DTH	18 VDC	02-124394	02-124392	02-124719	02-124389	02-148712	02-124511
HH	24 VDC	02-123959	02-123939	02-123951	02-123943	_____	02-124275
DJH	98 VDC	02-123960	02-123940	02-123952	02-123944	_____	02-124238
PH	110 VDC	02-123961	02-123941	02-123953	02-123945	_____	02-124276
SH	220 VDC	02-124260	02-124441	_____	_____	_____	_____

Type "F" flying lead coils must be powered by DC electrical signal. Type P12L coils must be powered by 110-120, 50-60 Hz AC. DIN rectified connectors (11" or 12" in model code) can be used to convert AC volts to DC voltage to power the valve.

Model Code	Terminal Box "W/J" Flying lead	Conduit Box "P12L" Plug in	Type
DG4V3-A/B/C-W	890341	_____	Single/double coil
DG4V3-A/B/C-J	890342	_____	
DG4V3(S)-C-P12L	_____	866000	Double coil with rectifier
DG4V3-A/B-P12L	_____	866001	Single coil with rectifier

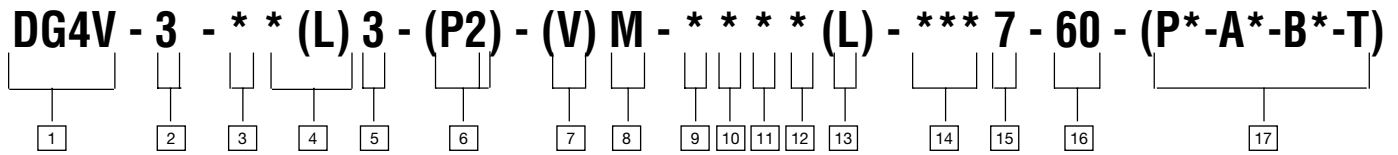
Rotate conduit box/rectifier/light assembly 180° for models AL, BL, and 8B with solenoid mounted on B port side of body.

Spool/Spring Arrangement DG4V3 Models

Model	Type	DG4V3 Spool	DG4V3 Spring
-*B/C	2*	892913	507889
	3*/31*	927027	507889
	6*	892914	694299
	8*	02-303660	927200
	33*	892915	507889
	0*	02-148720	507889
-*A	2A	892916	507889

Assemble type "3" spool in body with narrow center land towards A port.
 Assemble type "31" spool in body with narrow center land towards B port.

DG4V-3 Soft Shift Model Series



<p>1 Valve Type</p> <p>D - Directional control valve</p> <p>G - Subplate mounted</p> <p>4 - Solenoid operated</p> <p>V - Rated pressure (350 bar)</p>	<p>6 Manual Override</p> <p>Blank - Override in solenoid end only</p> <p>P2 - Manual override in end cap and solenoid, A & B models only.</p>	<p>12 Wiring Housing Thread</p> <p>(“F” type coils only, omit if not required)</p> <p>W - 1/2" NPT</p> <p>J - M20 x 1.5 - 6H</p> <p>G - G1/2</p>
<p>2 Interface</p> <p>3 - ISO 4401-03, CETOP 3 (NFPA D03)</p> <p>(High performance only)</p>	<p>7 Solenoid Energization identity</p> <p>Blank - ANSI B93 energize solenoid A to give flow P to A</p> <p>V - Solenoid identification determined by position of solenoid (i.e. solenoid A is at port A end of valve, solenoid B is at port B end of valve.)</p>	<p>13 Solenoid Indicator Lights</p> <p>(Not available on PA, U, SP1, SP2. Omit if not required.)</p>
<p>3 Spool Types</p> <p>0 - Open center</p> <p>2 - Closed center (all ports)</p> <p>3 - P & B closed, A to T</p> <p>6 - Closed center (P only)</p> <p>8 - Tandem center (open crossover)</p> <p>31 - P & A closed, B to T</p> <p>33 - Closed center (bleed A & B)</p>	<p>8 Flag Symbol</p> <p>(Introduces electrical features and options)</p>	<p>14 Coil Identification Letter</p> <p>GH - 12V DC</p> <p>DTH - 18V DC</p> <p>HH - 24VDC</p> <p>DJH - 98V DC (req'd. for P12L models)</p> <p>PH - 110V DC</p> <p>SH - 220V DC</p>
<p>4 Spool/Spring Arrangement</p> <p>A - Spring offset, single solenoid</p> <p>AL - Spring offset, single solenoid (left hand build)</p> <p>B - Spring centered, single solenoid</p> <p>BL - Spring centered, single solenoid (left hand build)</p> <p>C - Spring centered</p>	<p>9 Coil Types</p> <p>F - Flying lead type coils</p> <p>U - DIN 43650 coils</p> <p>SP1 - Single 1/4" male spade</p> <p>SP2 - Dual 1/4" male spade</p> <p>P12L - Plug-in coils w/rectifier in junction box, lights included.</p> <p>KU - Top exit flying leads</p>	<p>15 Tank Pressure Rating</p> <p>7 - 210 bar (3045 psi)</p>
<p>5 Soft Shift Valve - Optimized Fixed Orifice</p>	<p>10 Coil Connectors</p> <p>(“U” type coils only, omit if not required)</p> <p>1 - Connector fitted</p> <p>6 - Connector with light fitted</p> <p>11 - Rectifier with lights fitted</p> <p>12 - Rectifier fitted</p>	<p>15 Design Number</p>
	<p>11 Electrical Connections</p> <p>(“F” type coils only, omit if not required)</p> <p>PA - Insta-plug male recpt. only</p> <p>PA3 - 3-pin receptacle</p> <p>PA5 - 5-pin receptacle</p> <p>PB - Insta-plug male & female recpt.</p> <p>T - Terminal block</p>	<p>17 Port Orifices</p> <p>Blank - 00</p> <p>03 - 0.3 mm dia.</p> <p>06 - 0.6 mm dia.</p> <p>08 - 0.8 mm dia.</p> <p>10 - 1.0 mm dia.</p> <p>13 - 1.3 mm dia.</p> <p>15 - 1.5 mm dia.</p> <p>20 - 2.0 mm dia.</p> <p>23 - 2.3 mm dia.</p> <p>(Example: “P03” = 0.3 mm dia. orifice in P port of valve. Omit if not required.)</p>

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