

ENGINEERING
TOMORROW

Danfoss

User Guide

Proportional Pressure Reducing Valves

KX(C)G-6-1*

KX(C)G-8-1*



June 2025

BC528353735959en-000101



Basic Characteristics

Max. inlet pressure . 350 bar (5000 psi)
 Max. reduced pressure 330 bar (4750 psi)
 Max. flow rate . . 300 L/min (80 USgpm)
 Mounting face to ISO 5781 (B port high pressure inlet):
 For KX(C)G-6 AG-06-2-A
 For KX(C)G-8 AH-08-2-A

General Description

These two-stage pressure reducing valves (based on Vickers by Danfoss type X(C)G2V valves, featured in catalog 2321) incorporate an electro-hydraulic proportional pressure pilot stage (Vickers by Danfoss type KCG-3 valve, described in catalog 2162) by which the reduced pressure setting is adjustable in response to an electrical input. Each model (in two sizes, with optional free reverse flow check valve) responds to variations of current input to its solenoid, for which separate Vickers by Danfoss drive amplifiers, with PWM output stage and output current control, are available.

Design Features

A maximum outlet pressure to suit the application requirements is preset by the manual adjustment. Below this maximum setting, the outlet pressure is controlled by the solenoid operated proportional pilot valve, according to the current applied to the solenoid.

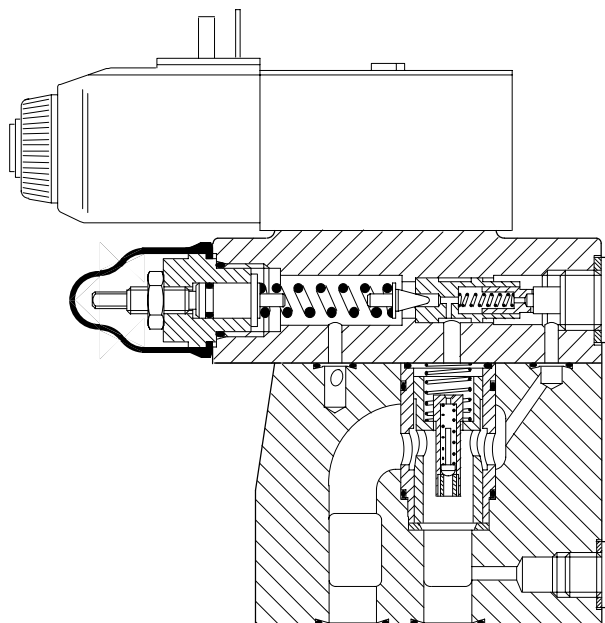
The “normally open” condition of the mainstage allows full flow from inlet to outlet port until the required reduced pressure is reached, whereupon the mainstage closes, or reduces the flow sufficient only to maintain the required outlet pressure.

High valve response ensures that the reduced outlet pressure is unaffected by inlet pressure peaks. Excess build-up of outlet pressure (during long holding periods, or flow back from an actuator reacting to an overload) is prevented by the small check valve in the mainstage spool, allowing fluid to bleed-off across the pilot stage.

Features and Benefits

- Remote electrical proportional control of reduced pressure from a choice of five pressure ranges per valve size.
- Excellent repeatability and stable performance results from cartridge design of mainstage parts.
- Low installed cost and space requirement from high power/size ratios (more than double that of many conventional designs).

KX(C)G-6 Valve with Type “U” Coil Connection



Functional Symbols

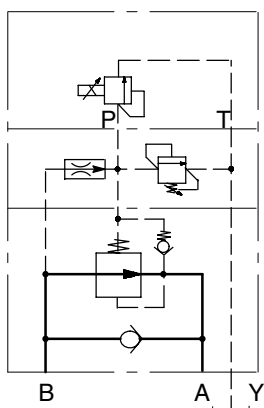
Manual and Electrical Pilots

Drained to Port Y:

Model Code **8** = Blank

Symbol for KXCG models.

For KXG models omit check and internal connection A-B.



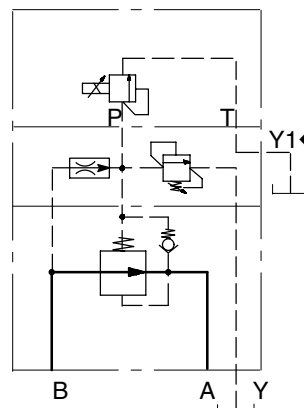
Manual Pilot Drained to Port Y;

Electrical Pilot Drained to Port Y1♦:

Model Code **8** = 3

Symbol for KXG models.

For KXCG models add check valve symbol and internal connection A-B.

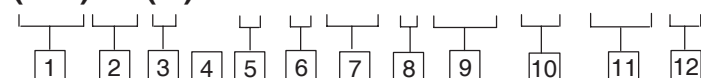


Model Code

Features in brackets () may be omitted. All other features must be specified.

Models requiring separate amplifiers

(F3-)KX(C)G- * - * * *- Z-M- *** - *** -1***



1 Fluid compatibility

Blank = Standard Buna-Nitrile Seals
F3 = Viton Seals

2 Valve type

KX = Proportional pressure relief

3 Reverse flow check

C = Reverse flow check
Omit if not required

4 Mounting type

G = Subplate mounted

5 Mounting surface, ISO 6264

With port B high pressure inlet and
port A reduced pressure outlet

6 = AR-06-2-A
8 = AS-08-2-A

6 Type of manual adjustment

K = Micrometer with keylock
M = Micrometer without keylock
W = Screw/locknut

7 Reduced pressure adjustment control range (see footnote)

(All coils except type HJ, see position
11 footnote ■)

40 = 10 - 40 bar (145 - 580 psi)
100 = 12 - 100 bar (175 - 1450 psi)
160 = 14 - 160 bar (200 - 2300 psi)
250 = 15 - 250 bar (220 - 3600 psi)
330 = 15 - 330 bar (220 - 4750 psi)

8 Pilot drain options

See also "Functional Symbols"

9 Standard features

Z-M = For KX(C)G-6/8

10 Coil connection type (KCG only)

U = ISO 4400 (DIN43650)
interface▼

U1 = ISO4400 (DIN 43650)
plug fitted

▼ Female connector to be supplied
by user.

11 Coil rating

Code = amps x ohms◆

G1 = 3,5 x 1,65

GP1 = 3,0 x 2,0

H1 = 1,6 x 7,3

HA1 = 0,94 x 22

HL1 = 0,80 x 29●

◆ Resistance at 20° C (68° F).

12 Design number, 1* series

Subject to change. Installation
dimensions unaltered for design
numbers 10 to 19 inclusive.

*Note: Reduced pressure adjustment
range 7 is based on an inlet pressure
of 350 bar (5000 psi). With an inlet
pressure of 100 bar (1450 psi) the lower
limits are 2 to 3 bar (30 to 40 psi) lower.*

Operating Data

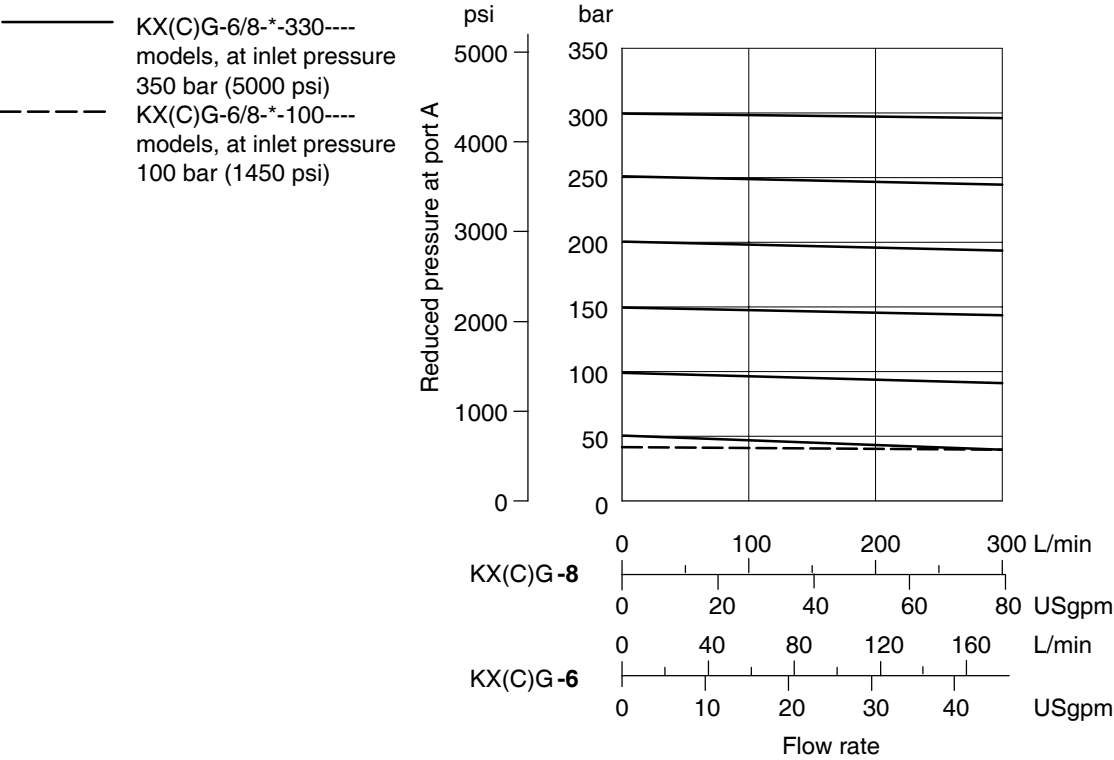
Standard test conditions are with antiwear hydraulic oil at 36 cSt (168 SUS) and 50°C (122°F)

Maximum pressures: Port B (pressure inlet) Port A (reduced pressure outlet) Port Y ▲ and side drain port Y1 ▲ ▲ <i>Back pressure at these ports is additive to the reduced pressure setting of the valve.</i>	350 bar (5000 psi) See [7] in "Model Code" 2 bar (30 psi)
Rated flow at $\Delta p = 12$ bar (175 psi) and 0 mA to coil: KX(C)G-6 KX(C)G-8	200 L/min (53 USgpm) 300 L/min (80 USgpm)
Pressure adjustment ranges	See [7] in "Model Code"
Minimum pressure differential ($P_B - P_A$) for effective reduced pressure control, all models	20 bar (300 psi)
Pilot control drain flow, all models	1,5 L/min (0.4 USgpm) max.
Coil or amplifier rating KX(C)G	See [11] in "Model Code" 24V x 40W max. (22 to 36V incl. 10% pk. to pk. max.ripple)
Pressure gain Factory setting - Maximum with 10V command signal. User adjustment - 30 to 120% of factory setting. Note that altering this setting will affect valve to valve interchangeability.	See graph
Pressure underide	See graph
Hysteresis, using Vickers by Danfoss drive amplifier KX(C)G	<6%
Linearity at conditions: 1. "Dead-head" (no flow from reduced pressure outlet port) 2. Between 10% and 100% rated pressure	<6% of rated pressure
Repeatability	< $\pm 1,3\%$ of rated pressure
Mass (weight) KX(C)G-6 KX(C)G-8	5,3 kg (11.7 lb) 6,2 kg (13.7 lb)
Supporting products: Amplifiers for KCG valves with "H" type coils only: EHH-AMP-7*2 series (power plug) EEA-PAM-513-A-14 (1 adjustable ramp) EEA-PAM-513-A-3* (2 adjustable ramps) Mounting bolts ■ ■ <i>Note: If not using Vickers by Danfoss recommended bolt kits, bolts must be to ISO 898 grade 12.9 or stronger.</i>	See catalogs 2114, 2115 and 2282 See catalog 2137 BC444273273086en-000101 See catalog 2314A
Mounting attitude	No restriction, provided that the valve is kept full of fluid through port T.
Ordering procedure	Valves, subplates, bolt kits and Vickers by Danfoss amplifiers should be ordered by full model code designation.

Performance Data

Typical with oil at 36 cSt (168 SUS) and at 50°C (122°F)

Pressure Underride



Pressure Drop

From port B to A at pressures below reduced pressure setting:

KX(C)G-6 valves Curve A

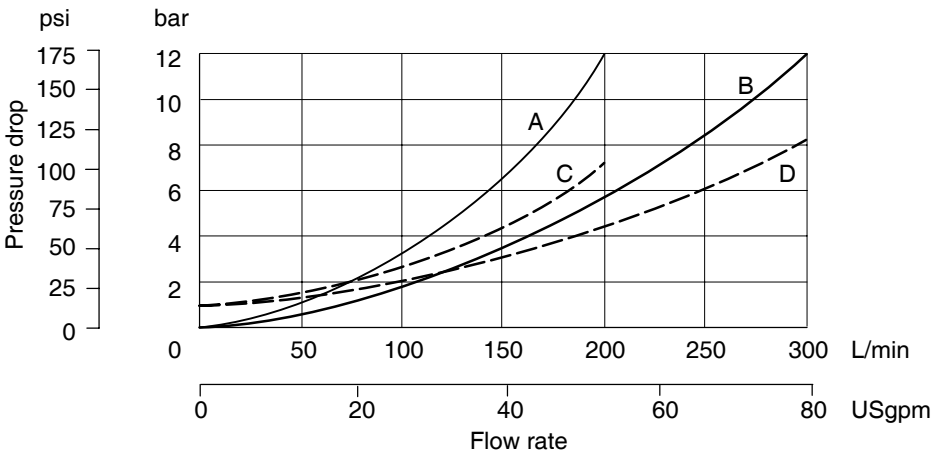
KX(C)G-8 valves Curve B

From port A to B through check valve (mainstage assumed closed).

Types KXCG only:

KXCG-6 valves Curve C

KXCG-8 valves Curve D



Pressure Gain

Typical example KX(C)G-6/8-*-250, at inlet pressure 350 bar (5000 psi). Valid for models driven from Vickers by Danfoss amplifier with appropriate settings of gain and offset.



Step Response

Typical data for KX(C)G-*-250 driven by Vickers by Danfoss Eurocard amplifier with appropriate settings of gain and offset, and with a ramp time of 80 ms▲.

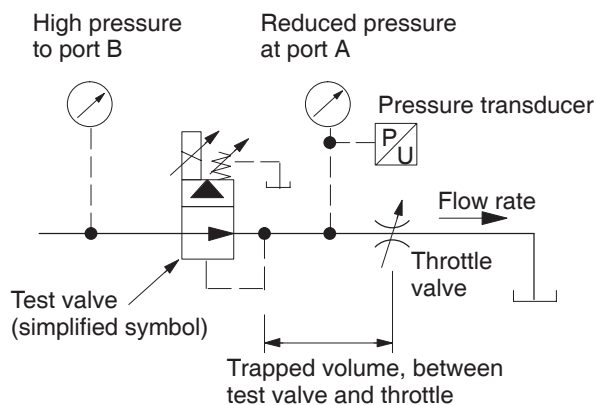
▲ Recommended minimum ramp rate to avoid excessive pressure overshoot: 80 ms/100% solenoid current.

Valve size	Test conditions: Trapped volume	Flow rate	Step size: Pressure demand	Response time (ms)
6	1,5 liters (0.4 USg)	75 L/min (20 USgpm)	0 to 100%	75
			100% to 0	60
			25 to 100%	60
			100 to 25%	50
8	3,0 liters (0.8 USg)	150 L/min (40 USgpm)	0 to 100%	70
			100% to 0	70
			25 to 100%	45
			100 to 25%	70

Test method

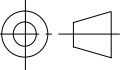
1. Inlet pressure set 300 bar (4350 psi)
2. Trapped volume as in table
3. Steady state flow rate adjusted by downstream throttle valve with $\Delta p = 250$ bar (3600 psi)
4. Response = time from step input signal until reduced output pressure reaches 90% of step change, as measured by transducer

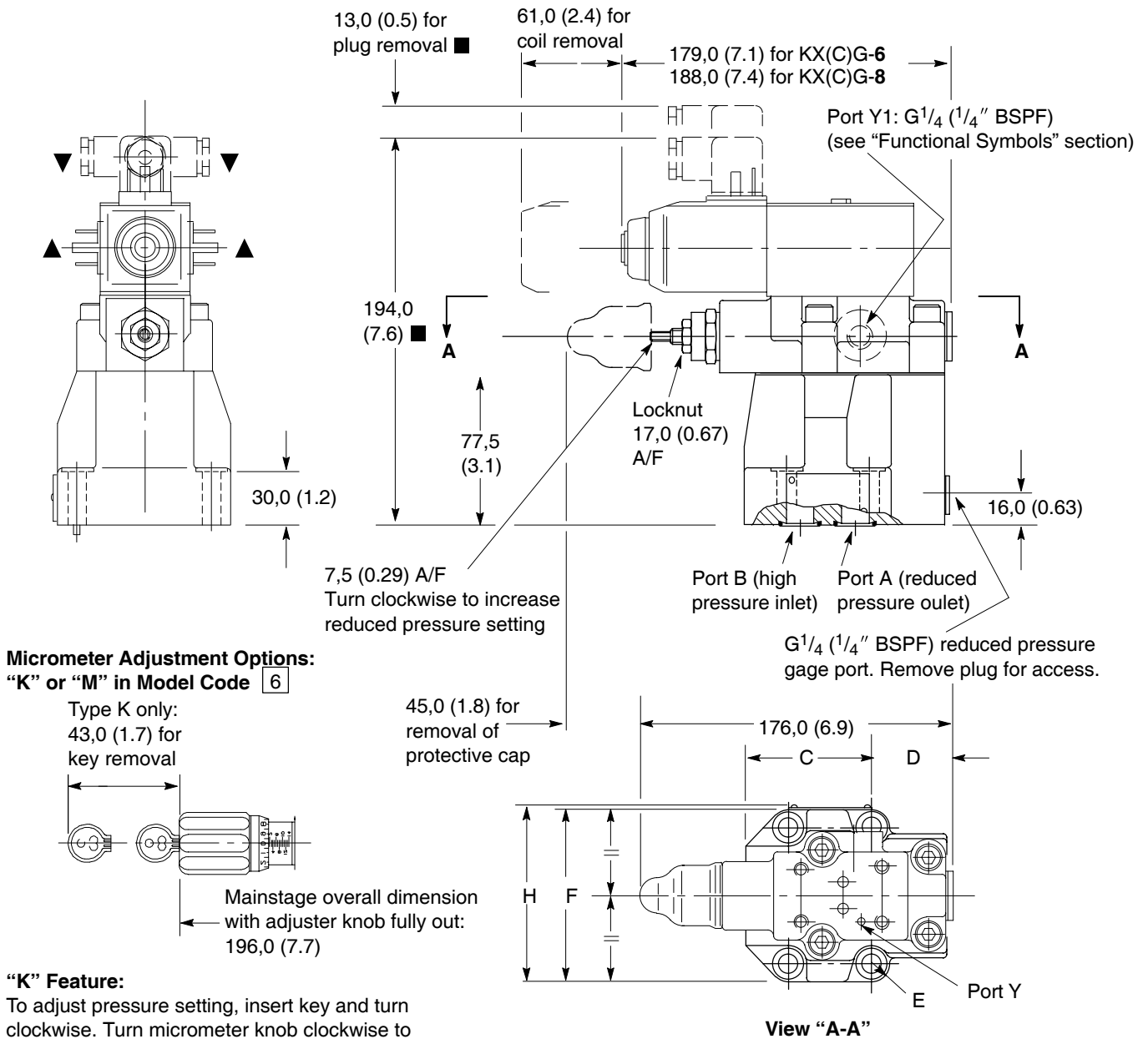
Test Circuit



Installation Dimensions in mm (inches)

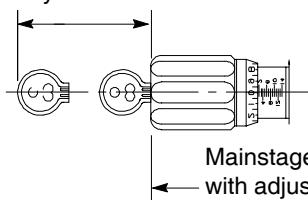
KX(C)G-* Models with Type “U” Coil Connection:
“U” at Model Code 10

3rd angle projection 



Micrometer Adjustment Options:
“K” or “M” in Model Code 6

Type K only:
43,0 (1.7) for key removal



“K” Feature:

To adjust pressure setting, insert key and turn clockwise. Turn micrometer knob clockwise to increase pressure setting; counter-clockwise to decrease setting. When the key is removed the knob can spin freely without affecting the pressure setting.

- ▲ Alternative plug positions by loosening knurled nut counter-clockwise, turning coil and re-tightening nut.
- Dimensions may vary according to source of plug.
- ▼ The cable entry on this plug can be repositioned at 90° intervals by reassembly of the contact holder relative to the plug housing. The cable entry is Pg 11 for cables Ø6-10 mm (0.24-0.4 dia).

Model	C	D	E rad.	F	H
KX(C)G-6	42,0 (1.7)	66,0 (2.6)	10,0 (0.4)	89,0 (3.5)	92,0 (3.65)
KX(C)G-8	40,0 (1.6)	77,0 (3.1)	11,0 (0.43)	104,0 (4.1)	107,0 (4.25)

Mounting Surfaces, ISO 5781
(B Port High Pressure Inlet)
AG-06-2-A
AH-08-2-A

When a subplate is not used a raised machined pad must be provided for mounting. The pad must be flat within 0,001 mm/100 mm (0.0001"/10") and smooth within 0,8 µm (32 µin). Dimensional tolerances are $\pm 0,2$ mm (± 0.008 ") except where indicated.

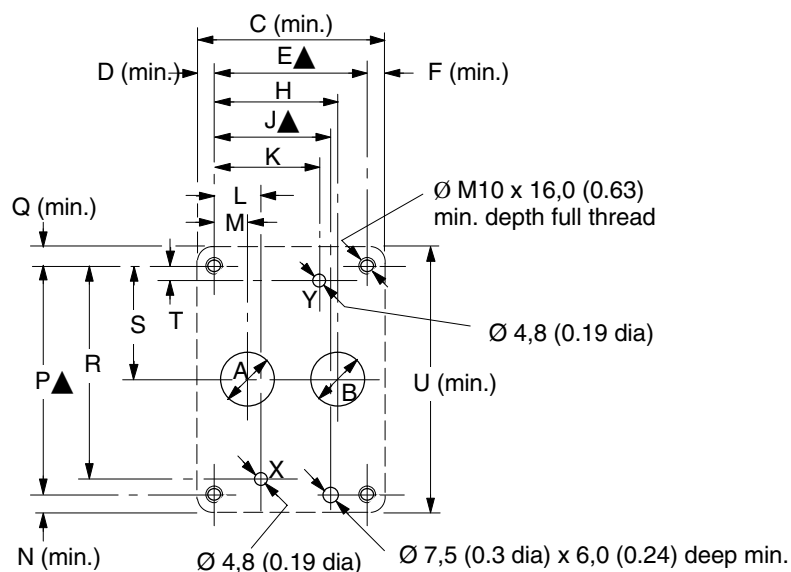
Port functions

A = Reduced pressure outlet (Also free reverse flow inlet for KXCG valves)

B = High pressure inlet (Also free reverse flow outlet for KXCG valves)

X = Not used for KX(C)G valves; can be omitted or plugged

Y = Drain port

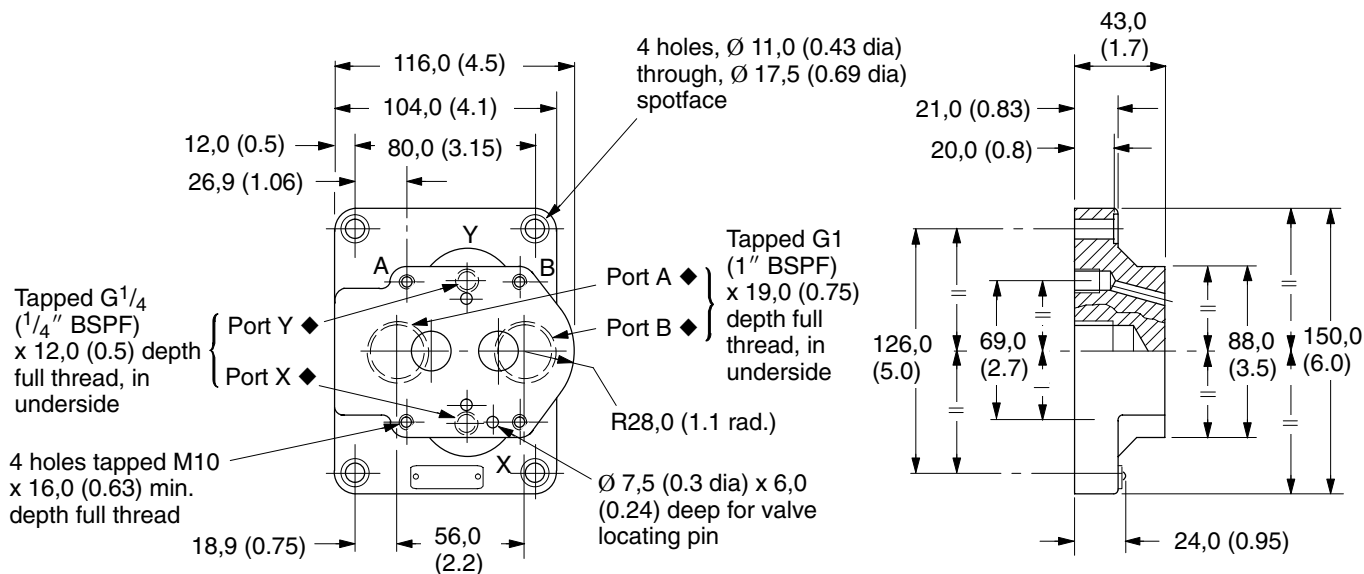


Size	A dia.	B dia.	C	D	E	F	H	J	K
06	14,7 (0.58)	14,7 (0.58)	61,0 (2.4)	9,0 (0.4)	42,9 (1.69)	9,0 (0.4)	35,7 (1.4)	31,8 (1.25)	21,4 (0.84)
08	23,4 (0.92)	23,4 (0.92)	78,0 (3.1)	8,8 (0.35)	60,3 (2.37)	8,8 (0.35)	49,2 (1.94)	44,5 (1.75)	39,7 (1.56)

Size	L	M	N	P	Q	R	S	T	U
06	21,4 (0.84)	7,1 (0.28)	10,0 (0.4)	66,7 (2.62)	10,0 (0.4)	58,7 (2.3)	33,3 (1.3)	7,9 (0.31)	87,0 (3.4)
08	20,6 (0.81)	11,1 (0.44)	10,8 (0.43)	79,4 (3.125)	10,8 (0.43)	73,0 (2.87)	39,7 (1.56)	6,4 (0.25)	101,0 (4.0)

▲ Tolerance on bolt and pin locations $\pm 0,1$ mm (± 0.004 ").

XCGVM-6-10R Subplate



◆ See "Mounting Surfaces" section above for port usage.

Further Information

Hydraulic Fluids

Materials and seals used in these valves are compatible with:

Anti-wear petroleum oils L-HM
For use with Non-alkyl based phosphate esters (L-HFD), use F3 version in model code.

The extreme operating range is 500 to 13 cSt (270 to 70 SUS) but the recommended running range is 54 to 13 cSt (245 to 70 SUS). For further technical information about fluids see 694.

Contamination Control Requirements

Recommendations on contamination control methods and the selection of products to control fluid condition are included in Vickers by Danfoss publication 9132 or 561, "Vickers by Danfoss Guide to Systemic Contamination Control". The book also includes information on the Vickers by Danfoss concept of "ProActive Maintenance". The following recommendations are based on ISO cleanliness levels at 2 µm, 5 µm and 15 µm.

For products in this catalog the recommended levels are:

Up to 210 bar (3000 psi) 18/16/13
Above 210 bar (3000 psi) 17/15/12

Installation and Start-up Guidelines

The proportional valves in this catalog can be mounted in any attitude but it may be necessary, in certain demanding applications, to ensure that the solenoids are kept full of hydraulic fluid.

If this proves to be the case any accumulated air can be bled from the solenoid bleed screw. This task is easier if the valve has been mounted base downwards. Good installation practice dictates that the tank port, and any drain port, are piped so as to keep the valve full of fluid once the system start-up has been completed.

Temperatures

For petroleum oil:

Min. -20°C (-4°F)

Max.* +70°C (158°F)

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

For other fluids where limits are outside those of petroleum oil, consult fluid manufacturer or Vickers by Danfoss representative. Whatever the actual temperature range, ensure that viscosities stay within those specified under "Hydraulic Fluids".

Ambient for:

Valves at full performance specification:

-20 to +60°C (-4 to +140°F).

Valves, as above, will operate at temperatures of 0 to -20°C (32 to -4°F) but with a reduced dynamic response.

Storage:

-25 to +85°C (-13 to +185°F)

Eurocard electronics:

0 to 50°C (32 to 122°F)

Seal Kits

Pilot valves

KCG-3 (DIN) 02-138201

KCG-3 ('F' & 'P' versions) .. 02-145869

Mainstage valves

KX(C)G-6 614824

KX(C)G-8 614826

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