Vickers®

Directional Controls

DG**V-2-10 & Size 02 SystemStak Valves

250 bar (3600 psi) 30 l/min (7.9 USgpm)
ISO/DIS 4401-02-02

VICKERS

5018/EN/1197/A

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Introduction

• DG**V-2 size 02 directional control valves
• DGM**-2 SystemStak™ valves
• A compatible range of subplates and stackable auxiliary plates

This is the first comprehensive product range conforming to ISO/DIS 4401 size 02 to be offered to the market and includes:

- Directional control valves:
  Solenoid actuation
  Manual actuation
- SystemStak:
  Pressure relief valve
  Counterbalance valve
  Sequence valve
  Pressure reducer valve
  Direct check valve
  Pilot operated check valve
  Flow restrictor valve
  Flow regulator valve
  Flow divider valve
  Blanking plate
  Crossover plates
  Tapping plates
  Orifice plate
- Adaptor DG4M4 to size 2
- Adaptor size 3 to size 2
- Single-station subplate
- Multi-station subplates
- ISO 02 Adaptor plate

In response to growing demands for a valve system smaller than size 3, Vickers participated in the development of the ISO 4401 size 02 interface standard and then designed the relevant products. Vickers experience as the leading worldwide supplier of size 3 valves played a major part in achieving design and development programs for these small valves.

All the basic functions of the well established and field-proven size 3 range are now available in a smaller package size for pressures up to 250 bar (3600 psi) and flows up to 30 l/min (7.9 USgpm).

These latest performance specifications are achieved through improved design and manufacturing methods, and the use of modern high-efficiency solenoids, combined with pro-active attention to quality.

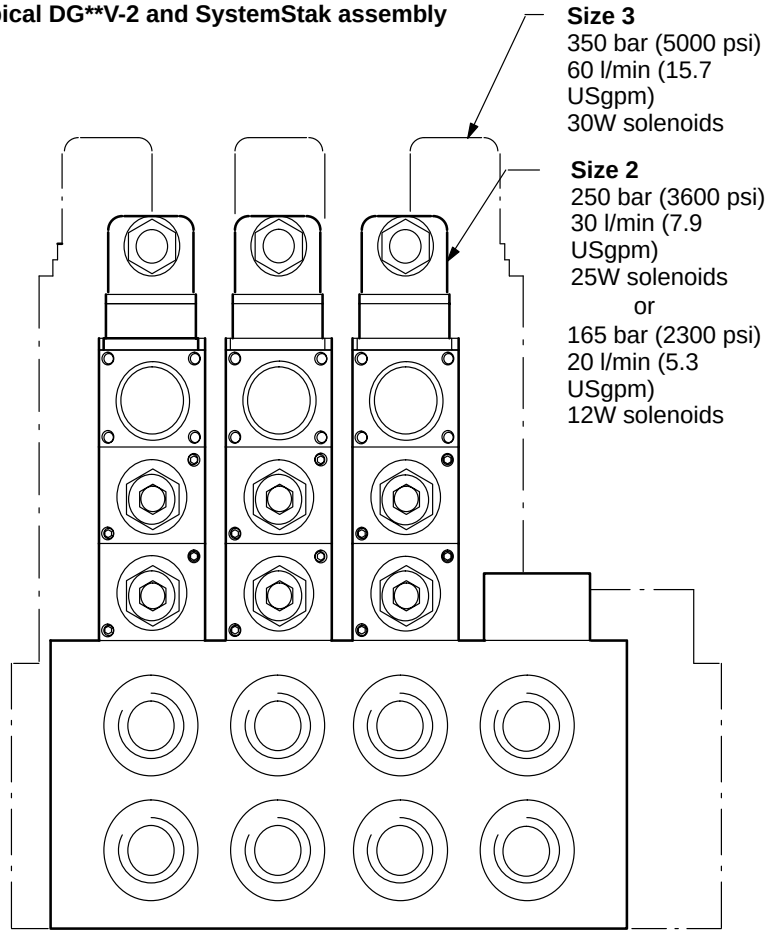
In response to requests for a solenoid controlled directional valve that can be driven directly from a Programmable Logic Controller (PLC), the DG4V-2 valve is available with a low power (500 mA) coil for pressures up to 165 bar (2300 psi) and flows up to 20 l/min (5.3 USgpm).

The range allows for complete systems to be designed and implemented in Vickers SystemStak™ configuration, giving significant reductions in space requirements compared to size 3, while achieving high performance levels.

The drawing illustrates the reduced installation dimensions of a size 2 control system compared to size 3, both having the same functions-a space saving of up to 40% on manifold systems.

The size 2 product range has been designed, developed and manufactured to the high standards that continue to assure Vickers customers of complete satisfaction with regard to performance and reliability. Testing ensures that all size 2 valves have a fatigue and endurance life in excess of 10 million operating cycles at maximum pressure. All Vickers customers and products are backed by worldwide customer support facilities.

Typical DGV-2 and SystemStak assembly**



Manually Actuated Control Valves

DG2/17/21V-2 10 Series

General description and application benefits

Vickers directional valves offer versatility of application for the many directional control requirements of hydraulic machinery. Ruggedness of design, manufacturing quality, and worldwide parts and service availability maximize uptime.

These valves are available in an ISO/DIS 4401-02-02 interface. Lever operated, roller cam and plunger operated models offer the following application benefits:

- Efficient control of high hydraulic powers, ideal for such applications as gate valves.
- Low internal leakage reduces power losses, increases system efficiency - the result of improved manufacturing techniques for spools and bores.
- Viton® seals with multi-fluid capability without need to change seals.
- High sustained machine productivity and higher uptime because of proven fatigue and endurance life- tested to over 10 million cycles.
- Compact and cost-effective system design when used with Vickers SystemStak™ valves and multi-station subplates.

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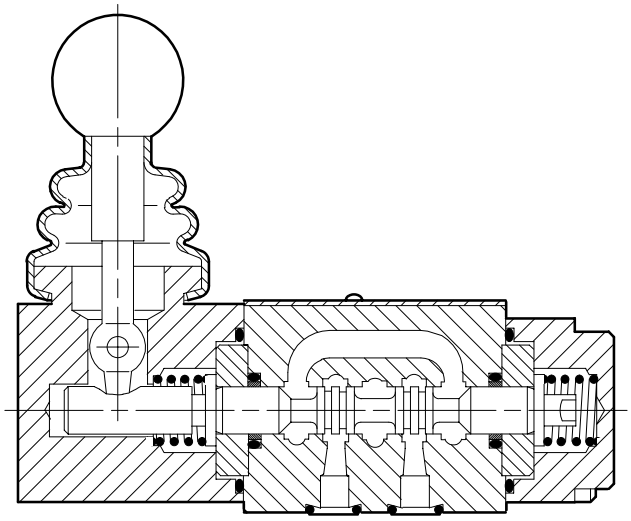
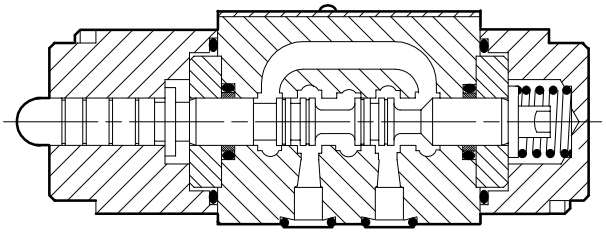
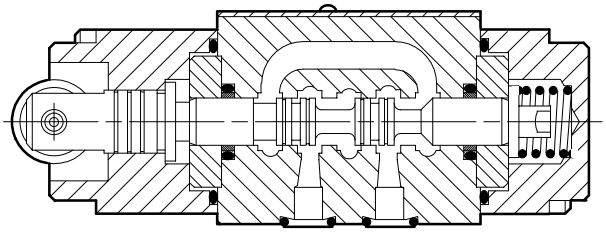
DG17V-2-N-10**
Lever operator



DG21V-2-24A-10
Plunger operator



DG2V-2-24A-5-10
Cam operator



General Information

General Description

Three types of valve are available with different controls primarily for controlling starting, stopping and direction of fluid flow in a system.

Basically, the valves are developed from the well-known series of DG4V-2-10 series solenoid operated valves. These manual valves are available with a choice of mechanically operated spool types, depending on valve configuration. All spools have been designed to provide good low-shock characteristics. External regulation of the control input by lever, cam or plunger operation allows matching to virtually any requirement where electrical control is not appropriate.

Models include no-spring, spring offset, spring centered and detented versions.

DG**V-2-*-10 Lever/Cam/Plunger Operated

Operating Information

The DG21V-2 plunger operator valves are internally drained to port T. They may be used only when surges or back pressure in the tank line cannot overcome the force applied to depress the plunger.

DG2/17/21 models must be released from the actuated position, without restriction to ensure proper spring return.

Cam operated directional control valve installation recommendations:

- Maximum cam angle 15°
- Cam should not drive roller at its vertical centerline to avoid any side loading on roller lever mechanism.

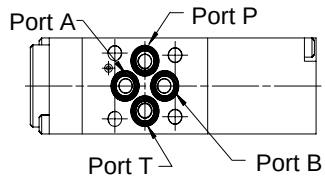
Actuation Force

Under rated conditions*, the approximate actuation force will be as shown in the chart below:

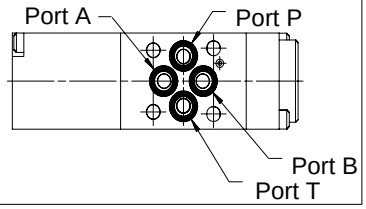
Valve type	Force N (lbf.)*
DG17V-2-*C(L)	25-40N (6 -9)
DG17V-2-*A(L)	25-40N (6 -9)
DG17V-2-*N(L)	10-17N (2-4)
DG2V-2	125-160N (28-36)
DG21V-2	125-160N (28-36)

* Tank return must be designed so that transient tank line pressure peaks do not exceed 6,9 bar (100 psi). For tank return line pressure in excess of 6,9 bar (100 psi) lever movement must be assisted.

Right hand assembly



Left hand assembly



NOTE

In a right hand assembly, operator “A” is adjacent to port “B”. In a left hand assembly, operator “B” is adjacent to port “A”. ***Please note that European designations are the opposite.*** See diagram on the nameplate of the valve for operator (port) identification.

Shifting Action

Surges of oil in a common tank line serving these and other valves can be of sufficient magnitude to cause inadvertent shifting of these valves. This is particularly critical in the no-spring and no-spring detented type valves. Separate tank lines or a vented manifold with a continuous downward path to tank is preferred.

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

If this valve is used for purposes other than a 4-way valve or as shown in the graphical symbol on the valve, consult your distributor or sales engineer.

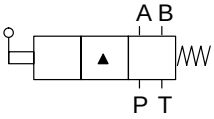
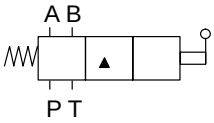
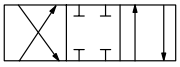
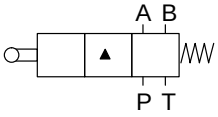
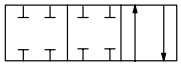
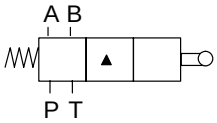
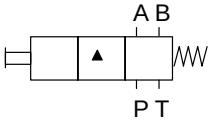
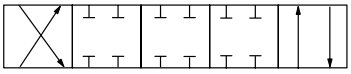
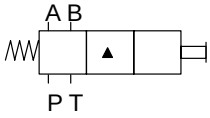
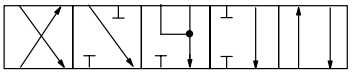
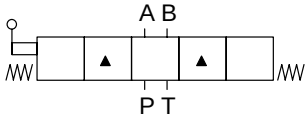
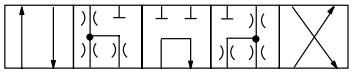
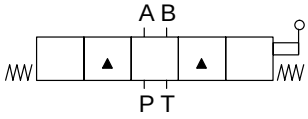
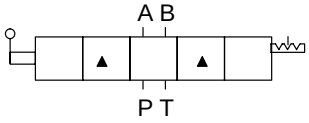
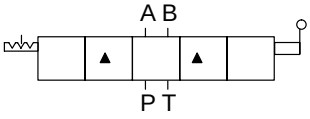
Mounting Position

There is no restriction on mounting of spring centered or spring offset models. Detented models must be mounted with the spool bore horizontal to reduce the possibility of accidental spool shift due to shock and/or vibration.

Port Connections

Port connections are made by mounting the valve on a manifold or subplate having mounting dimensions which conform to ISO/DIS 4401-02-02.

DG2/17/20V-2-*-10 Functional Symbols

Spool Options	Model	Basic Valve Symbol	Usable Spool Options
Spool types shown represent the highest anticipated portion of market requirements, based on Vickers experience with size 3 valves. For other spool functions that may be required, consult your Vickers representative.	DG17V-2-**A		2, 24
	DG17V-2-**AL		2, 24
DG17/2/21V-2-*A "2" 	DG2V-2-**A		2, 24
"24" 	DG2V-2-**AL		2, 24
	DG21V-2-**A		2, 24
DG17V2-*C/N "2" 	DG21V-2-**AL		2, 24
"6" 	DG17V-2-**C		2, 6, 8
"8" 	DG17V-2-**CL		2, 6, 8
Full flow Restricted flow	DG17V-2-**N		2, 6, 8
	DG17V-2-**NL		2, 6, 8 ▲ *Transient condition only*

Model Code

DG ** V – 2 – ** – (Y) * –10**

1 2 3 4 5 6 7 8 9

1 Model Series

D – Directional valve
G – Subplate/manifold mounted

2 Operator type

2 – Roller/cam operated
17 – Lever operated
21 – Plunger operated

3 Pressure rating

V – 250 bar (3600 psi)

4 Interface

2 – ISO/DIS 4401-02-02

5 Spool type

2 – Closed center (all ports)
6 – Closed center (P only)
8 – Tandem center (P to T)
24 – Closed center (all ports)

6 Spool spring arrangement

A – Spring offset, end-to-end
AL – Same as “A” but left hand build
C – Spring centered
CL – Same as “C” but left hand build
N – No-spring detented
NL – Same as “N” but left hand build

7 Roller orientation (DG2V)

Y – Horizontal (omit for vertical)

8 Tank pressure rating

5 – 100 bar (1438 psi)

9 Design

Subject to change. Installation dimensions same for designs 10 thru 19.

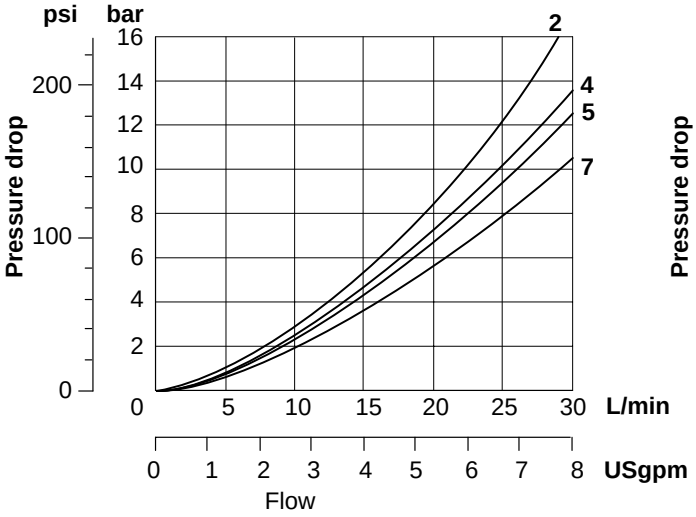
Operating Data

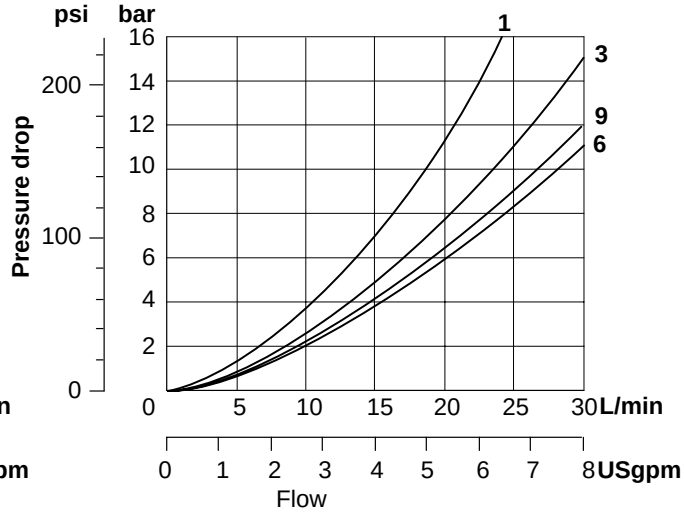
Performance data is typical with fluid at 36 cSt (168 SUS) and 50° C (122° F)

Pressure limits:	P, A, B T	250 bar (3600 psi) 100 bar (1500 psi)
Flow rating, max	30 l/min (7.9 USgpm)	
Actuation forces	DG17V-2-*C(L) DG17V-2-*A(L) DG17V-2-*N(L) DG2V-2 DG21V-2	25-40N (6-9 lbf.) 25-40N (6-9 lbf.) 10-17N (2-4 lbf.) 125-160N (28-36 lbf.) 125-160N (28-36 lbf.)
Mass:	DG17V-2 DG2V-2 DG21V-2	1.02 kg (2.25 lb.) 1.00 kg (2.20 lb.) 1.00 kg (2.20 lb.)
Installation data: Mounting attitude	No restrictions except for no-spring detented model DG17V-2-*N(L). It should be mounted with the spool axis horizontal.	

Performance Data

Pressure Drops





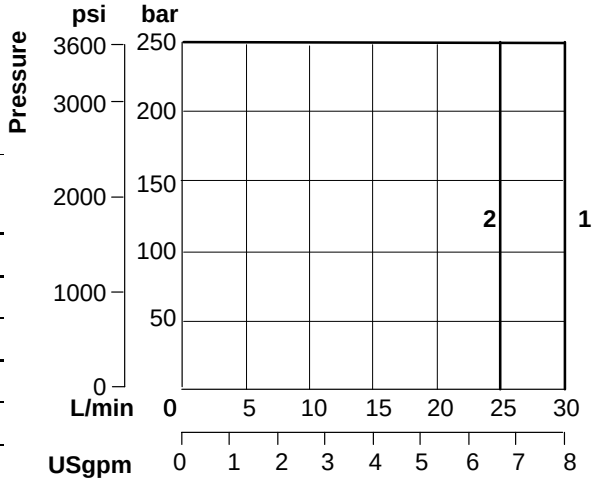
Refer to appendix for other viscosities

Pressure drops in offset positions except where otherwise indicated

Pressure Drop Curve Number

Spool/spring code	Spool offset		Spool centred	
	P → A/B	A/B → T	A/B → T	P → T
DG2V-2 & DG21V-2				
2A/(L) &24A(L)	3	4	–	–
DG17V-2				
2A	3	4	–	–
2C	5	7	–	–
2N(L)	5	6	–	–
6C	4	6	5	–
6N	3	6	9	–
8C(L)	1	1	–	2
8N(L)	1	1	–	2

Looped Flow Malfunction

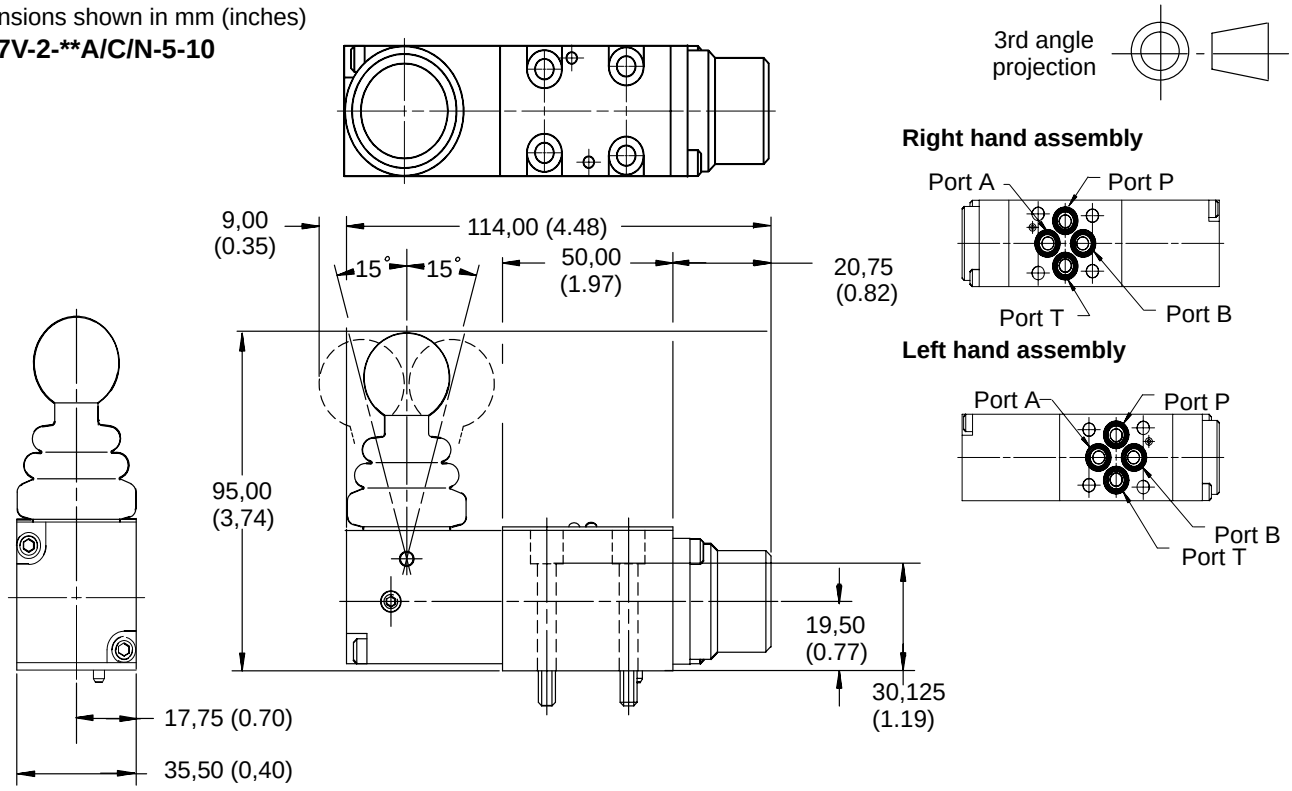


Spool/spring Code	Curve Number
2N, 6N, & 8N	1
2A, 24A, 2C, 6C & 8C	2

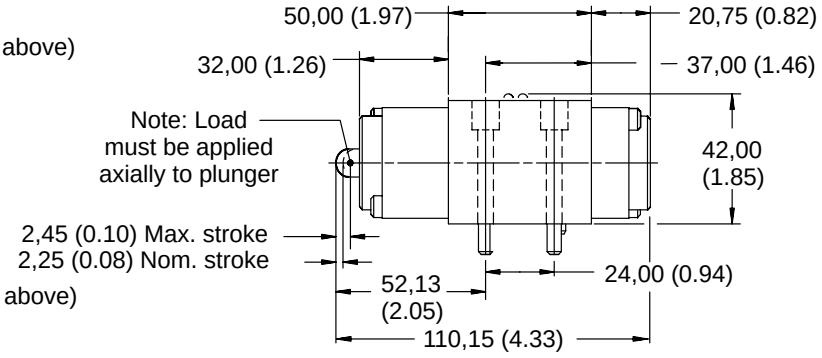
Installation Dimensions

Dimensions shown in mm (inches)

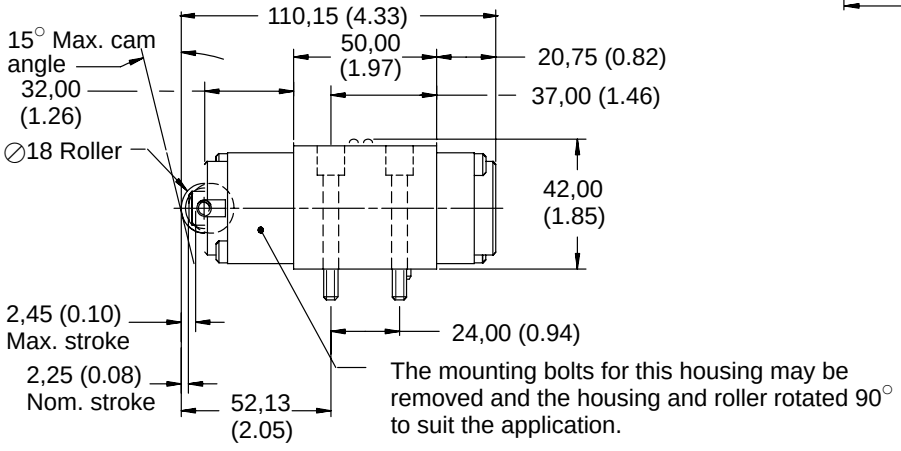
DG17V-2-A/C/N-5-10**



DG21V-2-A-5-10**
Plunger operated
(Dimensions not shown are same as DG17V-2, above)



DG2V-2-A-(Y)-5-10**
Cam operated
(Dimensions not shown are same as DG17V-2, above)



Solenoid Operated Directional Valves

DG4V-2 10 Series

General description and application benefits

These solenoid operated directional control valves are for directing and stopping flow at any point in a hydraulic system. The features being released with this range are based on Vickers experience with size 3 valves.

- Efficient control of high hydraulic powers with low solenoid power consumption.
- Low internal leakage reduces power losses, increases system efficiency - the result of improved manufacturing techniques for spools and bores.
- Viton® seals with multi-fluid capability without need to change seals.
- High sustained machine productivity and higher uptime because of proven fatigue and endurance life- tested over 10 million cycles.
- Compact and cost-effective system design when used with Vickers SystemStak™ valves and multi-station subplates.

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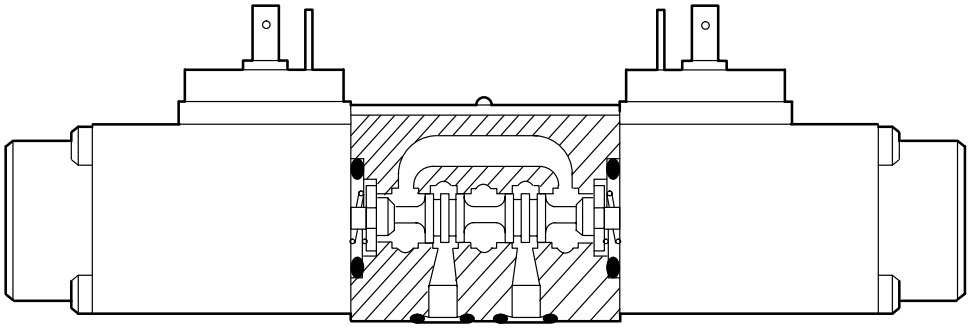
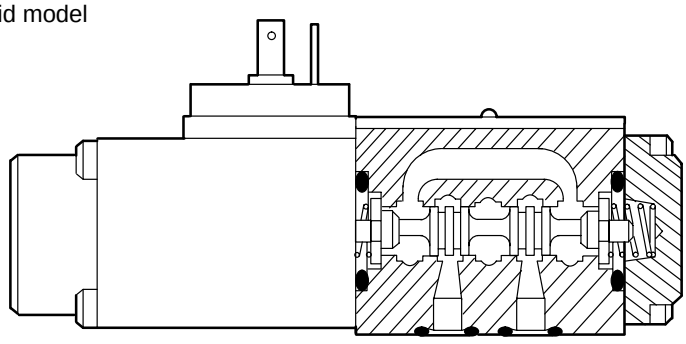
DG4V-2-2C
Double solenoid model



DG4V-2-2B
Single solenoid model

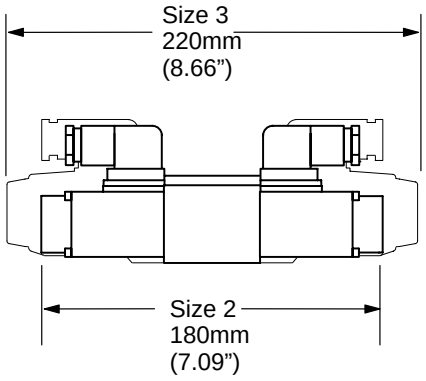


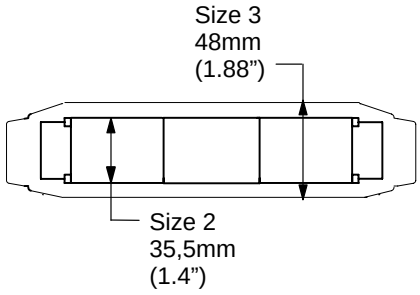
Features and Benefits

• Size

The reduced size of the DG4V-2 valve compared to size 3 valves, offers new installation possibilities, especially when used with size 2 SystemStak valves.

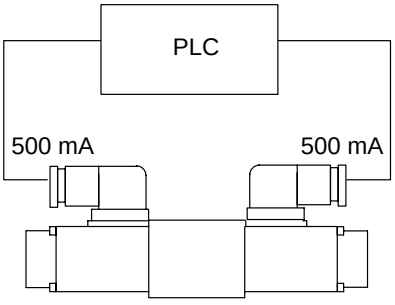
The DG4V-2 double solenoid models requires only 55% of the space of the size 3 DG4V-3 valve.





• Low Wattage

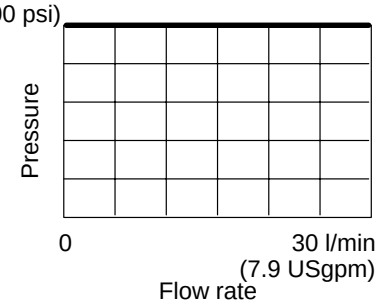
A 12W coil for direct drive from a PLC or PC. Ideal for bus communications, allowing dramatic reduction in cabling, with savings in time and cost.



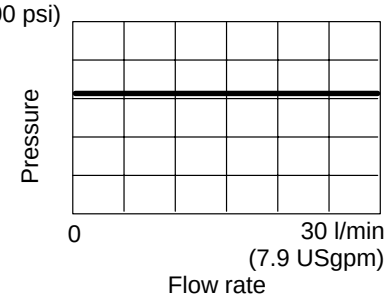
• High Pressure and Flow Capability

Highly reliable operation up to 30 l/min (7.9 USgpm) and 250 bar (3600 psi). Establishes new market standards while opening new possibilities to system designers on valve size selection.

Ports P, A, B
250 bar
(3600 psi)

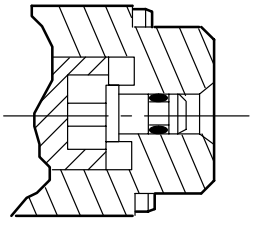


Port T
160 bar
(2300 psi)



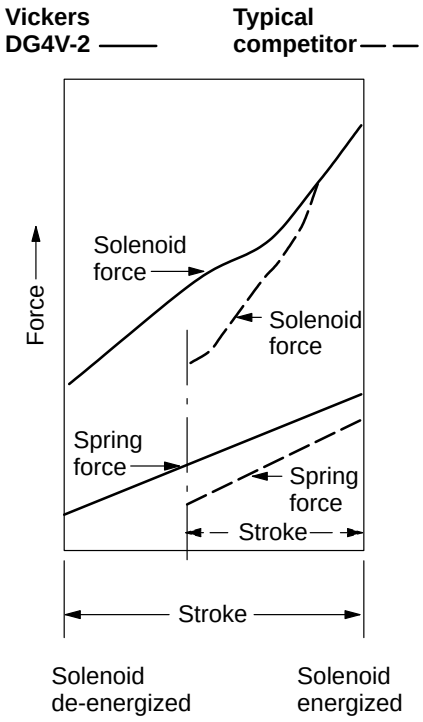
• Manual Override

All solenoids have manual override fitted as standard to allow the spool to be moved in no-power situations. Ideal during machine set-up and power failure situations.



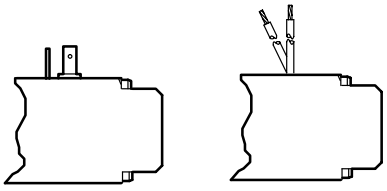
• High Reliability

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



• Mobile Connectors

All solenoids are available with flying leads. Because they make possible the use of several mobile connectors, flying leads are ideal for the mobile market. Connectors are also available directly connected to the solenoid.

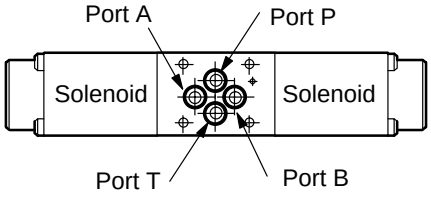


Functional Symbols

Spool types shown represent the highest anticipated proportion of market requirements, based on Vickers experience with size 3 valves. For other spool functions that may be required, consult your VIckers representative.

Solenoids Identified to U.S. Standards

Functional symbol 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).

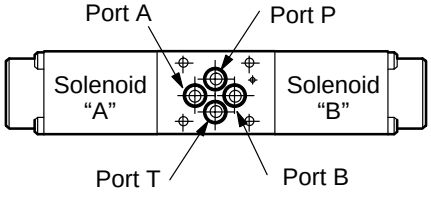


Solenoid	For spool type	Solenoid
B	All except “8”	A
A	“8’” only	B

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

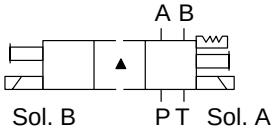
Solenoids Identified to European Standards (Specify “V” in model code)

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.

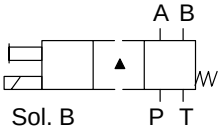


U.S. Solenoid Standard

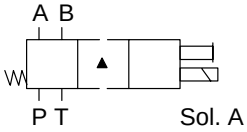
Double solenoid valves, two position, detented



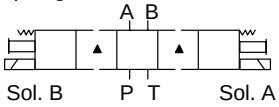
Single solenoid valves, solenoid at port A end



Single solenoid valves, solenoid at port B end



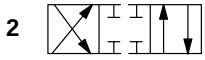
Double solenoid valves, spring centered



▲ *Transient condition only*

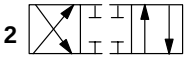
The schematics of the valve function applies to both U.S. and European valves.

DG4V-2-*N(V) valves

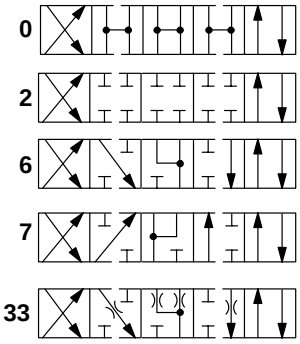


DG4V-2-*A(V) valves

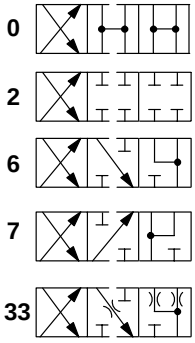
DG4V-2-*AL(V) valves



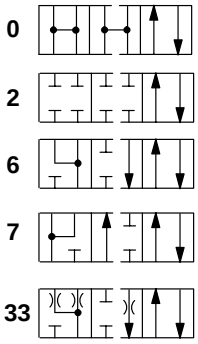
DG4V-2-*C(V) valves



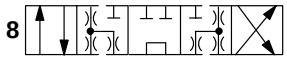
DG4V-2-*B(V) valves



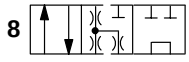
DG4V-2-*BL(V) valves



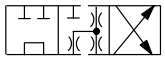
DG4V-2-8C(V) valves



DG4V-2-8BL(V) valves

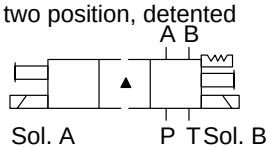


DG4V-2-8B(V) valves

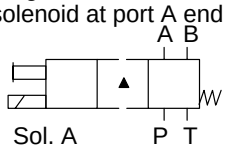


European Solenoid Standard

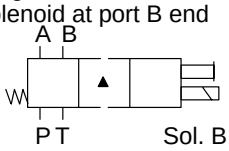
Double solenoid valves, two position, detented



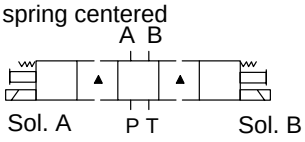
Single solenoid valves, solenoid at port A end



Single solenoid valves, solenoid at port B end



Double solenoid valves, spring centered



▲ *Transient condition only*

Model Code

DG4V–2– *(L) – (V) M – U – ** 6 – 1***

1 2 3 4 5 6 7 8 9 10

1 Model Series

D – Directional valve
G – Subplate/manifold mounted
4 – Solenoid operated
V – Pressure rating
250 bar (3600 psi)

2 Interface

2 – ISO/DIS 4401-02-02

3 Spool type

0 – Open center (all ports)
2 – Closed center (all ports)
6 – Closed center (P only)
7 – Open center (T blocked)
8 – Tandem center P to T)
33 – Closed center (bleed A & 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
N – No-spring detented

5 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.

6 Flag symbol

M – Electrical options and features

7 Coil type

U – DIN 43650 connector
KU – Mobile series (top exit lead, no connector)

8 Voltage options

(The DG4V-2 valve is available only with DC coils.)

Coils for use with DC control systems:
G – 12 V DC
H – 24 V DC
HL – 24 V DC, low power

Coils for use with AC control systems via rectifier plug (Refer to tables below).
DJ – 98 V DC (rectified 110/120V 50/60 Hz)
EJ – 196 V DC (rectified 220/240V 50/60 Hz)

9 Tank pressure rating

6 – 160 bar (2300 psi)

10 Design

Subject to change. Installation dimensions same for designs 10 thru 19.

Electrical Connectors to ISO 4400 (DIN 43650)

Order separately by part number. A flying lead connector and an Amp Jr Timer connector are also available. Contact your Vickers representative for details.

The cable entry on these plugs can be repositioned to 90° intervals by reassembly of the contact holder relative to the plug housing.

The cable entry is PG 11 for cable ⌀6-10 mm (0.24” to 0.39” dia).

Connectors w/o indicator lights

Part No.	Color	Used on solenoid coil
710775	Black	Solenoid B
710776	Gray	Solenoid A

Connectors with LED

Voltage	Part Number	
	Gray (sol. A)	Black (sol. B)
12-24V	977467	977466

Connectors with rectifier

Coil code	AC input voltage 50/60 Hz	*Connector with rectifier NO LED*		*Connector with rectifier with LED*	
		Gray (sol. A)	Black (sol. B)	Gray (sol. A)	Black (sol. B)
DJ	110/120V	873761	873760	873778	873777
EJ	220/240V	873776	873775	873780	873779

Operating Data

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

Pressure limits: P, A and B ports: using 25W solenoid coils using 12W solenoid coil type HL T port	 250 bar (3600 psi) 165 bar (2400 psi) 160 bar (2300 psi)
Flow rating: Full power (25W) coils Low power (12W) coil, type HL	 30 l/min (7.9 USgpm) 20 l/min (5.3 USgpm)
Relative duty factor	Continuous; ED = 100%
Type of protection Coils with ISO 4400 connector fitted correctly Coil winding Coil encapsulation	 IEC 947 class IP65 Class H Class F
Permissible voltage fluctuation: Maximum Minimum	 110% rated 90% rated
Typical response times at 100% rated volts measured from application/removal of voltage at conditions: flow rate P-A, B-T pressure Spool type 2C full stroke: energizing de-energizing, no suppression de-energizing, diode suppression Spool type 2C to flow opening/closing point: energizing de-energizing, no suppression de-energizing, diode suppression	 30 l/min (7.9 USgpm) 125 bar (1800 psi) 45 ms 30 ms 110 ms 25 ms 25 ms 100 ms
Power consumption, DC solenoids at rated voltage and 20°C (68°F): Type DJ, 98V Type EJ, 198V Type G, 12V Type H, 24V Type HL, 24V, low power	 25W 25W 25W 25W 12W
Hydraulic fluids	Refer to appendix
Filtration requirements	
Temperature limits	
Mass, approximate Single solenoid valve Double solenoid valve	 0,93 kg (2.1 lb.) 1,3 kg (2.9 lb.)
Installation data: Mounting attitude	 No restrictions except for no-spring detented model DG4V-2-***N.** It should be mounted with the spool axis horizontal. This model type may be affected by severe vibration or shock, especially if a solenoid is not held energized.

Operating Considerations

1. Dependent on the application and 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 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 recommended.

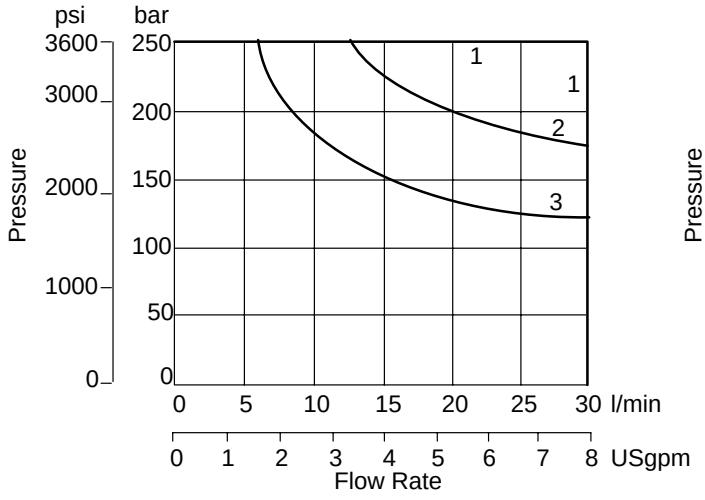
Performance Data

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

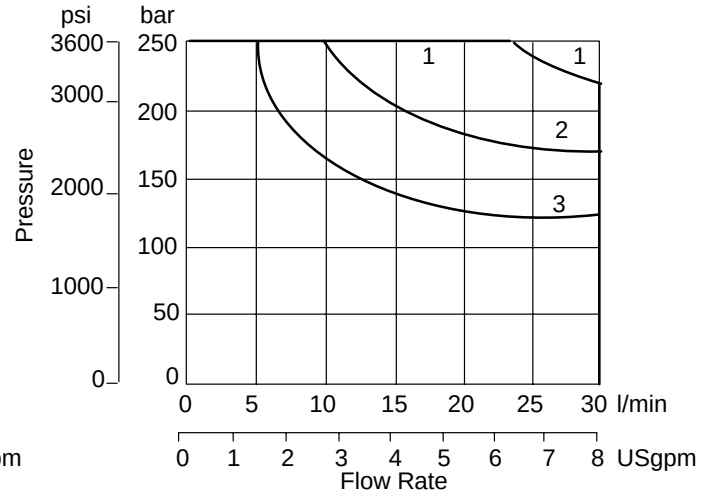
Maximum Flow Rates

Performance conditions:
Looped flow P-A plus B-T
(or P-B plus A-T).
Solenoid coil warm and operating at
90% rated voltage.

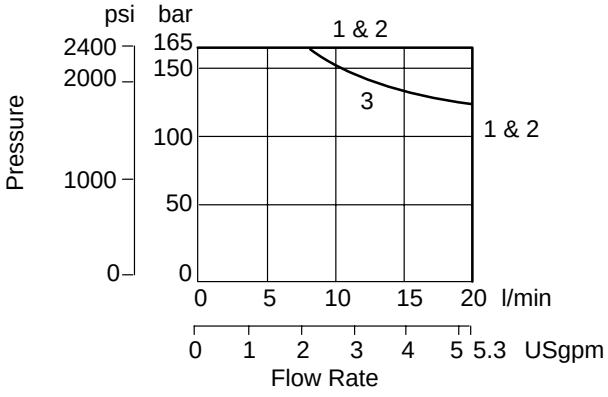
Standard, 25W coils
Types G, H



Types DJ, EJ



Low Power, 12W coil
Type HL



Spool Type	Curve Number
0, 2	1
7, 8	2
33, 6	3

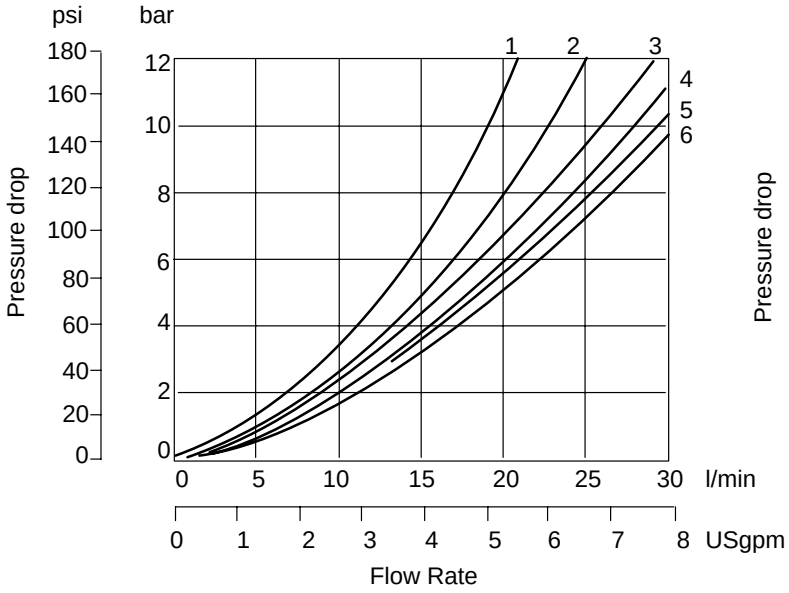
Asymmetrical Flow Rates

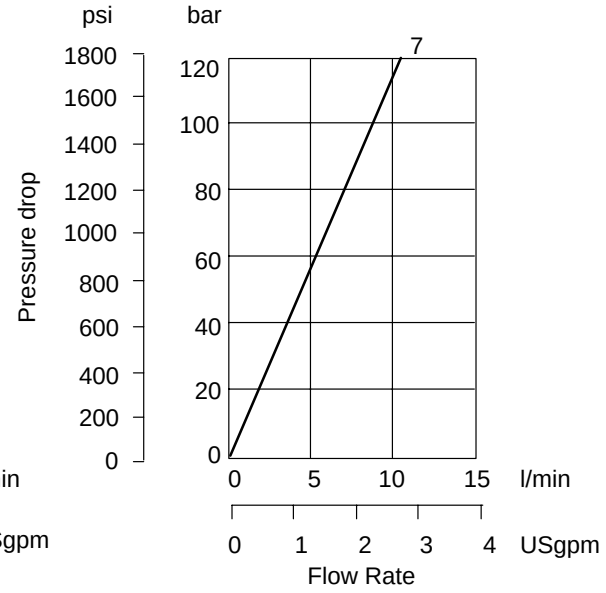
Consult Vickers with applications details if either of the following usages are required:

(a) Single flow path, i.e. P-A, P-B, A-T or B-T.

(b) When flow rates between P-A, B-T (or P-B, A-T) are significantly different, e.g. A and B connected to a cylinder having a large differential area.

Pressure Drops





Refer to appendix for other viscosities

Pressure drops in offset positions except where otherwise indicated

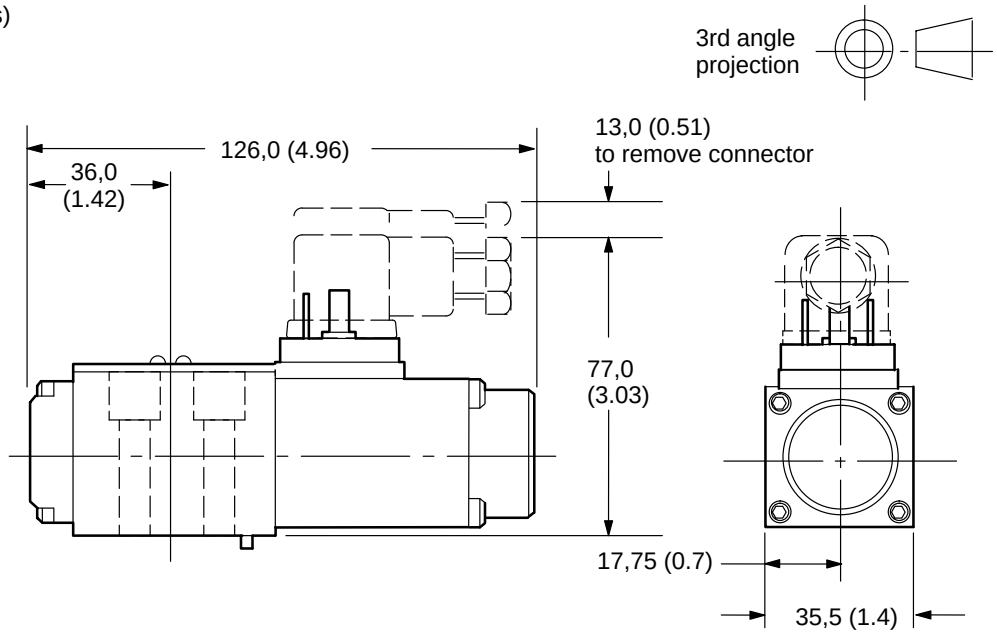
Spool/spring arrangement	**Spool positions covered**	**P to A**	**P to B**	**A to T**	**B to T**	**P to T**	**B to A or A to B**
0A(L)	Both	6	6	3	3	–	–
0B(L) & 0C	De-energized Energized	– 6	– 6	– 3	– 3	6 –	– –
2A(L)	Both	3	3	4	4	–	–
2B(L) & 2C	Energized	4	4	5	5	–	–
2N	Both	4	4	5	5	–	–
6B(L) & 6C	De-energized Energized	– 3	– 3	4 5	4 5	– –	– –
7B(L) & 7C	De-energized Energized	3 4	3 4	– 4	– 4	– –	3 –
8B(L) & 8C	All	1	1	1	1	2	–
33B(L) & 33C	De-energized Energized	– 4	– 4	7 5	7 5	– –	– –

Installation Dimensions

Dimensions shown in mm (inches)

Single solenoid models

DG4V-2-A(L)
DG4V-2-B(L) **Spring offset**

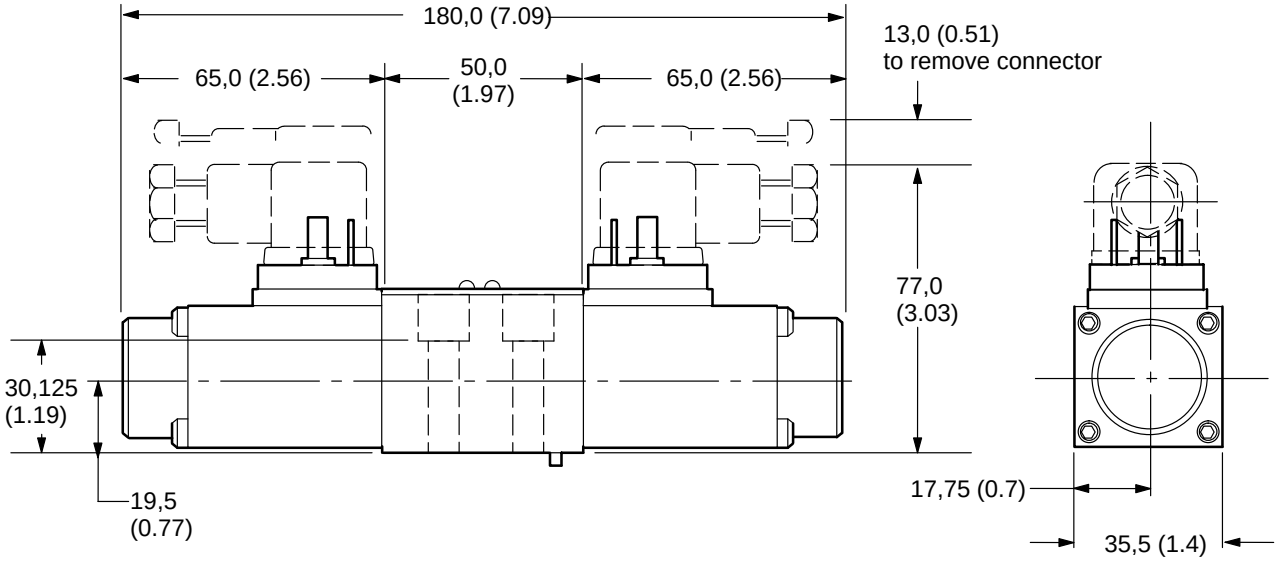


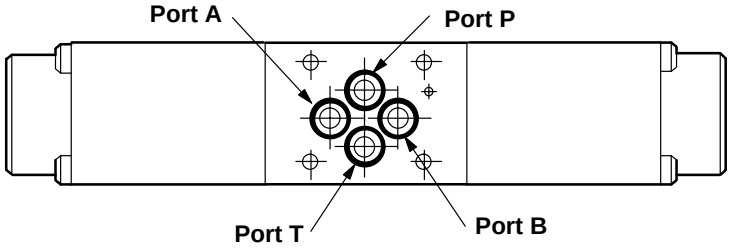
Dimensions are shown for standard connectors. For connectors with rectifiers and/ or LED this dimension varies up to 84,0 (3.31) maximum.

Refer to double solenoid models below for port designations.

Double solenoid models

DG4V-2-C Spring centered
DG4V-2-N No-spring detented





SystemStak™ Systems

Reduce System Space Requirements

SystemStak valves make compact hydraulic systems in which specific function valves are “sandwich’ mounted between a directional valve and a standard mounting surface.

The design of this range of small stacking valves is based on the well proven Vickers DGM**-3, size 3 System Stak valves, and offers opportunities for achieving very small, compact control assemblies, especially when used with multi-point subplates.

Reduce Cost

SystemStak valves eliminate intervalve piping and leak-prone tube and pipe connections. Installed cost is less than when using conventional valves.

Easy to Understand, Easy to Design

SystemStak valves have all the internal passages necessary to serve the directional valve mounted on top of them. Mounting surfaces and port patterns are to the international standard: ISO/DIS 4401-02-02.

Rugged and Reliable

Internal working parts are produced from hardened steel and mounted in free machining mild steel bodies. All seals are Viton®.Excellent reliability is ensured. Working parts on most models are accessible without removing valves from an assembled stak.

Viton® is a registered trademark of E.I. DuPont

Valve Placement

SystemStak valves are divided into two groups:

1. Valves acting in the pressure and/or tank lines (“P” and/or “T”)

DGMC	Relief valve
DGMDC	Direct check
DGMFD	Flow divider
DGMFN	Flow control
DGMFG	Pressure compensated flow control
DGMR1	Sequence valve
DGMX2	Pressure reducing

The general rule for this group is that the DGMC relief valve be placed nearest the subplate or manifold.
The DGMDC direct check valve should be placed nearest the directional control valve.
The DGMR1 sequence valve should be the farthest valve from the directional valve. The DGMR1 must be mounted directly to a subplate or manifold with a drain port, to externally drain the DGMR1 at the mounting face.

2. Valves acting in the service lines (“A” and/or “B”)

DGMC	Relief valve
DGMC2	Dual relief valve
DGMFD	Flow divider
DGMDC	Direct check
DGMPC	Pilot operated check
DGMFN	Flow control
DGMR	Counterbalance

The general rule for this group is that the DGMC system relief valve be the farthest valve from the directional valve.
When using a DGMPC with a DDMFN (meter-out), the DGMPC should be nearest the directional valve.

Easy to Understand, Easy to Design

SystemStak circuitry is best shown using slightly different symbols than those for traditional valve configurations. Each SystemStak symbol has the same basic form and size as shown in Figure 1.

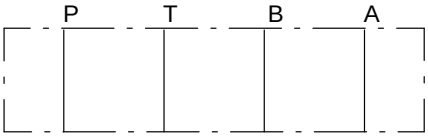


Figure 1.

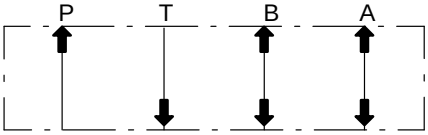


Figure 2.

For ease of understanding, remember the directions of flow for each line, and that all four flow paths pass through each valve (see Figure 2). For clarity, directional valves are drawn vertically in SystemStak circuit diagrams (see Figure 3.)

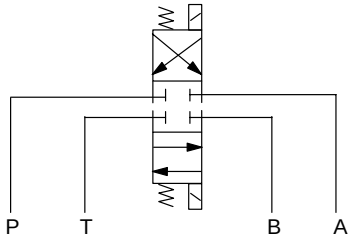


Figure 3.

Each station (valve stack) is a combination of functions. When designing and assembling SystemStak valves, care must be taken to ensure that they interact as required by stacking the functions in the correct sequence (see Figure 4). Relief valves should normally be positioned next to the mounting surface (i.e. at the bottom of the stack). When both a flow control and a pilot operated check valve are required, it is recommended that the flow control valve be between the check valve and the actuator to prevent check valve chatter.

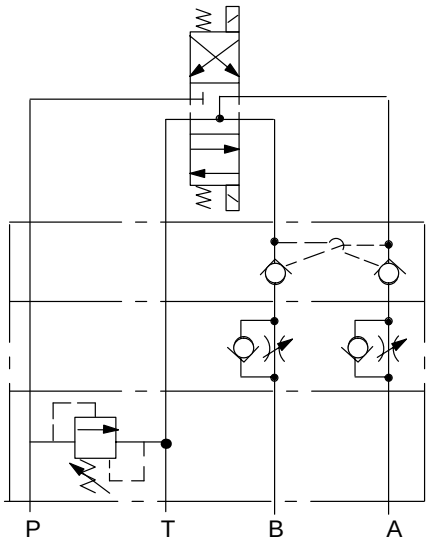


Figure 4.

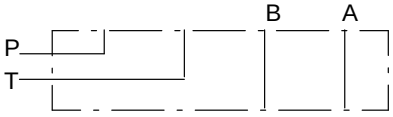


Figure 5.

A combination of directional valve, SystemStak valve(s) and subplate/ manifold block (Figure 5 single station subplate and Figure 6 multi station manifold) completes the assembly.

Figure 7 represents a complete SystemStak system, showing typical use of functions available from this range. The circuit diagram also shows the use of a tapping plate for accessing line pressure readings, and a blanking plate to close off an unused station of a multi-station manifold.

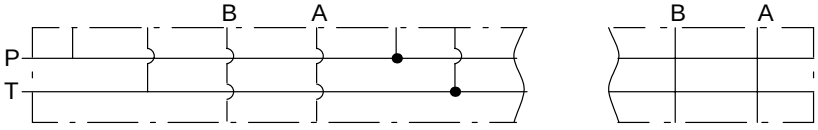


Figure 6.

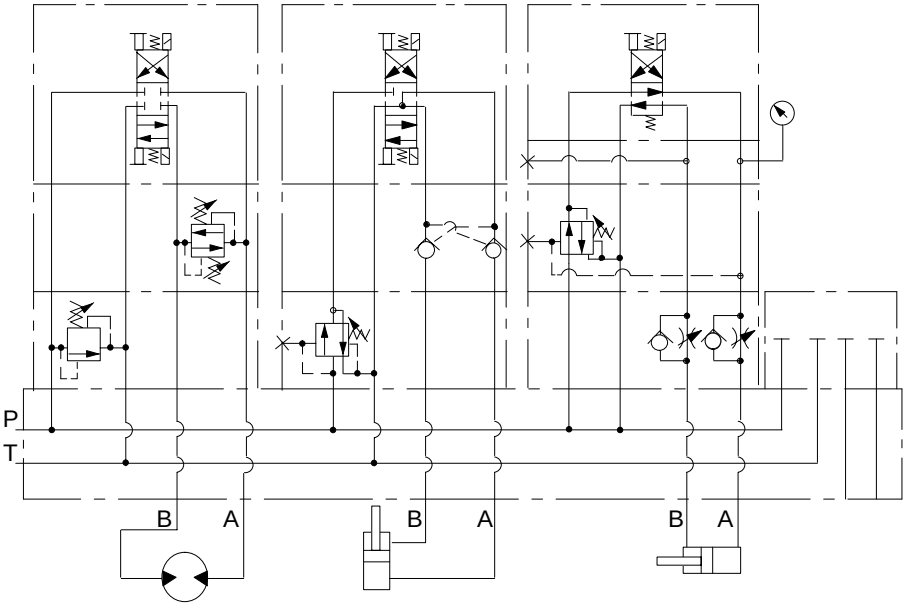


Figure 7.

SystemStak™ Direct Relief Valves

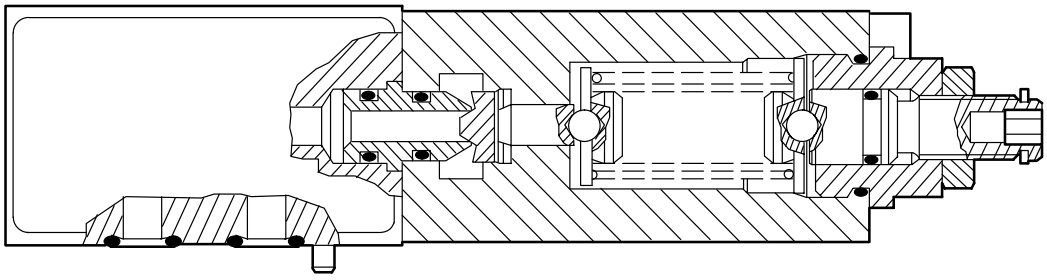
DGMC-2-1* series
DGMC2-2-1* series

General description

These adjustable direct-acting pressure relief valves limit the maximum pressure in the line(s) controlled by the integral relief valve elements.

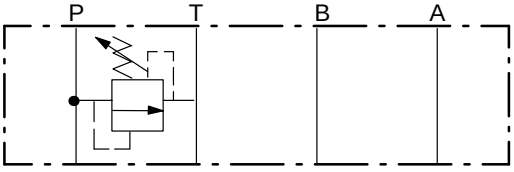
Pressure adjustment options are screw/locknut, handknob and micrometer type with keylock.

Typical Sectional View

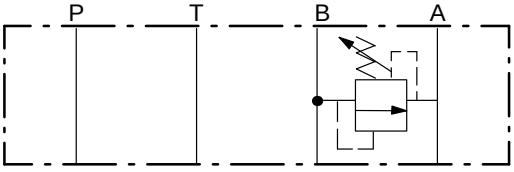


Functional Symbols

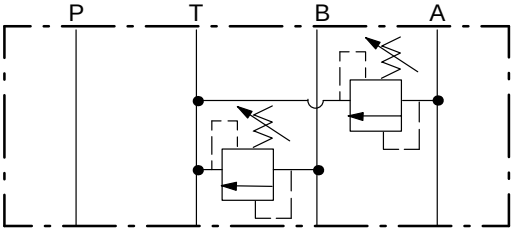
DGMC-2-PT-**



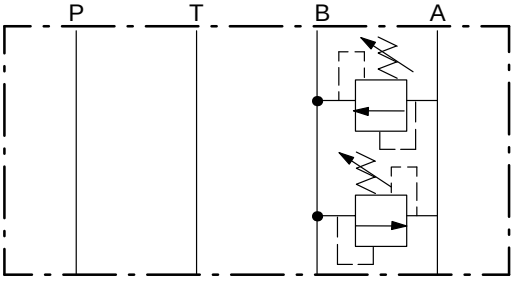
DGMC-2-BA-**



DGMC-2-AT-**-BT-**



DGMC-2-AB-**-BA-**



Model Code

DGM C (2) – 2 – ** – * * (–B* – * *) – 1*

1 2 3 4 5 6 7 8 9 10

1 Model Series

Manifold or gasket mounted

2 Relief valve

C – Pressure relief (single)
C2 – Dual relief

3 Interface

2 – ISO/DIS 4401-02-02

4 First function

Single relief, or first line of dual models

Code	Pressure limited in	Discharge into	Usage
PT	P	T	Single
AB	A	B	Single or dual with BA
BA	B	A	Single
AT	A	T	Single or dual with BT
BT	B	T	Single

5 Pressure adjustment range

B – 2 – 40 bar (29-580 psi)
C – 30 – 100 bar (435-1450 psi)
F – 70 – 160 bar (1000-2300 psi)
G – 120– 250 bar (1740-3600 psi)

6 Adjustment type

H – Handknob
K – Micrometer with keylock
W – Screw and locknut

7 Second function

(Omit for single line models)

Code	Pressure limited in	Discharge into	Usage
BA	B	A	Dual with AB
BT	B	T	Dual with AT

8 Pressure adjustment range

B – 2 – 40 bar (29-580 psi)
C – 30 – 100 bar (435-1450 psi)
F – 70 – 160 bar (1000-2300 psi)
G – 120– 250 bar (1740-3600 psi)

9 Adjustment type

H – Handknob
K – Micrometer with keylock
W – Screw and locknut

10 Design

Subject to change. Installation dimensions unchanged for design numbers 10 thru 19.

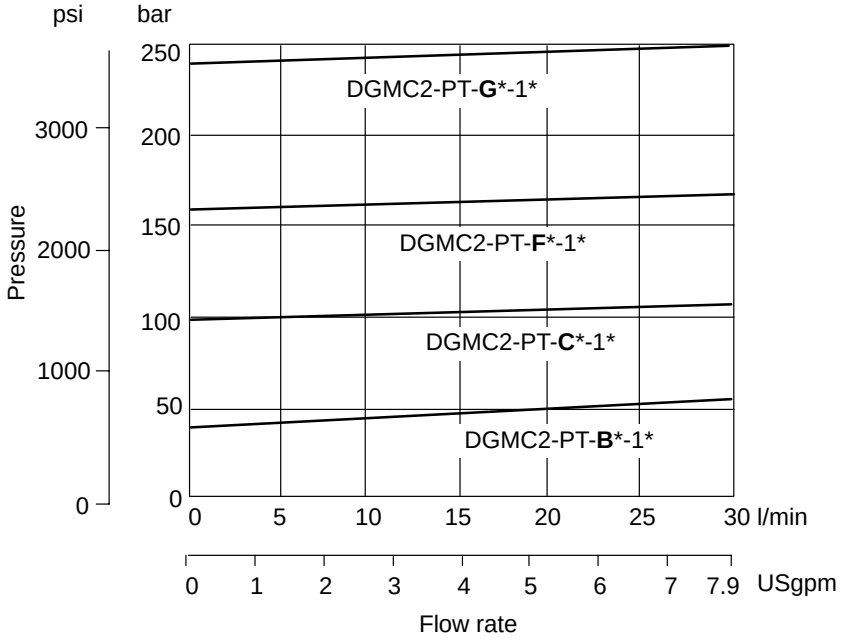
Operating Data

Maximum flow rate	30 l/min (7.9 USgpm)
Maximum operating pressure	250 bar (3600 psi)
Hydraulic fluids	Refer to appendix
Filtration requirements	
Temperature limits	
Mass, approximate DGMC DGMC2	 0,78 kg (1.7 lb.) 1,21 kg (2.7 lb.)
Mounting attitude	No restrictions.

Performance Data

Pressure Override

Typical performance for **PT** models at maximum pressure settings with mineral oil at 21 cSt (102 SUS) and at 50°C (122°F).



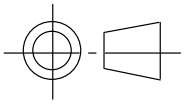
For other viscosities refer to appendix.

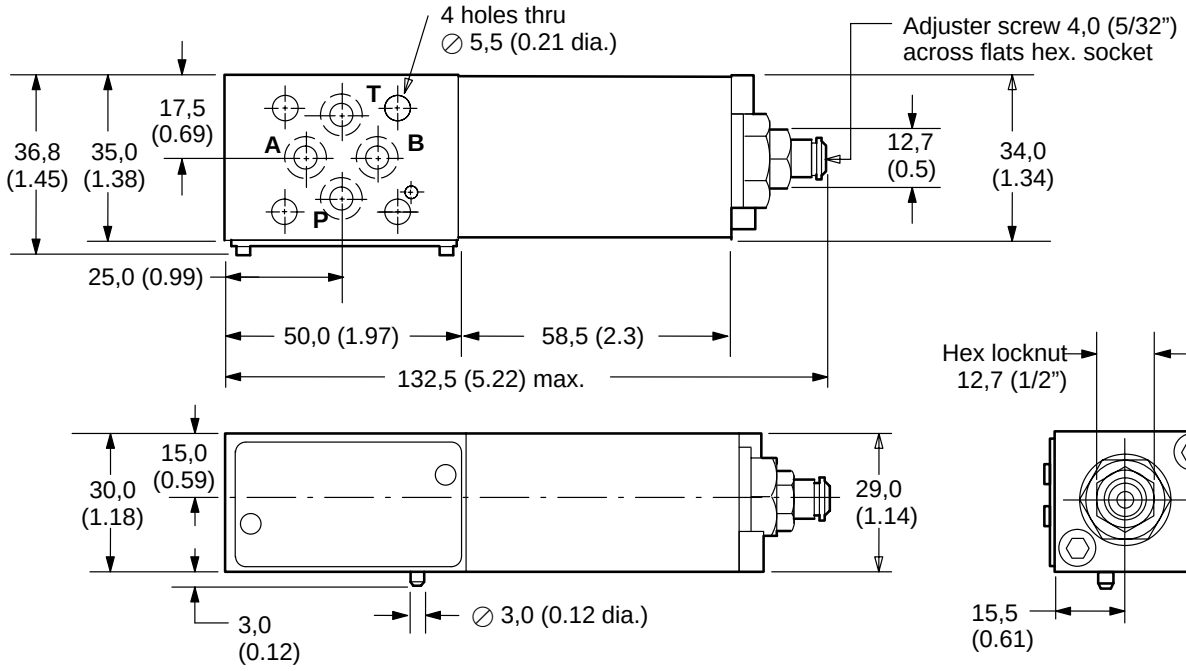
Installation Dimensions

Dimensions shown in mm (inches)

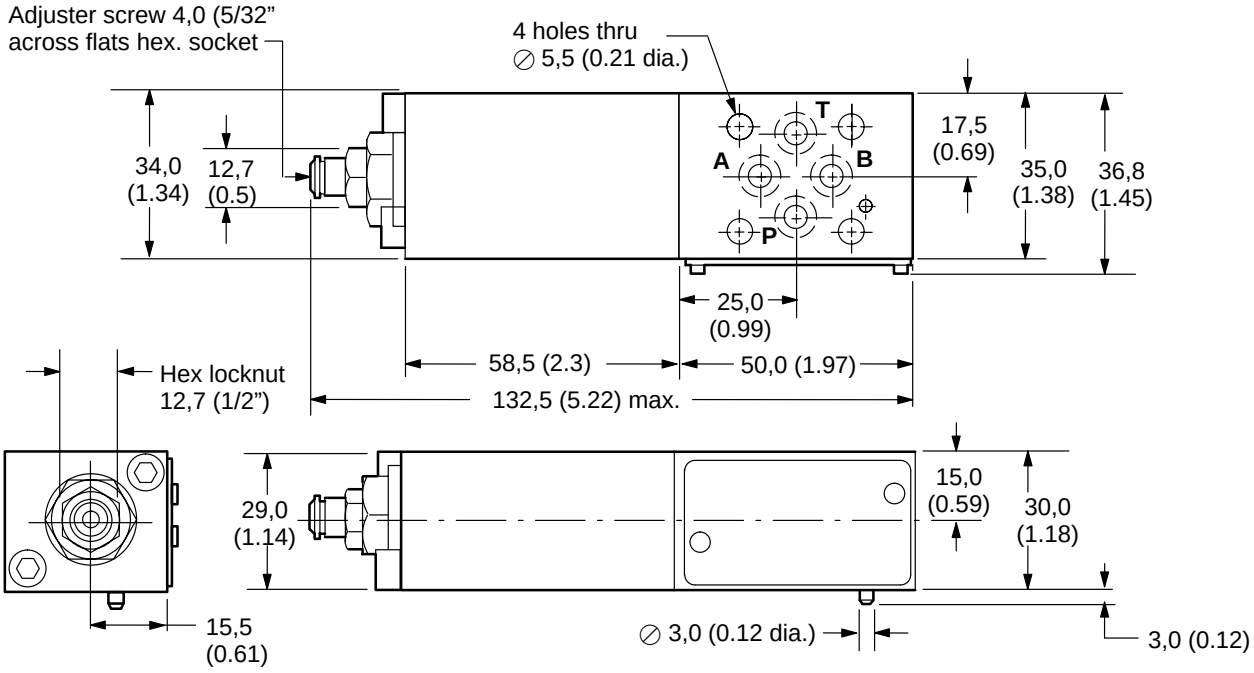
DGMC-2-PT-*W-1*
DGMC-2-BT-*W-1*
DGMC-2-BA-*W-1*

3rd angle projection





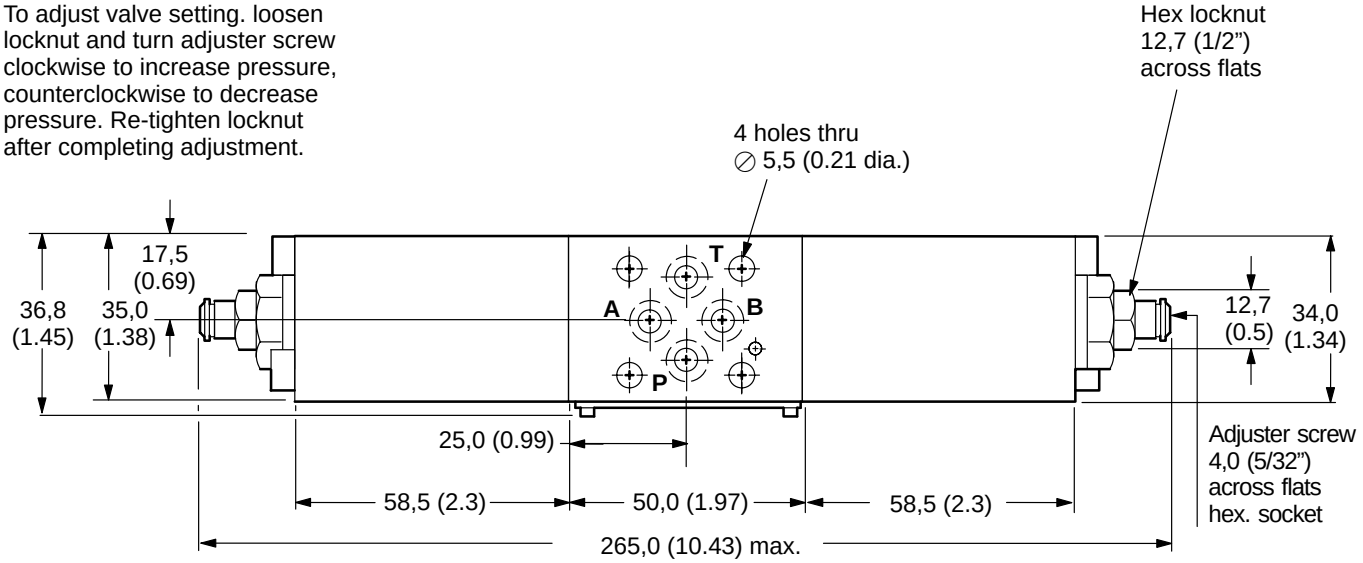
DGMC-2-AT-*W-1*
DGMC-2-AB-*W-1*

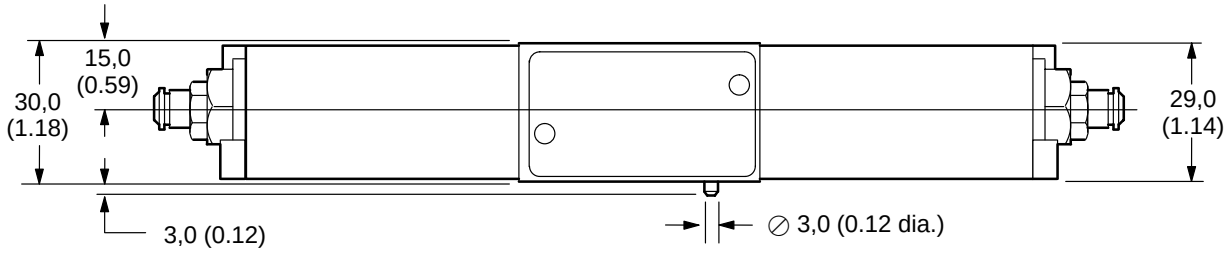


Dimensions shown in mm (inches)

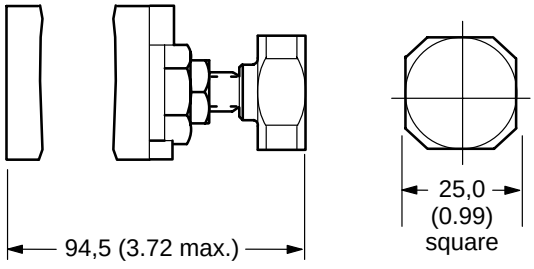
DGMC2-2-AB-*W-BA-*W-1*
DGMC2-2-AT-*W-BT-*W-1*

W adjuster (Shown)
To adjust valve setting. loosen locknut and turn adjuster screw clockwise to increase pressure, counterclockwise to decrease pressure. Re-tighten locknut after completing adjustment.

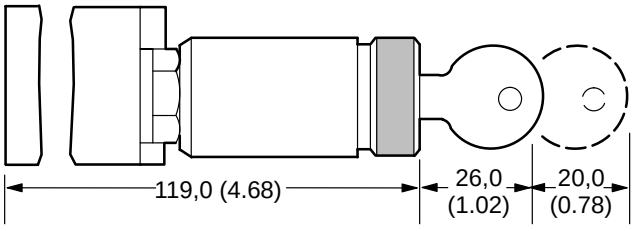




H adjuster
To adjust valve setting. loosen locknut and turn knob clockwise to increase pressure, counterclockwise to decrease pressure. Re-tighten locknut after completing adjustment.



K adjuster
Key must be inserted and turned to allow valve setting to be adjusted. Turn knob clockwise to increase pressure, counterclockwise to decrease pressure. When key is removed, adjustment mechanism can be freely turned without changing valve setting.



SystemStak™ Pilot Operated Relief Valve

DGMC-2-PT-CH-10 EN81

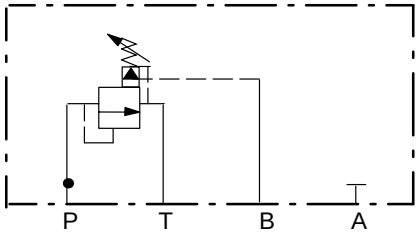
General description

This adjustable direct-acting pressure relief valve limits the maximum pressure in the line controlled by the integral relief valve element.

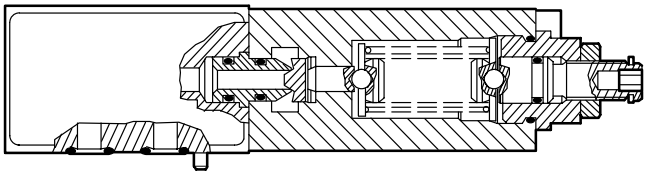
Pressure adjustment is by handknob or by remote pilot pressure.

Functional Symbols

DGMC-2-PT-CH-10



Typical Sectional View



Model Code

DGM C – 2 – PT – C H – 10 – EN81

1 2 3 4 5 6 7 8

1 Model Series

Manifold or gasket mounted

2 Relief valve

C – Pressure relief (single)

3 Interface

2 – ISO/DIS 4401-02-02

4 Function

Single relief

Code	Pressure limited in	Discharge into	Usage
PT	P	T	Single

5 Pressure adjustment range

C – 30 – 100 bar (435-1450 psi)

6 Adjustment type

H – Handknob

7 Design

Subject to change. Installation dimensions unchanged for design numbers 10 thru 19.

8 Special feature

EN81 – Remote pilot option

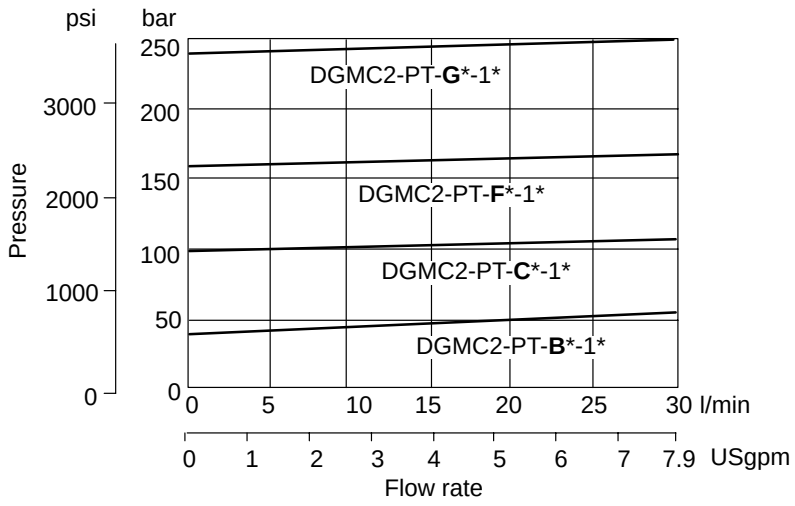
Operating Data

Maximum flow rate	30 l/min (7.9 USgpm)
Maximum operating pressure	250 bar (3600 psi)
Hydraulic fluids	Refer to appendix
Filtration requirements	
Temperature limits	
Mass, approximate	0,78 kg (1.7 lb.)
Mounting attitude	No restrictions.

Performance Data

Typical performance with mineral oil at
21 cSt (102 SUS) and at 50°C (122°F).

For other viscosities refer to appendix.



Performance Characteristic

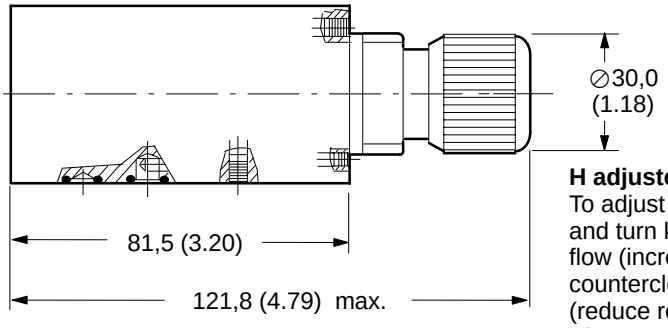
Flow rate versus pressure for number
of turns of adjuster from fully closed position.

Pressure Override

Free flow through check
valve with throttle closed and open.

Installation Dimensions

Single Function
DGMC-2-PT-CH-10 EN81
Dimensions shown
in mm (inches)



H adjuster
To adjust valve setting. loosen locknut and turn knob clockwise to decrease flow (increase restriction), counterclockwise to increase flow (reduce restriction). Re-tighten locknut after completing adjustment.

Counterbalance, Sequence and Pressure Reducing

DGMR(1)-2-1* series
DGMX2-2-1* series

General description

These single stage valves operate by the application of pressure on the end of the valve spool, acting against a spring which is loaded by means of the manual adjustment mechanism.

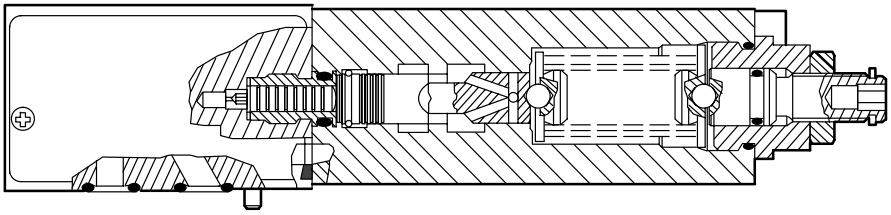
In the counterbalance and sequence valves, the spool is offset by the spring such that flow cannot pass through the valve. When the force exerted by the pilot pressure on the spool end exceeds the force of the main spring, the spool is moved to allow flow through the valve.

In the pressure reducing valve, the flow path is normally open and is closed as the pilot pressure exceeds the manual setting of the valve. Excessive pressure in the reduced pressure line is prevented by a pressure relieving function.

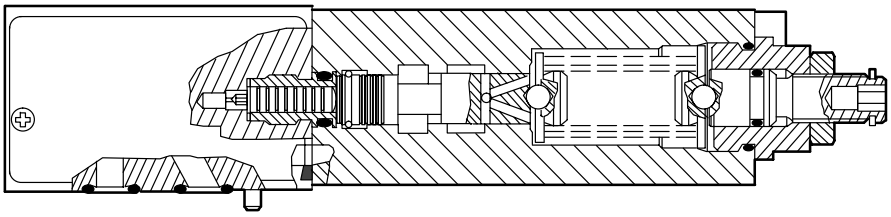
Pressure adjustment options are screw/locknut, handknob and micrometer type with keylock.

Typical Sectional Views

DGMX2-2-P*-*W-10

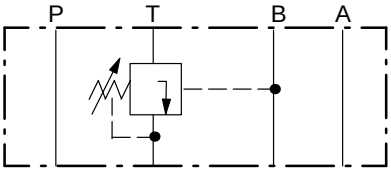


DGMR1-2-PP-*W-10

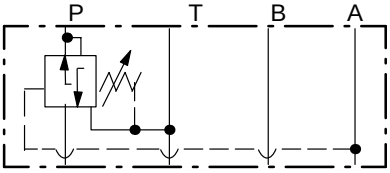


Functional Symbols

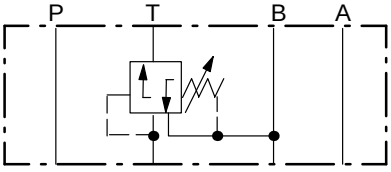
DGMR-2-TB



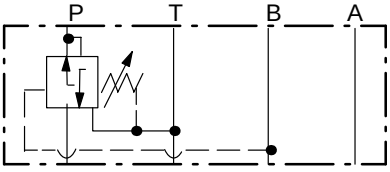
DGMX2-2-PA



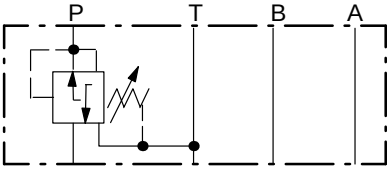
DGMR1-2-PP



DGMX2-2-PB



DGMX2-2-PP



Model Code

DGM ** – 2 – ** – * * – 1*

1 2 3 4 5 6 7

1 Model Series

Manifold or gasket mounted

2 TYPE

R – Counterbalance
R1– Sequence
X2 – Pressure reducing

3 Interface

2 – ISO/DIS 4401-02-02

4 Function ports

DGMR models only:
TB – Counterbalance control function in “T” port, controlled by pressure in “B” port.

DGMR1 models only:
PP – Sequence control in “P” port, controlled by pressure in “P” port

DGMX2 models only:
PA – Pressure reducing function in line P, piloted from A
PB – Pressure reducing function in line P, piloted from B
PP – Pressure reducing function in line P, piloted from P

5 Pressure adjustment range

A – 2 – 16 bar (29-232 psi)
B – 2 – 40 bar (29-580 psi)
C – 30 – 100 bar (435-1450 psi)
F – 70 – 160 bar (1000-2300 psi)
G – 120– 250 bar (1740-3600 psi)

6 Adjustment type

H – Handknob
K – Micrometer with keylock
W – Screw and locknut

7 Design

Subject to change. Installation dimensions unchanged for design numbers 10 thru 19.

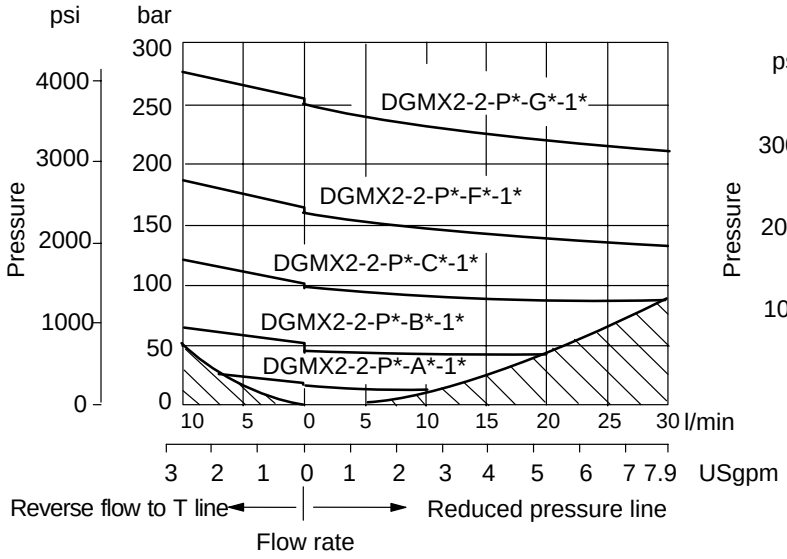
Operating Data

Maximum flow rate	30 l/min (7.9 USgpm)
Maximum operating pressure	250 bar (3600 psi)
Hydraulic fluids	Refer to appendix
Filtration requirements	
Temperature limits	
Mass, approximate (all models)	0,87 kg (1.9 lb.)
Mounting attitude	No restrictions.

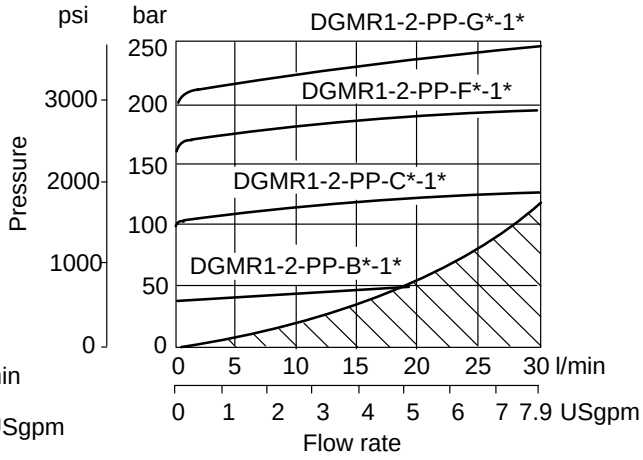
Performance Data

Typical performance with mineral oil at
21 cSt (102 SUS) and at 50°C (122°F).

DGMX2-2-P*

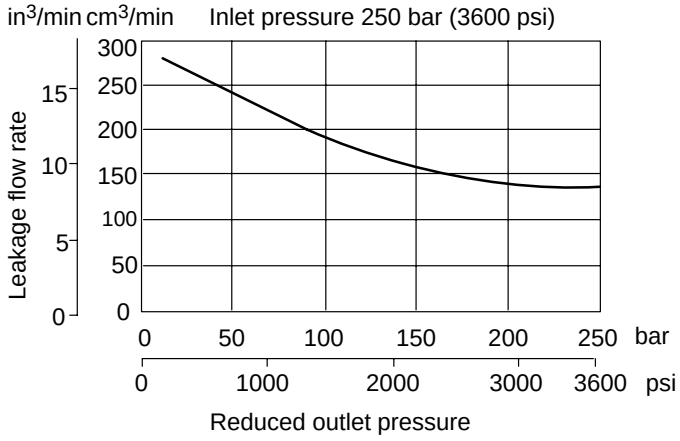


DGMR1-2-PP



Note: Valves will not function at pressure/flow values in shaded area.

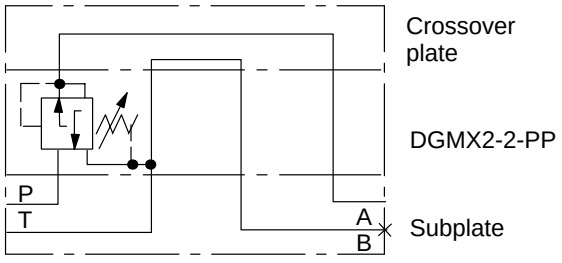
Typical leakage flow from reduced pressure line into T at “dead-head” condition (i.e. no flow required at reduced pressure outlet). This leakage flow must be provided at the inlet line P in order to maintain the reduced outlet pressure.



For other viscosities refer to appendix

Note that the effective reduced pressure is the sum of the valve adjustment and any back pressure in line T. The effect is illustrated below.

Typical installation

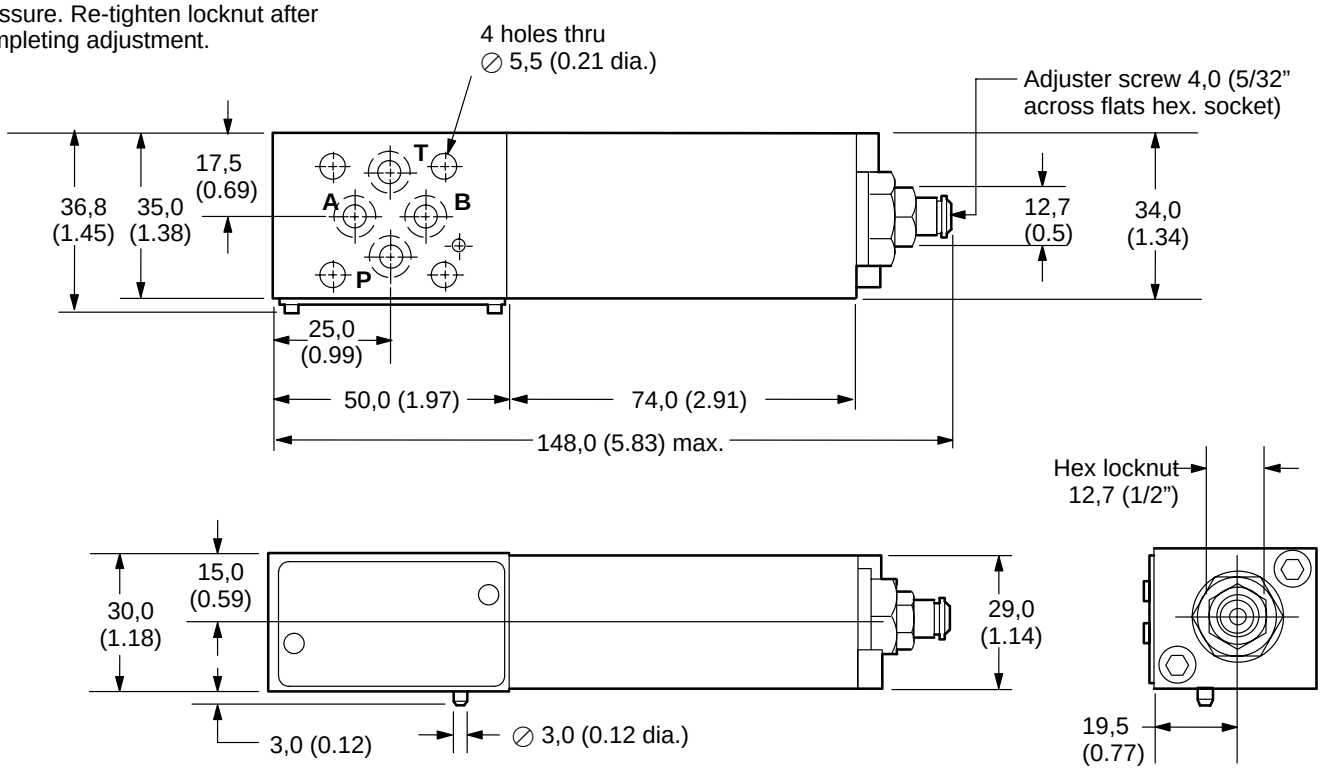


Installation Dimensions

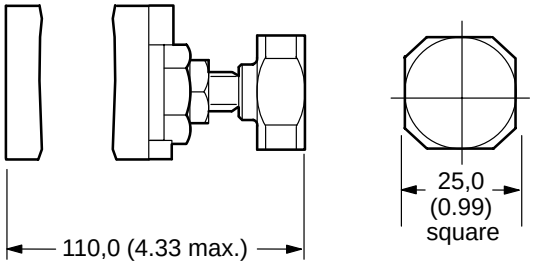
Dimensions shown in mm (inches)

DGMR-TB-*W-1*
DGMR1-PP-*W-1*
DGMX2-P*-*W-1*

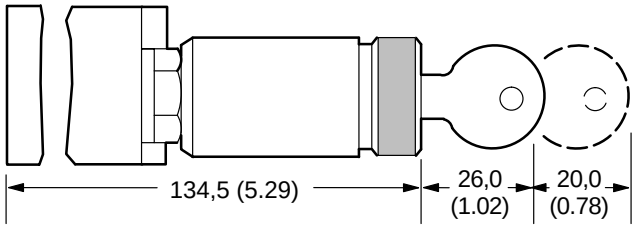
W adjuster (Shown)
To adjust valve setting. loosen locknut and turn adjuster screw clockwise to increase pressure, counterclockwise to decrease pressure. Re-tighten locknut after completing adjustment.



H adjuster
To adjust valve setting. loosen locknut and turn knob clockwise to increase pressure setting, counterclockwise to decrease pressure setting. Re-tighten locknut after completing adjustment.



K adjuster
Key must be inserted and turned to allow valve setting to be adjusted. Turn knob clockwise to increase pressure setting, counterclockwise to decrease pressure setting. When key is removed, adjustment mechanism can be freely turned without changing valve setting.



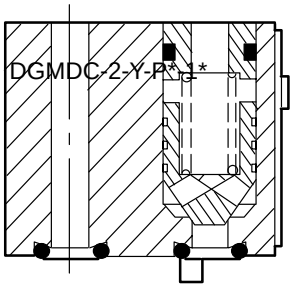
SystemStak™ Direct Check Valves

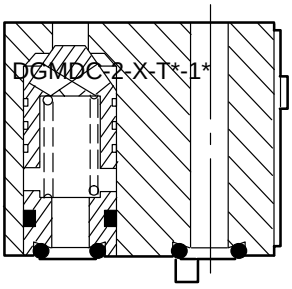
DGMDC-2, 1* series

General description

These valves allow free flow in one direction in the line in which the check valve element is located, i.e. either line P or line T. Flow in the opposite direction is not possible.

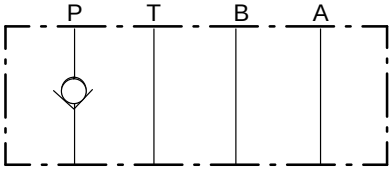
Typical Sectional Views



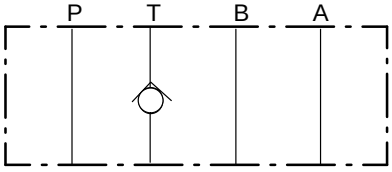


Functional Symbols

DGMDC-2-Y-P*



DGMDC-2-X-T*



Model Code

DGM DC – 2 – * – * * – 1*

1 2 3 4 5 6

1 **Model Series**

Manifold or gasket mounted

2 **Type**

DC – Direct check

3 **Interface**

2 – ISO/DIS 4401-02-02

4 **Direction of flow and check location**

X-T – Free flow away from actuator, in line T

Y-P – Free flow towards actuator, in line P

5 **Check valve cracking pressure**

K – 1 bar (14.5 psi)

M – 2,5 bar (36 psi)

6 **Design**

Subject to change. Installation dimensions unchanged for design numbers 10 thru 19.

Operating Data

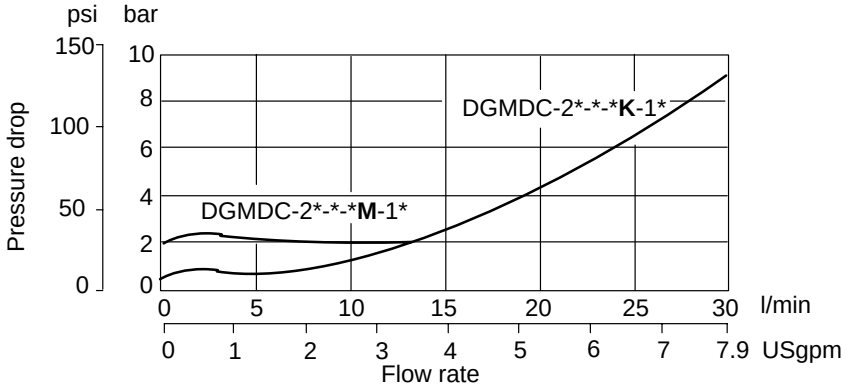
Maximum flow rate	30 l/min (7.9 USgpm)
Maximum operating pressure	250 bar (3600 psi)
Hydraulic fluids	Refer to appendix
Filtration requirements	
Temperature limits	
Mass, approximate	0,35 kg (0.77 lb.)
Mounting attitude	No restrictions

Performance Data

Typical performance with mineral oil at
21 cSt (102 SUS) and at 50°C (122°F).

Pressure Drop

Free flow through check valve



Internal Leakage Across Closed Check Valve

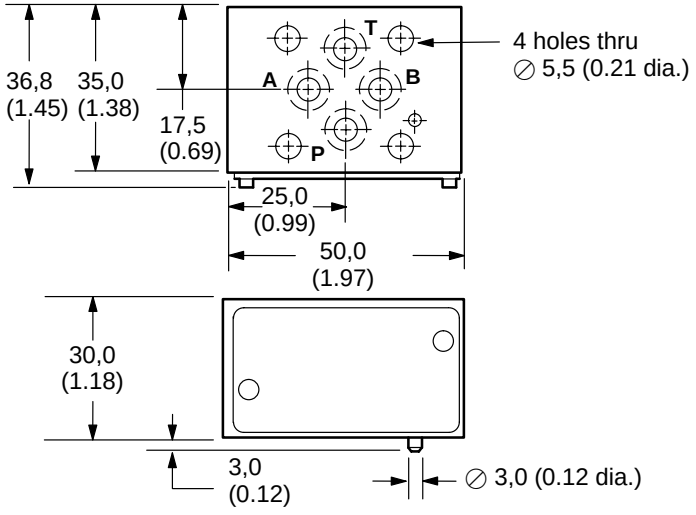
Less than 0,25 cm^3/min
(0.015 in^3/min)
at 250 bar (3600 psi).

For other viscosities refer to appendix

Installation Dimensions

Dimensions shown in mm (inches)

DGMDC-2-Y-P*-1*
DGMDC-2-X-T*-1*



SystemStak™ Pilot Operated Check Valves

DGMPC-2-1* series

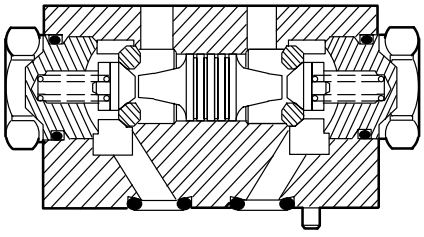
General description

These valves provide pilot operated check functions in one or both service lines (A or B), the operating pilot supply coming from the opposite service line. Thus with pressure in one service line the check valve in the other service line will be open (subject to system/actuator pressures being correct for the valve area ratios).

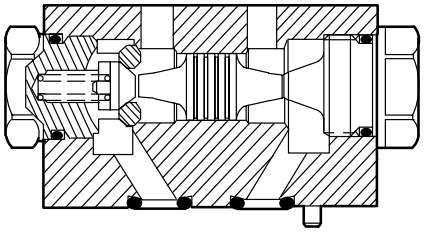
The area ratio of pilot piston to check valve seat is 3,3:1.

Typical Sectional Views

DGMPC-2 Dual Function

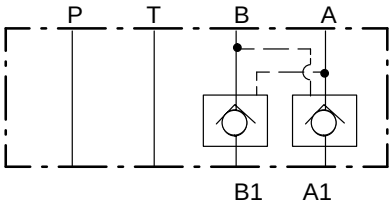


DGMPC-2 Single Function

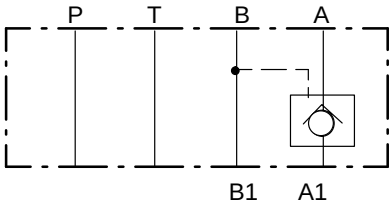


Functional Symbols

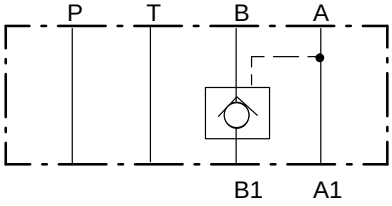
DGMPC-2-AB*-BA*-1*



DGMPC-2-AB*-1*



DGMPC-2-BA*-1*



Model Code

DGM PC – 2 – ** * (– ** *) – 1*

1 2 3 4 5 6 7 8

1 Model Series

Manifold or gasket mounted

2 Type

PC – Pilot operated check

3 Interface

2 – ISO/DIS 4401-02-02

4 Function

AB – Check in line A, pilot operated from line B

BA – Check in line B, pilot operated from line A (single function model only)

5 Check valve cracking pressure

K – 1 bar (14.5 psi)
M – 2,5 bar (36 psi)

6 Second function of dual models

BA – Check in line B, pilot operated from line A

Omit for single function models

7 Check valve cracking pressure (Second function of dual models)

K – 1 bar (14.5 psi)
M – 2,5 bar (36 psi)

8 Design

Subject to change. Installation dimensions unchanged for design numbers 10 thru 19.

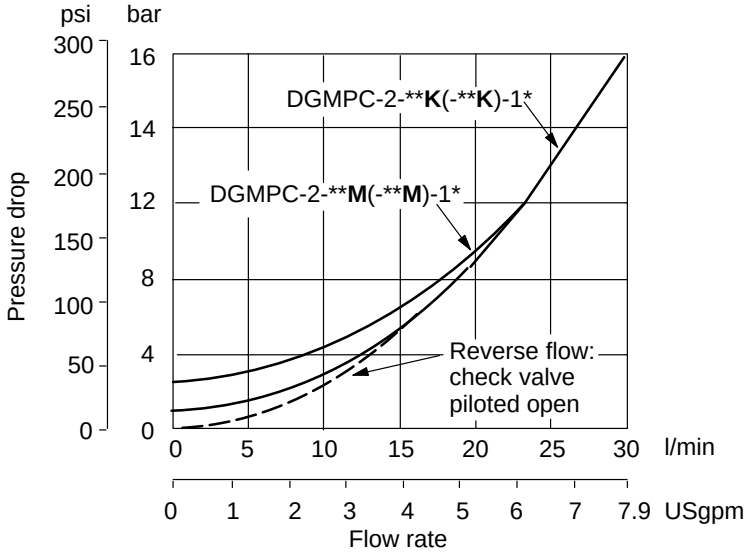
Operating Data

Maximum flow rate	30 l/min (7.9 USgpm)
Maximum operating pressure	250 bar (3600 psi)
Hydraulic fluids	Refer to appendix
Filtration requirements	
Temperature limits	
Mass, approximate	0,39 kg (0.86 lb.)
Mounting attitude	No restrictions.

Performance Data

Typical performance with mineral oil at
21 cSt (102 SUS) and at 50°C (122°F).

Pressure Drop



For other viscosities refer to appendix

Pilot Pressures

Area ratio, pilot piston to check valve = 3,3:1
Formula for calculating pilot pressure
required to open valve:

To open valve in line A: Pressure at B1 = $\frac{p_A + p_C - p_{A1}}{\text{Area ratio factor}} + p_{A1}$

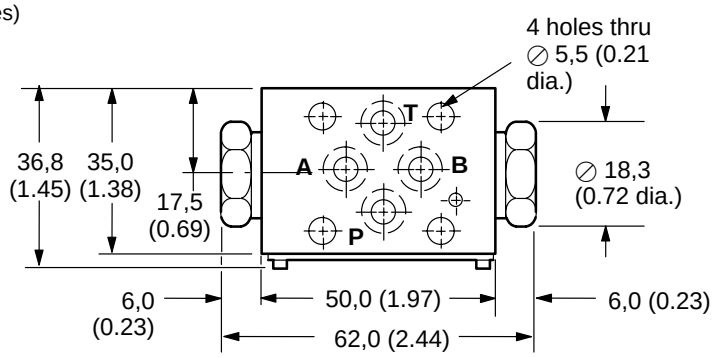
To open valve in line B: Pressure at A1 = $\frac{p_B + p_C - p_{B1}}{\text{Area ratio factor}} + p_{B1}$

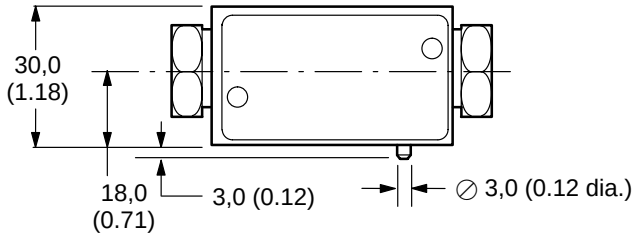
Where
p_A = Pressure at A
p_c = Cracking pressure
p_{A1} = Pressure at A1
p_B = Pressure at B
p_{B1} = Pressure at B1
A =
B =
A1 =
B1 =
} Service line location; Refer to functional symbols.

Installation Dimensions

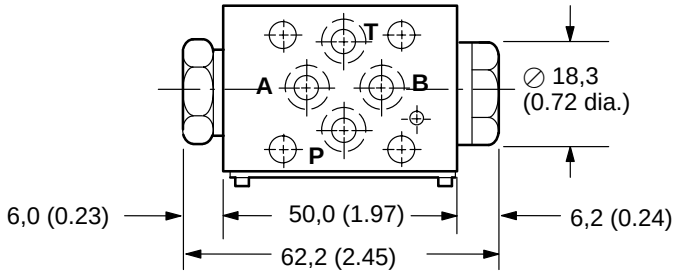
Dual Function Models
DGMPC-2-AB*-BA*-1*

Dimensions shown in mm (inches)

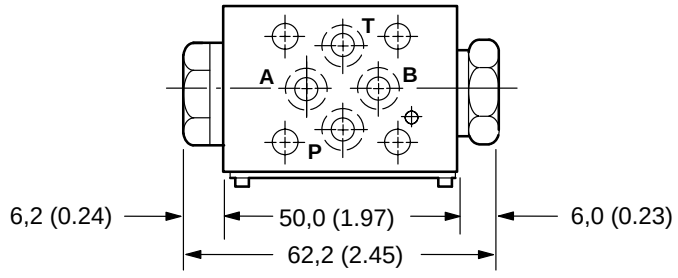




Single Function Models
DGMPC-2-AB*-1*



Single Function Models
DGMPC-2-BA*-1*



DGMFG-2-Y-PH-10 series

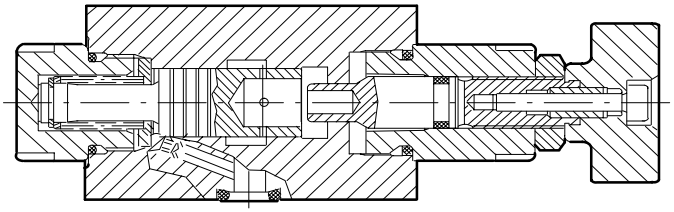
General description

These valves regulate flow by means of an adjustable orifice. Flow through the valve is pressure compensated.

Currently this function is available in a single line version, without check valve.

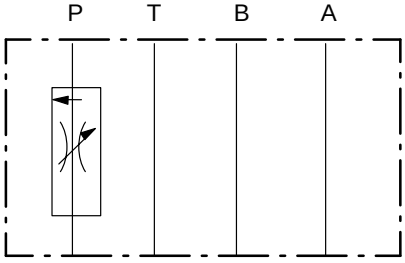
Adjustment option is only available with handknob. Please contact your Vickers representative for availability of other options.

Typical Sectional View



Functional Symbols

DGMFG-2-Y-PH-10



Model Code

DGMFG - 2 - Y - P H - 10

1 2 3 4 5 6

1 Model series

Directional valve, gasket mounted, pressure compensated flow control

2 Interface

ISO/DIS 4401-02-02

3 Direction of flow control (with respect to machine actuator)

Y – Meter-out control

4 Location of control function (single model)

P – Line P (single model)

5 Adjustment type

H – Handknob

6 Design number

Operating Data

Maximum flow rate	30 l/min (7.9 USgpm)
Maximum operating pressure	250 bar (3600 psi)
Hydraulic fluids	Refer to appendix
Filtration requirements	
Temperature limits	
Mass, approximate	0,42 kg (0.93 lb.)
Mounting attitude	No restrictions

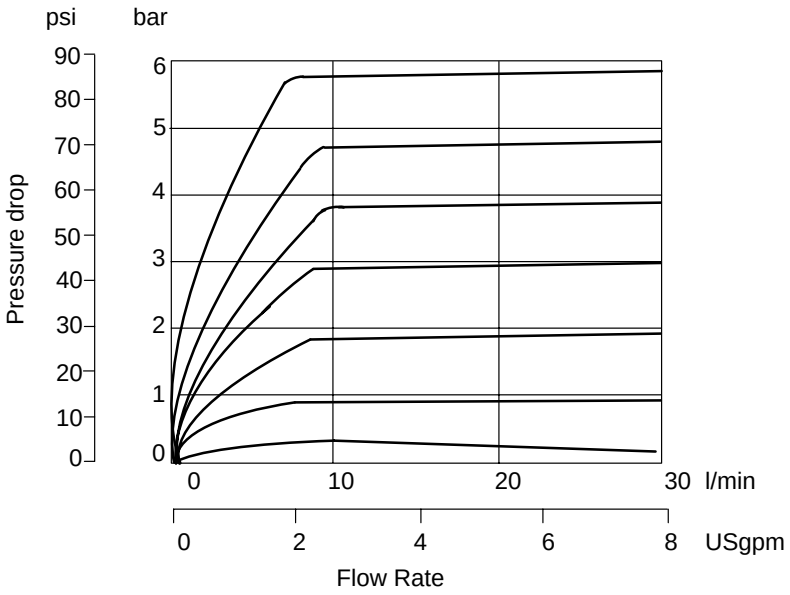
Performance Data

Typical performance with mineral oil at
21 cSt (102 SUS) and at 50°C (122°F).

Control characteristics

Flow rate versus pressure Drop

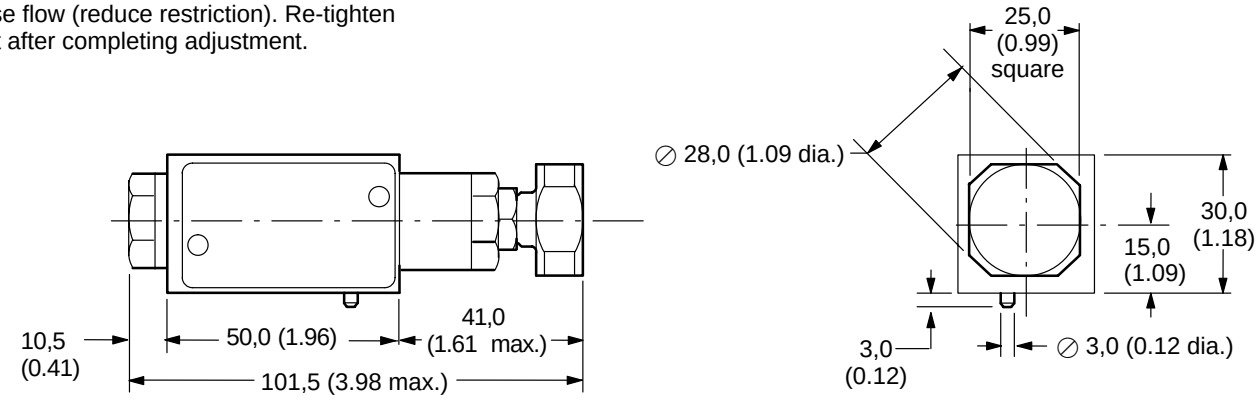
For other viscosities refer to appendix.



Installation Dimensions

Dimensions shown in mm (inches)
H adjuster (shown)
To adjust valve setting. loosen locknut and turn knob clockwise to decrease flow (increase restriction), counterclockwise to increase flow (reduce restriction). Re-tighten locknut after completing adjustment.

Single Function
DGMG-2-Y-PH-10



SystemStak™ Flow Regulator Valves

DGMFN-2-1* series

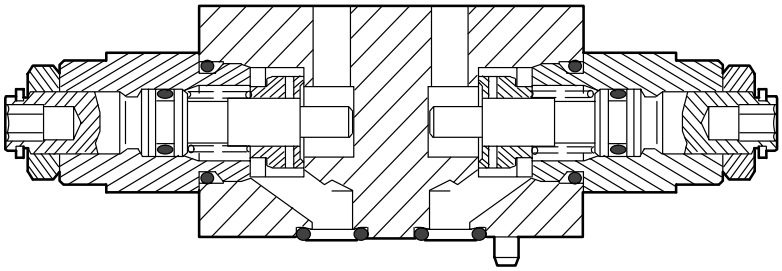
General description

These valves regulate flow by means of an adjustable orifice. Flow through the valve at any setting of the orifice is dependent upon pressure drop.

Dual service-line models with integral non-return valves provide for meter-in or meter-out control; single line versions of these are available. Additionally there is a single line model, without check valve, for controlling flow in line P.

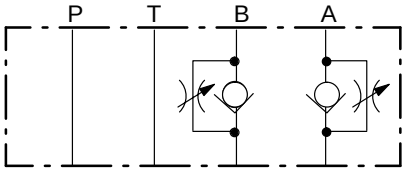
Adjustment options are screw/locknut, handknob or micrometer with keylock.

Typical Sectional View

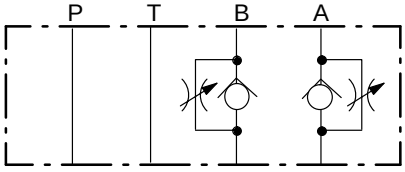


Functional Symbols

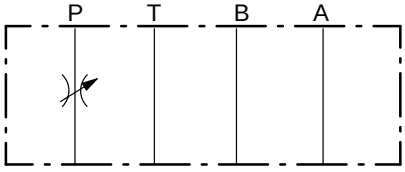
DGMFN-2-X-A*-B*



DGMFN-2-Y-A*-B*



DGMFN-2-Z-P*



Model Code

DGM FN – 2 – * – * * (– * *) – 1*

1 2 3 4 5 6 7 8 9

1 Model Series

Manifold or gasket mounted

2 Type

FN – Flow restrictor

3 Interface

2 – ISO/DIS 4401-02-02

4 Direction of flow control (with respect to machine actuator)

X – Meter-in control, applicable to lines A and B.
Y – Meter-out control, applicable to lines A and B.
Z – Meter-in control, line P only.

5 Location of control function (single model or first line of dual model)

A – Line A (single model or first line of dual model)
B – Line B (single model only)
P – Line P (single model only)

6 Adjustment type

H – Handknob
K – Micrometer with keylock
W – Screw and locknut

7 Control in second line

B – Line B (use for dual models with "A" specified at 5)
Omit for single function models

8 Adjustment type (Omit for single models)

H – Handknob
K – Micrometer with keylock
W – Screw and locknut

9 Design

Subject to change. Installation dimensions unchanged for design numbers 10 thru 19.

Operating Data

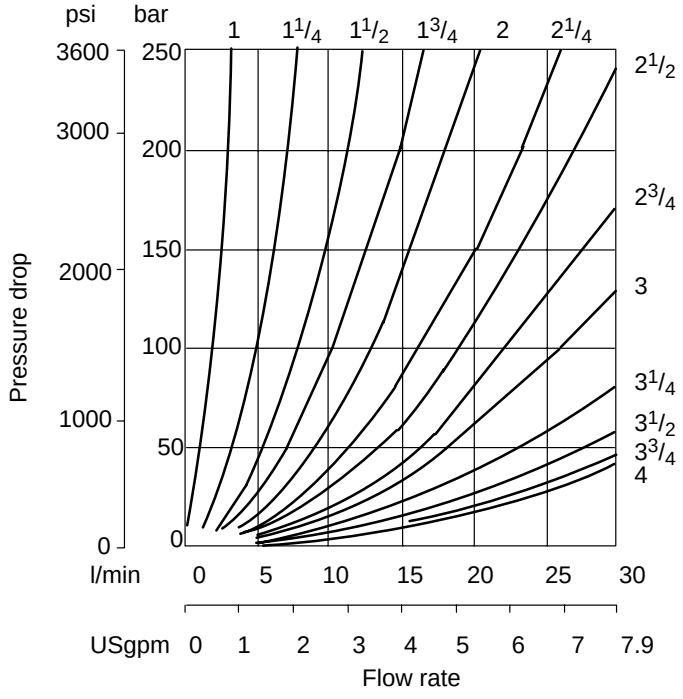
Maximum flow rate	30 l/min (7.9 USgpm)
Maximum operating pressure	250 bar (3600 psi)
Hydraulic fluids	Refer to appendix
Filtration requirements	
Temperature limits	
Mass, approximate	0,42 kg (0.92 lb.)
Mounting attitude	No restrictions

Performance Data

Typical performance with mineral oil at
21 cSt (102 SUS) and at 50°C (122°F).

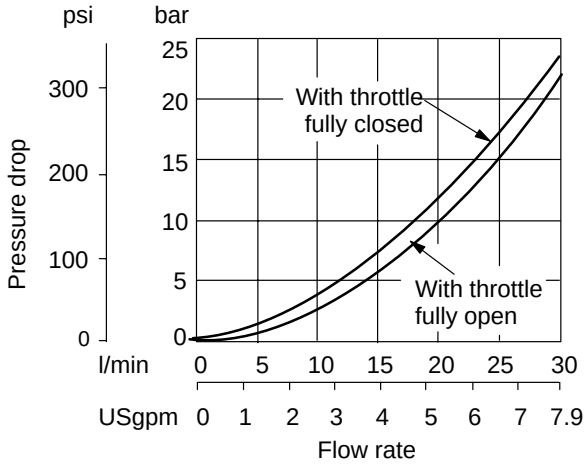
Control characteristics

Flow rate versus pressure drop for number of turns of adjuster from fully closed position.



Pressure Drop

Free flow through check valve with throttle closed and open.

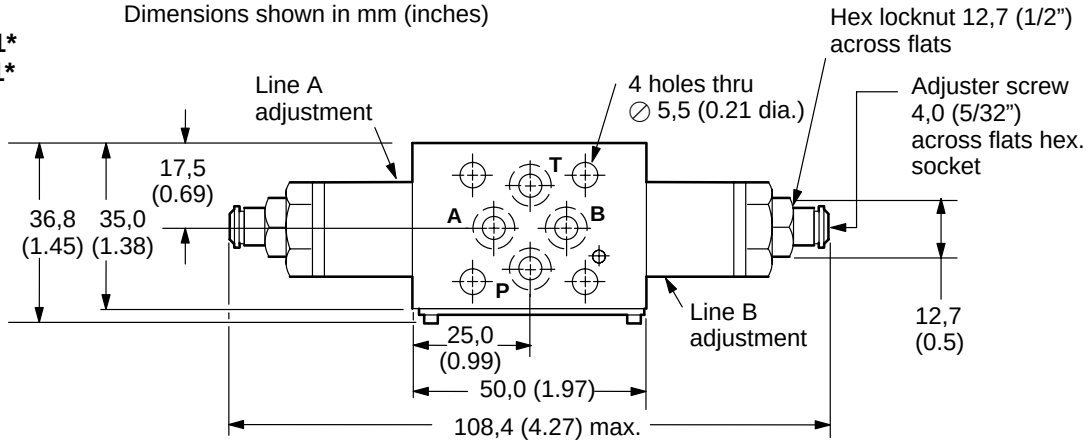


For other viscosities refer to appendix.

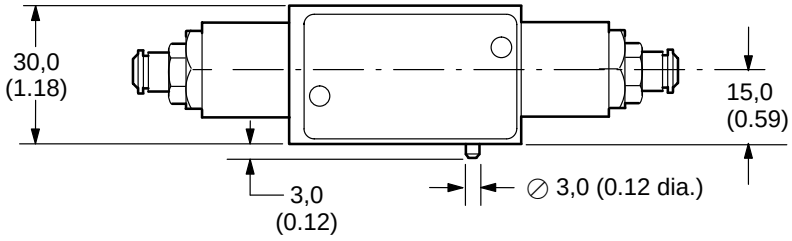
Installation Dimensions

Dual Function
DGMFN-2-X-A*-B*-1*
DGMFN-2-Y-A*-B*-1*

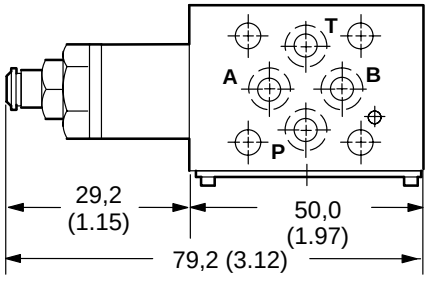
Dimensions shown in mm (inches)



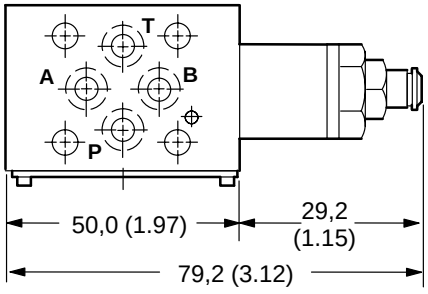
W adjuster (Shown)
To adjust valve setting. loosen locknut and turn adjuster screw clockwise to decrease flow (increase restriction), counterclockwise to increase flow (reduce restriction). Re-tighten locknut after completing adjustment.



Single Function
DGMFN-2-X-A*-1*
DGMFN-2-Y-A*-1*

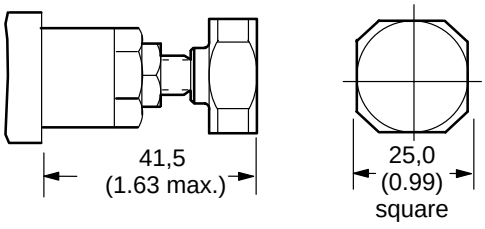


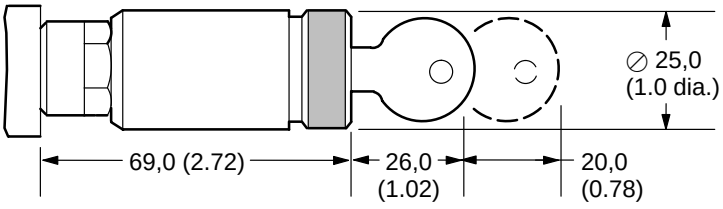
Single Function
DGMFN-2-X-B*-1*
DGMFN-2-Y-B*-1*
DGMFN-2-Z-P*-1*



H adjuster
To adjust valve setting. loosen locknut and turn knob clockwise to decrease flow (increase restriction), counterclockwise to increase flow (reduce restriction). Re-tighten locknut after completing adjustment.

K adjuster
Key must be inserted and turned to allow valve setting to be adjusted. Turn knob clockwise to decrease flow (increase restriction), counterclockwise to increase flow (reduce restriction). When key is removed, adjustment mechanism can be freely turned without changing valve setting.





SystemStak™ Flow Divider Valve

DGMFD-2-10 series

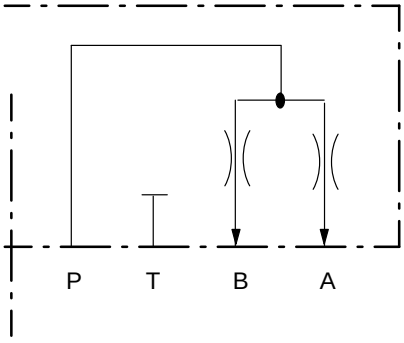
General description

This flow dividing valve divides flow equally between the “A” port and the “B” port with flow generated in “P” port.

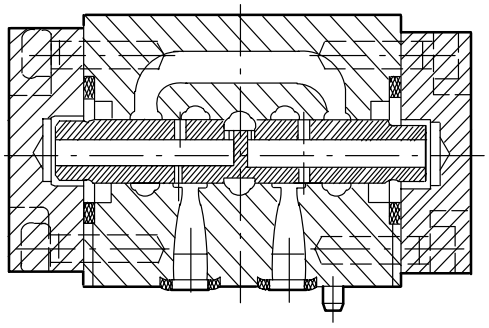
Note - The flow divider valve should not be applied where cylinder synchronization is important.

Functional Symbols

DGMFD-2-P-AB-10



Typical Sectional View



Model Code

DGM FD – 2 – P– AB – 10

1 2 3 4 5 6

1 Model Series

Manifold or gasket mounted

2 Type

FD – Flow divider

3 Interface

2 – ISO/DIS 4401-02-02

4 First function

P – Flow from “P” port

5 Flow division

AB – Flow split between ports “A” and “B”

6 Design

Subject to change. Installation dimensions unchanged for design numbers 10 thru 19.

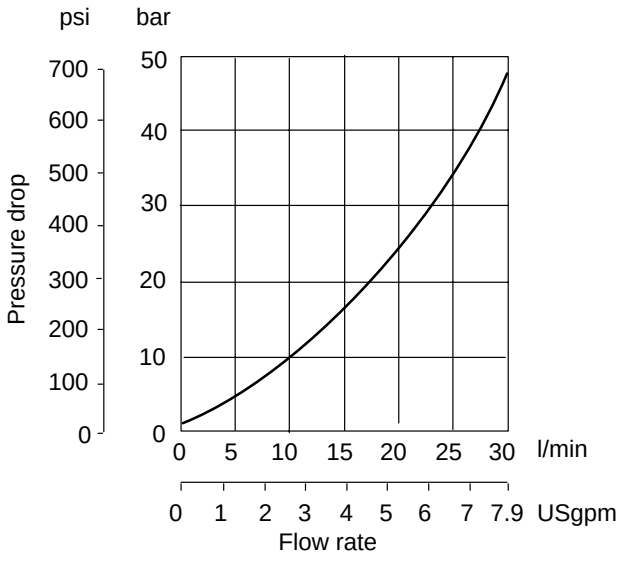
Operating Data

Maximum flow rate	30 l/min (7.9 USgpm)
Flow variation (between A & B ports)	± 10%
Maximum operating pressure	250 bar (3600 psi)
Hydraulic fluids	Refer to appendix
Filtration requirements	
Temperature limits	
Mass, approximate	0,58 kg (1.30 lb.)
Mounting attitude	No restrictions

Performance Data

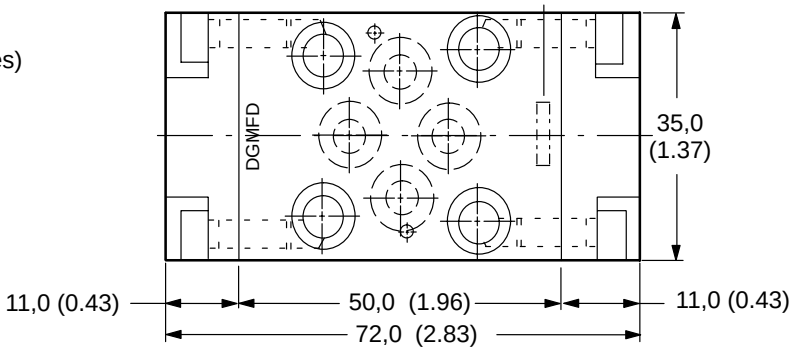
Typical performance with mineral oil at
30 cSt (140 SUS) and at 50°C (122°F).
For other viscosities refer to appendix

Pressure Drop



Installation Dimensions

DGMFD-2-10 series
Flow Divider
Dimensions shown in mm (inches)



Subplates, Connection Plates and Mounting Surfaces

General description

This range of subplates and auxiliary connection plates are for use with size 2 valves. Optional BSPF or SAE/UNF pipe thread connections are available.

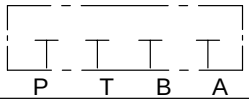
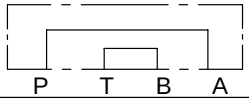
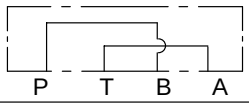
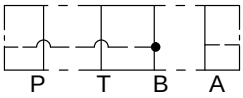
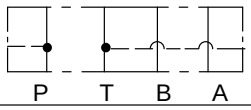
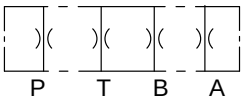
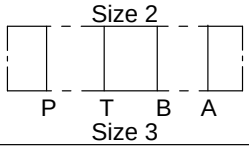
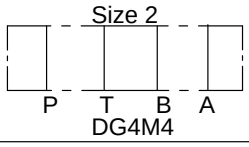
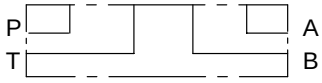
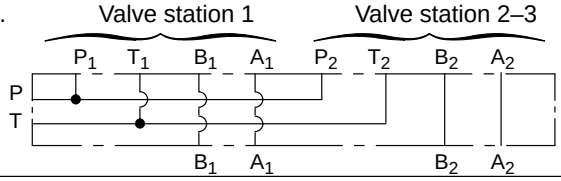
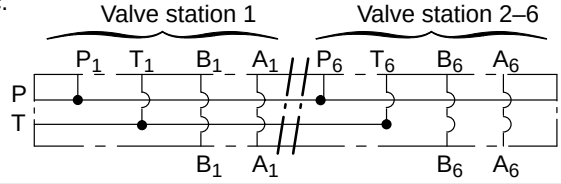
The 2 to 6 multi-station subplates, when used together with VIckers SystemStak valves, provide very compact control assemblies.

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

All Vickers size 2 valves and auxiliary plates are fitted with a location pin to ensure correct orientation of the mounting faces.

Operating and Installation Data

Max. flow rates	No functional limitations – Dependent on valves used.
Temperature limits	As for valves, subject to limits: –20°C to 70°C (–4°F to 158°F)
Model	Material kg (lb)
DGMA–2–B	Cast iron 0,24 (0.53)
DGMA–2–C*	Cast iron 0,21 (0.46)
DGMA–2–T*	Cast iron 0,28 (0.62)
DGAM–2–3	Cast iron 0,43 (0.95)
DGOM–2	Cast iron 0,12 (0.27)
DGMS–2–1E	Aluminum 0,13 (0.29)
DGMS–2–2E	Aluminum 1,36 (3.0)
DGMS–2–3E	Aluminum 1,85 (4.1)
DGMS–2–4E	Aluminum 2,36 (5.2)
DGMS–2–5E	Aluminum 2,87 (6.3)
DGMS–2–6E	Aluminum 3,37 (7.4)
Mounting attitude	No restrictions, other than for valves.

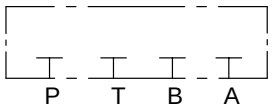
Description and maximum pressure	Functional symbol	Model code
Blanking plate 250 bar (3600 psi)		DGMA–2–B–1*
Crossover plate P–A, B–T 250 bar (3600 psi)		DGMA–2–C1–1*
Crossover plate P–B, A–T 250 bar (3600 psi)		DGMA–2–C2–1*
Tapping plate Ports A and B 250 bar (3600 psi)		DGMA–2–T1–1*–R DGMA–2–T1–1*–S
Tapping plate Ports P and T 250 bar (3600 psi)		DGMA–2–T2–1*–R DGMA–2–T2–1*–S
Orifice plate 250 bar (3600 psi)		DGOM–2–1*–R
Adaptor plate Size 3 to 2 250 bar (3600 psi)		DGAM–2–3–1*–R DGAM–2–3–1*–S
Adaptor plate DG4M4 to Size 2 250 bar (3600 psi)		DGAM–2–4–10–R DGAM–2–4–10–S
Single station subplate/manifold Side ports P,T,A,B 250 bar (3600 psi)		DGMS–2–1E–1*–R DGMS–2–1E–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–2–2/3E–1*–R DGMS–2–2/3E–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–2–4/5/6E–1*–R DGMS–2–4/5/6E–1*–S

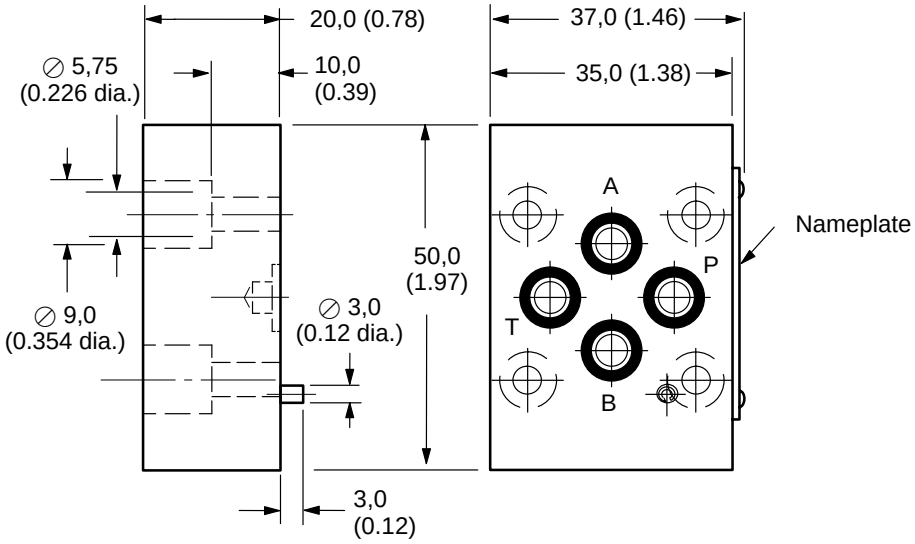
Design number subject to change. No change of installation dimensions for designs 10 thru 19. " R" suffix – ISO 228 (BSPF) ports and/or metric attaching bolts tapping and/or orifice plugs. "S" suffix – SAE/UNC ports and/or UNC attaching bolt tapping and/or orifice plugs.

Installation Dimensions

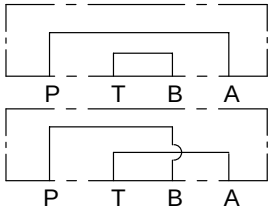
DGMA-2-B-1*
Blanking Plate

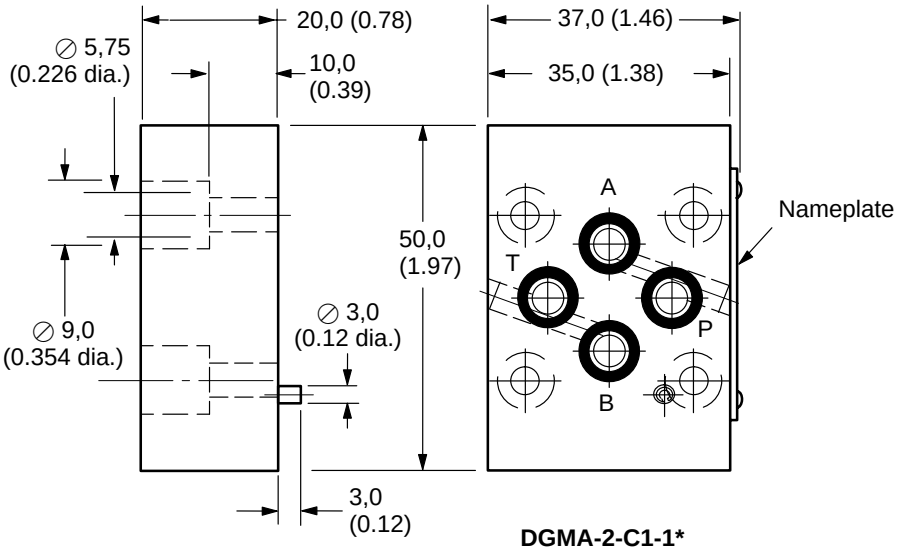
Dimensions shown in mm (inches)



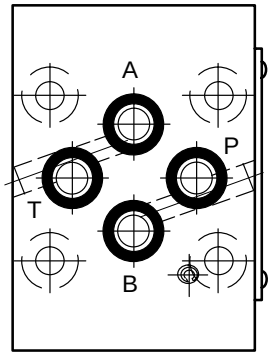


DGMA-2-C*-1*
Crossover Plate





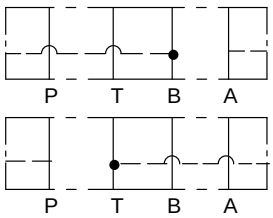
DGMA-2-C1-1*
(P–A, B–T)

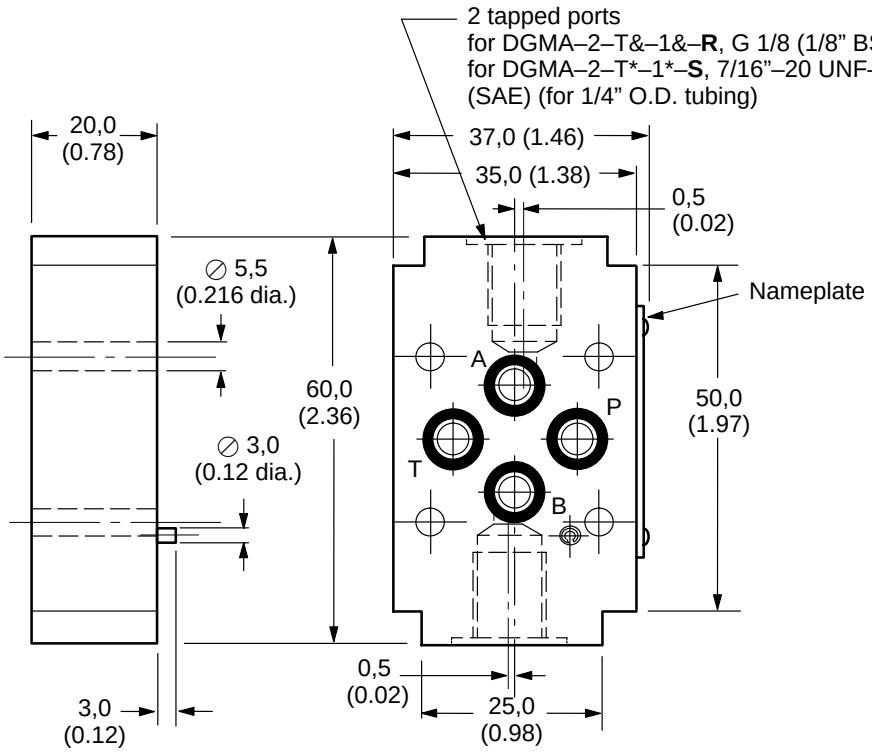


DGMA-2-C2-1*
(P–B, A–T)

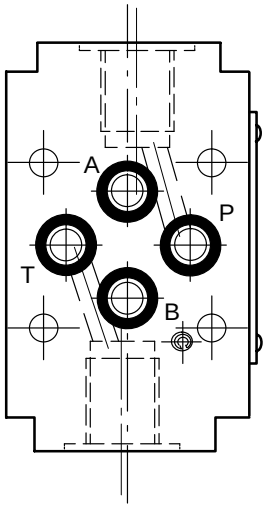
DGMA-2-T*-1*-*
Tapping Plate

Dimensions shown in mm (inches)



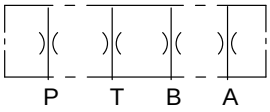


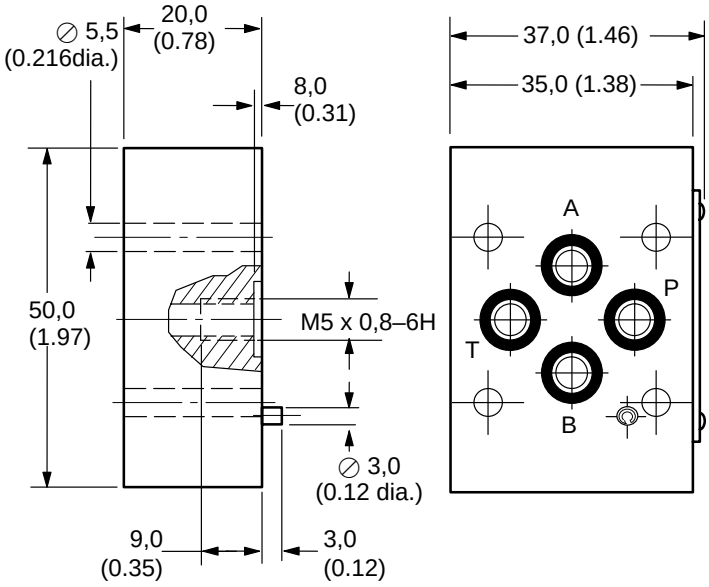
DGMA-2-T1-1*–*
(Ports A and B)



DGMA-2-T2-1*–*
(Ports P and T)

DGOM-2-1*-R
Orifice Plate





Port Restrictor Plugs

Restrictor plugs are available for use in ports P, T, A and 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.

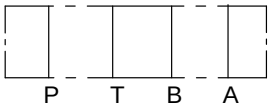
Code	Orifice diameter	Part number ■
*00	Blank	977935
*05	0,5 (0.02)	977936
*06	0,6 (0.024)	977937
*07	0,7 (0.028)	977938
*08	0,8 (0.030)	986031
*09	0,9 (0.036)	873753
*10	1,0 (0.040)	986032
*11	1,1 (0.044)	977939
*12	1,2 (0.047)	977940
*13	1,3 (0.052)	977941
*14	1,4 (0.056)	977942
*15	1,5 (0.060)	986033
*18	1,8 (0.071)	872451
*20	2,0 (0.080)	479008
*23	2,3 (0.090)	977943
*24	2,4 (0.096)	479009

**: P, T, A or B as required.*
■ *Available in multiples of 25 per part number*

ISO 02 Adaptor Plate

DGAM-2-4-10-R
DGAM-2-4-10-S

Dimensions shown in mm (inches)

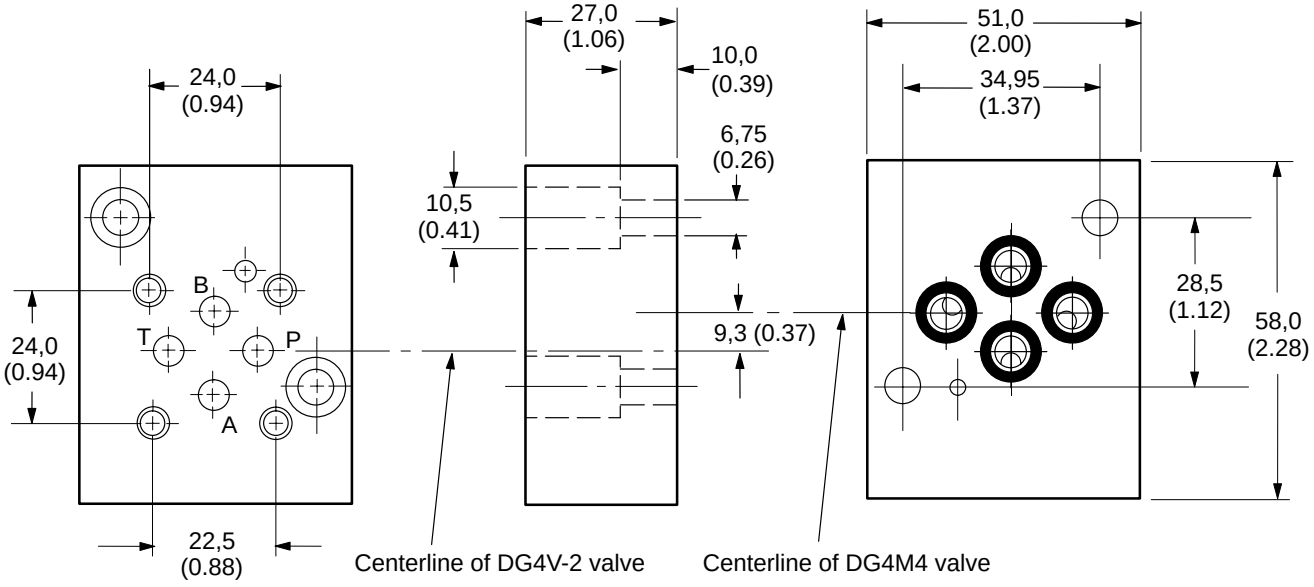


When replacing a DG4M4, this adaptor plate has been designed in line with our range of subplates and auxiliary plates.

Two versions are offered:

S – SAE-UNC ports and/or UNC attaching bolt tappings and/or orifice plugs.

R – ISO 228 (BSPF) ports and/or metric attaching bolt tappings and/or orifice plugs.



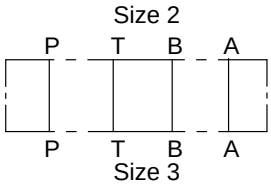
DGAM-2-3–1*–R (Metric bolt tapping)
DGAM-2-3–1*–S (UNC bolt tapping)

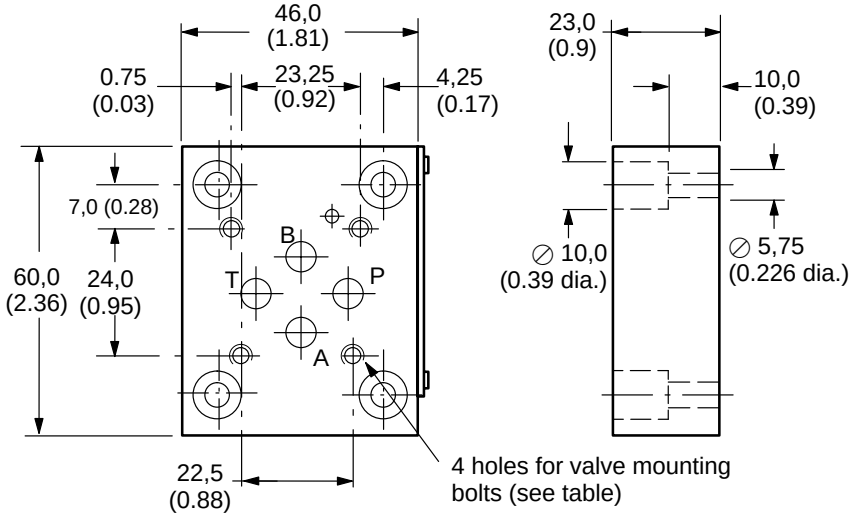
Adaptor plate, Size 3 to 2 for pressure up to 250 bar (3600 psi)

Dimensions shown in mm (inches)

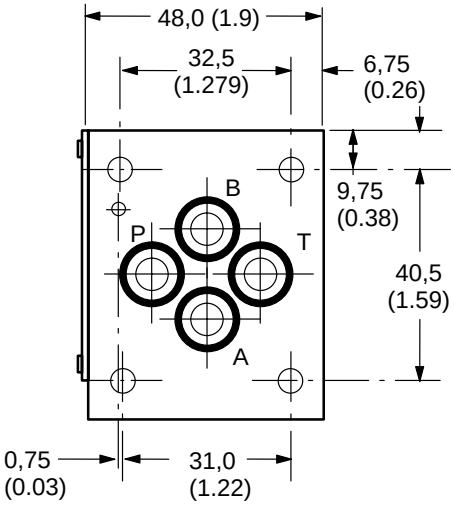
Size 2 valves can frequently be used in place of size 3 valves, or generally where the system flow rate is within that of size 2 valves..

The DGAM–2 adaptor plate bolts to an existing size 3 interface and provides a size 2 mounting face for the smaller valves.





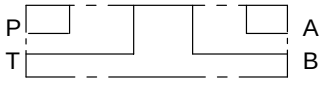
Size 2 Mounting Face

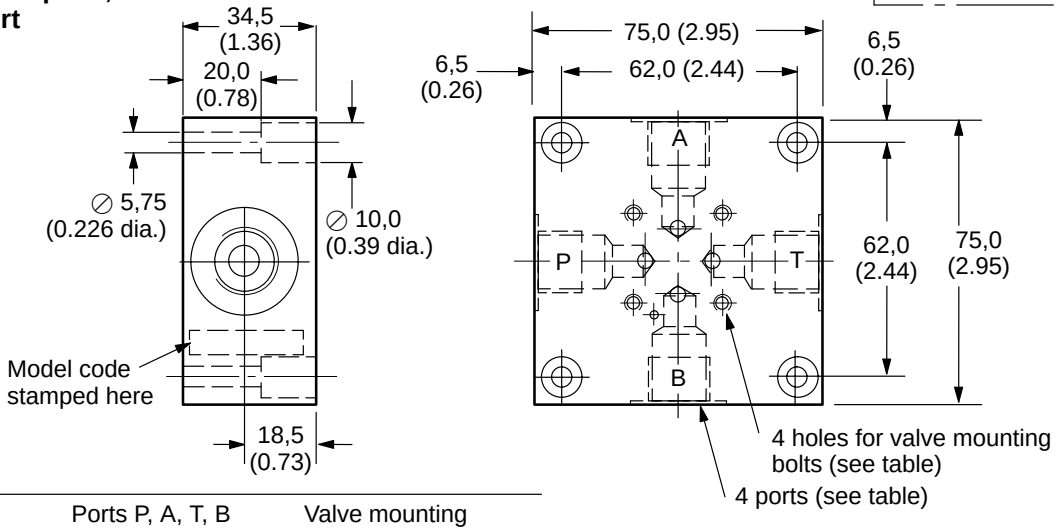


Size 3 Mounting Face (ISO 4401 Size 03)

Model	Tappings for valve mounting bolts
DGAM–2–3–1*–R	M5 x 12,3 (0.48) deep
DGAM–2–3–1*–S	#10–24 UNC x 14,9 (0.587) deep

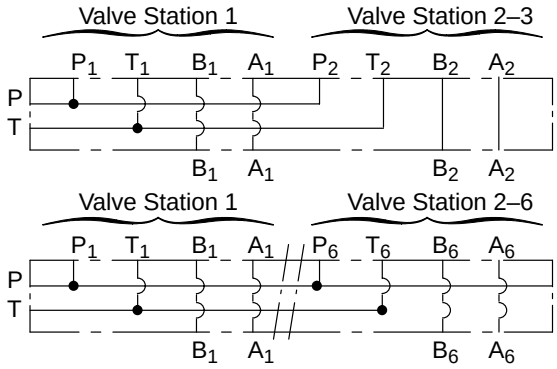
DGMS-2-1E-1*-*
Single station subplate, side tapped port





Model	Ports P, A, T, B tappings	Valve mounting bolt tappings
DGMS–2–1E–1*–R	G3/8 (3/8” BSPF) x 12,0 (0.47) deep	M5 x 12,3 (0.48) deep
DGMS–2–1E–1*–S	3/4” 16 UNF–2B x 14,3 (0.56) deep	#10–24 UNC x 14,9 (0.587) deep

DGMS-2-*E-1*-*
Multi-station subplate,
(4 station shown)
Dimensions shown in mm (inches)



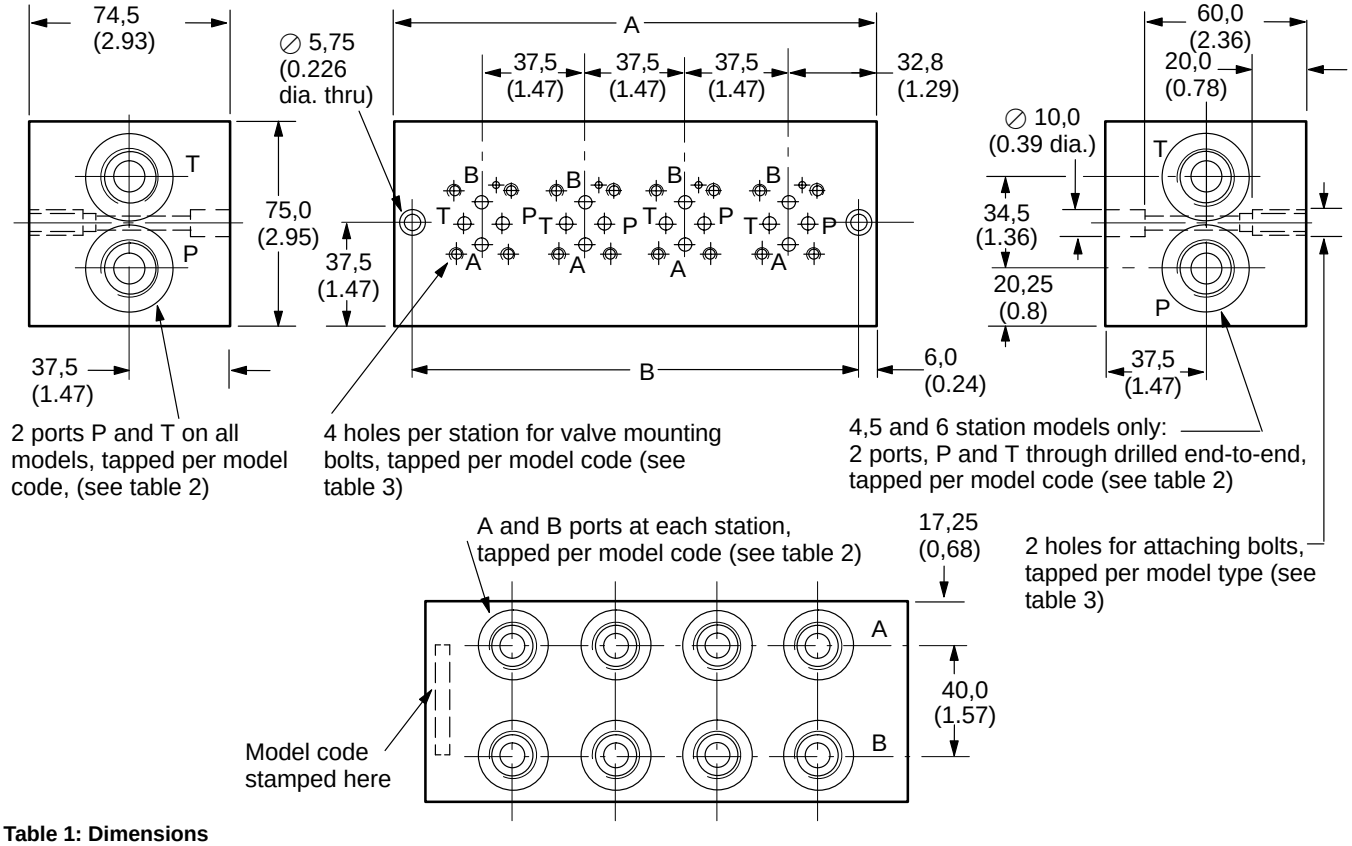


Table 1: Dimensions

Model	A	B
DGMS–2–2E–1*–*	102 (4.02)	90 (3.54)
DGMS–2–3E–1*–*	140 (5.5)	125 (4.92)
DGMS–2–4E–1*–*	178 (7.0)	165 (6.5)
DGMS–2–5E–1*–*	215 (8.5)	200 (7.9)
DGMS–2–6E–1*–*	254 (10.0)	240 (9.45)

Table 2: Port Tappings

Model	Ports P, T	Ports A, B
DGMS–2–1E–1*–R	G1/2 (1/2” BSPF)	G3/8 (3/8” BSPF) x 12,0 (0.47) deep
DGMS–2–1E–1*–S	3/4” 16 UNF–2B	3/4”–16 UNF–2B x 14,3 (0.56) deep

Table 3: Mounting Bolt Tappings

Model	Valve mounting bolts	Manifold rear mount holes
DGMS–2–1E–1*–R	M5 x 12,3 (0.48) deep	M8 x 1,25–6H
DGMS–2–1E–1*–S	#10–24 UNC x 14,9 deep	5/16” –18 UNC–2B

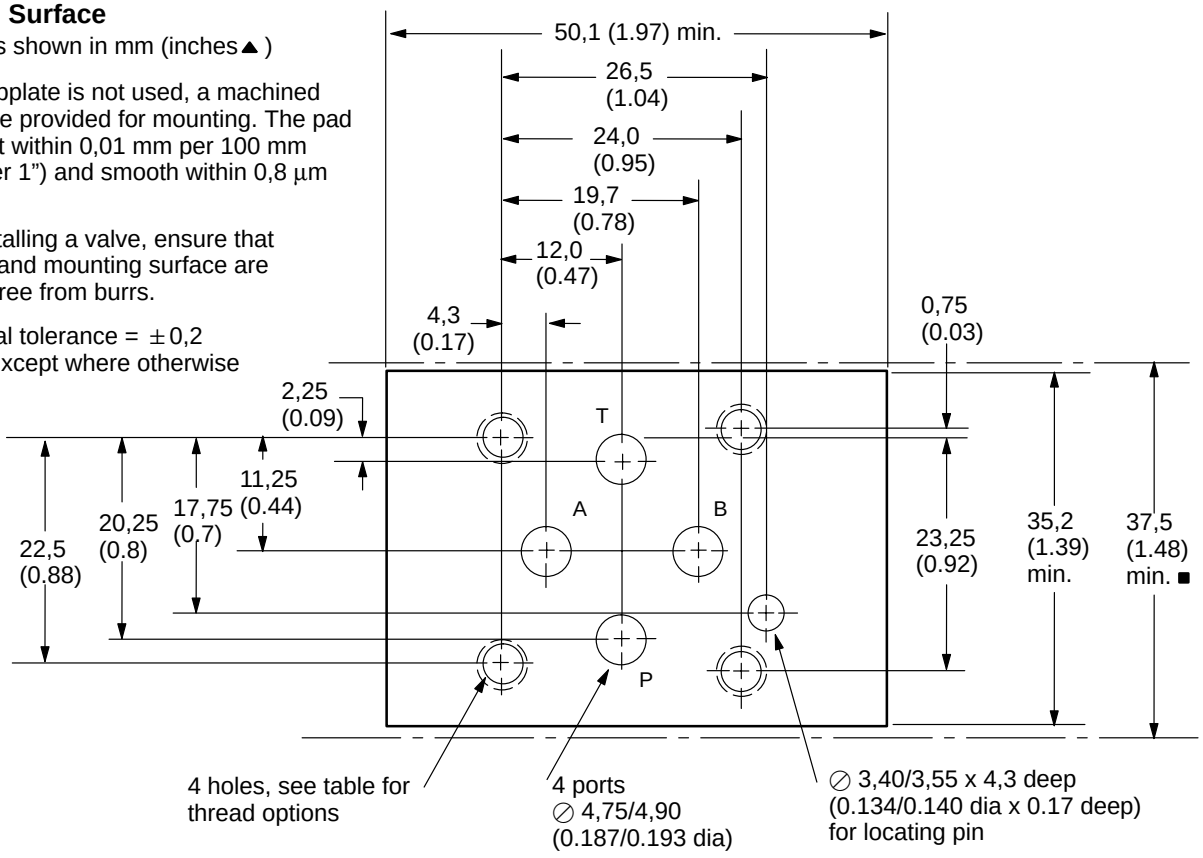
Mounting Surface

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).

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

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



Mounting Bolt Tapping Options

ISO/4401-02-01-0-94 defines only M5 tapping. Inch tapping options are as available in Vickers subplates and manifolds.

Thread	Min. tapping depth for subplates/manifolds in: Steel	Cast Iron	Aluminum
Metric M5–6H	12,3 (0.484)	12,3 (0.484)	12,3 (0.484)
Inch #10–24 UNC–2B	12,6 (0.496)▼	14,9 (0.587)▼	14,9 (0.587)▼

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

▼ *It is recommended that customers’ own manifold blocks for UNC bolts be tapped to these minimum depths.*

■ *This dimension gives the minimum space required for a valve with this mounting surface. The dimension is also the minimum center-to-center pitch of mounting surfaces on a manifold block.*

Appendix

Mounting Bolts

Metric bolt kits, M5-6H

DG**V-2 SystemStak	For subplates/manifolds in steel, cast iron or aluminum
DG**V-2	BK02-156493
DG**V-2 + 1 module	BK 464125M
DG**V-2 + 2 modules	BK 466839M
DG**V-2 + 3 modules	BK 466842M

Inch bolt kits, #10-24 UNC-2B

DG**V-2 SystemStak	For subplates/manifolds in: Steel	Cast iron	Aluminum
DG**V-2	BK 590720	BK02-156494	BK02-156494
DG**V-2 + 1 module	BK 870017	BK 870017	BK02-156496
DG**V-2 + 2 modules	BK02-156497	BK02-156497	BK02-156497
DG**V-2 + 3 modules	BK02-156499	BK02-156498	BK02-156498

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

Bolts should be torqued to 5-7 N.m (44-62 lbf. in.) with threads lubricated. Prior to installation of DG4V-2 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.

Seal Kits

Model	Seal Kit
DG**V-2	02-156492
DGMC(S)-2	02-157032
DGMR(1)/X(2)	02-157033
DGMDC	02-157030
DGMPC	
DGMFN	02-157031

Fluids and Seals

Materials and seals used in these valves are compatible with anti-wear hydraulic oils, water-in-oil emulsions, water glycols, and non-alkyl-based phosphate esters. The extreme operating viscosity range is from 500 to 13 cSt (2270 to 70 SUS) but the recommended operating range is 54 to 13 cSt (245 to 70 SUS).

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.

Pressure Drop at Other Viscosities

Pressure drop data in this catalog is given at different viscosities:
- For DG4V-2 directional valve: @36 cSt (168 SUS)
- For SystemStak valves: @ 21 cSt (102 SUS)

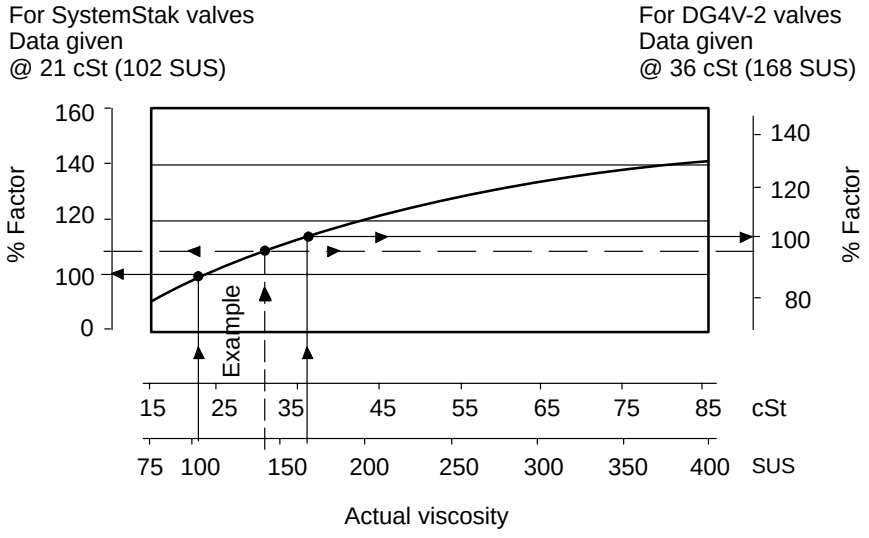
The graph shows the approximate percentage change in pressure drop for a range of other viscosities. To determine the appropriate pressure drop for any given fluid viscosity, multiply the published value by the applicable percentage factor for the required (actual) viscosity.

Example shown:

For an actual fluid viscosity of 32 cSt (150 SUS), pressure drop correction factors are:
- Approximately 95% for DG4V-2 directional valve data.
- Approximately 114% for SystemStak data.

For a different specific gravity, the pressure drop is approximately proportional to the change from SG 0.87.

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



Cleanliness codes for petroleum oil usage

Product	<70 bar <2000 psi	70-207 bar 2000-3000 psi	207+ bar 3000+ psi
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
Check valves	20/18/15	20/18/15	20/18/15
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
Radial piston motors	20/18/14	19/17/13	18/16/13

Ordering Procedure

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