

Product Selection Guide

Vickers® by Danfoss Proportional Valves

Valve specification made easy

Danfoss offers a number of proportional valves with a variety of features, flow rates and performance levels. This guide is designed to simplify the specification of our proportional valve product range. On the back side of this sheet is a chart detailing valve capabilities, arranged in a decision tree format. Start in the top left, and follow these steps to select the appropriate valve:

Step 1: Determine whether the application requires a valve with or without onboard electronics (OBE). Valves with OBE do not require an external controller (PAM card, power plug or Din Rail Module). The controller is built into the valve. The command to the electronic module can be voltage (+/-10V), current (4mA to 20mA) or an industrial network like CANopen, Profinet, Ethernet/IP* or EtherCAT*.

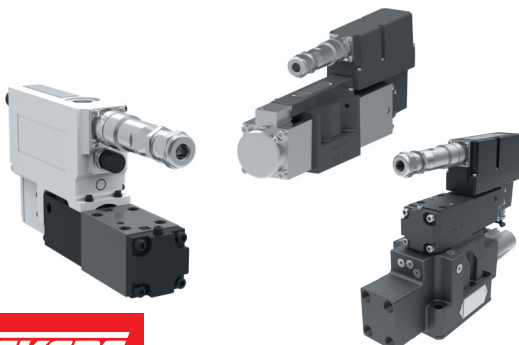
Step 2: Determine whether the application requires a single-stage or dual-stage valve. This decision is made primarily because of flow. For size 5 only, occasionally the lower pressure rating of a spool in body is needed.

Step 3: Determine which valve type is suitable for the application. The valve types listed within the chart include the options detailed to the right.

Step 4: Select the appropriate size.

Step 5: Refer to the specific product catalog for additional details such as pressure ratings, available spool types, power capacity curves, etc., to finalize selection.

* Ethernet/IP and EtherCAT protocol support scheduled for release 2023.



Vickers by Danfoss proportional valve types

Single stage

AxisPro: Single solenoid digital valve. Spool goes to 4th position when power is removed. Amplifier has spool position feedback and offers CAN and Ethernet communication.

- Level 1: Digital version of the KBS valve
- Level 2: Has external sensor inputs, which allow closing higher level control loops on the valve, e.g. cylinder position/speed, force
- Level 3: Level 2 plus built-in pressure sensors

KBS: Single solenoid analog valve. Spool goes to 4th position when power is removed. Amplifier has spool position feedback.

KBF: Dual solenoid analog valve. Spool stays in center position when power is removed. Amplifier has spool position feedback.

KBD: Dual solenoid digital valve. Spool stays in center position when power is removed. Amplifier does not have spool position feedback.

Dual stage

AxisPro: Pilot spool goes to 4th position when power is removed. Amplifier has pilot and main-stage spool position feedback.

- Level 1: Digital version of the KBH valve
- Level 2: Has external sensor inputs, which allow closing higher level control loops on the valve, e.g. cylinder position/speed, force
- Level 3: Not available

KBH: Pilot spool goes to 4th position when power is removed. Amplifier has pilot and main-stage spool position feedback.

KBF: Pilot spool stays in center position when power is removed. Amplifier has only main-stage spool position feedback.

KBD: Pilot spool stays in center position when power is removed. Amplifier has no spool position feedback.

Vickers by Danfoss proportional valve product guide

Decision 1: Onboard electronics (OBE) or non-OBE	Decision 2: Single stage or dual stage	Decision 3: Valve type	Size	Technology	Max rated flow	Maximum pressure P, A & B ports	Speed	Flow accuracy	Response time 0%-100%	Hysteresis	Valve closes external loops
OBE	Single stage (up to 100 L/min)	AxisPro	Size 3	Spool/sleeve (rated @ 70 bar)	40 L/min @ 70 bar	350 bar	+++	+++	8 ms	<0.1%	yes
			Size 5	Spool/sleeve (rated @ 70 bar)	100 L/min @ 70 bar	350 bar	+++	+++	16-22 ms	<0.1%	yes
		KBS	Size 3	Spool/sleeve (rated @ 70 bar)	40 L/min @ 70 bar	350 bar	+++	+++	10 ms	<0.5%	no
			Size 5	Spool/sleeve (rated @ 70 bar)	100 L/min @ 70 bar	350 bar	+++	+++	10 ms	<0.5%	no
		KBF	Size 3	Spool in body (rated @ 10 bar)	30 L/min @ 10 bar	350 bar	++	++	17 ms	<1%	no
			Size 5	Spool in body (rated @ 10 bar)	75 L/min @ 10 bar	315 bar	++	++	30 ms	<1%	no
	KBD	Size 3	Spool in body (rated @ 10 bar)	28 L/min @ 10 bar	350 bar	+	+	26 ms	<8%	no	
		Size 5	Spool in body (rated @ 10 bar)	70 L/min @ 10 bar	315 bar	+	+	115 ms	<8%	no	
	Dual stage	AxisPro	Size 5	Spool in body (rated @ 10 bar)	95 L/min @ 10 bar	315 bar	+++	+++	24 ms	<0.4%	yes
			Size 7	Spool in body (rated @ 10 bar)	230 L/min @ 10 bar	350 bar	+++	+++	38 ms	<0.4%	yes
			Size 8	Spool in body (rated @ 10 bar)	375 L/min @ 10 bar	350 bar	+++	+++	33 ms	<0.4%	yes
			Size 5	Spool in body (rated @ 10 bar)	95 L/min @ 10 bar	310 bar	+++	+++	24 ms	<0.5%	no
			Size 7	Spool in body (rated @ 10 bar)	230 L/min @ 10 bar	350 bar	+++	+++	24 ms	<0.5%	no
			Size 8	Spool in body (rated @ 10 bar)	375 L/min @ 10 bar	350 bar	+++	+++	33 ms	<0.5%	no
		KBH	Size 10	Spool in body (rated @ 10 bar)	700 L/min @ 10 bar	350 bar	+++	+++	64 ms	<0.5%	no
			Size 5	Spool in body (rated @ 10 bar)	95 L/min @ 10 bar	310 bar	++	++	47 ms	<1%	no
			Size 7	Spool in body (rated @ 10 bar)	230 L/min @ 10 bar	350 bar	++	++	52 ms	<1%	no
			Size 8	Spool in body (rated @ 10 bar)	375 L/min @ 10 bar	350 bar	++	++	84 ms	<1%	no
		KBF	Size 10	Spool in body (rated @ 10 bar)	700 L/min @ 10 bar	350 bar	++	++	130 ms	<1%	no
			Size 5	Spool in body (rated @ 10 bar)	90 L/min @ 10 bar	315 bar	+	+	42 ms	<8%	no
Size 7			Spool in body (rated @ 10 bar)	230 L/min @ 10 bar	350 bar	+	+	45 ms	<8%	no	
Size 8			Spool in body (rated @ 10 bar)	330 L/min @ 10 bar	350 bar	+	+	85 ms	<8%	no	
KBD	Size 10	Spool in body (rated @ 10 bar)	550 L/min @ 10 bar	350 bar	+	+	110 ms	<8%	no		
	Size 5	Spool in body (rated @ 10 bar)	40 L/min @ 70 bar	350 bar	+++	+++	10 ms	<0.5%	no		
	Size 3	Spool in body (rated @ 10 bar)	28 L/min @ 10 bar	350 bar	++	++	18 ms	<1% ²	no		
	Size 5	Spool in body (rated @ 10 bar)	70 L/min @ 10 bar	315 bar	++	++	31 ms	<1% ²	no		
Non-OBE	Single stage (up to 70 L/min)	KDG	Size 3	Spool in body (rated @ 10 bar)	30 L/min @ 20 bar	350 bar	+	+	100 ms	<8% ²	no
			Size 5	Spool in body (rated @ 10 bar)	70 L/min @ 10 bar	See note 3	+	+	See note 3	<8% ²	no
		KSD	Size 5	Spool in body (rated @ 10 bar)	100 L/min @ 10 bar	350 bar ¹	+++	+++	24 ms	<1%	no
			Size 7	Spool in body (rated @ 10 bar)	200 L/min @ 10 bar	350 bar ¹	+++	+++	24 ms	<1%	no
	Dual stage	KHD	Size 8	Spool in body (rated @ 10 bar)	300 L/min @ 10 bar	350 bar ¹	+++	+++	37 ms	<1%	no
			Size 10	Spool in body (rated @ 10 bar)	700 L/min @ 10 bar	350 bar ¹	+++	+++	See note 3	<1%	no
			Size 5	Spool in body (rated @ 10 bar)	90 L/min @ 10 bar	350 bar	+	+	48 ms	<4%	no
		KDG	Size 7	Spool in body (rated @ 10 bar)	180 L/min @ 10 bar	350 bar	+	+	61 ms	<4%	no
			Size 8	Spool in body (rated @ 10 bar)	330 L/min @ 10 bar	350 bar	+	+	80 ms	<4%	no
			Size 10	Spool in body (rated @ 10 bar)	550 L/min @ 10 bar	350 bar	+	+	208 ms	<6%	no

1 - 350 bar max pressure if valve purchased with pressure reducer. Otherwise max pressure is 210 bar.

2 - Hysteresis value if valve is utilized with a matching Danfoss PAM card.

3 - Refer to catalog for exact value.



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