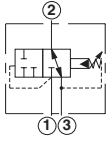
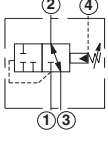
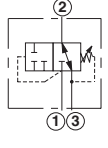
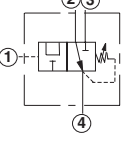
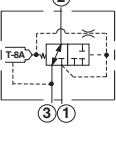
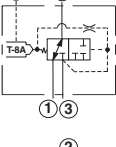
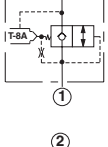
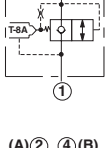
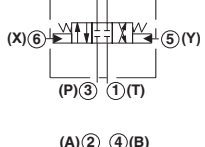
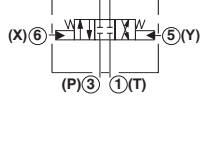
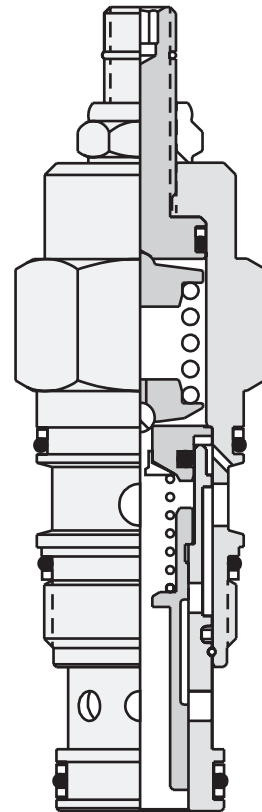
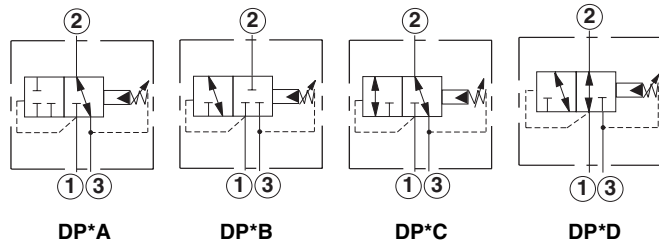
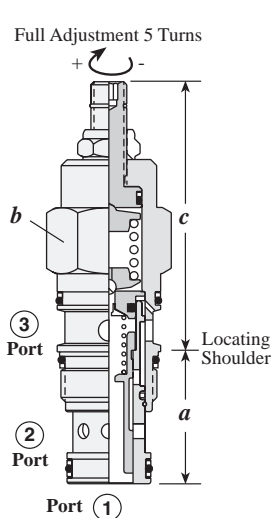


Directional Cartridge Valves

	<i>Cartridge Type</i>	<i>Page</i>
	2-position, 2-way and 3-way, with Internal Drain	102
	2-position, 2-way and 3-way, with External Drain	103
	2-position, 2-way and 3-way Direct Acting, with Internal Drain	104
	2-position, 2-way and 3-way, Direct Acting	105
	3-port, 2-way and 3-way with Integral Pilot Control Cavity	106
	4-port, 2-way and 3-way with Integral Pilot Control Cavity	107
	2-position, 2-way Poppet, Control 1 to 2 with Integral Pilot Control Cavity	108
	2-position, 2-way Poppet, Control 2 to 1 with Integral Pilot Control Cavity	109
	3-position, 4-way Spring Centered	110
	2-position, 4-way Detented	111



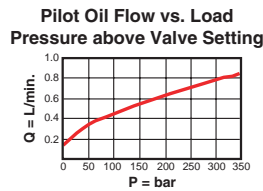
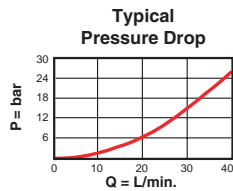
2 POSITION, 2-WAY AND 3-WAY, WITH INTERNAL DRAIN



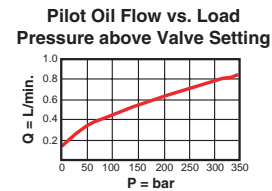
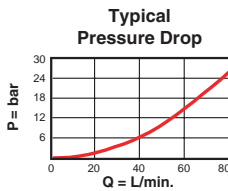
Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions					Installation Torque (Nm)
			a	b	L	C	K	
30 L/min.	DPBA – LAN	T - 11A	34,9	22,2	64	66	70	40/50
60 L/min.	DPCA – LAN	T - 2A	34,9	28,6	72	74	78	60/70

Performance Curves

DPB*



DPC*



- Maximum operating pressure = 350 bar
- Maximum valve leakage = 16,4 cc/min. at 70 bar
- Control pilot flow at opening = DPBA, DPBB, DPBC, DPBD = 0,11 - 0,16 L/min., DPCA, DPCB, DPCC, DPCD = 0,16 - 0,25 L/min.
- Maximum pressure at port 3 should be limited to 210 bar.
- Pressure at port 3 is directly additive to the setting of the valve. Because of this, port 3 may not be useable as a work port in your circuit. If this is a consideration, the 4 port version of this valve may be a solution.
- For DP*C and DP*D port 3 can be blocked to prevent the cartridge from shifting.

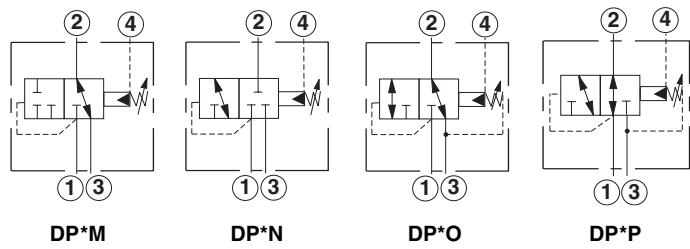
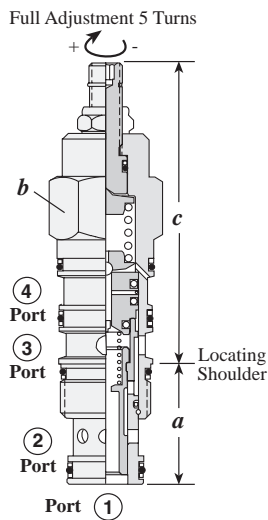
Nominal Capacity	Version	Control**	Adjustment Range	Seal
B 30 L/min.	A 2 Position 2-Way Normally Open	L Standard Screw	A 7 - 210 bar	N Buna-N
C 60 L/min.	B 2 Position 2-Way Normally Closed	C Tamper Resistant	B 3,5 - 105 bar	V Viton
	C 2 Position 3-Way Port 1 Blocked	K Handknob	D 2 - 55 bar	
	D 2 Position 3-Way Port 1 Open		E 2 - 25 bar	
			W 10 - 315 bar	

Adjustment Range Options:
 A, B, and W are standard set at 70 bar.
 D Option is standard set at 25 bar.
 E Option is standard set at 14 bar.
 Customer may specify pressure setting.

** See page 162 for information on Control Options

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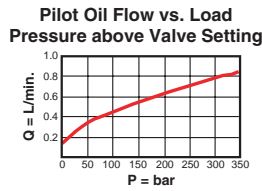
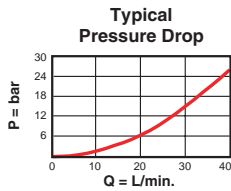
2 POSITION, 2-WAY AND 3-WAY, WITH EXTERNAL DRAIN



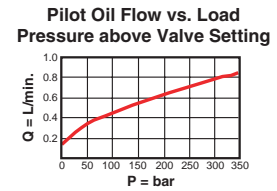
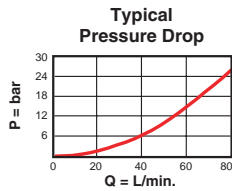
Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions						Installation Torque (Nm)
			a	b	c				
					L	C	K		
30 L/min.	DPBM - LAN	T - 21A	34,9	22,2	79	81	85	40/50	
60 L/min.	DPCM - LAN	T - 22A	34,9	28,6	88	90	94	60/70	

Performance Curves

DPB*



DPC*



- Maximum operating pressure = 350 bar
- Maximum valve leakage = 16,4 cc/min. at 70 bar
- Control pilot flow at opening = DPBM, DPBN, DPBO, DPBP = 0,11 - 0,16 L/min., DPCM, DPCN, DPCO, DPCP = 0,16 - 0,25 L/min.
- Maximum pressure at port 3 should be limited to 210 bar.
- Pressure at port 4 is directly additive to the setting of the valve.
- Port 3 can be used as a work port.
- Port 4 can be blocked to prevent the cartridge from shifting.

DP ★ ★ - ★ ★ ★

Nominal Capacity	Version	Control**	Adjustment Range	Seal
B 30 L/min.	M 2 Position 2-Way Normally Open	L Standard Screw	A 7 - 210 bar	N Buna-N
C 60 L/min.	N 2 Position 2-Way Normally Closed	C Tamper Resistant	B 3,5 - 105 bar	V Viton
	O 2 Position 3-Way Port 1 Blocked	K Handknob	D 2 - 55 bar	
	P 2 Position 3-Way Port 1 Open		E 2 - 25 bar	
			W 10 - 315 bar	

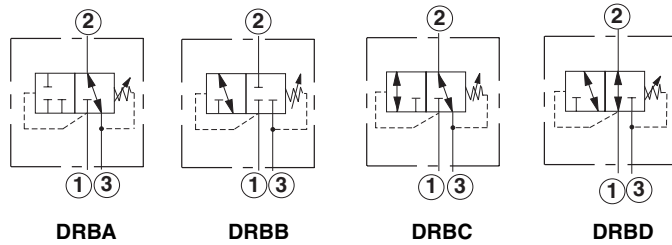
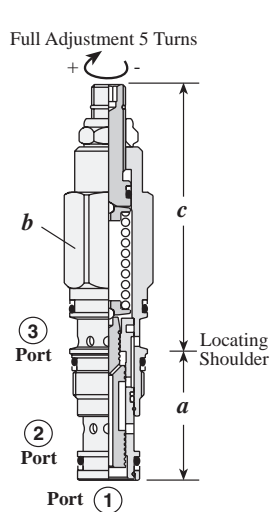
Adjustment Range Options:
 A, B, and W are standard set at 70 bar.
 D Option is standard set at 25 bar.
 E Option is standard set at 14 bar.
 Customer may specify pressure setting.

** See page 162 for information on Control Options

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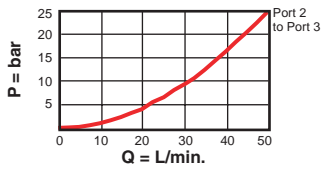
2 POSITION, 2-WAY AND 3-WAY DIRECT ACTING, INTERNAL DRAIN



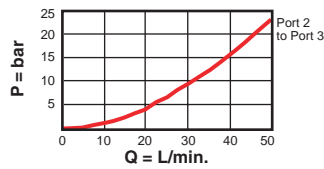
Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions					Installation Torque (Nm)
			a	b	L	C	K	
30 L/min.	DRBA – LAN	T - 11A	34,9	22,2	79	81	85	40/50

Performance Curves

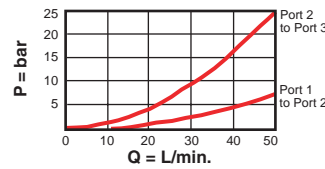
DRBA



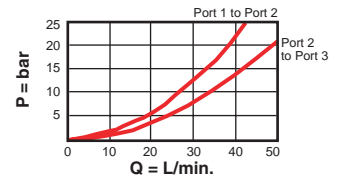
DRBB



DRBC



DRBD



Typical Pressure Drop

- Maximum operating pressure = 350 bar
- Maximum valve leakage = 32,8 cc/min. at 70 bar
- Maximum pressure at port 3 should be limited to 210 bar.
- Pressure at port 3 is directly additive to the setting of the valve. Because of this, port 3 may not be useable as a work port in your circuit. If this is a consideration, the 4 port version of this valve may be a solution.

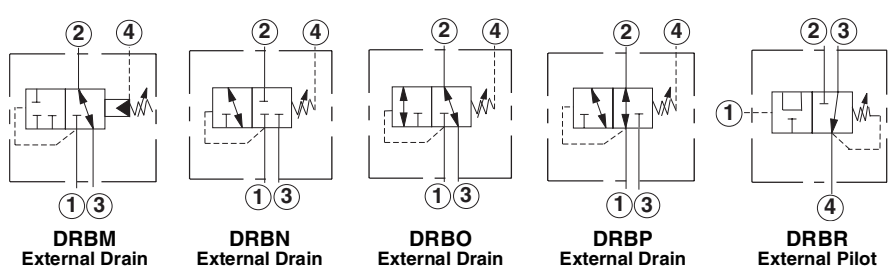
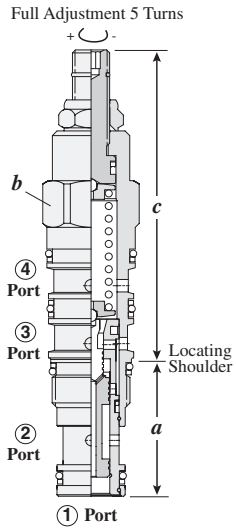
Nominal Capacity	Version	Control**	Adjustment Range	Seal
B 30 L/min.	A 2 Position 2-Way Normally Open	L Standard Screw	A 35 - 210 bar	N Buna-N
	B 2 Position 2-Way Normally Closed	C Tamper Resistant	B 14 - 105 bar	V Viton
	C 2 Position 3-Way Port 1 Blocked	K Handknob	D 1,5 - 55 bar	
	D 2 Position 3-Way Port 1 Open		E 1,5 - 25 bar	
			S 1,5 - 14 bar	
			W 50 - 315 bar	

Adjustment Range Options:
 A, B, and W are standard set at 70 bar.
 D Option is standard set at 25 bar.
 E and S are standard set at 14 bar.
 Customer may specify pressure setting.

** See page 162 for information on Control Options

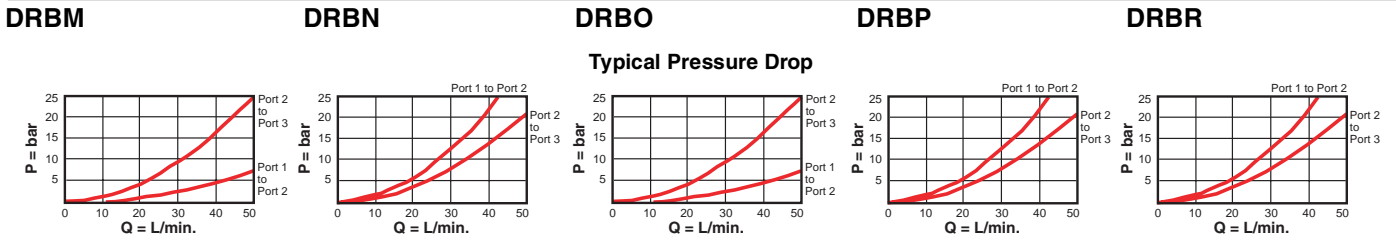
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2-POSITION, 2-WAY AND 3 WAY, DIRECT ACTING



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions					Installation Torque (Nm)
			a	b	c			
					L	C	K	
30 L/min.	DRBM – LAN	T - 21A	34,9	22,2	79	81	85	40/50
30 L/min.	DRBN – LAN	T - 21A	34,9	22,2	79	81	85	40/50
30 L/min.	DRBO – LAN	T - 21A	34,9	22,2	79	81	85	40/50
30 L/min.	DRBP – LAN	T - 21A	34,9	22,2	79	81	85	40/50
30 L/min.	DRBR – LAN	T - 21A	34,9	22,2	79	81	85	40/50

Performance Curves



- Maximum operating pressure = 350 bar
- Maximum valve leakage = 32,8 cc/min. at 70 bar
- Maximum pressure at port 3 should be limited to 210 bar.
- DRBM, DRBN, DRBO, DRBP: Port 3 can be used as a work port
- DRBM, DRBN, DRBO, DRBP: Pressure at port 4 is directly additive to the setting of the valve.

Nominal Capacity	Version	Control**	Adjustment Range	Seal
B 30 L/min.	M 2-Position, 2-Way, Normally Open, External Drain	L Standard Screw	A 35 - 210 bar	N Buna-N
	N 2-Position, 2-Way, Normally Closed, External Drain	C Tamper Resistant	B 14 - 105 bar	V Viton
	O 2-Position, 3-Way, Port 1 Blocked, External Drain	K Handknob	N* 4 - 55 bar	
	P 2-Position, 3-Way, Port 1 Open, External Drain		E* 2 - 25 bar	
	R 2-Position, 3-Way, External Pilot*		S* 2 - 14 bar	
			W 50 - 315 bar	

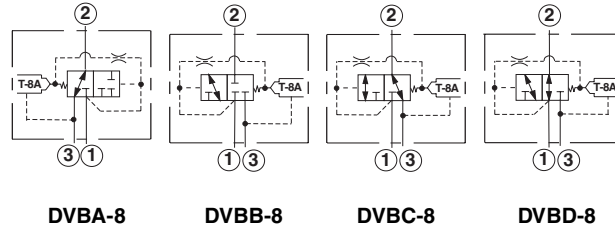
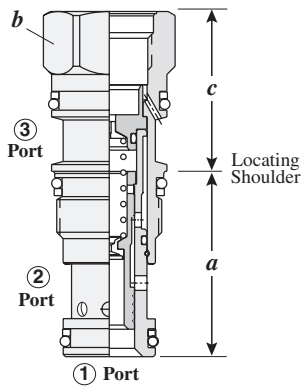
Adjustment Range Options:
 A, B, and W are standard set at 70 bar.
 N Option is standard set at 25 bar.
 E and S are standard set at 14 bar.
Customer may specify pressure setting.

** See page 162 for information on Control Options

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2-WAY AND 3-WAY WITH INTEGRAL PILOT CONTROL CAVITY

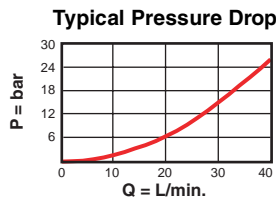


The -8 control option allows the pilot control valve to be incorporated directly into the end of the cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges on page 121.

Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
28 L/min.	DVBA-8FN	T-11A	35,1	22,2	35,1	45/50
28 L/min.	DVBB-8FN	T-11A	35,1	22,2	35,1	45/50
28 L/min.	DVBC-8FN	T-11A	35,1	22,2	35,1	45/50
28 L/min.	DVBD-8FN	T-11A	35,1	22,2	35,1	45/50

Performance Curves

DV***-8



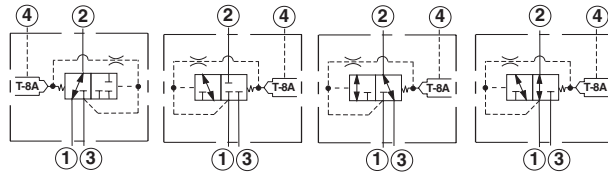
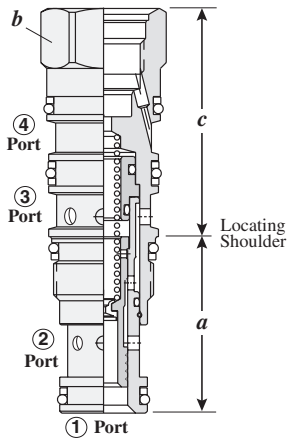
- Maximum operating pressure = 350 bar
- Control pilot flow at opening = DVBA-8, DVBB-8, DVBC-8, DVBD-8 = 0,11 - 0,16 L/min., DVCA-8, DVCB-8, DVCC-8, DVCD-8 = 0,16 - 0,25 L/min.
- Maximum leakage per path = 32,8 cc/min. at 70 bar
- Maximum pressure at port 3 should be limited to 210 bar.
- There must be a pressure source at port 1, relative to port 3, to shift the valve.
- Pressure at port 3 may oppose the opening of the valve. Because of this, port 3 may not be useable as a work port in your circuit. If this is a consideration, the 4 port version of this valve may be a solution.
- The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.

Nominal Capacity	Version	Control**	Adjustment Range	Seal
B 28 L/min.	A 2 Position, 2-Way Normally Open	8 T-8A Cavity in hex body for pilot operation (Pilot valve to be ordered separately)	F 7 bar	N Buna-N
	B 2 Position, 2-Way Normally Closed			V Viton
	C 2 Position, 3-Way, Port 1 Blocked			
	D 2 Position, 3-Way, Port 1 Open			

** See page 162 for information on Control Options

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4-PORT, 2-WAY AND 3-WAY WITH INTEGRAL PILOT CONTROL CAVITY



The -8 control option allows the pilot control valve to be incorporated directly into the end of the cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges on page 121.

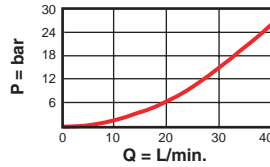
DVBM-8 DVBN-8 DVBO-8 DVBP-8

Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
28 L/min.	DVBM – 8FN	T-21A	35,1	22,2	42,9	45/50
28 L/min.	DVBN – 8FN	T-21A	35,1	22,2	42,9	45/50
28 L/min.	DVBO – 8FN	T-21A	35,1	22,2	42,9	45/50
28 L/min.	DVBP – 8FN	T-21A	35,1	22,2	42,9	45/50

Performance Curves

DV☆☆-8

Typical Pressure Drop



- Maximum operating pressure = 350 bar
- Control pilot flow at opening = DVBM-8, DVBN-8, DVBO-8, DVBP-8 = 0,11 - 0,16 L/min., DVCM-8, DVCN-8, DVCO-8, DVCP-8 = 0,16 - 0,25 L/min.
- Maximum leakage per path = 32,8 cc/min. at 70 bar
- Maximum pressure at port 3 should be limited to 210 bar.
- There must be a pressure source at port 1, relative to port 4, to shift the valve.
- The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.

DV☆☆ - 8☆☆

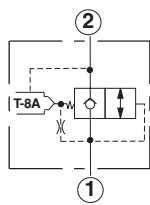
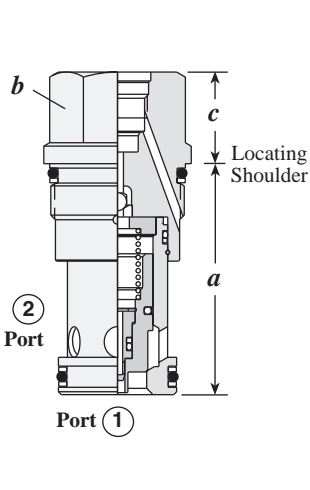
Nominal Capacity	Version	Control**	Adjustment Range	Seal
B 28 L/min.	M 2 Position, 2-Way Normally Open	8 T-8A Cavity in hex body for pilot operation (Pilot valve to be ordered separately)	F 7 bar	N Buna-N
	N 2 Position, 2-Way Normally Closed			V Viton
	O 2 Position, 3-Way, Port 1 Blocked			
	P 2 Position, 3-Way, Port 1 Open			

** See page 162 for information on Control Options

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2-POSITION, 2-WAY POPPET, CONTROL 1 TO 2 WITH INTEGRAL PILOT CONTROL CAVITY

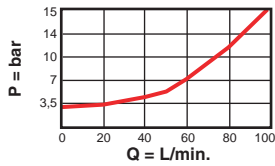


The -8 control option allows the pilot control valve to be incorporated directly into the end of the cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges on page 121.

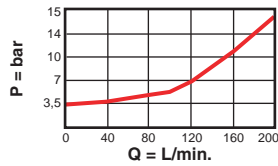
Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
60 L/min.	DFCA – 8DN	T - 13A	34,9	22,2	46	40/50
120 L/min.	DFDA – 8DN	T - 5A	41.1	28,6	17,5	60/70
240 L/min.	DFEA – 8DN	T - 16A	62,0	31,8	24,6	200/215
480 L/min.	DFFA – 8DN	T - 18A	79,5	41,3	30,2	465/500

Performance Curves

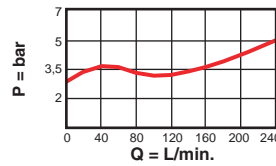
DFCA-8



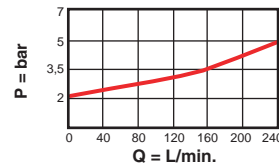
DFDA-8



DFEA-8



DFFA-8



Typical Pressure Drop

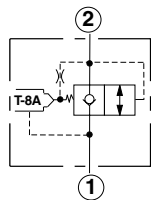
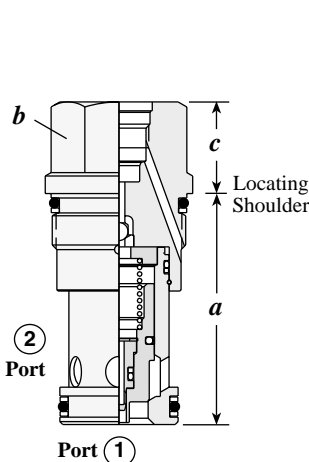
- Maximum operating pressure = 350 bar
- The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.
- Main stage leakage less than 0,3 cc/min.

DF ★ A - 8 D ★

Nominal Capacity	Control**	Adjustment Range	Seal
C 60 L/min.	8 T-8A cavity in hex body for pilot operation (Pilot valve to be ordered separately) Options are: • Solenoid Pilot • Air Pilot • Hydraulic Pilot • Manual Control	D 3,5 bar	N Buna-N
D 120 L/min.			V Viton
E 240 L/min.			
F 480 L/min.			

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2-POSITION, 2-WAY POPPET, CONTROL 2 TO 1 WITH INTEGRAL PILOT CONTROL CAVITY

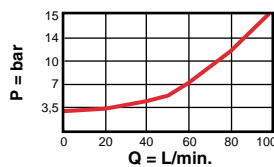


The -8 control option allows the pilot control valve to be incorporated directly into the end of the cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges on page 121.

Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
60 L/min.	DFCB – 8DN	T - 13A	34,9	22,2	18	40/50
120 L/min.	DFDB – 8DN	T - 5A	41,1	28,6	18	60/70
240 L/min.	DFEB – 8DN	T - 16A	61,9	31,8	25	200/215

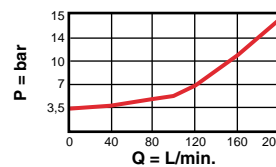
Performance Curves

DFCB-8

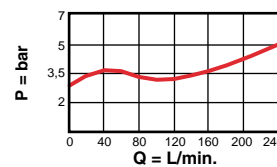


DFDB-8

Typical Pressure Drop



DFEB-8



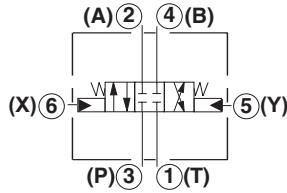
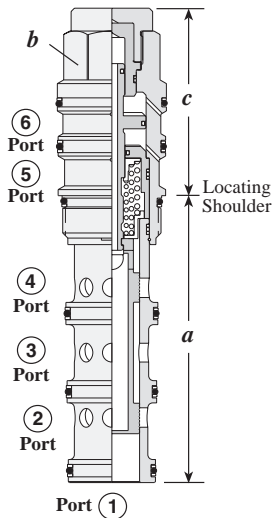
- Main stage leakage less than 5 drops/min. Maximum operating pressure = 350 bar
- The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.
- Main stage leakage less than 0,3 cc/min.

DF ★ B – 8 D ★

Nominal Capacity	Control	Adjustment Range	Seal
C 60 L/min.	T-8A Pilot Cavity Pilot Stage Control to be ordered separately. Options are: • Solenoid Pilot • Air Pilot • Hydraulic Pilot • Manual Control	D Bias Spring 3,5 bar	N Buna-N
D 120 L/min.			V Viton
E 240 L/min.			

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3-POSITION, 4-WAY SPRING CENTERED



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
40 L/min.	DCCC – XCN	T - 61A	84,8	22,2	50	40/50
80 L/min.	DCDC – XCN	T - 62A	92,2	28,6	59	60/70
160 L/min.	DCEC – XCN	T - 63A	114,4	31,8	73	200/215
320 L/min.	DCFC – XCN	T - 64A	139,7	41,3	92	465/500

Performance Curves

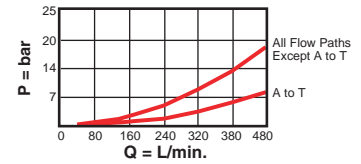
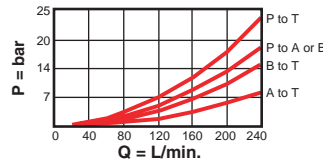
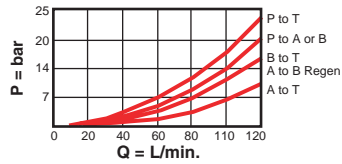
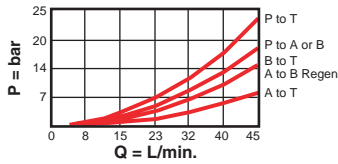
DCCC

DCDC

DCEC

DCFC

Typical Pressure Drop



- Maximum operating pressure = 350 bar
- Maximum leakage per path = 2 in³/min. at 1000 psi
- Pilot volume for complete shift = DCCC: 0,33 cc/min., DCDC: 0,98 cc/min., DCEC: 2,8 cc/min., CFC: 6,9 cc/min.
- Minimum pilot pressure required to shift valve = DCCC: 12 bar, DCDC: 10,5 bar, DCEC, DCFC: 9 bar
- All ports will accept 350 bar, including the x and y pilot ports (port 5 and port 6).

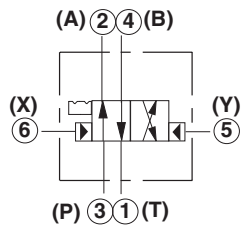
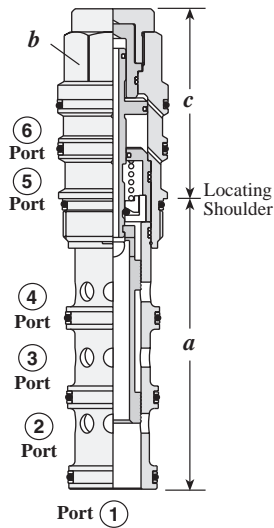
DC * C - X * *

Nominal Capacity	Spool Configuration Capacity (L/min.)				Seal	
	C	D	E	F		
C 40 L/min.		95,0	189,0	378,0	756,0	N Buna-N
D 80 L/min.		38,0	91,0	151,0	378,0	V Viton
E 160 L/min.		38,0	95,0	151,0	378,0	
F 320 L/min.		38,0	189,0	378,0	756,0	
		45,0	189,0	378,0	756,0	
		27,0	42,0	95,0	189,0	
		27,0	45,0	95,0	189,0	
		27,0	57,0	113,0	227,0	
		38,0	189,0	284,0	567,0	
		38,0	---	284,0	---	

Typical switching pilot pressure differential between pilot ports 5 and 6 is 14 bar.

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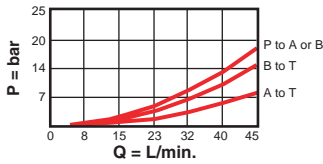
2-POSITION, 4-WAY DETENTED



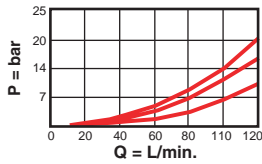
Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
40 L/min.	DCCD - XCN	T - 61A	84,8	22,2	50	40/50
80 L/min.	DCDD - XCN	T - 62A	92,2	28,6	59	60/70
160 L/min.	DCED - XCN	T - 63A	114,4	31,8	73	200/215
320 L/min.	DCFD - XCN	T - 64A	139,7	41,3	92	465/500

Performance Curves

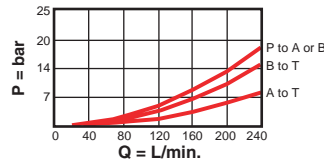
DCCD



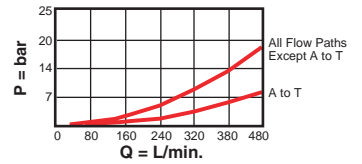
DCDD



DCED



DCFD



- Maximum operating pressure = 350 bar
- Maximum leakage per path = 2 in³/min. at 1000 psi
- Pilot volume for complete shift = DCCD: 0,82 cc/min., DCDD: 2,0 cc/min., DCED: 5,6 cc/min., DCFD: 14,0 cc/min.
- Minimum pilot pressure required to shift valve = 3 bar
- All ports will accept 350 bar, including the x and y pilot ports (port 5 and port 6).

DC * D - X * *

Nominal Capacity	Spool Configuration Capacity (L/min.)				Seal	
	C	D	E	F		
C 40 L/min.		42,0	83,0	170,0	340,0	N Buna-N
D 80 L/min.		38,0	76,0	151,0	302,0	V Viton
E 160 L/min.		49,0	151,0	302,0	567,0	
F 320 L/min.						

Typical switching pilot pressure differential between pilot ports 5 and 6 is 14 bar.

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