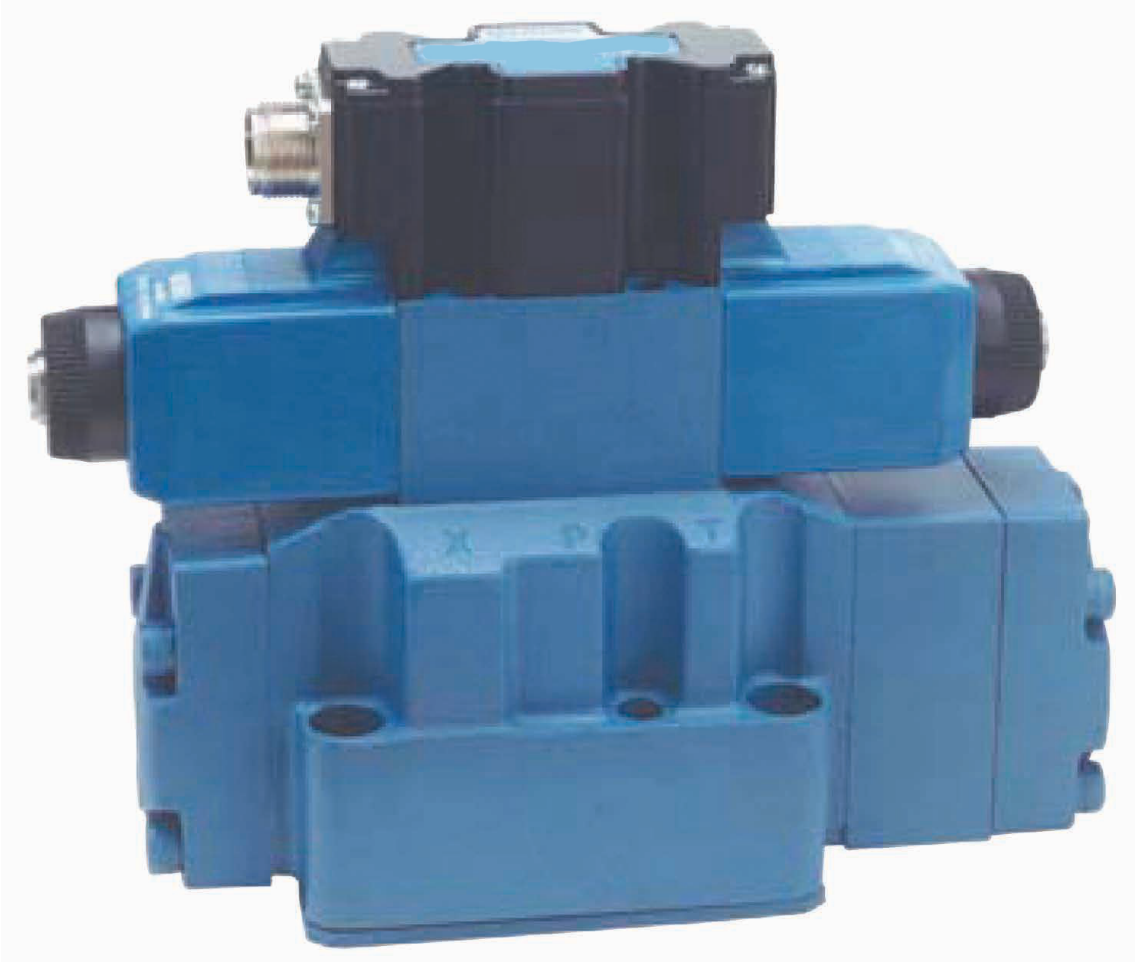
Technical Information

Proportional directional control valves
Two-stage models without electrical feedback

KBDG5V-5-1* KBDG5V-7-1*
KBDG5V-8-1* KBDG5V-10-1*



Danfoss

BC443076726452en-000101

Contents

GENERAL DESCRIPTION 3
MODEL CODES 4
SPOOL DATA 5
FUNCTIONAL SYMBOLS 6
OPERATING DATA 7
PERFORMANCE CHARACTERISTICS 8
POWER CAPACITY ENVELOPES 9
FLOW CHARACTERISTICS
KBDG5V-10 ..... **10**
KBDG5V-10 ..... **11**
STEP RESPONSE 13
INSTALLATION DIMENSIONS
KBDG5V-5/7/10 ..... **14**
Pilot Supply and Drain Plugs **15**
Views on mounting faces **16**
ELECTRICAL INFORMATION
Block diagram **17**
Wiring connections **18**
APPLICATION DATA 20

CE

This product has been designed and tested to meet specific standards outlined in the European Electromagnetic Compatibility Directive (EMC) 2014/30/EU which repealed Directive 2004/108/EC . For Restriction of Hazardous Substances, complies to (RoHS) Directive 2011/65/EU. For instructions on installation requirements to achieve effective protection levels, see the Installation W iring Practices for Danfoss Electronic Products . W iring practices relevant to this Directive are indicated by ⚠ Electromagnetic Compatibility (EMC) .

General description

Vickers™ KBDG5V-5/7/8/10 are solenoid operated directional control, non-feedback type proportional valves .

These are two-stage proportional directional control valves in which the main-stage spool is positioned according to the output from an integrally mounted proportional, Solenoid operated,pressure-reducing valve . Direction of main-spool travel depends upon which of the two solenoids of the pilot valve is energized and the amount of travel is dependent upon the current input to the solenoid .

At any intermediate position of the main spool, a force balance exists between the controlled, reduced pilot pressure acting on the spool end and the opposing centering spring, plus the action of flow forces .There is no electrical feedback of the main-stage spool position .

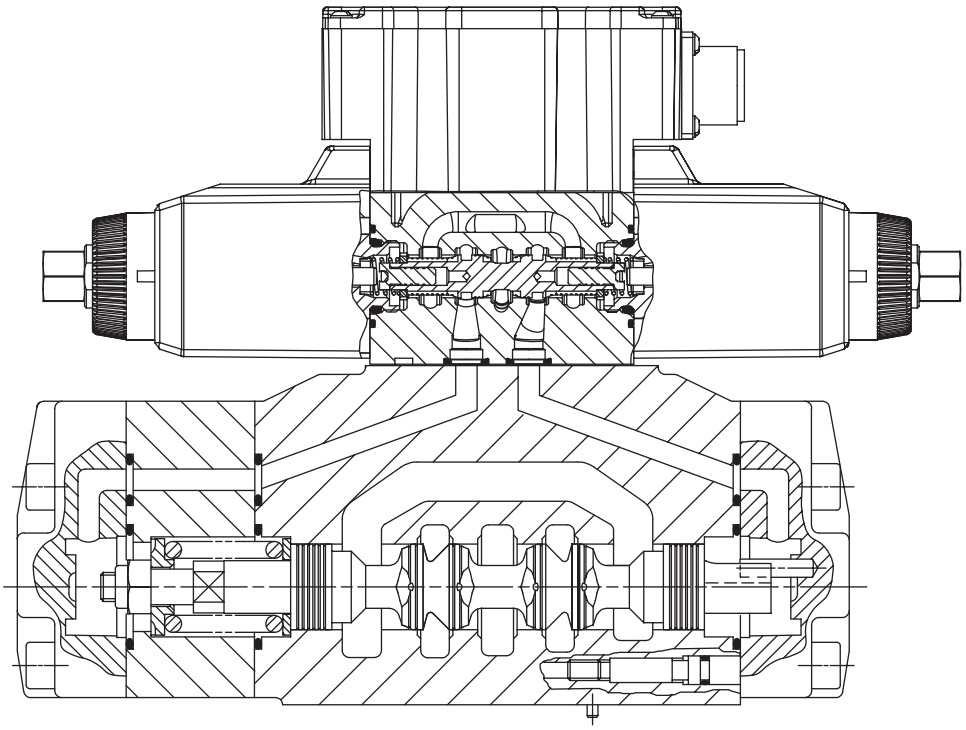
This range of valves offers effective and economic solutions for applications having repetitive load conditions throughout each operating cycle, e .g. mold closure/ opening in plastics molding machinery.

Standard features and benefits

- These global products, manufactured to world-class quality standards, are sold and serviced throughout the world .
- These valves open up expanded application opportunities as a cost effective alternative to feedback-type proportional and servo valves .
- Auxiliary DIN-rail mounted function modules available .

Typical section

KBDG5V-7
Without integral pilot pressure reducer



Model codes

KBDG5V-	*-	***	C	***	N	(***)	(**)	(T)	(*)	*	P*7	*1	1*
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 Model series

KB	Proportional valve with integral amplifier, B series
D	Directional valve
G	Subplate mounted
5	Solenoid controlled/pilot operated
V	Pressure rating on P, A & B ports Sizes 7, 8 and 10: 350 bar (5000 psi) Size 5: 315 bar (4500 psi)

2 Mounting interface size (ISO 4401)

5	NFPA D05, CETOP 5
7	NFPA D07, CETOP 7
8	NFPA D08, CETOP 8
10	NFPA D10, CETOP 10

3 Spool type

See "Spool Data", page 5

2	All ports blocked when spool centered
7	Open P to A&B
12	All ports blocked when spool centered, regenerative function when spool energized
33/133	Bleed A and B to T when spool centered

4 Spool/spring arrangement

C	Spool spring centered

5 Flow rating

See "Spool Data", page 5

Flow rating (L/min) for symmetric spools

"A" port flow rating (L/min) for asymmetric spools

6 Spool metering type

N	Meter-in and meter-out

7 Flow rating

See "Spool Data", page 5

"B" port flow rating (L/min) for asymmetric spools

8 Pilot supply

Models without integral, fixed pilot pressure reducer module

E	External pilot supply
Blank	Internal pilot supply

Models with integral, fixed pilot pressure reducer module

X	Internal pilot supply
EX	External pilot supply

For system pressures less than 200 bar (2900 psi) the pilot pressure reducing module is optional.

For system pressures above 200 bar (2900 psi) the pilot pressure reducing module must be fitted.

9 Pilot drain

T	Internal pilot drain
Blank	External pilot drain

10 Manual override

Blank	Plain overrides
H	Water-resistant overrides
Z	No overrides

11 Electrical command option

M1	+/- 10V control signal
M2	4-20 mA control signal

12 Electrical connection

PC7	7 pin connector without plug supplied
PE7	7 pin connector with plug supplied
PH7	As PE7 but with pin "C" used for enable signal
PR7	As PC7 but with pin "C" used for enable signal

13 Coil identification

H	24V

14 Design number, 11 series

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

⚠ WARNING

Valves with integral amplifiers are supplied with or without the metal 7-pin plug. The Vickers™ plug, part no. 934939, must be correctly fitted to ensure that the EMC rating and IP67 rating are achieved. The plug retaining nut must be tightened to 2-2,5 Nm (1.5-2.0 lbf ft) to effect a proper seal.

Spool data

Spool types and flow ratings

Symmetric spools

Flow ratings for flow through P-A-B-T at △p = 5 bar (72 psi) per flow path, e.g. P-A, or B-T. For other pressure drop values see "Flow Gain" curves on pages 10 and 11.

Spool code	Main stage spool symbol	Flow rating
For KBDG5V-5 valves:		
2C90N	2C	90 L/min (24 USgpm)
33C80	33C	80 L/min (21 USgpm)
For KBDG5V-7 valves:		
2C180N	2C	180 L/min (48 USgpm)
33C85N	33C	85 L/min (22.6 USgpm)
33C170N	33C	170 L/min (45 USgpm)
For KBDG5V-8 valves:		
2C330N	2C	330 L/min (88 USgpm)
33C330N	33C	330 L/min (88 USgpm)
For KBDG5V-10 valves:		
2C550N	2C	550 L/min (145 USgpm)
7C550N	7C	550 L/min (145 USgpm)
12C550N	12C	550 L/min (145 USgpm)
33C550N	33C	550 L/min (145 USgpm)

Asymmetric spools

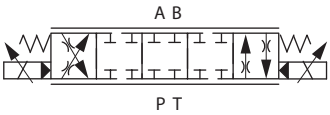
Figure preceding metering type designator, "N" (e.g. 2C***N) is flow rating P-A, or A-T ("A" port flow); figure after "N" (N***) is flow rating P-B, or B-T ("B" port flow).

Spool code	Main stage spool symbol	Flow rating
For KBDG5V-5 valves:		
2C70N45	2C	70 L/min (18.6 USgpm), "A" port flow
		45 L/min (12.0 USgpm), "B" port flow
33C60N35	33C	60 L/min (16.0 USgpm), "A" port flow
		40 L/min (10.6 USgpm), "B" port flow
For KBDG5V-7 valves:		
2C180N100	2C	180 L/min (48.0 USgpm), "A" port flow
		100 L/min (26.6 USgpm), "B" port flow
33C130N65	33C	130 L/min (34.6 USgpm), "A" port flow
		65 L/min (17.3 USgpm), "B" port flow
133C160N100	133C	160 L/min (42.3 USgpm), "A" port flow
		100 L/min (26.6 USgpm), "B" port flow
For KBDG5V-8 valves:		
2C330N200	2C	330 L/min (88.0 USgpm), "A" port flow
		200 L/min (66.6 USgpm), "B" port flow
33C330N200	33C	330 L/min (88.0 USgpm), "A" port flow
		200 L/min (66.6 USgpm), "B" port flow
133C330N200	133C	330 L/min (88.0 USgpm), "A" port flow
		200 L/min (66.6 USgpm), "B" port flow
12C330N200	12C	330 L/min (88.0 USgpm), "A" port flow
		200 L/min (66.6 USgpm), "B" port flow
For KBDG5V-10 valves:		
2C310N550	2C	310 L/min (82.6 USgpm), "A" port flow
		550 L/min (145 USgpm), "B" port flow
2C550N310	2C	550 L/min (145 USgpm), "A" port flow
		310 L/min (82.6 USgpm), "B" port flow
33C310N550	33C	310 L/min (82.6 USgpm), "A" port flow
		550 L/min (145 USgpm), "B" port flow
33C550N310	33C	550 L/min (145 USgpm), "A" port flow
		310 L/min (82.6 USgpm), "B" port flow
133C550N310	133C	550 L/min (145 USgpm), "A" port flow
		310 L/min (82.6 USgpm), "B" port flow

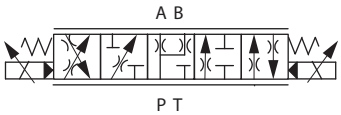
Functional symbols

Spool symbols

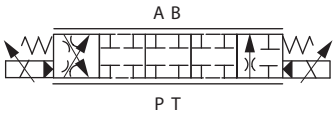
Simplified symbols including transient flow conditions (dotted line).



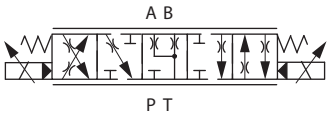
Spool type 2C



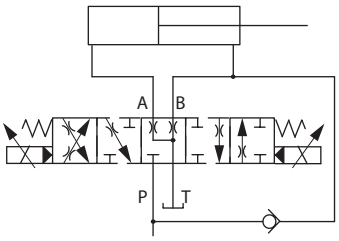
Spool type 7C



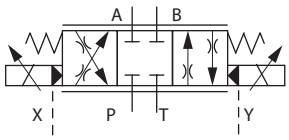
Spool type 12C



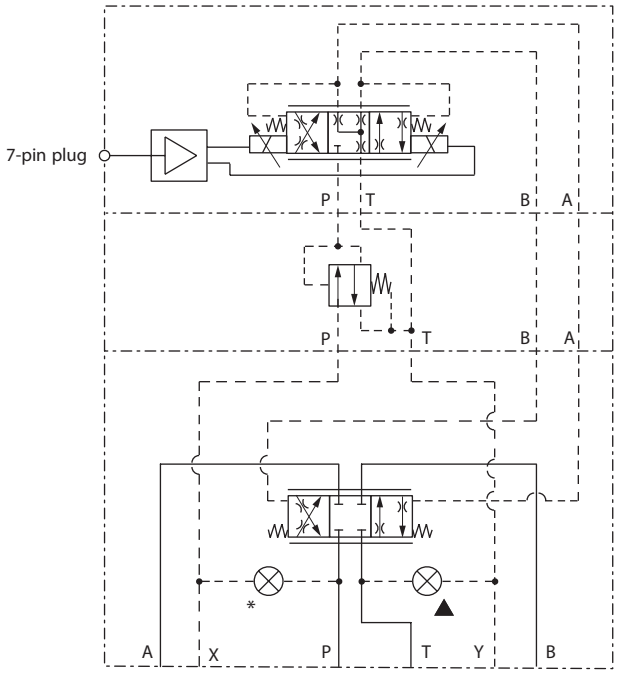
Spool type 33C



Spool type 133C with typical regenerative circuit



Simplified symbol
KBDG5V models
(Spool type "2" shown)



Pilot stage with integral amplifier.

Pressure reducer module, see "Model Code".

Main-stage.
Spool type "2C" shown.

Typical schematic symbol

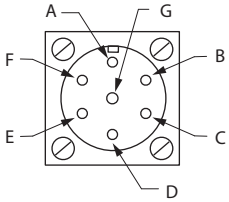
* Internal plug shown, for external pilot supply (via port X). For internal pilot supply (from port P) plug is not fitted. Port X should be blocked at mounting interface, or otherwise plugged at subplate or manifold block. See "Model Code".

▲ Internal plug shown, for external pilot drain (via port Y). For internal pilot drain (via port T) plug is not fitted. Port Y should be blocked at mounting interface, or otherwise plugged at subplate or manifold block. See "Model Code".

See also "Pilot Drain Application" notes.

Operating data

Data is typical with fluid at 36 cSt (168SUS) and 50˚C (122˚F).

Power supply (24V)	(Model code 13 H)	24V DC (21V to 36V including 10% peak-to-peak ripple) maximum current - 1.2A
Command signal		
Voltage mode		0 to 10V DC, or 0 to –10V DC, or –10V to + 10V DC
• Input impedance		M1: 47 kΩ
• Common mode voltage to pin D		18V (max)
• Max differential voltage to pin E to pin B		4V
Current mode		4-20 mA
The content of row input impedance		100 ohms
Command signal (Current) Input impedance	(Model code 11 2)	4 to 20 mA 100Ω
Valve enable signal: Enable Disable Input impedance		 >9.0V (34V max) <2.0V 36 kΩ
7-pin plug connector  View of pins of fixed half		Pin Description A Power supply positive (+) B Power supply 0V and current command return C Valve enable (PH7 & PR7) D Command signal (+V or current in) E Command signal (-V or current GND) F Output monitor G Protective ground
Electromagnetic compatibility (EMC)		IEC 61326-2-1 (Electrical equipment for measurement, control and laboratory use)
		Conducted Emissions CISPR11 -2015-06 Ed 6.0/EN55011 - Class A, 150kHz to 30MHz
		Radiated Emissions CISPR11 -2015-06 Ed 6.0 /EN55011 - Class A, 30MHz – 1GHz
		RF Continuous Conducted disturbances IEC 61000-4-6, 3Vrms Class A 150 KHz to 80 MHz
		RF Electromagnetic Field, 80MHz to 1GHZ, 10V/m; 1.4GHz to 2.7GHz, 3V/m; Meets Criterion A
		Surge: IEC 61000-4-5
		• DC Power Port : ±1kV • Signal/Control Port : ±1kV
		Electrical Fast Transients IEC 61000-4-4, Class B
		• DC Power Port : ±1kV • Signal/Control Port: ±0.5kV
		Electrostatic discharges (ESD) IEC 61000-4-2, Class B
		• Air ±8kV • Contact ±4kV
ROHS Compliance:		Complies with: Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU
Monitor signal (pin F) Output impedance		0 to +5V (0.39 V/A) 10kΩ
Reproducibility, valve-to-valve (at factory settings): Flow at 100% command signal		 ≤5%
Protection: Electrical Environmental		 Reverse polarity protected IEC 529, Class IP67
Ambient air temperature range for full performance Oil temperature range for full performance		0˚C to 70˚C (32˚F to 158˚F) 0˚C to 70˚C (32˚F to 158˚F)
Minimum temperature at which valves will work at reduced performance		–20° C (–4° F)
Storage temperature range		–25˚C to +85˚C (-13˚F to +185˚F)
Mass: Valves with integral pressure reducing module KBDG5V-5 KBDG5V-7 KBDG5V-8 KBDG5V-10 For models without reducing module, deduct 1,2 kg (2.6 lb)		 9,8 kg (21.2 lb) 11,9 kg (25.8 lb) 20,6 kg (44.6 lb) 54,9 kg (118.9 lb)
Supporting products: Auxiliary electronic modules (DIN-rail mounting): EHA-CON-201-A-2* Signal converter EHD-DSG-201-A-1* Command signal generator EHA-RMP-201-A-2* Ramp generator EHA-PID-201-A-2* PID controller EHA-PSU-201-A-10 Power supply		 See catalog 2410A See catalog 2470 See catalog 2410A See catalog 2427 See catalog 2410A
Ramp time		0-12 sec for full step input (0-100%)
Relative duty factor		Continuous rating (ED = 100%)
Hysteresis with flow through P-A-B-T		<8% of rated flow

Performance characteristics

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

Minimum pressure

KBDG5V-5/7/8
For full flow performance, pilot pressure ≥45 bar (650 psi).

KBDG5V-10
For full flow performance, pilot pressure ≥28 bar (405 psi).

i.e.

Pressure at port P for internal pilot supply.

or

Pressure at port X for external pilot supply.

Pilot drain application notes

External pilot drain is the recommended configuration.

Internal pilot drain is possible where a stable "T" port pressure, not exceeding 8 bar (116 psi), can be guaranteed.

⚠ WARNING

Any pressure surges at the "T" port (drain) will cause the main spool to move and change the valve output. This possibility is eliminated by the use of an external drain.

Maximum Pressures, bar (psi) for models without integral pilot pressure reducer

Model	Pilot pressure source	Model code 7	Ports P, A, B	T	X	Y †
KBDG5V-5	External	E	315	210	200	8
			(4500)	(3000)	(2900)	(116)
	Internal	Omit	200§	210	■	8
			(2900)	(3000)		(116)
KBDG5V-7/8	External	E	350	350	200	8
			(5000)	(5000)	(2900)	(116)
	Internal	Omit	200§	350	■	8
			(2900)	(5000)		(116)
KBDG5V-10	External	E	350	350	40	8
			(5000)	(5000)	(580)	(116)
	Internal	Omit	40	350♦	■	8
			(580)	(5000)		(116)
For models with integral pilot pressure reducer						
KBDG5V-5	External	EX	315	210	315	8
			(4500)	(3000)	(4500)	(116)
	Internal	X	315	210	■	8
			(4500)	(3000)		(116)
KBDG5V-7/8	External	EX	350	350♣	315	8
			(5000)	(5000)	(4500)	(116)
	Internal	X	350	350♣	■	8
			(5000)	(5000)		(116)
KBDG5V-10	External	EX	350	350♦	315	8
			(5000)	(5000)	(4500)	(116)
	Internal	X	350	350♦	■	8
			(5000)	(5000)		(116)

■ When using internal pilot pressure, port X should be plugged at the subplate or manifold face (e.g. manifold not drilled for connection to port X).

§ The maximum pressure for ports A and B is: 310 bar (4500 psi) for size 5; 350 bar (5000 psi) for sizes 7 and 8.

† See "Pilot Drain Application" note.

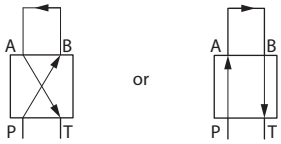
♦ Pilot must be externally drained, otherwise "Y" port pressure applies.

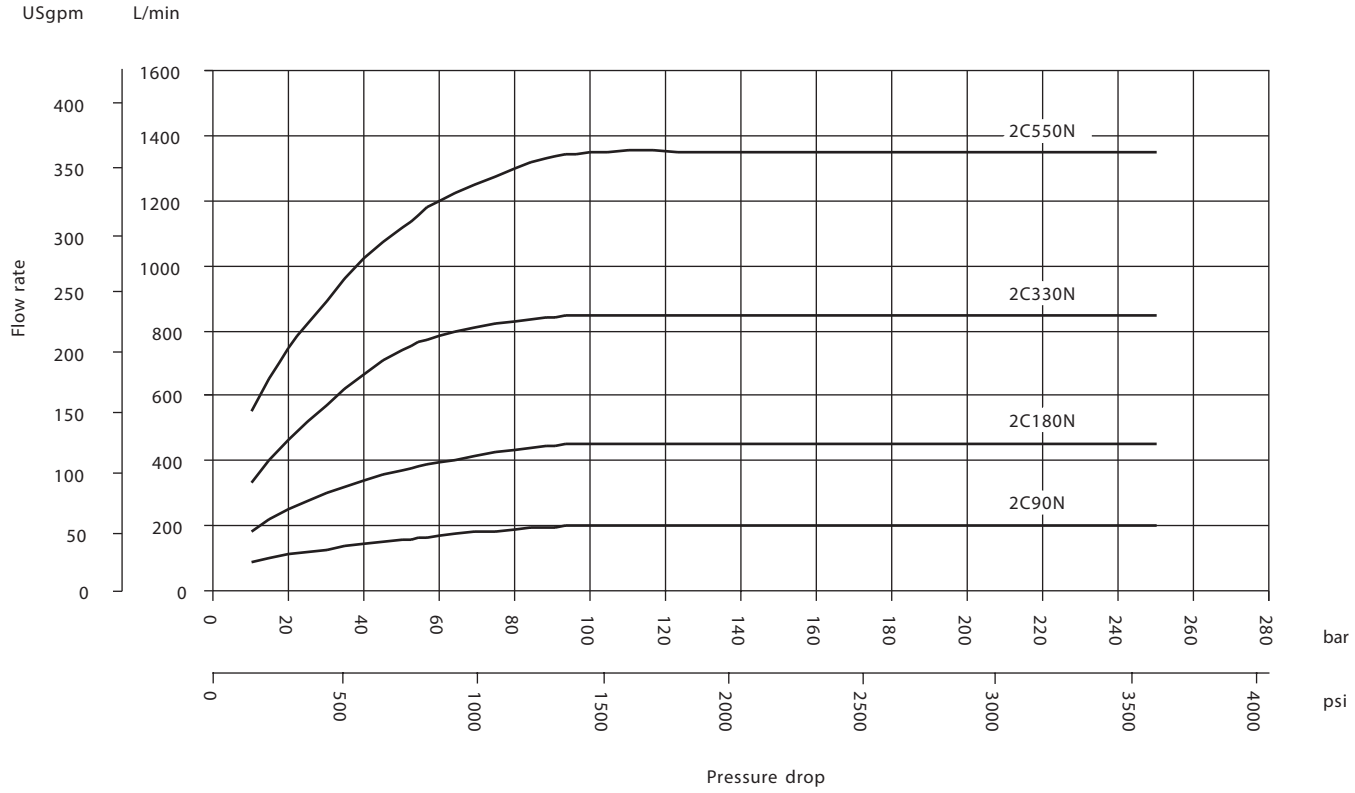
♣ Pilot must be externally drained, otherwise "T" port pressure limited to 210 bar (3000 psi).

Power capacity envelopes

Flow throughP-A-B-T or P-B-A-T

Power capacity
Looped flow

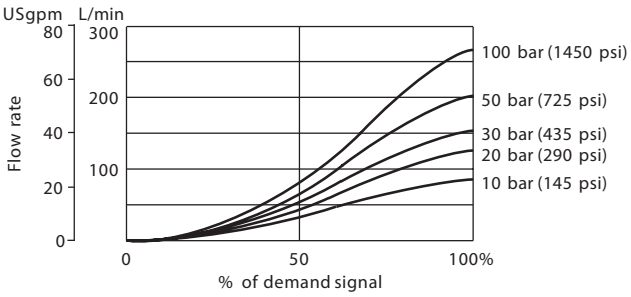




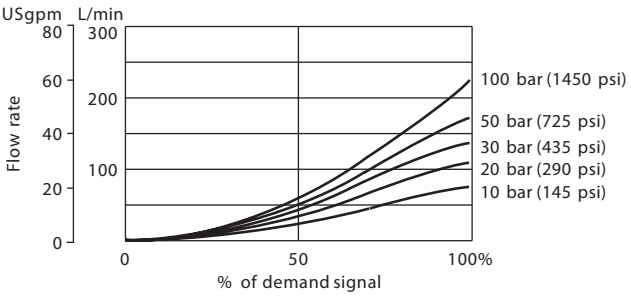
Flow characteristics

Flow gain curves at stated values of total valve pressure drop, for flow P-A-B-T, or P-B-A-T.

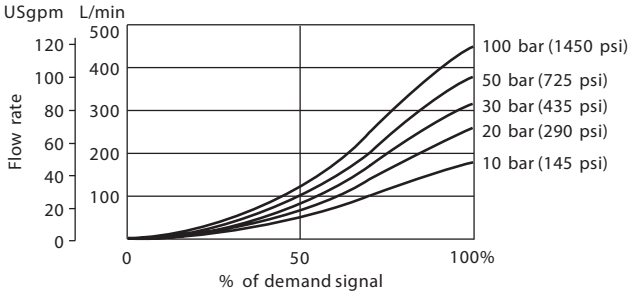
KBDG5V-5-2C90N



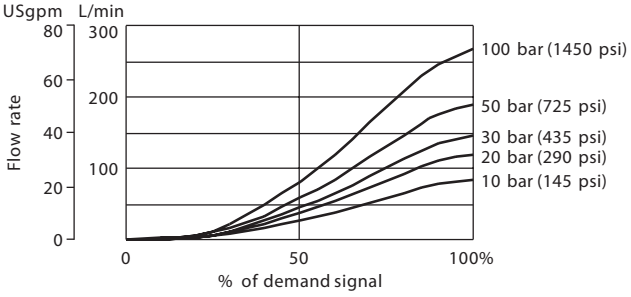
KBDG5V-5-33C80N



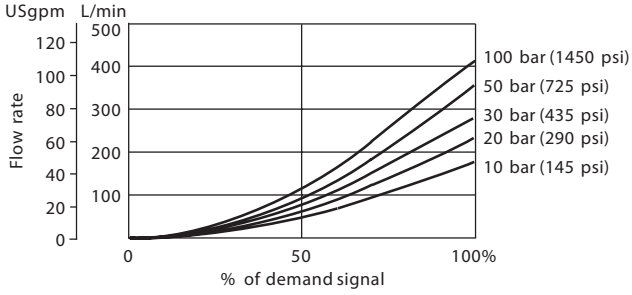
KBDG5V-7-2C180N



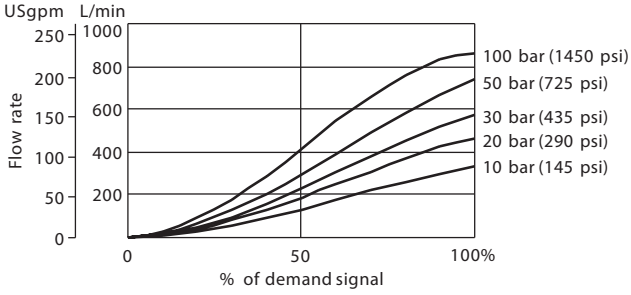
KBDG5V-7-33C85N



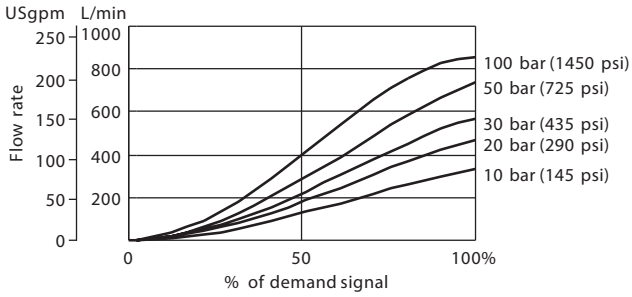
KBDG5V-7-33C170N



KBDG5V-8-2C330N



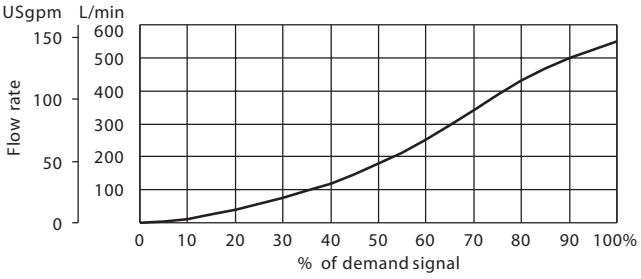
KBDG5V-8-33C330N



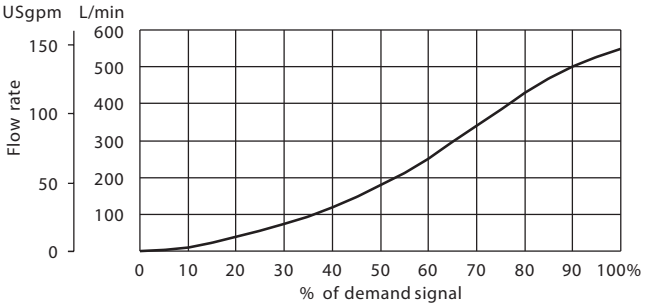
Flow characteristics

Flow gain curves at 10 bar (145) psi valve pressure drop, for flow P-A-B-T, or P-B-A-T.

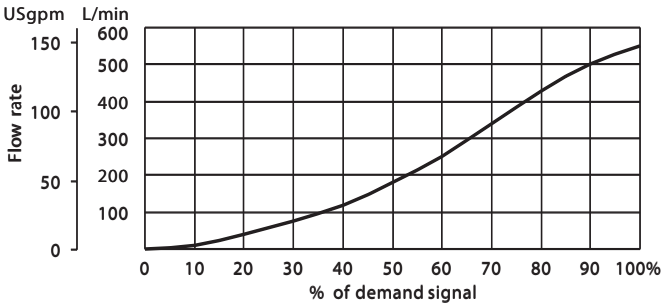
KBDG5V-10-2C550N



KBDG5V-10-7C550N
KBDG5V-10-12C550N



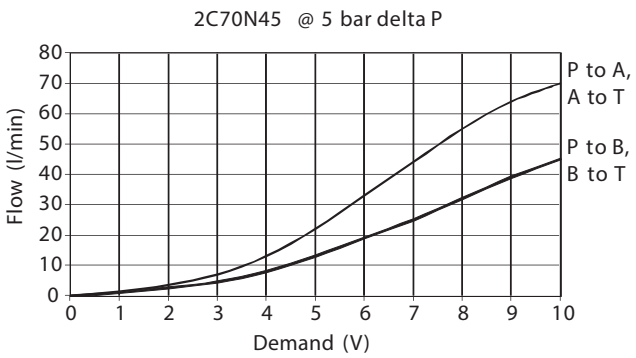
KBDG5V-10-33C550N



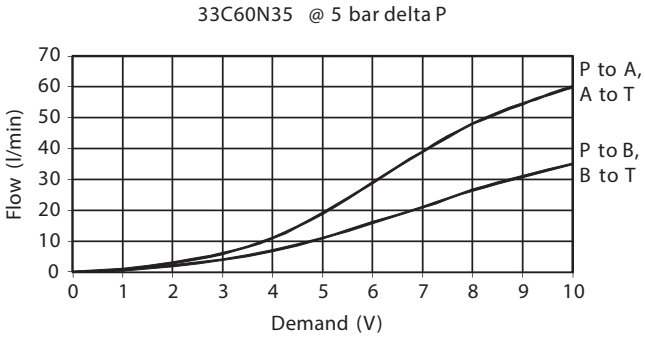
Asymmetric spools

At 5 bar (72 psi) valve pressure drop

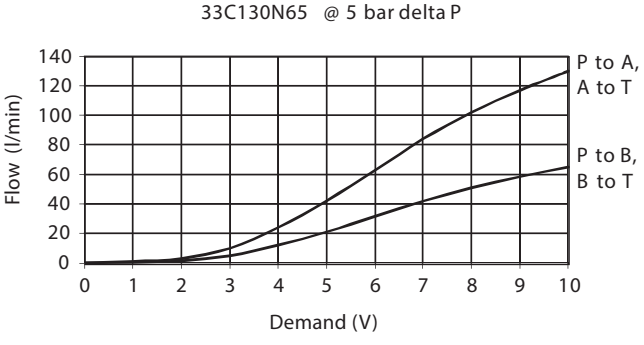
2C70N45 @ 5 bar delta P



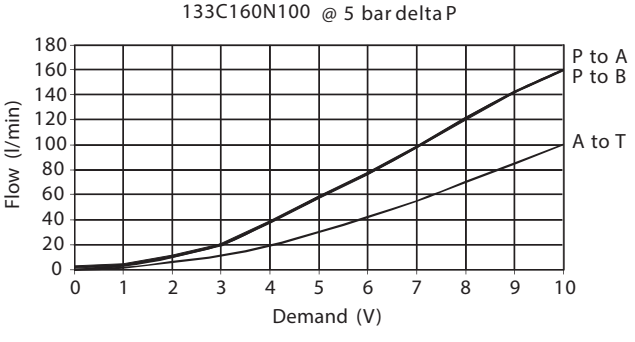
33C60N35 @ 5 bar delta P



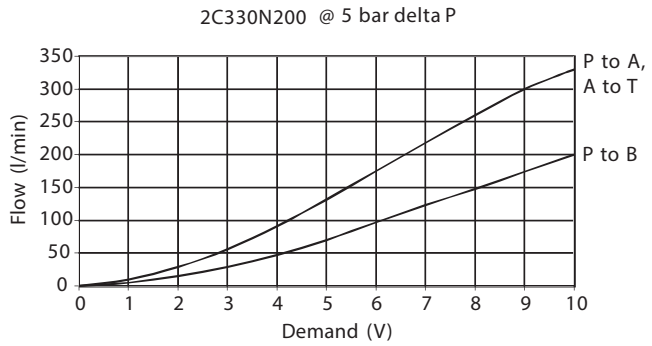
33C130N65 @ 5 bar delta P



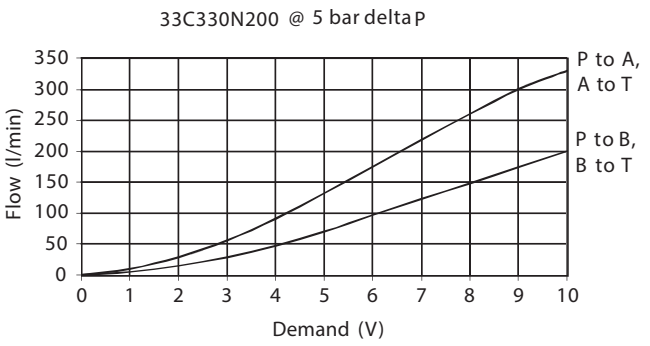
133C160N100 @ 5 bar delta P



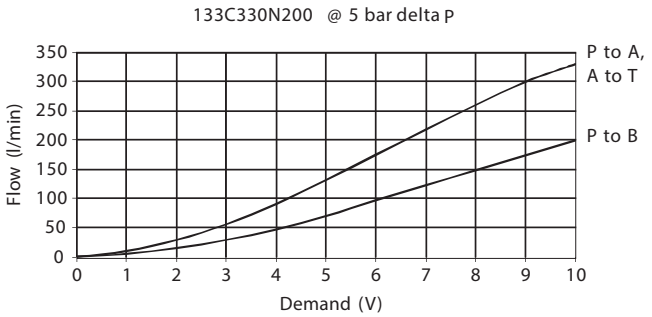
2C330N200 @ 5 bar delta P



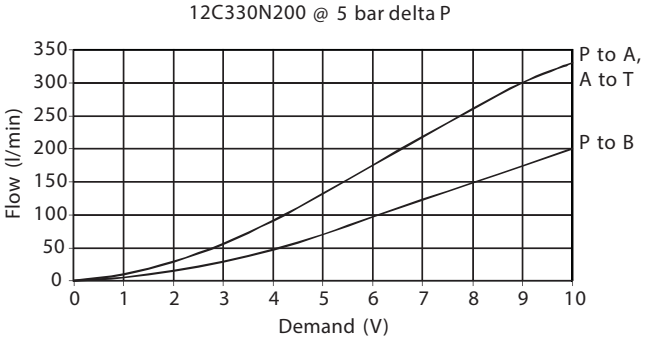
33C330N200 @ 5 bar delta P



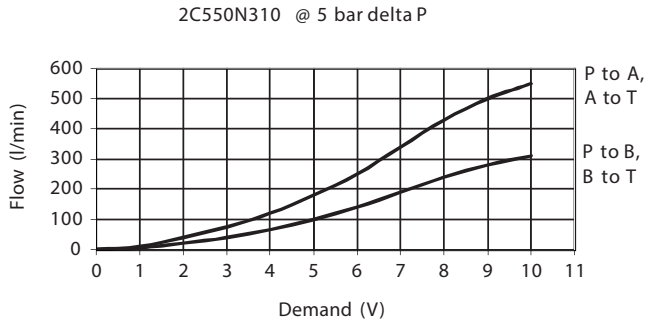
133C330N200 @ 5 bar delta P



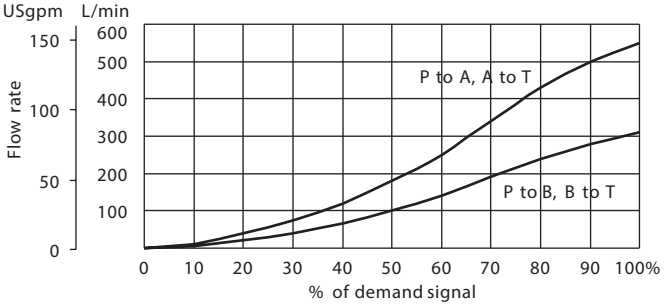
12C330N200 @ 5 bar delta P



2C550N310 @ 5 bar delta P



KBDG5V-10-33C550N310



Step response (typical)

Test conditions:

No pressure reducer module

Flow P-A-B-T

Total valve △p = 10 bar (145 psi)

External pilot
pressure = 50 bar (725 psi)

"Response" = Time, from step response signal, until output reaches 90% of step change value

Input signal step change	Spool response times (ms) KBDG5V-5	KBDG5V-7	KBDG5V-8	KBDG5V-10
0 to 100%	42	45	85	110
100% to 0	33	47	55	110
10% to 90%	43	58	75	100
90% to 10%	40	50	54	100
25% to 75%	34	50	70	95
75% to 25%	30	48	45	95
90% to 90%	78	78	144	200

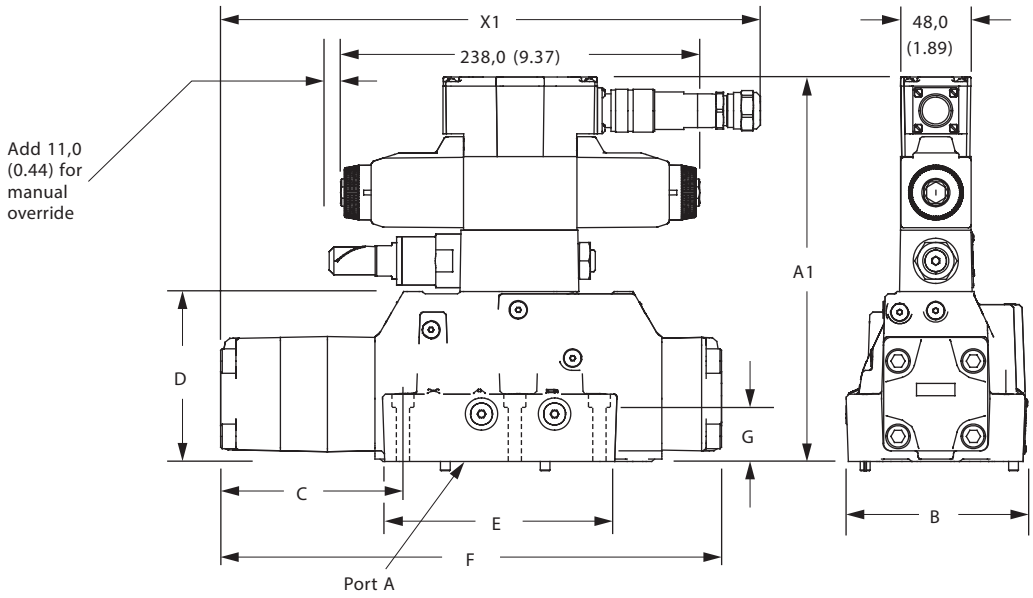
Pilot flow required to achieve above response times:

	KBDG5V-5	KBDG5V-7	KBDG5V-8	KBDG5V-10
	3,8 L/min	6,2 L/min	6,2 L/min	23,0 L/min
	(0.98 USgpm)	(1.6 USgpm)	(1.6 USgpm)	(5.96 USgpm)

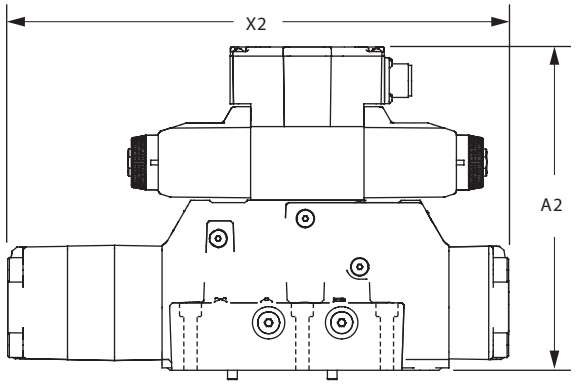
Installation dimensions

KBDG5V Models with "EX" or "X"
(With integral pilot pressure reducer)
The illustration is correct for KBDG5V-8 valves
Dimensions are shown in mm (inches)

3rd angle projection



KBDG5V Models with "E" or no symbol
(Without integral pilot pressure reducer)



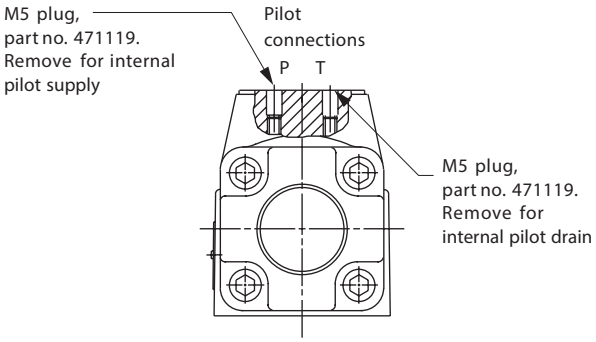
Model	A1	A2	B	C	D	E	F	G	X1 ▲	X2 ▲
KBDG5V-5	233,6	187,6	70,4	94,4	87,3	98,0	217,0	30,0	277,0	238,0
	(9.20)	(7.39)	(2.77)	(3.72)	(3.4)	(3.86)	(8.54)	(1.18)	(10.9)	(9.37)
KBDG5V-7	241,4	195,4	92,8	83,3	95,1	124,0	232,0	33,0	297,0	258,0
	(9.50)	(7.69)	(3.65)	(3.3)	(3.7)	(4.88)	(9.14)	(1.3)	(11.69)	(10.15)
KBDG5V-8	257,3	211,3	117,0	117,3	111,0	175,5	327,0	42,5	352,0	327,0
	(10.13)	(8.32)	(4.60)	(4.62)	(4.37)	(6.91)	(12.87)	(1.67)	(13.86)	(12.87)
KBDG5V-10	339,8	293,8	196,8	194,3	193,5	226,8	516,9	35,0	516,9	516,9
	(13.38)	(11.57)	(7.75)	(7.65)	(7.62)	(8.93)	(20.35)	(1.38)	(20.35)	(20.35)

▲ Overall installed length of KBD valves is X1 with connector fitted, and X2 without.

Pilot supply and drain plugs

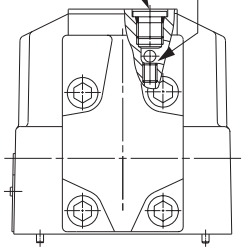
KBDG5V-5 models

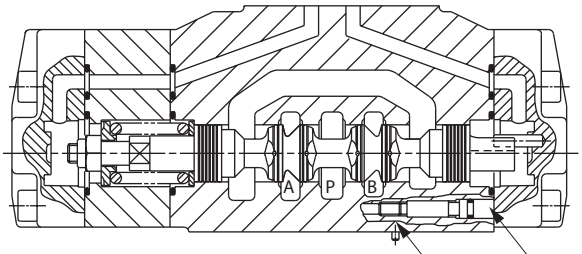
Viewed from port B end of main-stage



KBDG5V-7 models only *
Remove this plug for access to pilot drain plug

KBDG5V-7 models only *
M6 x 8 mm plug, part no. 471131: fitted for external pilot drain. Not fitted for internal pilot drain.





KBDG5V-7 models only *
M6 x 8 mm plug, part no. 471131: fitted for external pilot supply models; not fitted for internal pilot supply models. See "Model Code".

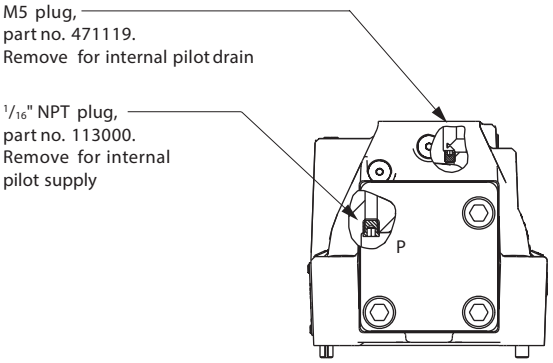
Size 7 only *
M5 internal thread for removal of closure plug

* Internal plug shown, for external pilot supply (via port X).

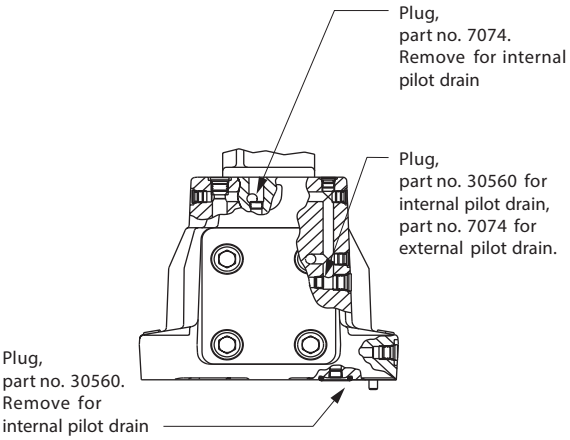
For internal pilot supply (from port P) plug is not fitted. Port X should be blocked at mounting interface, or otherwise plugged at subplate of manifold block. See "Model Code".

KBDG5V-8 models

Section through port P of main-stage



KBDG5V-10 models

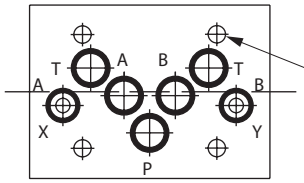


Installation dimensions

Views on mountingfaces

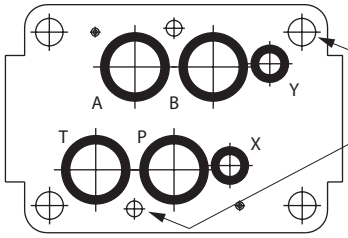
All O-seals supplied

KBDG5V-5



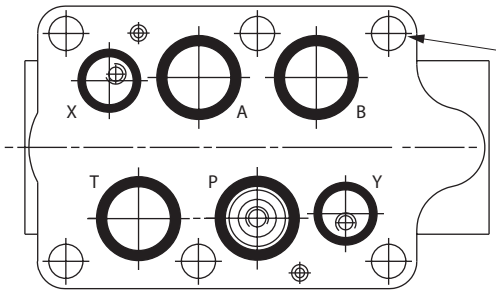
4 holes for mounting bolts
Ø 7,02 (0.27 Ø) spotfaced to
Ø 11,0 (0.43 Ø)

KBDG5V-7



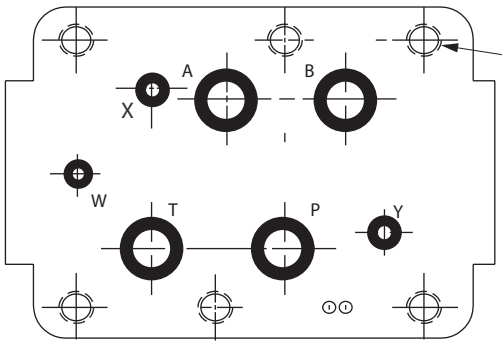
6 holes for mounting bolts
4 x Ø 11,0 (0.43 Ø) c'bored
Ø 17,5 (0.68 Ø)
2 x Ø 6,4 (0.25 Ø) c'bored
Ø 11,0 (0.43 Ø)

KBDG5V-8



6 holes for mounting bolts
Ø 13,5 (0.53 Ø)
spotfaced to
Ø 20,0 (0.78 Ø)

KBDG5V-10



6 holes for mounting bolts

Electrical information

Block diagram KBDG5V-*

Command signals and outputs

7-pin plug			Flow direction
Command = Volts (±10V)	**Pin D**	**Pin E**	
	Positive	0V	P to A
	0V	Negative	
	$V_D - V_E$ = Positive		
	Negative	0V	P to B
	0V	Positive	
	$V_D - V_E$ = Negative		

Command = Current (4-20 mA)	**Pin D**	**Pin E**	**Pin B**	**Flow direction**
	More than 12 mA	Current GND	Current return	P to A
	Less than 12 mA	Current GND	Current return	P to B

Wiring

Connections must be made via the 7-pin plug mounted on the amplifier. Recommended cable sizes are:

Power cables

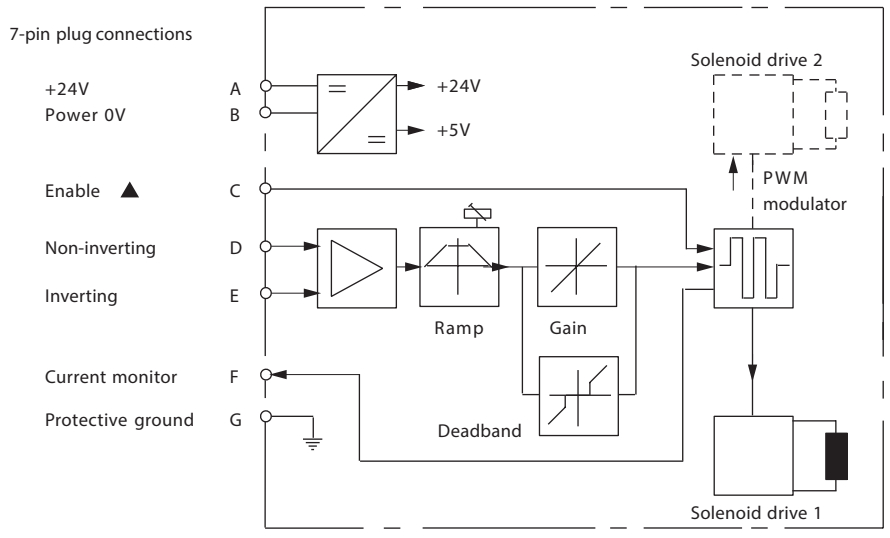
For 24V supply:
0,75 mm² (18 AWG) up to 20m (65 ft)
1,00 mm² (16 AWG) up to 40m (130 ft)

Signal cables

0,50 mm² (20 AWG)

Screen (shield)

A suitable cable would have 7 cores, a separate screen for the signal wires and an overall screen . Cable outside diameter 8,0-10,5 mm (0 .31- 0 .41 inches) . See connection diagrams on next page.



Command signal, see table

▲ In valves with PH7 or PR7 type electrical connection.

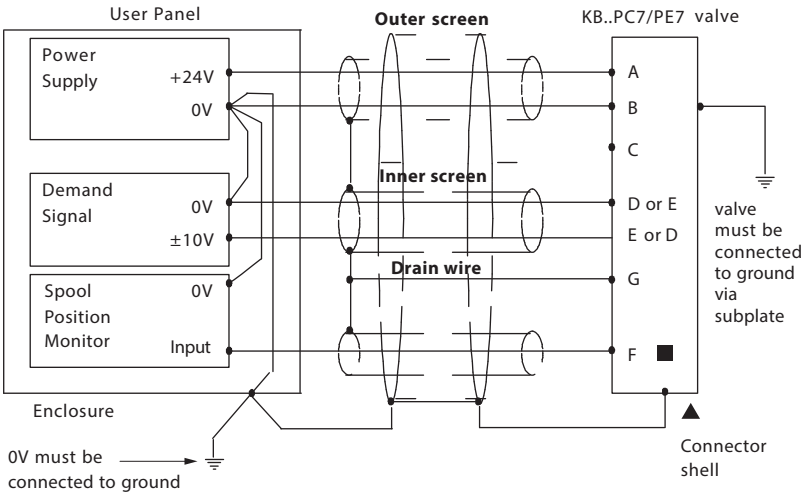
⚠ WARNING

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

Electrical information

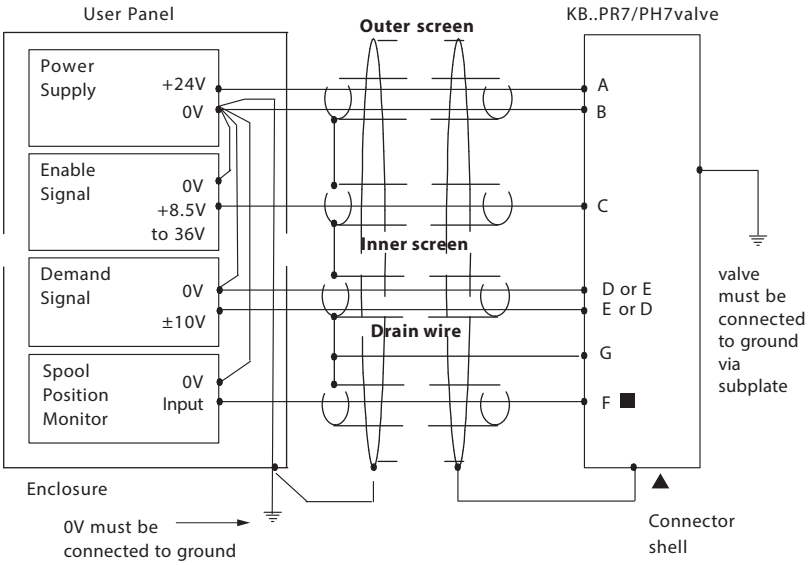
Voltage input (M1) wiring

■ Spool position monitor voltage (pin F) will be referenced to the KB valve local ground.



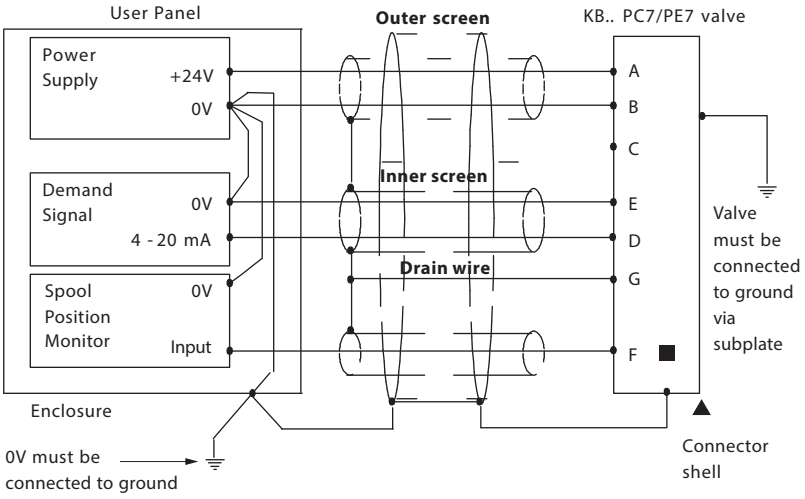
Wiring connections for M1 valves with enable feature

Notee:▲ In applications where the valve must conform to European RFI/EMC regulations, the outer screen (shield) must be connected to the outer shell of the 7 pin connector, and the valve body must be fastened to the earth ground. Proper earth grounding practices must be observed in this case, as any differences in command source and valve ground potentials will result in a screen (shield) ground loop.



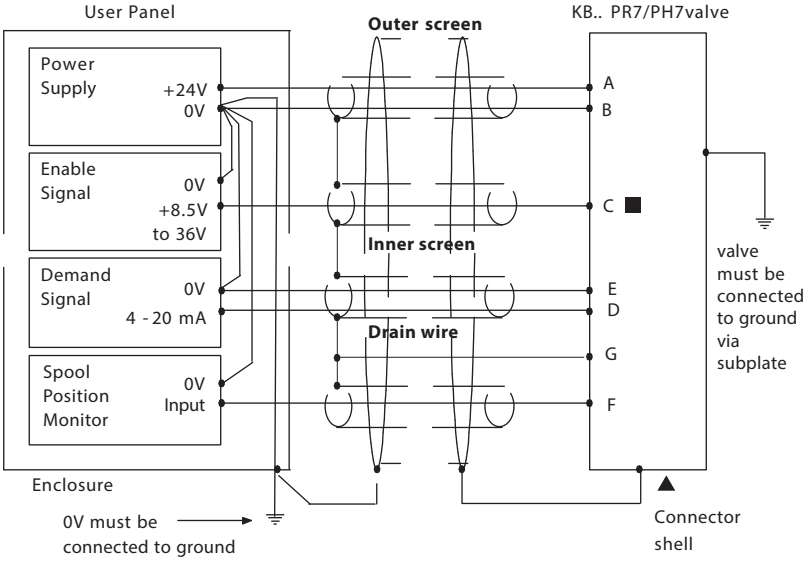
Current input (M2) wiring

■ Spool position monitor voltage (pin F) will be referenced to the KB valve local ground.



Wiring connections for M2 valves with enable feature

Notee:▲ In applications where the valve must conform to European RFI/EMC regulations, the outer screen (shield) must be connected to the outer shell of the 7 pin connector, and the valve body must be fastened to the earth ground. Proper earth grounding practices must be observed in this case, as any differences in command source and valve ground potentials will result in a screen (shield) ground loop.



⚠ WARNING

Electromagnetic Compatibility (EMC)
It is necessary to ensure that the valve is wired up as above. For effective protection the user electrical cabinet, the valve subplate or manifold and the cable screens should be connected to efficient ground points. The metal 7 pin connector part no. 934939 should be used for the integral amplifier. In all cases both valve and cable should be kept as far away as possible from any sources of electromagnetic radiation such as cables carrying heavy current, relays and certain kinds of portable radio transmitters, etc. Difficult environments could mean that extra screening may be necessary to avoid the interference. It is important to connect the 0V lines as shown above. The multi-core cable should have at least two screens to separate the demand signal and monitor output from the power lines. The enable line to pin C should be outside the screen which contains the demand signal cables.

Application data

Hydraulic fluids and fluid cleanliness

Recommendations on contamination control methods and the selection of products to control fluid condition are included in Danfoss Hydraulic Fluid Recommendation 03-401-2010 rev 1.

For products in this catalog the recommended levels are: 0 to 70 bar (1000 psi) ..18/16/13 70+ bar (1000+ psi) ...17/15/12

Hydraulic fluids

Materials and seals used in these valves are compatible with antiwear hydraulic oils, and with non-alkyl-based phosphate esters .

The extreme operating viscosity range is 500 to 13 cSt (2270 to 70 SUS) but the recommended running range is 54 to 13 cSt (245 to 70 SUS) .

Installation

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. Good installation practice dictates that the tank port and any drain port are piped so as to keep the valves full of fluid once the system start-up has been completed.

Mounting bolt kits

For KBDG5V-5
BK02-156493M (metric)
BK590720 (inch)

For KBDG5V-7
BKDG7M (metric)
BK590724 (inch)

For KBDG5V-8
BKDG8-655M (metric)
BKDG06-635 (inch)

For KBDG5V-10
BKDG10636M (metric)
BKDG10636 (inch)

If not using recommended Vickers™ bolt kits, bolts used should be to ISO 898, 12.9 or better.

Mounting bolt torques

Recommended torques with threads lubricated

For KBDG5V-5
M6 or 1/4"-20 UNC bolts:
To 210 bar (3000 psi) 14 Nm (10.3 lbf ft)
To 310 bar (4500 psi) 20 Nm (14.75 lbf ft)

For KBDG5V-7
M10 or 3/8"-16 UNC bolts:
49 to 59 Nm (36 to 43 lbf ft) plus
M6 or 1/4"-20 UNC bolts 9 to 14 Nm (6.6 to 10.3 lbf ft)

For KBDG5V-8
M12 or 1/2"-13 UNC bolts
103 to 127 Nm (76 to 93 lbf ft)

For KBDG5V-10
M20 or 3/4"-10 UNC-2B bolts 185-220 Nm
(250-300 lbf ft)

Seal kits (Mainstage only)

KBDG5V-5..... 565143.....

KBDG5V-7.... 02-351175

KBDG5V-8.... 02-352520

KBDG5V-10 02-329888

Plugs

7-pin plug (metal) 934939
7-pin plug (plastic) 694534
(Metal plug must be used for full EMC protection)

Notee: An alternative metal connector which gives EMC protection but not IP67 rating is available from ITT-Cannon, part number CA06-COM-E-14S-A7-P.

Service information

The products from this range are preset at the factory for optimum performance;
disassembling critical items would destroy these settings.
It is recommended that if any mechanical or electronic repair is necessary, valves should be returned to the nearest Danfoss repair center.The products will be refurbished as necessary and retested to specification before return.

Field repair is restricted to the replacement of the seals .

This page is intentionally left blank

This page is intentionally left blank

This page is intentionally left blank

ENGINEERING
TOMORROW

Products we offer:

- Cartridge valves
- DCV directional control valves
- Electric converters
- Electric machines
- Electric motors
- Gear motors
- Gear pumps
- Hydraulic integrated circuits (HICs)
- Hydrostatic motors
- Hydrostatic pumps
- Orbital motors
- PLUS+1® controllers
- PLUS+1® displays
- PLUS+1® joysticks and pedals
- PLUS+1® operator interfaces
- PLUS+1® sensors
- PLUS+1® software
- PLUS+1® software services, support and training
- Position controls and sensors
- PVG proportional valves
- Steering components and systems
- Telematics

Hydro-Gear
www.hydro-gear.com

Daikin-Sauer-Danfoss
www.daikin-sauer-danfoss.com

Danfoss Power Solutions is a global manufacturer and supplier of high-quality hydraulic and electric components. We specialize in providing state-of-the-art technology and solutions that excel in the harsh operating conditions of the mobile off-highway market as well as the marine sector. Building on our extensive applications expertise, we work closely with you to ensure exceptional performance for a broad range of applications. We help you and other customers around the world speed up system development, reduce costs and bring vehicles and vessels to market faster.

Danfoss Power Solutions – your strongest partner in mobile hydraulics and mobile electrification.

Go to www.danfoss.com for further product information.

We offer you expert worldwide support for ensuring the best possible solutions for outstanding performance. And with an extensive network of Global Service Partners, we also provide you with comprehensive global service for all of our components.

Local address:

Danfoss
Power Solutions (US) Company
2800 East 13th Street
Ames, IA 50010, USA
Phone: +1 515 239 6000

Danfoss
Power Solutions GmbH & Co. OHG
Krokamp 35
D-24539 Neumünster, Germany
Phone: +49 4321 871 0

Danfoss
Power Solutions ApS
Nordborgvej 81
DK-6430 Nordborg, Denmark
Phone: +45 7488 2222

Danfoss
Power Solutions Trading (Shanghai) Co., Ltd.
Building #22, No. 1000 Jin Hai Rd
Jin Qiao, Pudong New District
Shanghai, China 201206
Phone: +86 21 2080 6201

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequent changes being necessary in specifications already agreed.
All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.