Danfoss KBH-07 Axis Pro Proportional Two Stage Directional Valve User Guide

Contents

Danfoss KBH-07 Axis Pro Proportional Two Stage Directional Valve

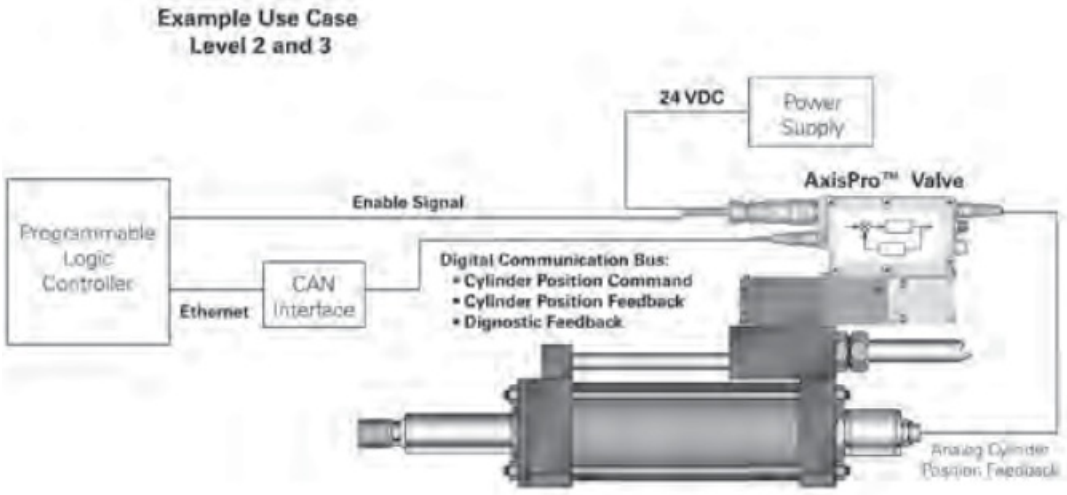
FAQs

- **Q: How can I configure the monitor output settings?**
  - A: The monitor output is initially shipped with one setting but can be configured to other monitor signal options using the Pro-FX Configure 2.0 software.
- **Q: Can I change the control mode of the valve?**
  - A: Yes, the valve's control mode is initially set to valve spool closed loop position control (VSC) but can be reconfigured to other command signal options using the Pro-FX Configure 2.0 software.

PRODUCT INFORMATION

AxisPro is a game-changing machine control valve. Its embedded intelligence simplifies traditionally complex control practices. Plug-and-play design reduces machine build time, and its ability to predict potential maintenance issues increases machine reliability.

AxisPro level 2 KBH valves, can be used to control machine motion in open or closed-loop control applications. The valve can receive its analog command input on the 7-pin connector from an external axis control device or, with the available on-board motion control feature activated (via Danfoss Pro-FXTM Configure 2.0), can close the external control loop around the actuator on the valve (taking feedback signal from cylinder or motor) – eliminating the separate motion controller. In this case the AxisPro valve receives a position, speed or force command and will create its own valve command needed to comply with the requested machine motion. In addition, digital communications over the CANopen bus is available for machine control or monitoring purposes.



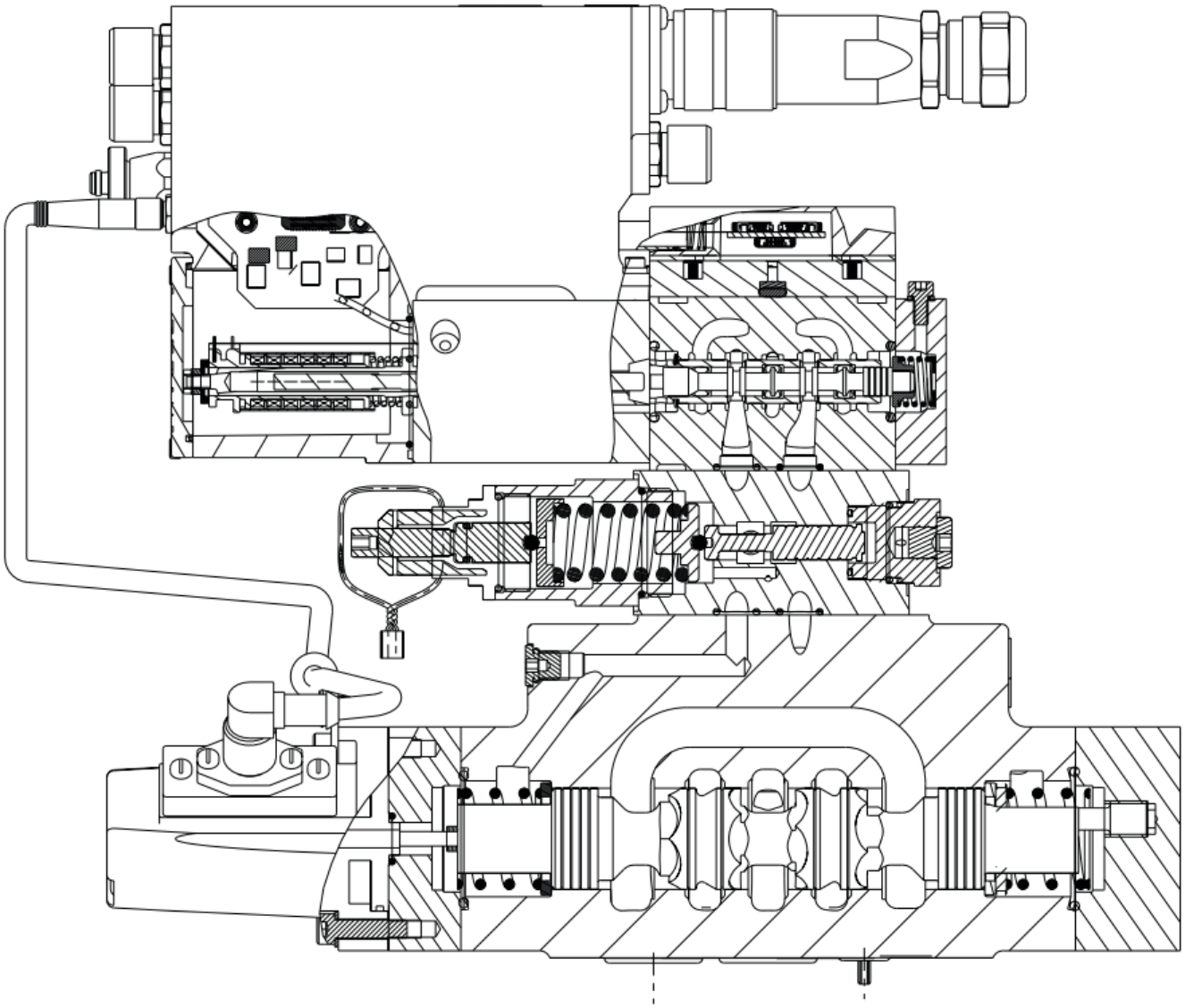
Introduction

General Description

Built on the proven KBH servo Proportional Valve technology, the AxisPro Proportional Valve provides a range of control capabilities in a modular design. These solenoid-operated proportional valves offer high dynamic performance which enables them to be used in closed-loop control applications.

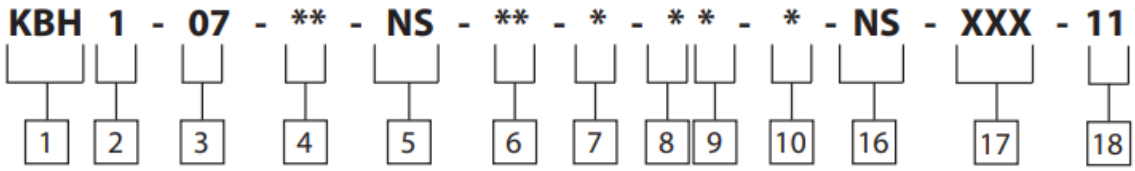
Unique benefits from AxisPro

The LED lens is standard on all AxisPro valves and provides a quick easy way to visually determine if AxisPro has detected any system warnings or faults. Detailed health, valve performance and warning/fault data is easily accessible via Danfoss's Pro-FX Configure 2.0 service tool. All AxisPro valves have the ability to change their command and feedback signal type. With Pro-FX Configure 2.0 you can quickly change a +/-10V valve to a 4-20mA valve. AxisPro also has the ability to activate/deactivate the "enable" pin feature. This flexibility allows for flexibility in inventory levels, as a single SKU can serve multiple needs. Level 2 AxisPro valves have the ability to do Cylinder position, Cylinder Speed, Cylinder pressure and Cylinder force control. You can also enable a secondary control mode. For example Cylinder speed with pressure limit as a secondary mode. In this configuration, the AxisPro valve will maintain the commanded cylinder speed, unless the force exceeds a user defined level, at which point the valve will transition into force control. These control modes can be completely configured via the easy-to-follow Pro-FX Configure 2.0 service tool, or they can be entirely setup over CANopen by a PLC. Custom user applications can also be hosted on the optional CODESYS white space. CODESYS applications are designed and deployed onto the AxisPro valve via the Pro-FX Control tool.



KBH*-07

Model Code



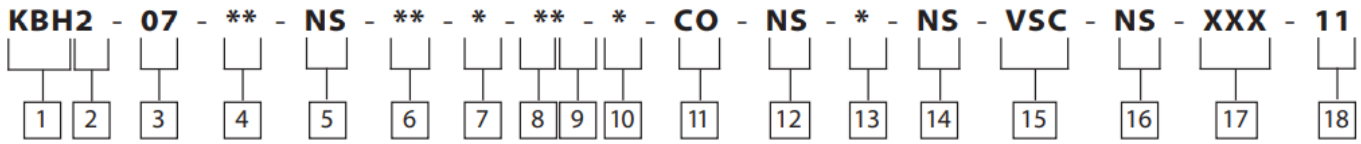
1. **Valve Type**
    - KBH – Two stage servo performance proportional valve with integral amplifier and electronic feedback
2. **1 Level 1**
3. **Interface**
    - 07 – ISO 4401, Size 7
4. **Spool/Sleeve Size 7**
    1. 2C230N – overlapped, P,A,B,T blocked
    2. 5C230N – zero lapped; P,A,B,T blocked
    3. 33C230N – P blocked, A & B to tank
    4. 2C230N140 – overlapped, P,A,B,T blocked, asymmetric

5. 5C230N140 – zero lapped, P,A, B, T blocked
6. 33C230N140 – P blocked, A & B to tank, asymmetric
7. PQ230F – Pressure flow control spool

5. **Valve Special Feature**
   - NS – Not Selected
6. **Pilot Supply**
   - TS – Internal supply without pressure reducer
   - ES – External supply without pressure reducer
   - TX – Internal supply with pressure reducer
   - EX – External supply with pressure reducer
7. **Pilot Drain**
   - T – Internal Drain
   - D – External Drain
8. **Command Signal**
   1. + /- 10V voltage command signal
   2. + /- 4-20mA current command signal
   3. + /- 10mA current command signal
   4. + /- 15mA current command signal
   5. + /- 20mA current command signal
9. **Monitor Output**
   - ±10V voltage feedback signal
   - 4 -20mA current feedback signal
10. **Electrical Connection**
    - C – 7 pin connector without plug
    - E – 7 pin connector with plug
    - H – As E but with pin “C” used for enable signal
    - R – As C but with pin “C” used for enable signal
11. **Electronics Special Feature**
    - NS – Not selected
12. **Software Revision**
    - XXX – Software revision
13. **Design Number**
    - 11 series

To find available product configurations go to www.danfoss.com

Model Code

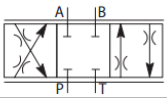
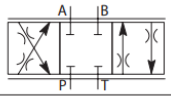
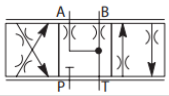
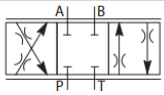
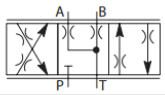
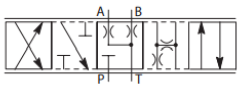


1. **2 – Level 1 plus network-enabled control modes**

2. **Command Signal**
    - 1 – +/- 10V voltage command signal
        - **Note**: Command signal is shipped with 1 configuration. You may configure to other command signal options using Pro-FX Configure 2.0 software.
    - 4-20mA current command signal
    - +/- 10mA current command signal
    - +/- 15mA current command signal
    - +/- 20mA current command signal
    - Command over Fieldbus
3. **Monitor Output**
    - ±10V voltage feedback signal
        - **Note**: Monitor Output is shipped with 1 setting. You may configure to other monitor signal options using Pro-FX Configure 2.0 software.
    - 4-20mA current feedback signal
    - Feedback over Fieldbus
4. **Digital Communication Interface**
    - CO – CANOpen
    - PN – ProfiNet
    - ET – Ethernet/IP
    - EC – EtherCAT
5. **Pilot Valve Sensors**
    - NS – Not Selected
    - PS – Pilot Pressure and Temperature Sensors
6. **External Sensor**
    - A – 4 4-20mA external sensor analog inputs and 2 discrete inputs
    - D – 1 SSI external digital sensor input
7. **C ustom Application Programming Space**
    - NS – Not Selected
    - CW – Codesys White Space
8. **Control Mode**
    - VSC – V alve spool position control

Note: Control Mode is shipped in valve spool closed loop position control (VSC) configuration. You may reconfigure to other command signal options using Pro-FX Configure 2.0 software. Refer to previous model code on for descriptions of other model code options

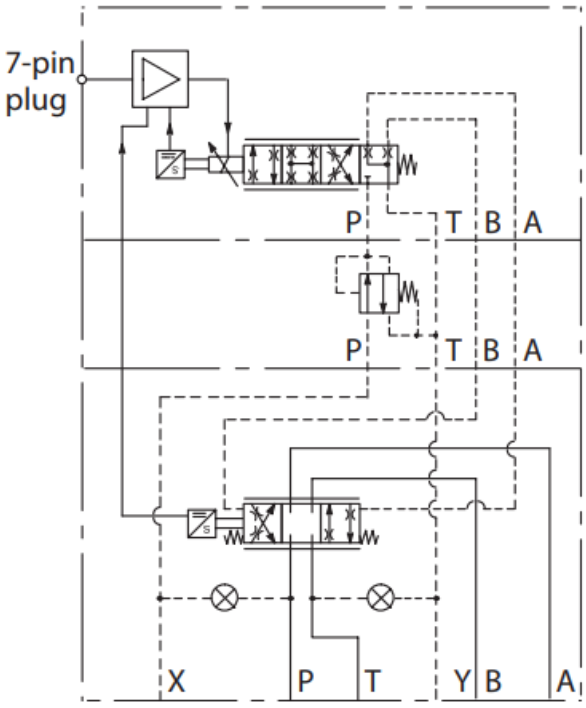
Spool Sleeve Details

Main-stage spool	Hydraulic symbol	Description	Flow ℓ/min@ Δ10 bar	Symmetric	Asymmetric	Notes
SIZE 7						
1		Overlapped, all ports block	230	√		
2		Critically lapped	230	√		
3		Overlapped, A,B,T connected	230	√		
4		Overlapped, all ports block	230/140		√	
6		Overlapped, A,B,T connected	230/140		√	
7		see flow curves	230			

Spool Data

Spool Symbols

- **Application Notes**
- **Main-Spool Options**
  - Spools shown are meter-in/ meter-out types. Center-condition options are type 5C.
- **Internally Piloted Models**
  - Differ from detailed symbols above by omission of plug A and the blocking of port X by the mating surface.
- **Internally Pilot Drain Models**
  - Differ from detailed symbols above by omission of plug Band blocking of port Y by the mating surface.



- **Spool Types and Flow Ratings**
  - 5 bar (72 psi) per metering flow path, e.g. B to T. For actual maximum flow refer to power capacity

envelope curves.

- **Symmetric Spools**
  - Base line pressure drop Δp
    - b: Valves with critically lapped spool are designed so that with the valve disabled the pressure in port B is at least twice that in port A (blocked ports).

Pressure and Minimum Flow Rates

Maximum Pressures, Bar (PSI) Valves With Pressure Reducer

Model	Pilot pressure source †	Pilot drain connection	P Port	A&B Ports	T Port	X Port ♦	Y Port
KBH*-07	External	External	350 (5000)	350 (5000)	350 (5000)	350 (5000)	50 (700)
		Internal*	350 (5000)	350 (5000)	50 (700)	350 (5000)	50 (700)
	Internal	External	350 (5000)	350 (5000)	350 (5000)	350 (5000)	50 (700)
		Internal*	350 (5000)	350 (5000)	50 (700)	350 (5000)	50 (700)

- † Minimum recommended pilot operating pressure = 50 bar (700 psi)
- * Internal drain is a non-preferred option
- ♦For pilot pressures ≤ 210 bar (3000 psi) a pilot pressure reducer is optional For pilot pressures > 210 bar (3000 psi) a pilot pressure reducer must be used Unused pilot port: Maximum pressure as shown

Maximum Pressures, Bar (PSI) Valves Without Pressure Reducer

Model	Pilot pressure source †	Pilot drain connection	P Port	A&B Ports	T Port	X Port ♦	Y Port
KBH*-07	External	External	350 (5000)	350 (5000)	350 (5000)	210 (3000)	50 (700)
		Internal*	350 (5000)	350 (5000)	50 (700)	210 (3000)	50 (700)
	Internal	External	210 (3000)	350 (5000)	350 (5000)	210 (3000)	50 (700)
		Internal*	210 (3000)	350 (5000)	50 (700)	210 (3000)	50 (700)

- † Minimum recommended pilot operating pressure = 50 bar (700 psi)
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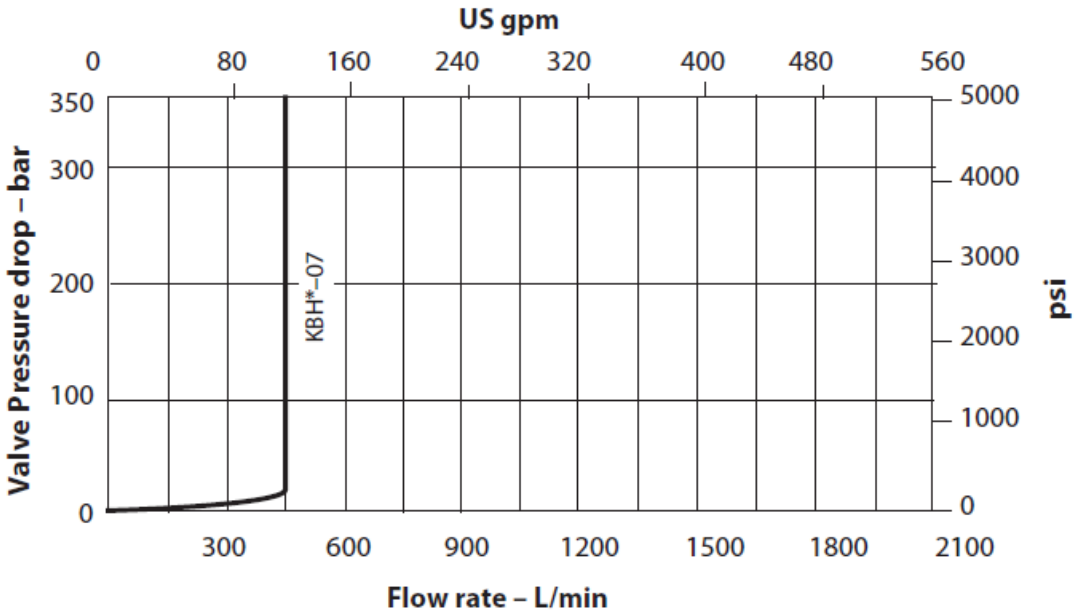
Minimum Recommended Flow Rates Valve3

Size/Spool Code	Min. Flow Rate L/min	in^3/min
KBH*-07	1.0	60

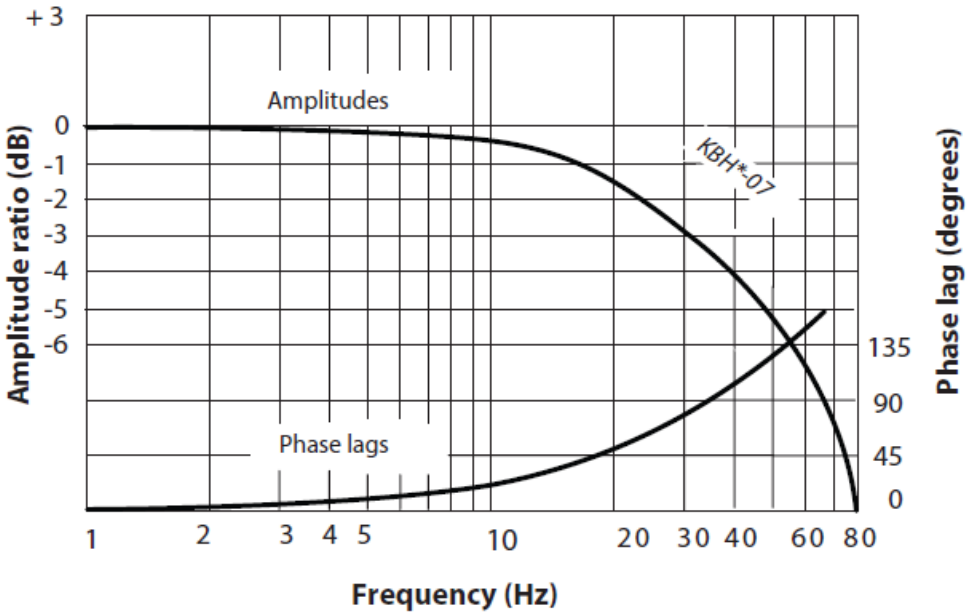
Performance Curves

POWER CAPACITY ENVELOPE Flow through P-A-B-T or P-B-A-T



FREQUENCY RESPONSE, TYPICAL

- For an amplitude of 50 ± 25% of rated flow (ISO 10770-1)
- 01 spool measured at = 36 cSt (168 SUS),
- t = 50˚C (122˚F) and pilot pressure = 40 bar (with-reducer model)



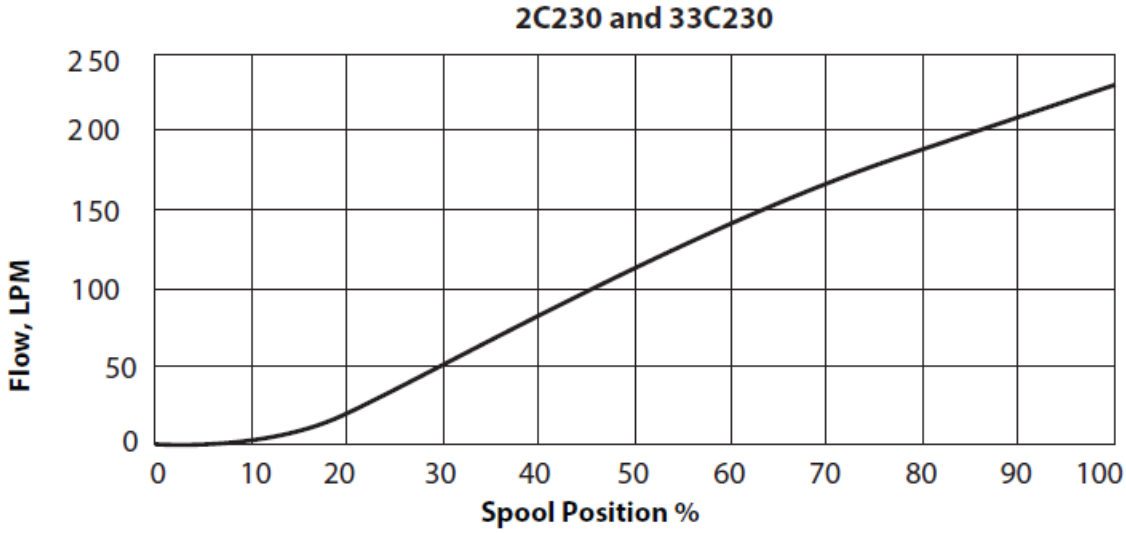
b

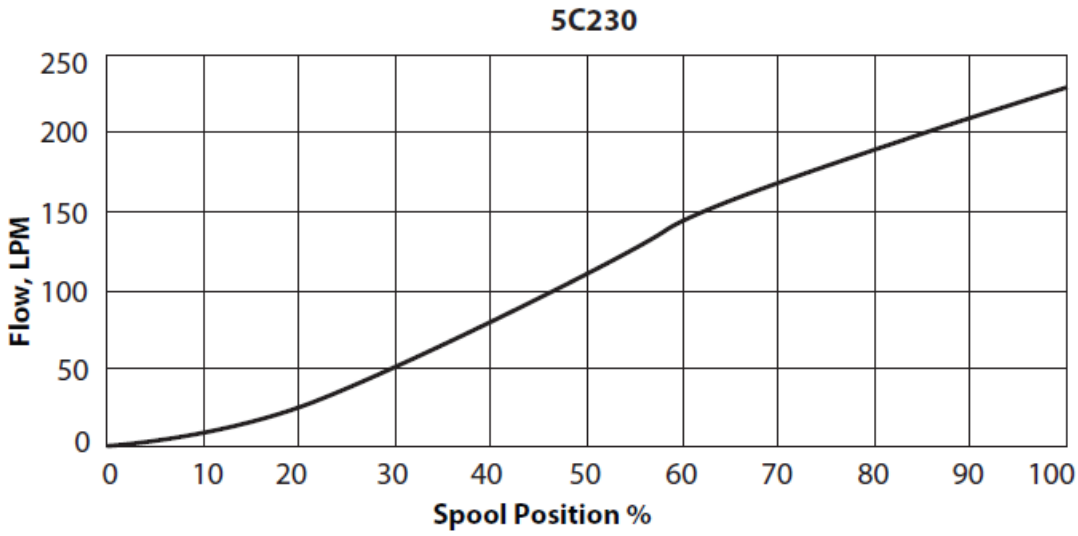
- At Øp = 5 bar (72 psi) per metering (e.g.P-A), Percentage command signals applicable for positive and negative values of command signal.
- At other Øp values, flow rates approximate to: QX = QD

$$\sqrt{\frac{\text{ØpX}}{\text{ØpD}}}$$

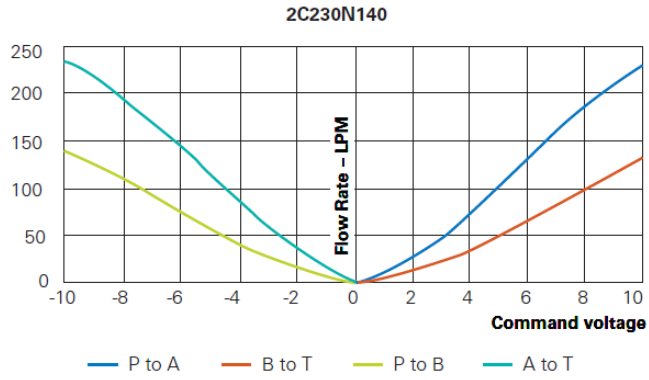
- where Q = Datum flow rate
- Øp = Pressure drop at datum flow rate

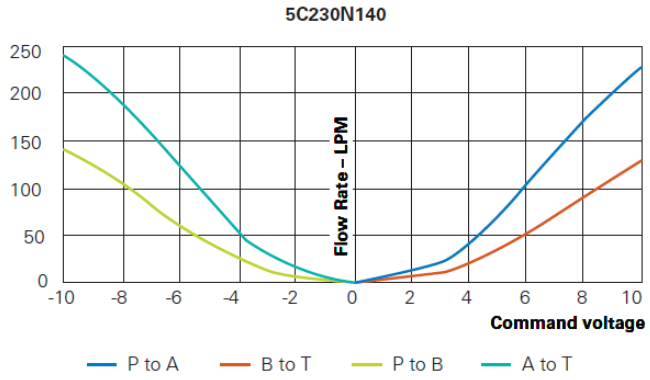
- Øp = Required p
- Limited by valve power capacity. Refer
- to curves on page 9

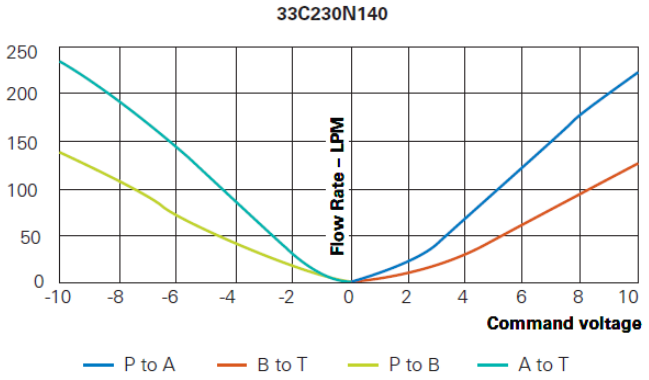


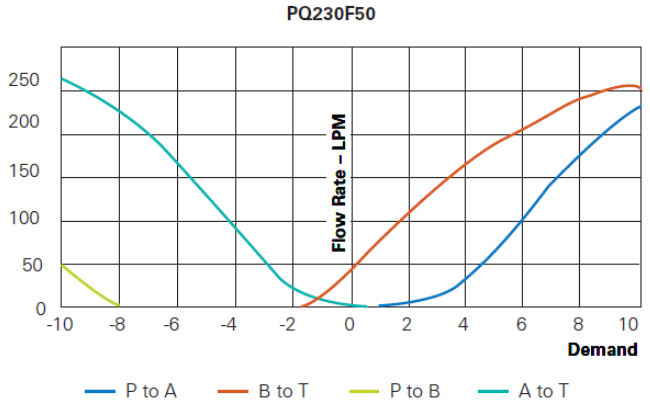


Performance Curves





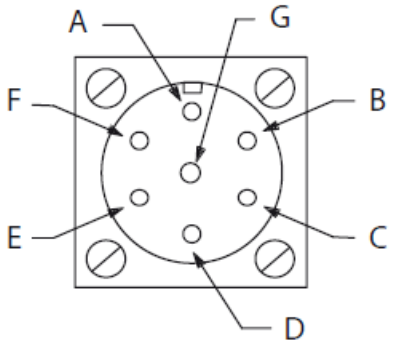




Operating Data

Connector Details

7-pin plug connector

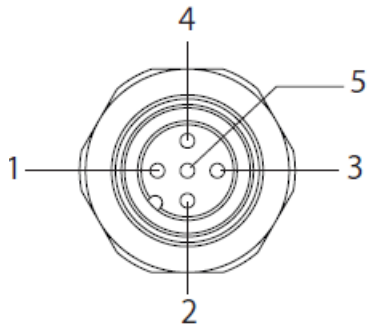


Pin Description

- A Power supply positive (+)
- B Power supply 0V and current command return
- C Not connected (Field 8 = C,E)
- D Valve enable (Field 8 = H,R)
- E Command signal (+V or current in)
- F Command signal (-V or current GND)
- G Output monitor
- H Protective earth

Note: Present at location 1 of the electronics enclosure (see figure 1 below). To ensure EMI protection use only metal shielded mating connectors. Mating 7-pin (connector) is Danfoss part number 934939

M12 5-pin CAN Connector (Male)



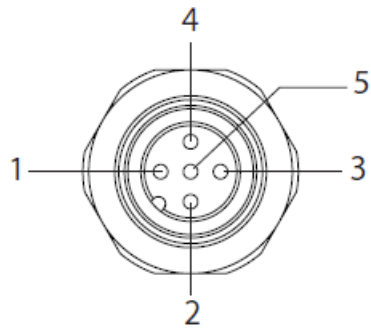
Pin Description

1. CAN shield Not
2. Connected Power
3. supply OV CAN
4. High
5. CAN Low

Note:

Present at location 4 of the electronics enclosure (see figure 1 below). Selection based on model code field number 9, present when CO option enabled. To ensure EMI protection use only metal shielded mating connectors Use only shielded twisted pair (STP) cables for mating connection.

M12 5-pin CAN Connector (Male)



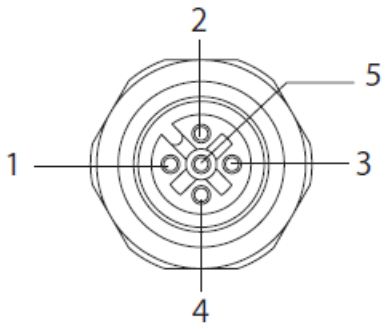
Pin Description

- CAN shield Not
- Connected Power
- supply OV CAN
- High
- CAN LOW

Note: Present at location 2 of the electronics enclosure (see figure 1 below). Selection based on model code field

number 9, present when CO option enabled. To ensure EMI protection use only metal shielded mating connectors Use only shielded twisted pair (STP) cables for mating connection.

M12 5-pin CAN Connector (Female)



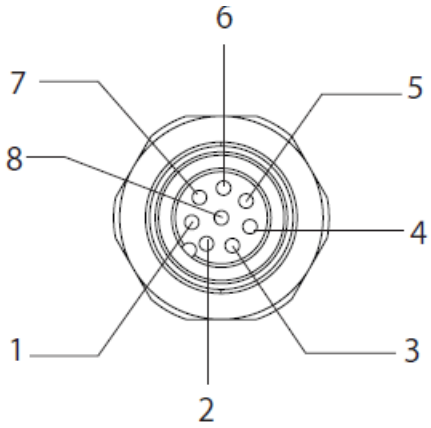
Pin Description

1. CAN shield
2. +24V External*
3. Power supply OV
4. CAN High
5. CAN Low

Not connected to pin A on 7-pin plug connector, needs to be supplied externally

Note: Present at location 5 of the electronics enclosure (see Figure 1 below). Selection based on model code field number 9, present when the CO option is enabled. To ensure EMI protection use only metal shielded mating connectors Use only shielded twisted pair (STP) cables for mating connection.

M12 8-pin External Digital Sensor



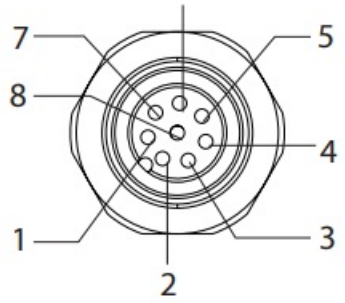
Pin Description

1. Power supply OV
2. +24V Supply
3. CLK-
4. DATA-
5. DATA+

6. Not Connected
7. CLK+
8. Not Connected

Note: Present at location 3 of the electronics enclosure (see figure 1 below). Selection based on model code field number 10, present when D option is enabled. To ensure EMI protection use only metal shielded mating connectors. 24V to Power supply OV (pin 2, 1) short circuit protected (max current 1.5 A). Use only shielded twisted pair (STP) cables for mating connection.

M12 8-pin External Analog Sensor Port 6

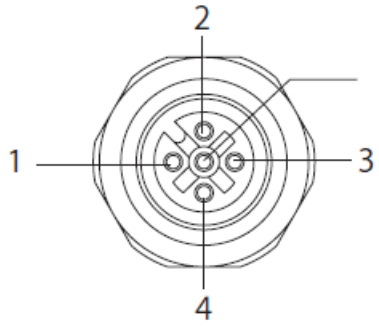


Pin Description

1. Speed Sensor Input 1
2. Speed Sensor Input2
3. 4-20mA External Sensor Signal
4. +15V Supply
5. 4-20mA External Sensor Signal2
6. Power supply OV
7. 4-20mA External Sensor Signal3
8. 4-20mA External Sensor Signal4

Note: Present at location 3 of the electronics enclosure (see figure 1 below). Selection based on model code field number 10, present when A option is enabled. To ensure EMI protection use only metal shielded mating connectors15V to Power supply OV (pin 4, 6) short circuit protected (max current 500 mA).

M12 4-pin Ethernet Connector (Female)



Pin Description

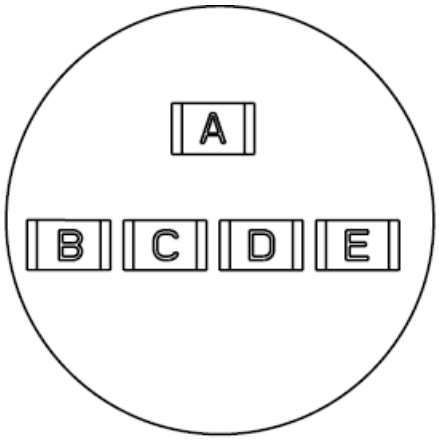
1. TxD+
2. RxD+
3. TxD-
4. RxD-

Note: Present at location 4 and 5 of the electronics enclosure (see figure 1 below). Selection based on model code field number 9, present when PN, ET or EC option enabled.Location 4 is Ethernet Channel 0 Location 5 is Ethernet Channel 1 M12 connector is D-Coded To ensure EMI protection use only pre made CA15 or CAT 6 cable

Operating Data

Data is typical, with fluid at 32 cST (150 SUS) and 40°C (104°F)

Diagnostic



- **Color**
  - A [Green]
  - B [Red]
  - C [Green]
  - D [Red]
  - E [Green]
- **Description CO**
  - Power
  - CAN Error
  - CAN Run
  - Diagnostic
  - Status
- **PN**
  - Power
  - PN Diagnostic (SF)
  - Valve Diagnostic
  - PN Network Status (BF)
  - Valve Status
- **ET**
  - Power

    - ET Module Status
    - Valve Diagnostic
    - ET Network Status
    - Valve Status
- **EC**
    - Power
    - EC Error
    - EC Run
    - Valve Diagnostic
    - Valve Status

Note:

Figure to the left references the clear plastic window on the top of the valve.

Electromagnetic compatibility (EMC): IEC61326-2-1

Manitar Drinte Ciansl.

- **Monitor Points Signal:**
    - Voltage mode Current +10V DC
    - mode Output 4 to 20 mA
    - impedance 10 kg
- **Power stage PWM frequency**
    - 20 kHz nominal
- **Reproducibility, valve-to-valve (at factory settings):**
    - Flow gain at 100% command signal ≤5%
- **Protection:**
    - Electrical Reverse polarity protected between pin A and B of the 7 pin plug connector
    - Ambient air temperature range for full performance-0°C to +70°C (+32°F to +158°F) CN version – 25°C to 70°C
    - Oil temperature range for full performance PN version -0°C to +60°C (+32°F to +140°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)
- Power supply 24V DC (18V to 36V including 10% peak-to-peak max ripple) max current 3,7A
- **Command Sianal:**
    - Voltage mode – 10V to + 10V DC 13 bit resolution, ≥ 1%
    - Input impedance Field 8 = 1:47k2, Field 6 = 2,3,4,5: 1000
    - Voltage between Pin D and B Field 8 = 1:18v (max)
    - Voltage between Pin E and B Field 8 = 1:18v (max)
    - Current mode Field 8 = 2,3,4,5: 13 bit resolution based on $20mA, £1%Field
    - Max differential voltage to pin E to pin B 8 = 2,3,4,5: 100 mV
- **Valve enable signal for model code H & R**

- Enable Disable Disable <6.5V; Enable Signal >8.5V (max 36V) 10
- Innut imnedance kΩ

- **Integrated Pilot Pressure and Temperature Sensors**
  - Integrated PCB temperature sensor accuracy: ‡ 2°C
  - For valves with “PS” Pressure Sensor option”
  - Integrated pressure sensors on all ports
  - Pressure sensor rated to 400bar
  - Integrated pressure sensor accuracy: ≤ 0.5% of full scale
  - Bandwidth: >100 Hz
  - Integrated temperature sensor on tank port Accuracy: + 5°C
  - Bandwidth: ~ 1 Hz
- **Amplifier Temperature Sensing**
  - 1°C (1.8°F) resolution, -25°C (-13°F) undertemp detect, 125°C (257°F) overtemp detect
- **Power Supply Detect**
  - 18-36Vdc, 0.01 V resolution ‡ 1%, 19V under voltage detect, 36V overvoltage
- **KBS*-07 Valves (all valves)**
  - Relative duty factor Continuous rating (ED = 100%)
  - Hysteresis <0.4%
- **Mass**: kg (lb) approx. Valves with pressure reducer 11 kg (24 |b) approx
- **Step response:** KBS*-07

  Step, % Flow ms
  - 0% to 100%, 100% to 0% < 60
  - 10% to 90%, 90% to 10% < 50
  - -25% to 75%, 75% to 25% < 45B

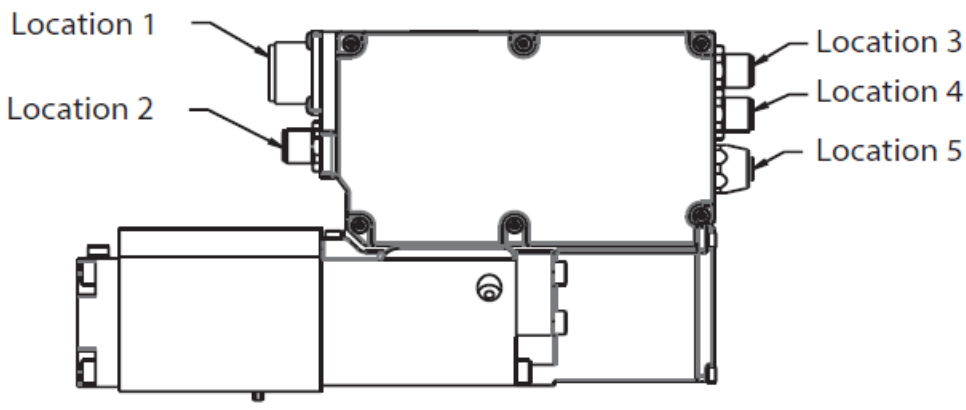


Figure 1
Note: See above for connector plugs specifications.

Software Information

KBH1

- Analog commanded spool control.

- Analog command source configuration options.
- Monitor output signal configuration options.
- Enable input signal enable/disable option.

KBH2/KBH3

- KBF 1capability.
- Sensor port configuration options. Configurable position, Speed, Pressure, Force and SSI Sensors.
- CANopen control modes (device options vary per available hardware options)
- valve spool position control (VPOC/VSC).
    - drive speed control (DSC).
    - drive force/pressure control (DFPC/DFP).
    - drive position control (DPC).
    - drive pressure/flow control (Danfoss DPQ).
- CANopen DSP306 compliant electronic data sheet (EDS).
- Diagnostic configuration options.

All levels and models are compatible with the Danfoss Pro-FX:For the latest revision, please visit **www.danfoss.com**

EtherCAT Version:

- EtherCAT Slave Device
- PDO communication 100us ring time 2ms refresh rate
- 100/10Mbit data rate
- SDO communication (COE)
- PDO dynamic mapping support (8 parameters)
- ESI file available
- TCP port:80 webserver, 300 (Profx tool) planned via EOE
- Profx tool access via CANopen
- training material available for TwinCAT connectivity

Ethernet/IP Version:

- Ethernet/IP Adapter Device
- Assembly package for Process Data 2ms refresh rate
- 100/10Mbit data rate
- two ports supported with daisy chaining, DLR support
- Class 3 explicit message support
- EDS file available
- TCP ports: 80 (webserver) 300 (Profx tool)
- Muticast support

Profinet Version:

- Protocol IO-Device
- Cyclic 5ms data exchange
- Conformance Class 2
- PROFINET IO specification: V 2.4
- 100/10 Mbit RT compatible
- Acyclic data exchange via Read Write Data
- Records
- Two ports both can be used as access, building Switch
- GDML file for Level1 and Level2
- TCP ports: 80 (webserver) 300 (Profx tool)

Download Pro-FX, Technical Information and Support Materials from Danfoss's Website: **www.danfoss.com**

Install the Danfoss Pro-FX Configure PC application tool. Installation is supported on a wide range of Windows-based operating systems including Windows 10/11 32-bit and 64-bit. The Pro-FX configure installation provides several options for PC USB peripheral CANbus adapters supported by the software. During installation, the user can choose to install drivers for an available CANbus adapter.

The adapters supported by Pro-FX Configure are:

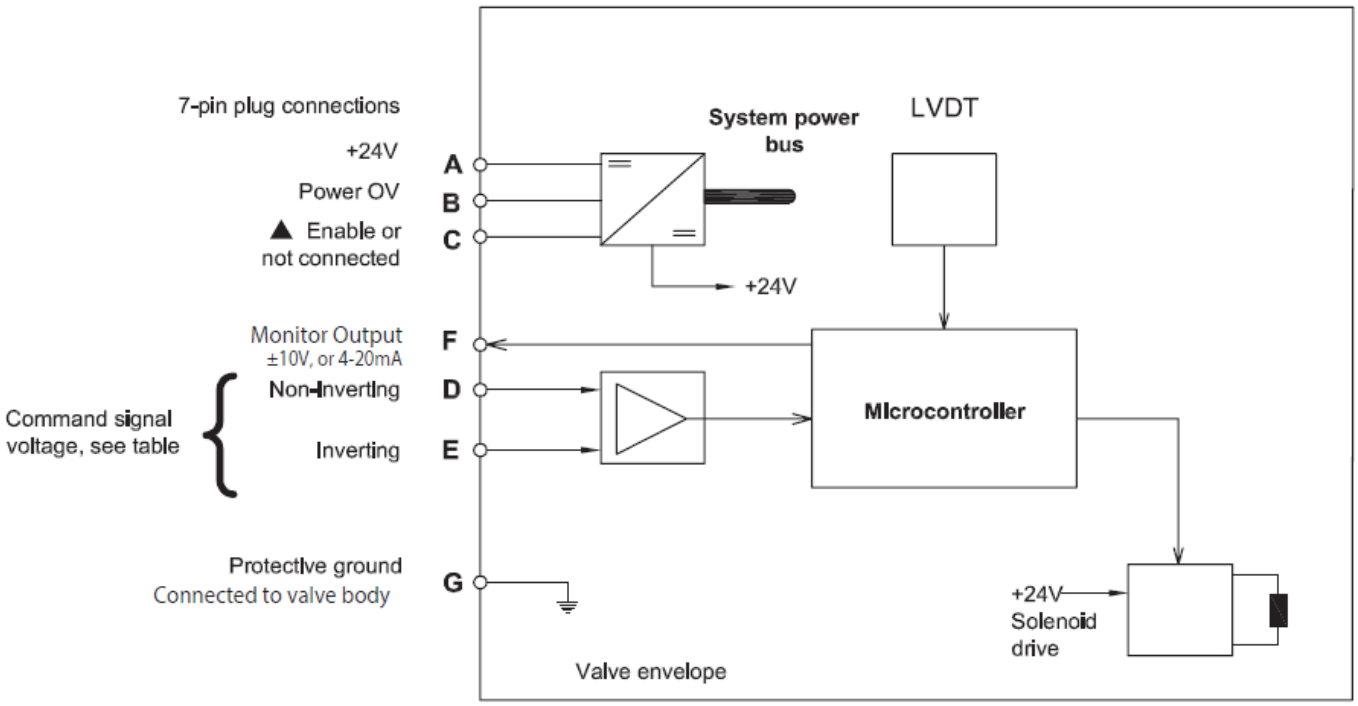
- PCAN-USB* PEAK-System Technik GmbH (**http://www.peak-system.com**)
- ValueCAN Intrepid Control Systems, Inc. (**http://www.intrepidcs.com**)
- Leaf-Light Kvaser AB (**http://www.kvaser.com**)

* The PCAN-USB adapter is recommended for compatibility with Danfoss Pro-FX: Control development environment used with KBS4DGV-xxx and other DanfossPro-FX products it is also included in the TEQ-470-A-10 test box

Electrical Information

Block Diagram Voltage

Input (Field 8 = 1) Wiring connections must be made via the 7-pin plug mounted on the amplifier. See page 18 of this leaflet and Danfoss's InstallationWiring Practices for Vickers Electronic Products, leaflet 2468. 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 anoverall screen. Cable outside diameter 8.0 – 10.5 mm (0.31 – 0.41inches) See connection diagram on

Command Signals and Outputs, Field 6 = 1

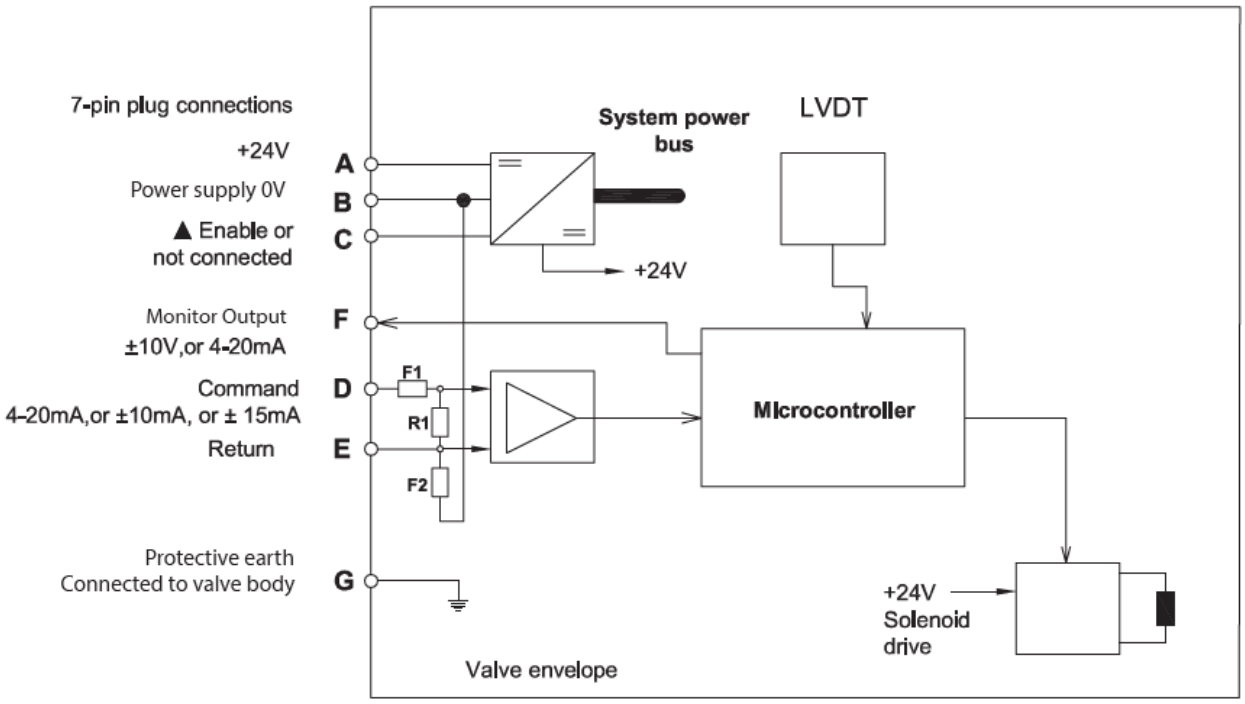
7-pin plug		Flow direction
Pin D	**Pin E**	
Positive OV $U_D - U_E$ = Positive	OV Negative	P to A
Negative OV $U_D - U_E$ = Negative	OV Positive	P to B

Electrical Information

- **Block Diagram Current Input (Field 8 = 2,3,4,5)**
  - Wiring connections must be made via the 7-pin plug mounted on the amplifier. See page 19 of this leaflet and Danfoss's Installation Wiring Practices for Vickers Electronic Products, leaflet 2468. 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 diagram.



▲ Pin C is used for a valve enable signal with electrical connections Field = H or R

R1 shunt resistor 100R
F1, F2 resettable fuse

Command Signals and Outputs, Field 6 = 2 7-pin plug

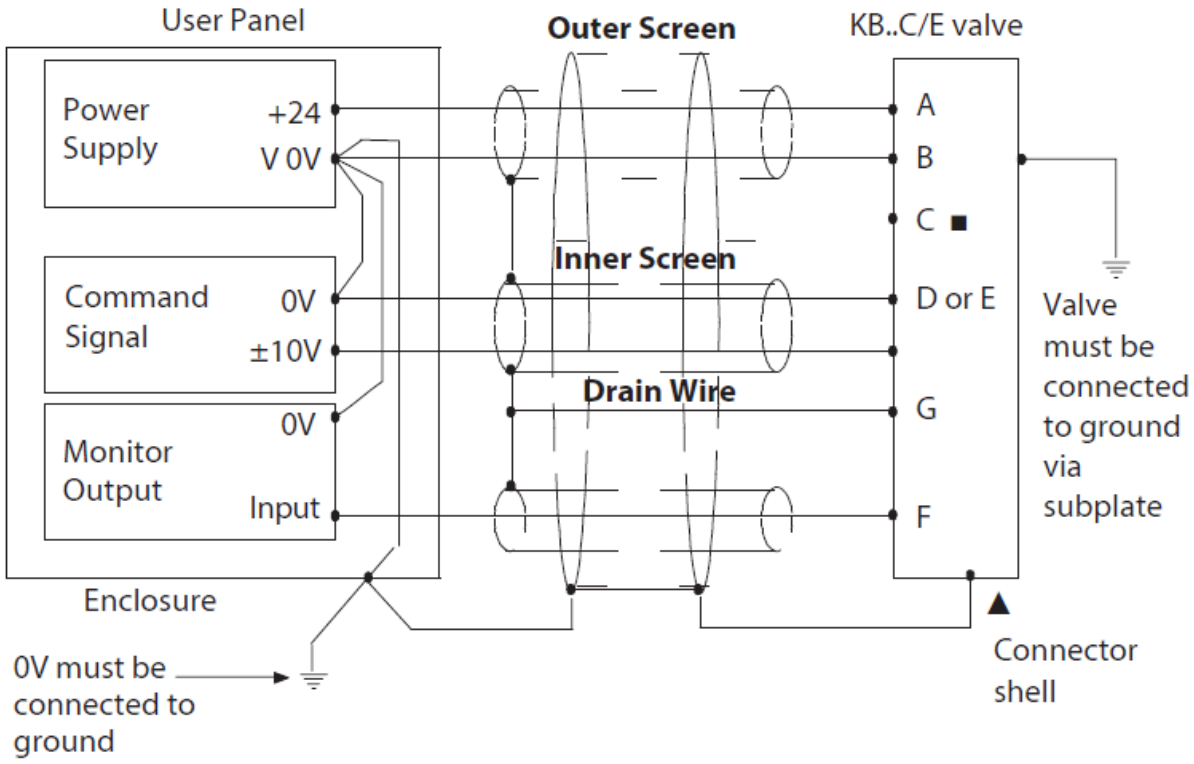
Pin D	Pin E	Pin B	Flow direction
More than 12 mA	Current return	Power ground	P to A
Less than 12 mA	Current return	Power ground	P to B

Command Signals and Outputs, Field 6 = 3,4,5 7-pin plug

Pin D	Pin E	Pin B	Flow direction
More than 0 mA	Current return	Power ground	P to A
Less than 0 mA	Current return	Power ground	P to B

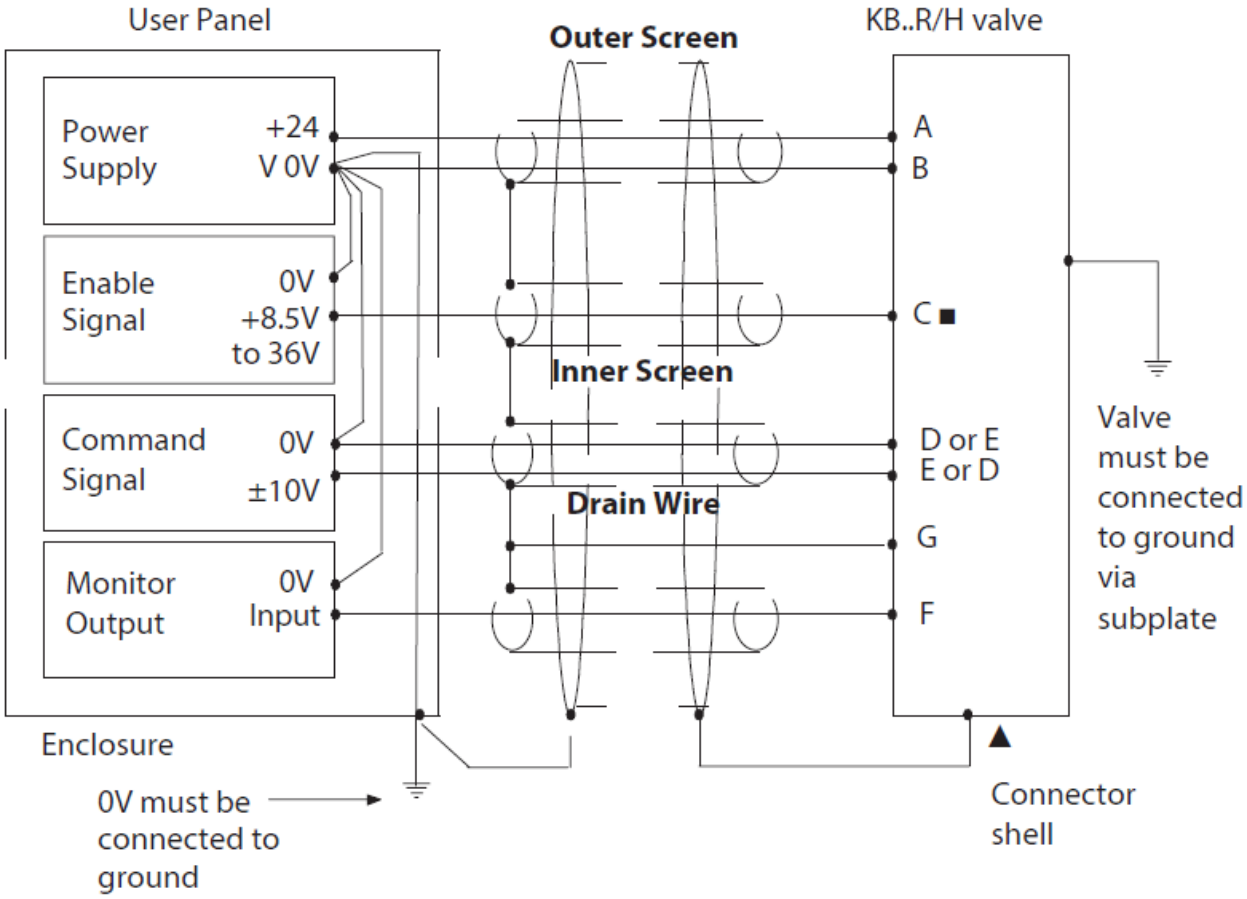
Wiring Connections Voltage Output (Field 9 = 1)

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



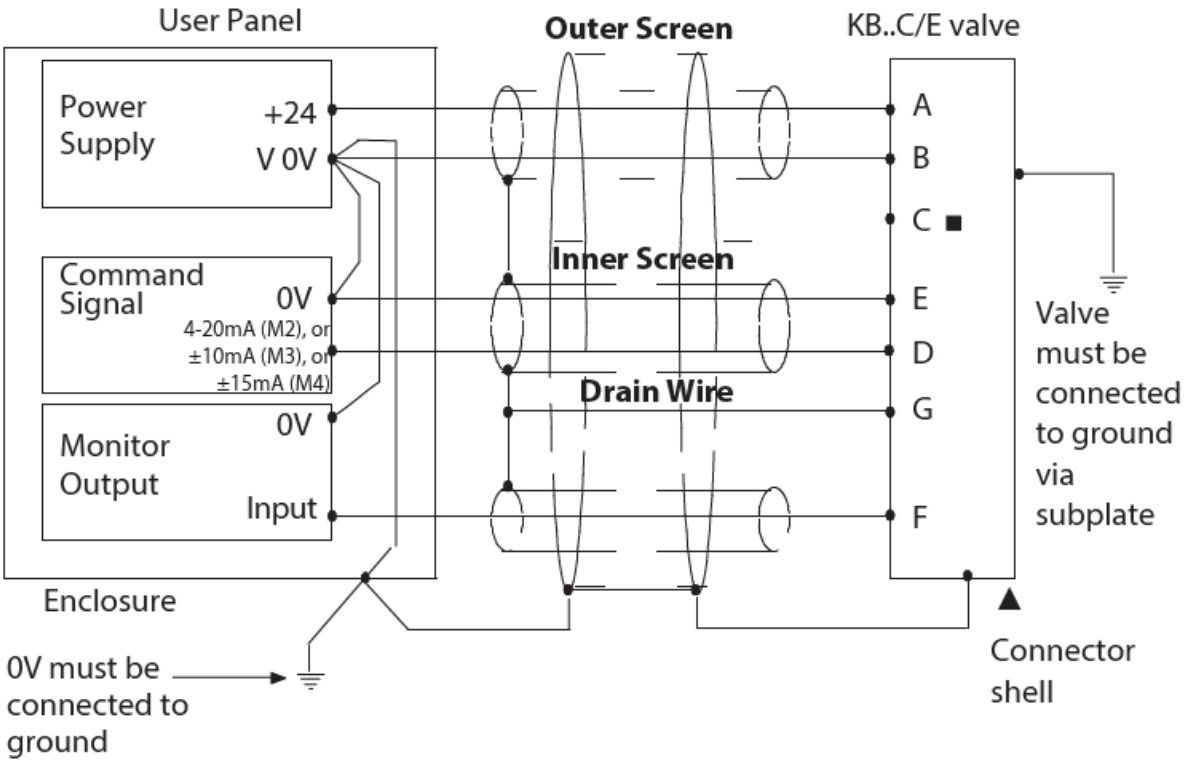
Wiring Connections for Voltage mode (Field 10 = R/H) Valves with Enable Feature

Note: 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.



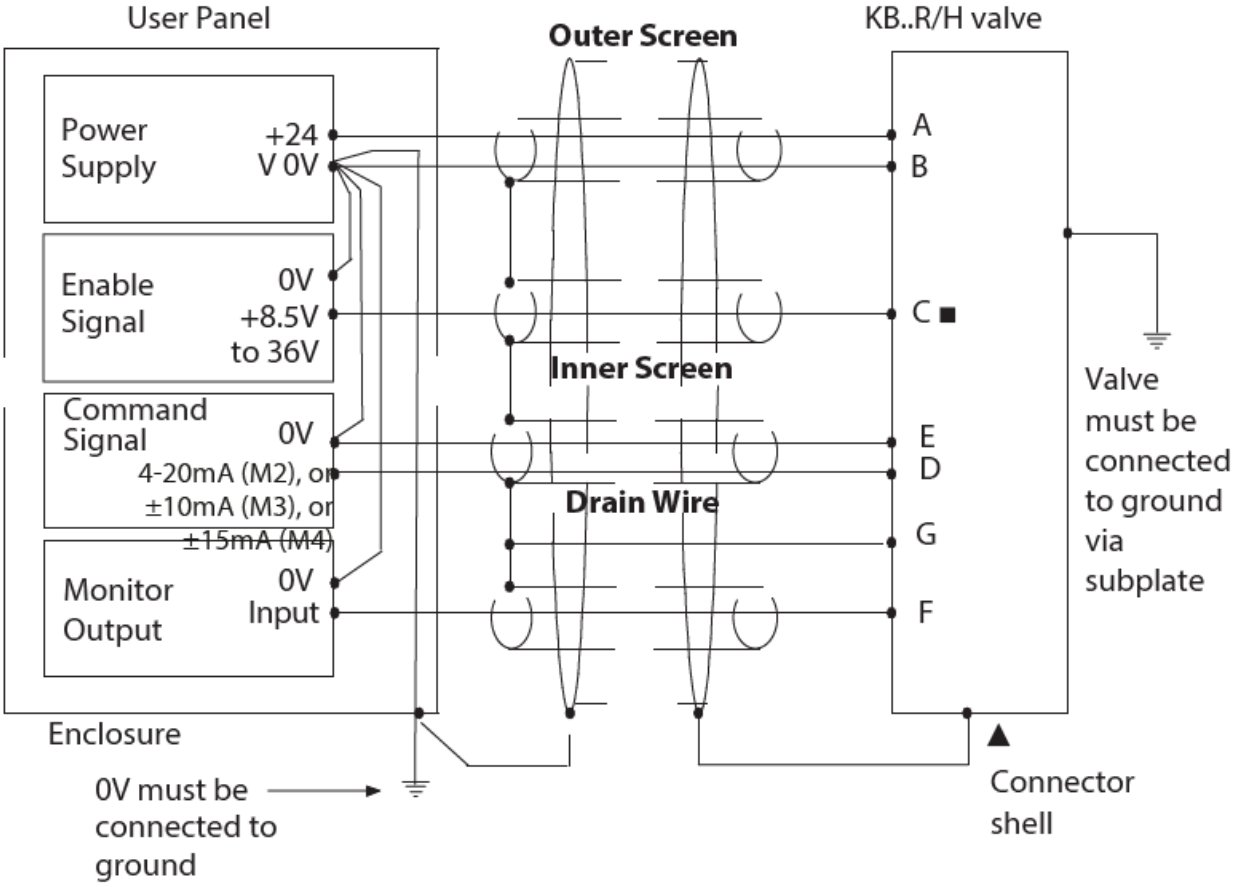
Wiring Connections Current Output (Field 9 = 2)

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



Wiring Connections for Current mode (Field 10 = R/H) Valves with Enable Feature

Note: 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

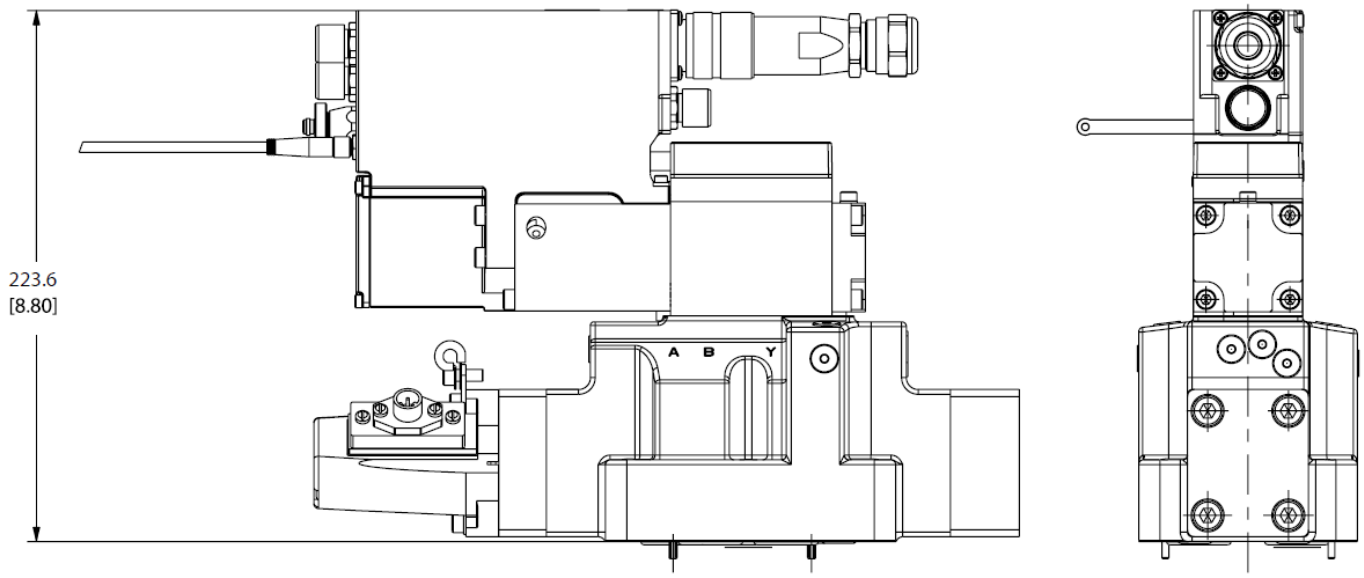
Electromagnetic Compatibility (EMC) It is necessary to ensure that the valve is wired up as above. For effective protection of the user electrical cabinet, the valve subplate or manifold and the cable screens should be connected to efficient ground points. The metal 7 pin connector part no. 934939 should 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 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.To ensure EMI protection use only metal shielded mating connectors.

Warning

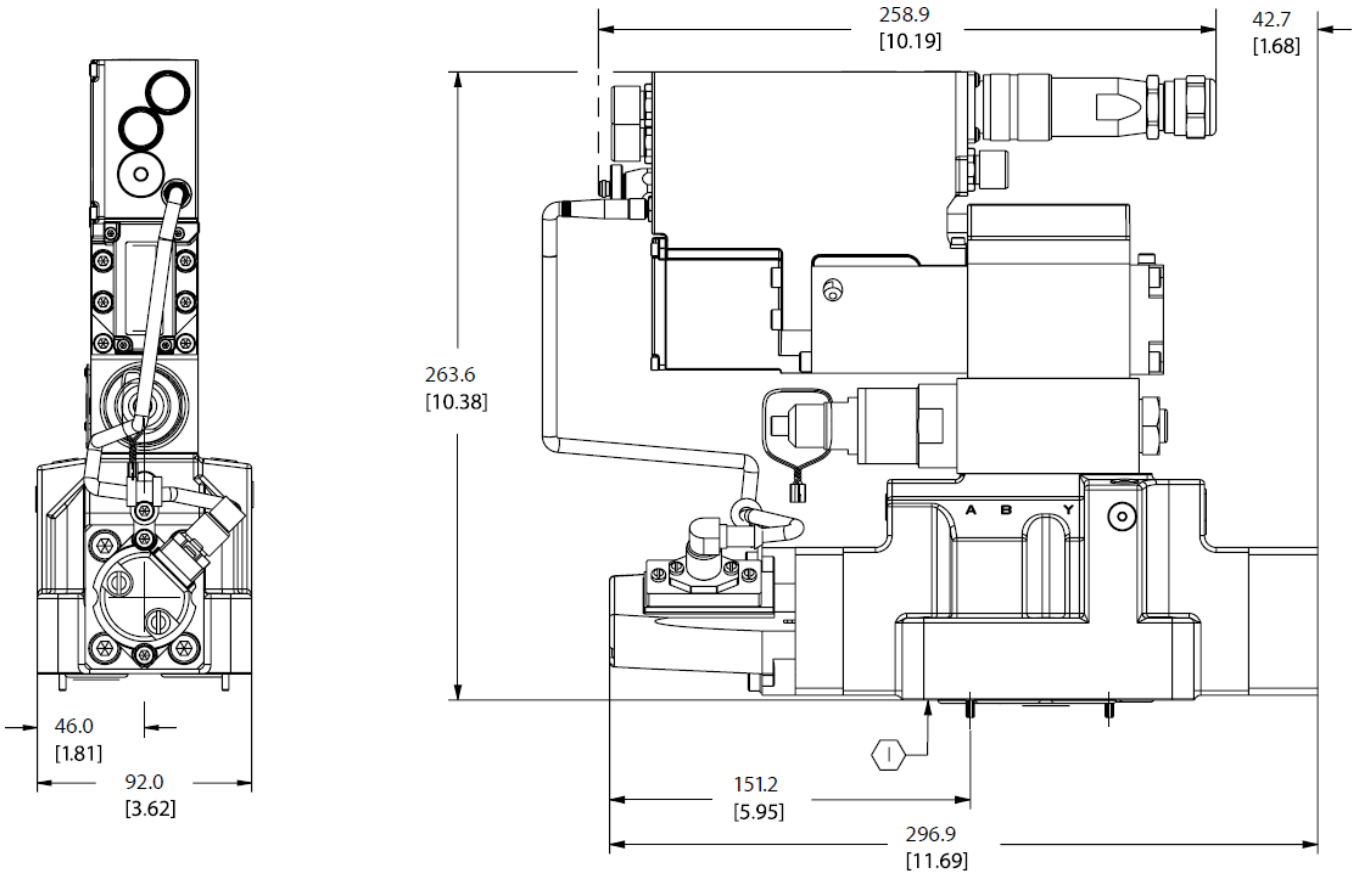
All power must be switched off before connecting/disconnecting any plugs.

Installation Dimensions

mm (inch)



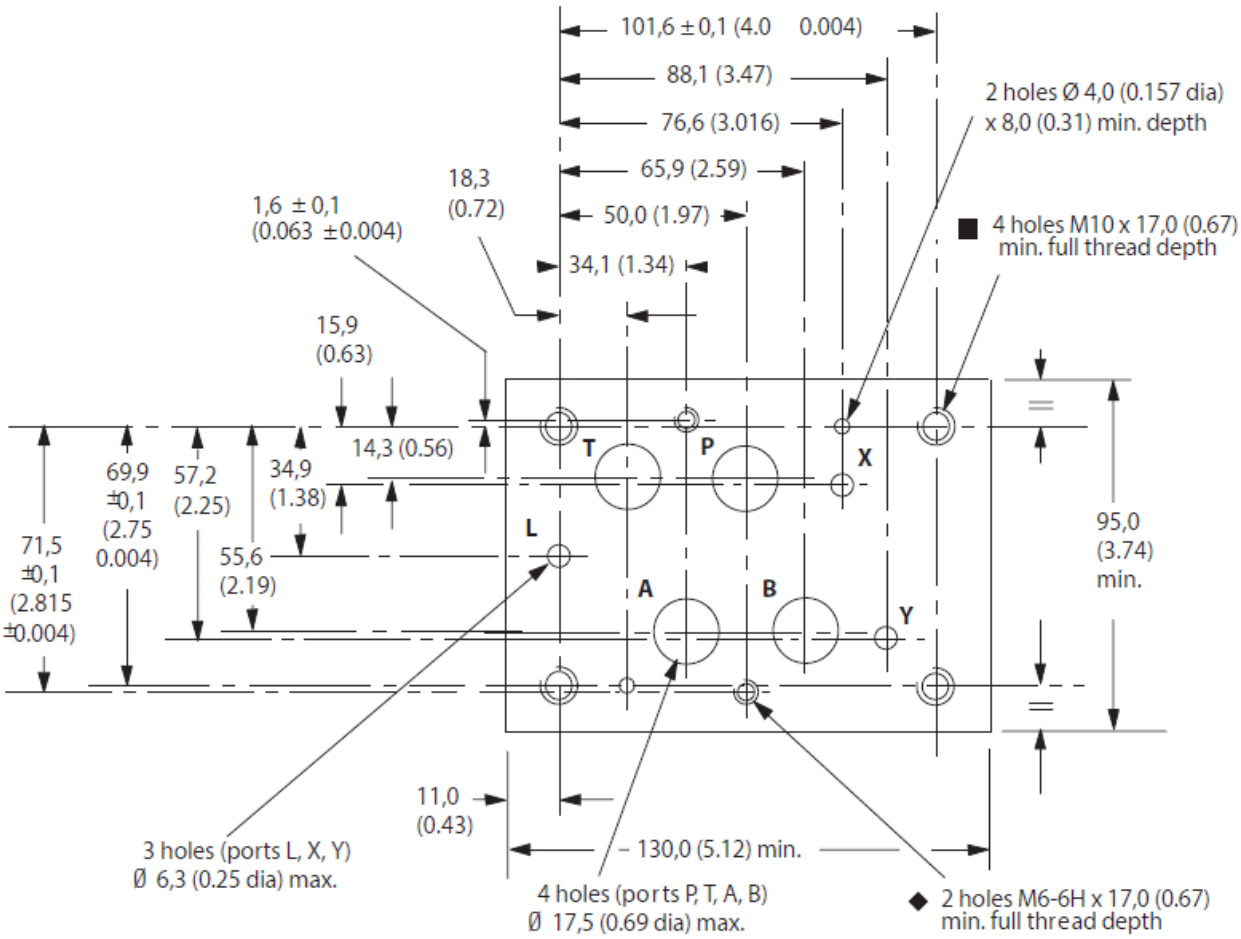
KBH – 7 Level -2 with pressure sensors



Mounting Surface Interface to ISO 4401 (Size 07)

This interface conforms to ISO4401-07-07-0-05 ANSI/B93.7M (and NFPA) size 07 CETOP R35H4.3-07 DIN 24340 Form A16

- 3/8 -16 UNC optional.
- 1/4 -20 UNC optional.



Application Data

Fluid Cleanliness

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

17/15/12

Danfoss products, as any components, will operate with apparent satisfaction in fluids with higher cleanliness codes th an those described. Other manufacturers will often recomme nd 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 above. These codes have been prov-en to provide a long trouble-free service life for the products shown, regardless of the manufacturer.

Hydraulic Fluids

Materials and seals used in these valves are compatible with antiwear hydraulic oils, and aryl 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 appli-cations, 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.

Service Information

The products from this range are preset at the factory for optimum performance; disassembling critical items would test these settings. It is therefore recommended that should any mechanical or electronic repair be necessary they should be returned to thenearest 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.

Products we offer:

- Cartridge valves
- DCV directional control valves
- Electric converters
- Electric machines
- Electric motors
- Fluid Conveyance
- Gear motors
- Gear pumps
- Hydraulic integrated circuits (HICs)
- Hydrostatic motors
- Hydrostatic pumps
- Industrial hydraulics
- 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

Local address:

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 and industrial markets as well as the marine sector. Building on our extensive application 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 hydraulics and mobile

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.

CONTACT INFORMATION

- **Hydro-Gear**
  - www.hydro-gear.com
- **Daikin-Sauer-Danfoss**
  - www.daikin-sauer-danfoss.com
- **Danfoss**
  - Power Solutions (US) Company
  - 2800 East 13th Street
  - Ames, IA 50010, USA
  - Phone: +1 515 239 6000
- **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

Documents / Resources

	Danfoss KBH-07 Axis Pro Proportional Two Stage Directional Valve [pdf] User Guide KBH-07, 11, KBH-07 Axis Pro Proportional Two Stage Directional Valve, KBH-07, Axis Pro Proportional Two Stage Directional Valve, Proportional Two Stage Directional Valve, Two Stage Directional Valve, Stage Directional Valve, Directional Valve, Valve

References

- Daikin Sauer Danfoss - Home
- Engineering Tomorrow | Danfoss
- Leading Drivetrain Manufacturer - Hydro-Gear
- Home | Intrepid Control Systems, Inc.

- **User Manual**