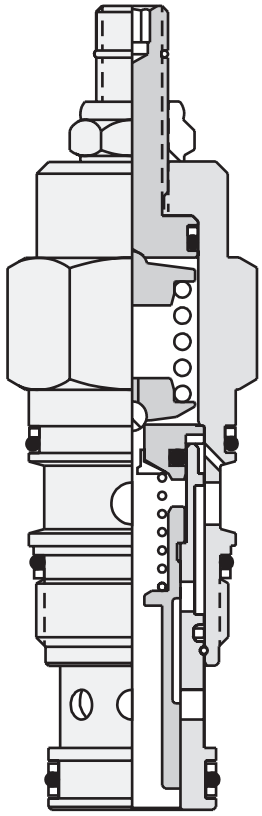
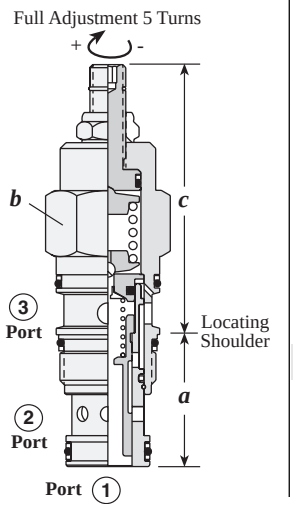
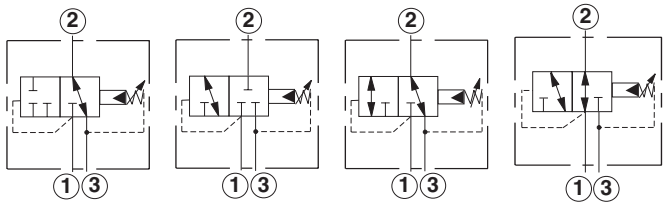
Directional Cartridge Valves



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



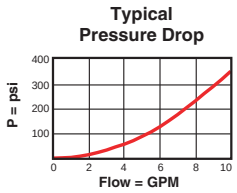


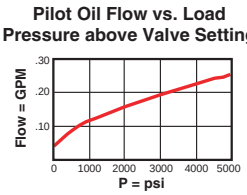
DP*A **DP*B** **DP*C** **DP*D**

Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions* *a*	*b*	*c* L	*c* C	*c* K	*Installation Torque (lb. ft.)*
7.0 GPM	**DPBA – LAN**	T - 11A	1.38	7/8”	2.50	2.56	2.75	30/35
15 GPM	**DPCA – LAN**	T - 2A	1.38	1 1/8”	2.81	2.88	3.06	45/50

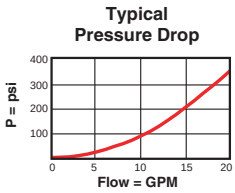
Performance Curves

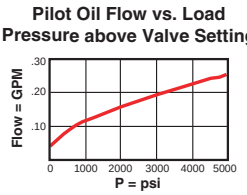
DPB*





DPC*





- Maximum operating pressure = 5000 psi
- Maximum valve leakage = 1 in³/min. at 1000 psi
- Control pilot flow at opening = DPBA, DPBB, DPBC, DPBD = 7 - 10 in³/min., DPCA, DPCB, DPCC, DPCD = 10 - 15 in³/min.
- Maximum pressure at port 3 should be limited to 3000 psi.
- 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.

OPTION ORDERING INFORMATION

Model Codes printed in Red are Preferred Versions and most readily available

DP ★ ★ – ★ ★ ★

Nominal Capacity

B 7.0 GPM

C 15 GPM

Version

A 2 Position 2-Way Normally Open

B 2 Position 2-Way Normally Closed

C 2 Position 3-Way Port 1 Blocked

D 2 Position 3-Way Port 1 Open

Control**

L Standard Screw

C Tamper Resistant

K Handknob

*** See page 162 for information on Control Options*

Adjustment Range

A 100 - 3000 psi

B 50 - 1500 psi

D 25 - 800 psi

E 25 - 400 psi

W 150 - 4500 psi

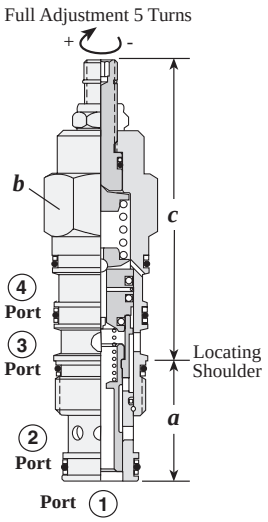
Adjustment Range Options:
A, B, and W are standard set at 1000 psi.
D Option is standard set at 400 psi.
E Option is standard set at 200 psi.
Customer may specify pressure setting.

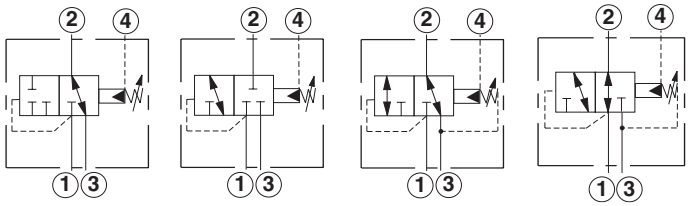
Seal

N Buna-N

V Viton

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



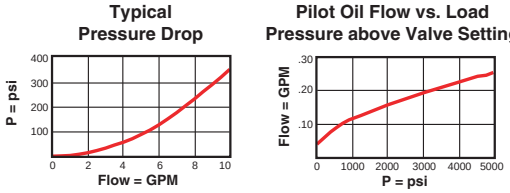


DP*M **DP*N** **DP*O** **DP*P**

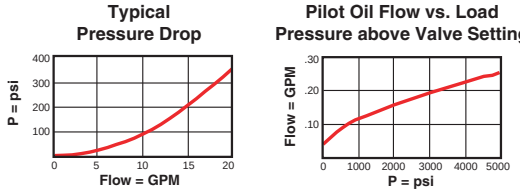
Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions* a	b	c L	c C	c K	*Installation Torque (lb. ft.)*
7.0 GPM	**DPBM– LAN**	T - 21A	1.38	7/8”	3.09	3.15	3.34	30/35
15 GPM	**DPCM– LAN**	T - 22A	1.38	1 1/8”	3.44	3.50	3.69	45/50

Performance Curves

DPB*



DPC*



- Maximum operating pressure = 5000 psi
- Maximum valve leakage = 1 in³/min. at 1000 psi
- Control pilot flow at opening = DPBM, DPBN, DPBO, DPBP = 7 - 10 in³/min., DPCM, DPCN, DPCO, DPCP = 10 - 15 in³/min.
- Maximum pressure at port 3 should be limited to 3000 psi.
- 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.

OPTION ORDERING INFORMATION

Model Codes printed in Red are Preferred Versions and most readily available

DP ★ ★ – ★ ★ ★

Nominal Capacity
- **B** 7.0 GPM
- **C** 15 GPM

Version
- **M** 2 Position 2-Way Normally Open
- **N** 2 Position 2-Way Normally Closed
- **O** 2 Position 3-Way Port 1 Blocked
- **P** 2 Position 3-Way Port 1 Open

*Control***
- **L** Standard Screw
- **C** Tamper Resistant
- **K** Handknob

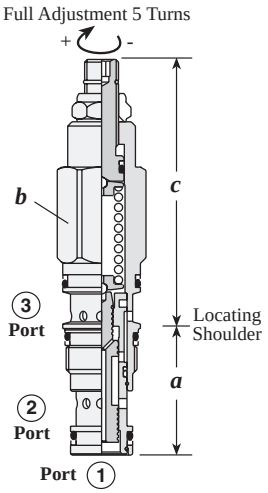
Adjustment Range
- **A** 100 - 3000 psi
- **B** 50 - 1500 psi
- **D** 25 - 800 psi
- **E** 25 - 400 psi
- **W** 150 - 4500 psi

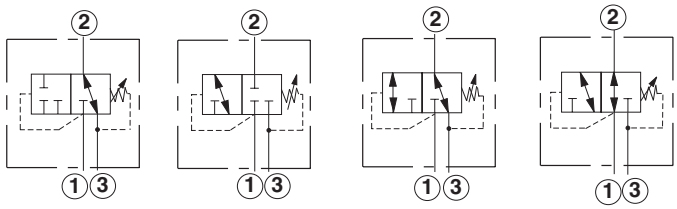
Seal
- **N** Buna-N
- **V** Viton

** *See page 162 for information on Control Options*

Adjustment Range Options:
A, B, and W are standard set at 1000 psi.
D Option is standard set at 400 psi.
E Option is standard set at 200 psi.
Customer may specify pressure setting.

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





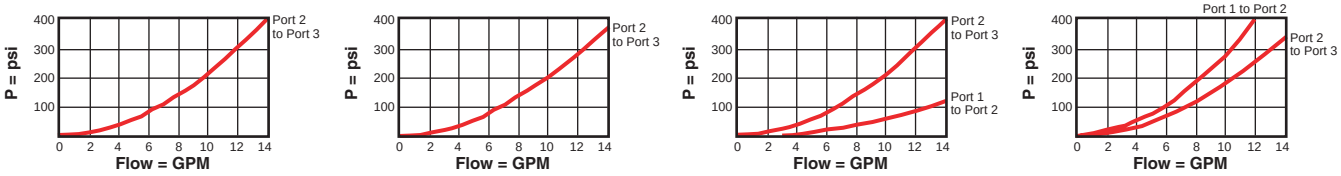
DRBA **DRBB** **DRBC** **DRBD**

Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions* a	b	c L	c C	c K	*Installation Torque (lb. ft.)*
7.0 GPM	**DRBA – LAN**	T - 11A	1.38	7/8”	3.10	3.16	3.34	30/35

Performance Curves

DRBA **DRBB** **DRBC** **DRBD**

Typical Pressure Drop



- Maximum operating pressure = 5000 psi
- Maximum valve leakage = 2 in³/min. at 1000 psi
- Maximum pressure at port 3 should be limited to 3000 psi.
- 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.

OPTION ORDERING INFORMATION **Model Codes printed in Red are Preferred Versions and most readily available**

DR ★ ★ – ★ ★ ★

Nominal Capacity

B 7.0 GPM

Version

A 2 Position 2-Way Normally Open

B 2 Position 2-Way Normally Closed

C 2 Position 3-Way Port 1 Blocked

D 2 Position 3-Way Port 1 Open

Control**

L Standard Screw

C Tamper Resistant

K Handknob

*** See page 162 for information on Control Options*

Adjustment Range

A 500 - 3000 psi

B 200 - 1500 psi

D 30 - 800 psi

E 30 - 400 psi

S 30 - 200 psi

W 750 - 4500 psi

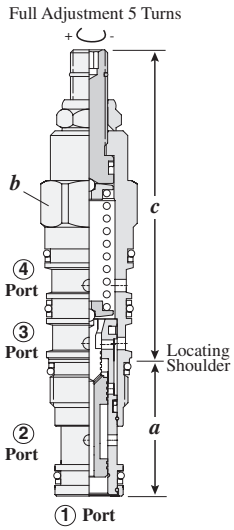
Adjustment Range Options:
A, B, and W are standard set at 1000 psi.
D Option is standard set at 400 psi.
E and S are standard set at 200 psi.
Customer may specify pressure setting.

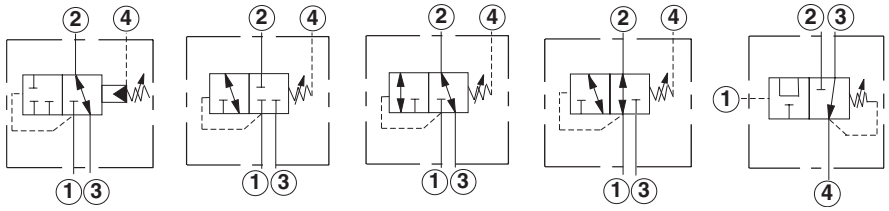
Seal

N Buna-N

V Viton

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



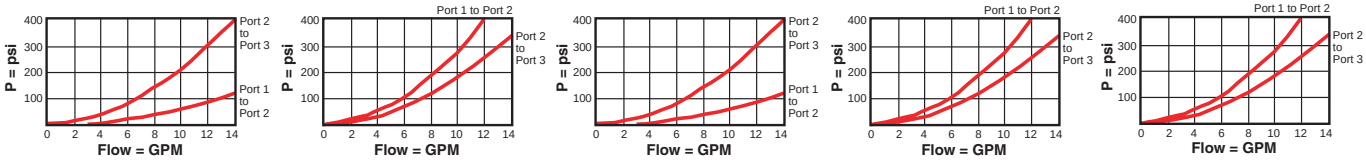


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions a	b	c L	c C	c K	Installation Torque (lb. ft.)
7.0 GPM	**DRBM– LAN**	T - 21A	1.38	7/8”	3.10	3.16	3.34	30/35
7.0 GPM	**DRBN – LAN**	T - 21A	1.38	7/8”	3.10	3.16	3.34	30/35
7.0 GPM	**DRBO – LAN**	T - 21A	1.38	7/8”	3.10	3.16	3.34	30/35
7.0 GPM	**DRBP – LAN**	T - 21A	1.38	7/8”	3.10	3.16	3.34	30/35
7.0 GPM	**DRBR – LAN**	T - 21A	1.38	7/8”	3.10	3.16	3.34	30/35

Performance Curves

DRBM **DRBN** **DRBO** **DRBP** **DRBR**

Typical Pressure Drop



- Maximum operating pressure = 5000 psi
- Maximum valve leakage = 2 in³/min. at 1000 psi
- Maximum pressure at port 3 should be limited to 3000 psi.
- 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.

OPTION ORDERING INFORMATION

Model Codes printed in Red are Preferred Versions and most readily available

DR ★ ★ – ★ ★ ★

Nominal Capacity	*Base Price*
B 7.0 GPM	**$ 84.50**

Version	
M 2-Position, 2-Way, Normally Open, External Drain	**-$ 7.20**
N 2-Position, 2-Way, Normally Closed, External Drain	**-$ 7.20**
O 2-Position, 3-Way, Port 1 Blocked, External Drain	**-$ .20**
P 2-Position, 3-Way, Port 1 Open, External Drain	**+$ 2.00**
R 2-Position, 3-Way, External Pilot*	**+$ 3.80**

*Control***	
L Standard Screw	**+$ 0.00**
C Tamper Resistant	**+$ 4.10**
K Handknob	**+$ 6.00**

Adjustment Range	
A 500 - 3000 psi	**+$ 0.00**
B 200 - 1500 psi	**+$ 0.00**
N* 30 - 800 psi	**+$ 1.00**
E* 30 - 400 psi	**+$ 1.00**
S* 30 - 200 psi	**+$ 2.00**
W 750 - 4500 psi	**+$ 0.00**

* *DRBR only available with these spring ranges.*

Seal	
N Buna-N	**+$ 0.00**
V Viton	**+$ 3.00**

** *See page 162 for information on Control Options*

Adjustment Range Options:
A, B, and W are standard set at 1000 psi.
N Option is standard set at 400 psi.
E and S are standard set at 200 psi.
Customer may specify pressure setting. **+$ 1.10**

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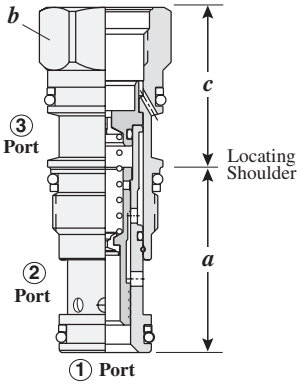
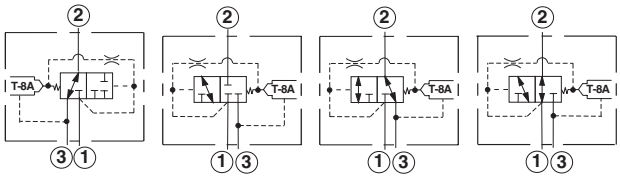
2-WAY AND 3-WAY WITH INTEGRAL PILOT CONTROL CAVITY





DVBA-8 **DVBB-8** **DVBC-8** **DVBD-8**

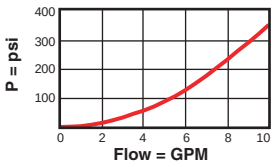
The -8 control option allows the pilot control valve to be incorporated directly into the end of the cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges on page 121.

Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions* a	b	c	*Installation Torque (lb. ft.)*
7 GPM	**DVBA-8FN**	T-11A	1.38	7/8	1.38	30/35
7 GPM	**DVBB-8FN**	T-11A	1.38	7/8	1.38	30/35
7 GPM	**DVBC-8FN**	T-11A	1.38	7/8	1.38	30/35
7 GPM	**DVBD-8FN**	T-11A	1.38	7/8	1.38	30/35

Performance Curves

DV✶✶-8

Typical Pressure Drop



- Maximum operating pressure = 5000 psi
- Control pilot flow at opening = DVBA-8, DVBB-8, DVBC-8, DVBD-8 = 7 - 10 in³/min., DVCA-8, DVCB-8, DVCC-8, DVCD-8 = 10 - 15 in³/min.
- Maximum leakage per path = 2 in³/min. at 1000 psi
- Maximum pressure at port 3 should be limited to 3000 psi.
- 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.

OPTION ORDERING INFORMATION **Model Codes printed in Red are Preferred Versions and most readily available**

DV ✶ ✶ – 8 ✶ ✶

Nominal Capacity

B 7GPM

Version

A 2 Position, 2-Way Normally Open

B 2 Position, 2-Way Normally Closed

C 2 Position, 3-Way, Port 1 Blocked

D 2 Position, 3-Way, Port 1 Open

*Control***

8 T-8A Cavity in in hex body for pilot operation (Pilot valve to be ordered separately)

Adjustment Range

F 100 psi

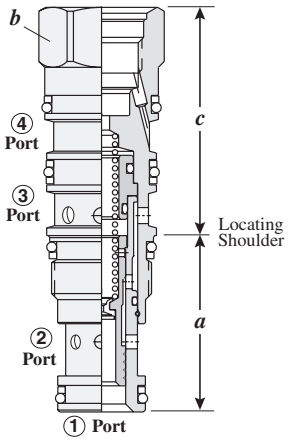
Seal

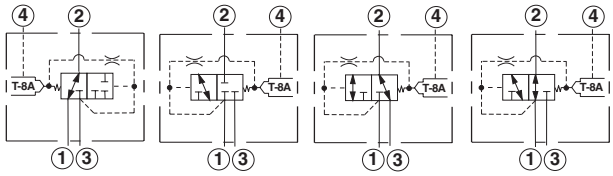
N Buna-N

V Viton

*** See page 162 for information on Control Options*

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





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

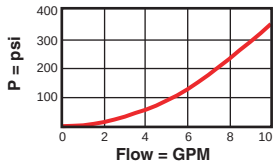
The -8 control option allows the pilot control valve to be incorporated directly into the end of the cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges on page 121.

Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions* a	b	c	*Installation Torque (lb. ft.)*
7 GPM	**DVBM – 8FN**	T-21A	1.38	7/8	1.69	30/35
7 GPM	**DVBN – 8FN**	T-21A	1.38	7/8	1.69	30/35
7 GPM	**DVBO – 8FN**	T-21A	1.38	7/8	1.69	30/35
7 GPM	**DVBP – 8FN**	T-21A	1.38	7/8	1.69	30/35

Performance Curves

DV✶✶-8

Typical Pressure Drop



- Maximum operating pressure = 5000 psi
- Control pilot flow at opening = DVBM-8, DVBN-8, DVBO-8, DVBP-8 = 7 - 10 in³/min., DVCM-8, DVCN-8, DVCO-8, DVCP-8 = 10 - 15 in³/min.
- Maximum leakage per path = 2 in³/min. at 1000 psi
- Maximum pressure at port 3 should be limited to 3000 psi.
- 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.

OPTION ORDERING INFORMATION

Model Codes printed in Red are Preferred Versions and most readily available

DV ✶ ✶ – 8 ✶ ✶

Nominal Capacity

B 7 GPM

Version

M 2 Position, 2-Way Normally Open

N 2 Position, 2-Way Normally Closed

O 2 Position, 3-Way, Port 1 Blocked

P 2 Position, 3-Way, Port 1 Open

Control**

8 T-8A Cavity in hex body for pilot operation (Pilot valve to be ordered separately)

Adjustment Range

F 100 psi

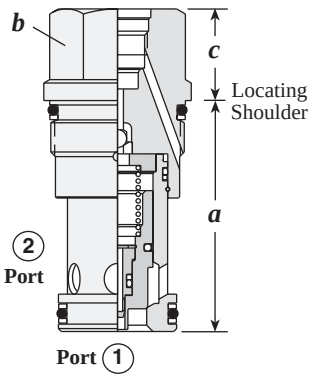
Seal

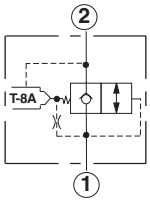
N Buna-N

V Viton

*** See page 162 for information on Control Options*

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





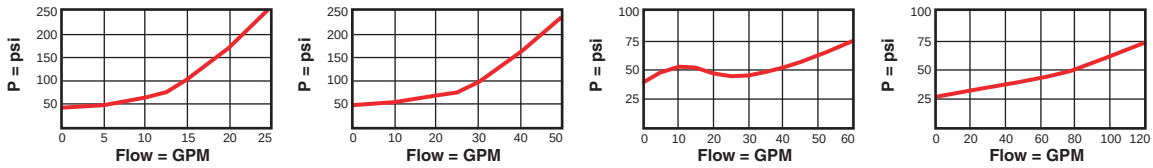
The -8 control option allows the pilot control valve to be incorporated directly into the end of the cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges on page 121.

Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions* *a*	*b*	*c*	*Installation Torque (lb. ft.)*
15 GPM	**DFCA – 8DN**	T - 13A	1.38	7/8	.75	30/35
30 GPM	**DFDA – 8DN**	T - 5A	1.62	1 1/8	.69	45/50
60 GPM	**DFEA – 8DN**	T - 16A	2.44	1 1/4	.97	150/160
120 GPM	**DFFA – 8DN**	T - 18A	3.13	1 5/8	1.19	350/375

Performance Curves

DFCA-8 **DFDA-8** **DFEA-8** **DFFA-8**

Typical Pressure Drop



- Maximum operating pressure = 5000 psi
- 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 5 drops/min.

OPTION ORDERING INFORMATION **Model Codes printed in Red are Preferred Versions and most readily available**

DF ✶ A – 8 D ✶

Nominal Capacity

- **C** 15 GPM
- **D** 30 GPM
- **E** 60 GPM
- **F** 120 GPM

*Control***

- **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

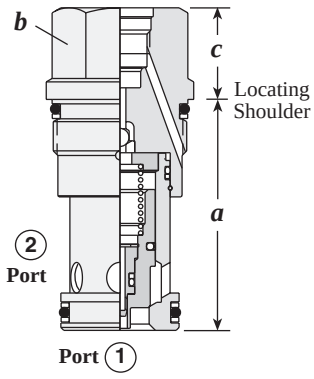
Adjustment Range

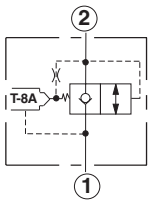
- **D** 50 psi

Seal

- **N** Buna-N
- **V** Viton

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





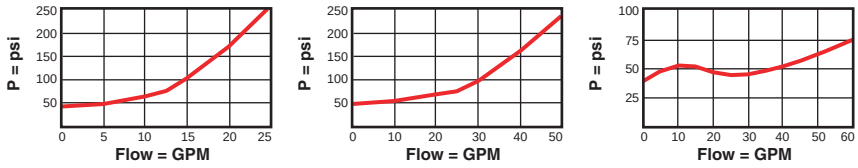
The -8 control option allows the pilot control valve to be incorporated directly into the end of the cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges on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

Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions*			*Installation Torque (lb. ft.)*
			a	*b*	*c*	
15 GPM	**DFCB – 8DN**	T - 13A	1.38	7/8”	.75	30/35
30 GPM	**DFDB – 8DN**	T - 5A	1.62	1 1/8”	.69	45/50
60 GPM	**DFEB – 8DN**	T - 16A	2.44	1 1/4”	.97	150/160

Performance Curves

DFCB-8 **DFDB-8** **DFEB-8**

Typical Pressure Drop



- Maximum operating pressure = 5000 psi
- 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 5 drops/min.

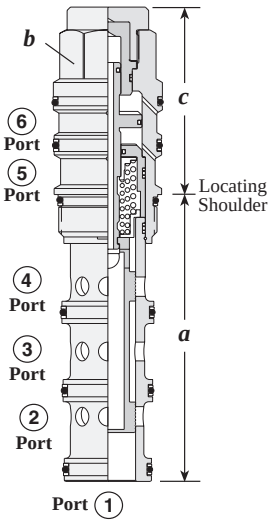
OPTION ORDERING INFORMATION

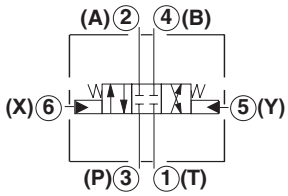
Model Codes printed in Red are Preferred Versions and most readily available

DF ★ B – 8 D ★

Nominal Capacity	*Control*	*Adjustment Range*	*Seal*
C 15 GPM	T-8A Pilot Cavity Pilot Stage Control to be ordered separately.	**D** Bias Spring 50 psi	**N** Buna-N
D 30 GPM	Options are:		**V** Viton
E 60 GPM	• Solenoid Pilot • Air Pilot • Hydraulic Pilot • Manual Control		

3-POSITION, 4-WAY SPRING CENTERED



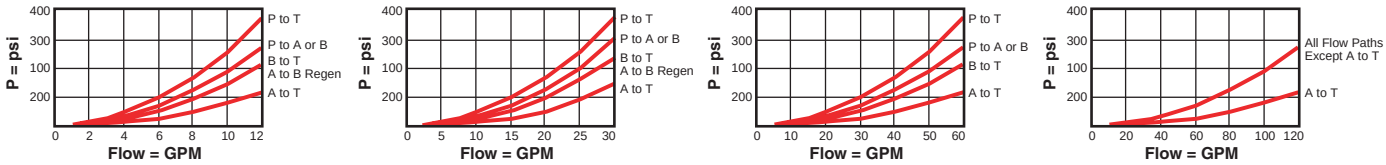


Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions*			*Installation Torque (lb. ft.)*
			a	*b*	*c*	
10 GPM	**DCCC – XCN**	T - 61A	3.35	7/8”	1.97	30/35
20 GPM	**DCDC – XCN**	T - 62A	3.63	1 1/8”	2.31	45/50
40 GPM	**DCEC – XCN**	T - 63A	4.51	1 1/4”	2.84	150/160
80 GPM	**DCFC – XCN**	T - 64A	5.51	1 5/8”	3.59	350/375

Performance Curves

DCCC **DCDC** **DCEC** **DCFC**

Typical Pressure Drop



- Maximum operating pressure = 5000 psi
- Maximum leakage per path = 2 in³/min. at 1000 psi
- Pilot volume for complete shift = DCCC: .02 in³/min., DCDC: .06 in³/min., DCEC: .17 in³/min., DCFC: .42 in³/min.
- Minimum pilot pressure required to shift valve = DCCC: 175 psi, DCDC: 150 psi, DCEC, DCFC: 125 psi
- All ports will accept 5000 psi, including the x and y pilot ports (port 5 and port 6).

OPTION ORDERING INFORMATION **Model Codes printed in Red are Preferred Versions and most readily available**

DC ✶ C – X ✶ ✶

Nominal Capacity

- **C** 10 GPM
- **D** 20 GPM
- **E** 40 GPM
- **F** 80 GPM

Spool Configuration

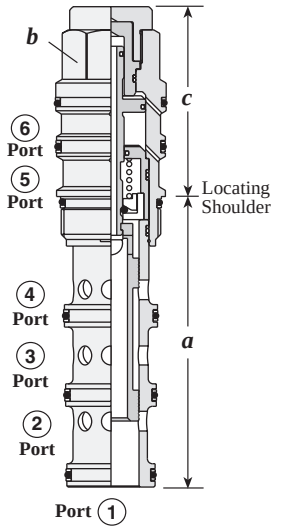
		Capacity (GPM) C	D	E	F
C		10⁺	30⁺	100⁺	200⁺
T		10	24	40	100
H		10	25	40	100
Y		10	30⁺	100⁺	200⁺
W		10⁺	30⁺	100	200
R		7.0	11	25	50
N		7.0	12	25	50
X		7.0	15	30	60
B		10	30⁺	75	150
A		10	30⁺	75	150

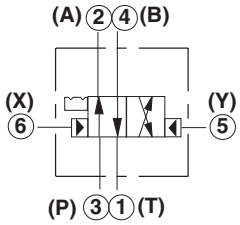
Seal

- **N** Buna-N
- **V** Viton

Typical switching pilot pressure differential between pilot ports 5 and 6 is 200 psi.

2-POSITION, 4-WAY DETENTED



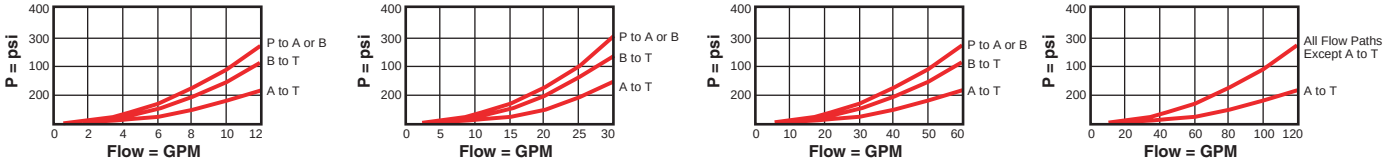


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions a	b	c	Installation Torque (lb. ft.)
10 GPM	**DCCD – XCN**	T - 61A	3.35	7/8”	1.97	30/35
20 GPM	**DCDD – XCN**	T - 62A	3.63	1 1/8”	2.31	45/50
40 GPM	**DCED – XCN**	T - 63A	4.51	1 1/4”	2.84	150/160
80 GPM	**DCFD – XCN**	T - 64A	5.51	1 5/8”	3.59	350/375

Performance Curves

DCCD **DCDD** **DCED** **DCFD**

Typical Pressure Drop



- Maximum operating pressure = 5000 psi
- Maximum leakage per path = 2 in³/min. at 1000 psi
- Pilot volume for complete shift = DCCD: .05 in³/min., DCDD: .12 in³/min., DCED: .34 in³/min., DCFD: .84 in³/min.
- Minimum pilot pressure required to shift valve = 40 psi
- All ports will accept 5000 psi, including the x and y pilot ports (port 5 and port 6).

OPTION ORDERING INFORMATION

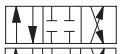
Model Codes printed in Red are Preferred Versions and most readily available

DC ✶ D – X ✶ ✶

Nominal Capacity

- **C** 10 GPM
- **D** 20 GPM
- **E** 40 GPM
- **F** 80 GPM

Spool Configuration

		Capacity (GPM) C	D	E	F
C		11	22	45	90
H		10	20	40	80
X		13	30⁺	60⁺	120⁺

Seal

- **N** Buna-N
- **V** Viton

Typical switching pilot pressure differential between pilot ports 5 and 6 is 200 psi.

NOTES