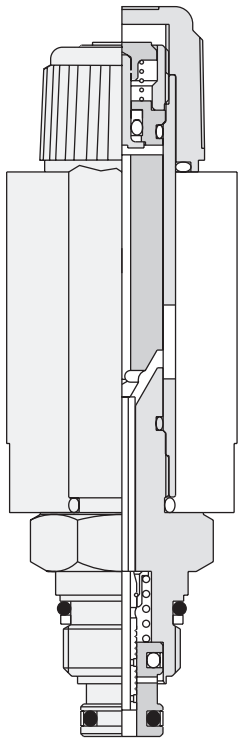
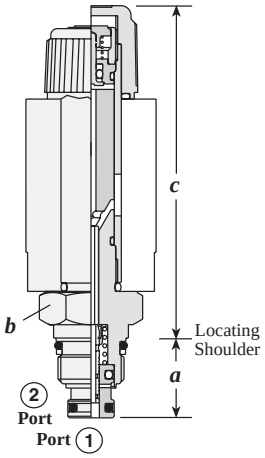
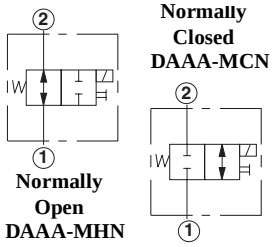
Pilot Control Valves



2-POSITION, 2-WAY SPOOL DIRECTIONAL VALVE – PILOT CAPACITY



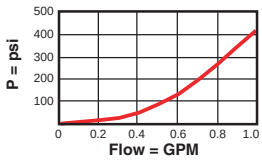


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions a	b	c M	c C	d	Installation Torque (lb. ft.)
.25 GPM	**DAAA – MCN**	T - 8A	.75	7/8”	2.94	3.13	1.22	25/30
.25 GPM	**DAAA – MHN**	T - 8A	.75	7/8”	2.94	3.13	1.22	25/30
.25 GPM	**DAAC – MCN**	T - 8A	.75	7/8”	2.94	3.13	1.22	25/30
.25 GPM	**DAAC – MHN**	T - 8A	.75	7/8”	2.94	3.13	1.22	25/30

Performance Curves

DAA*-M*N

Pressure vs. Flow



- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- Switching frequency = 15000 cycles/hour
- Cartridge can be installed directly into a cavity in some Sun pilot operated and ventable cartridges to provide electrically operated pilot control functions.
- Proper installation of solenoid valves requires an extra deep socket to clear the solenoid tube. Sockets are available from Snap On tools (P/N SIML280) or Sun Hydraulics (P/N 998-100-006). See www.sunhydraulics.com for details.

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

D A A A – M ✶ ✶ – ✶ ✶ ✶

Nominal Capacity
A .25 GPM

Control
M Manual Override
C Concealed Override

Version
A Standard
C Canadian Standards Association Certified 3500 psi max.

Spool Configuration
H Normally Open
C Normally Closed

Seal
N Buna-N
V Viton

Coil Configuration*

ISO/DIN
206 6 VDC
212 12 VDC
224 24 VDC
211 115 VAC
223 230 VAC

SAE J858
506 6 VDC
512 12 VDC
524 24 VDC

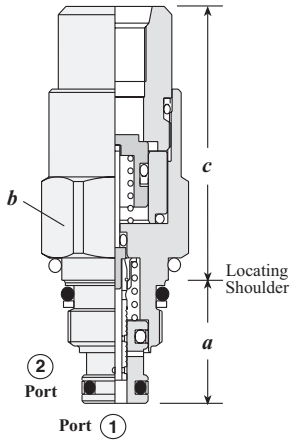
Twin Lead
706 6 VDC
712 12 VDC
724 24 VDC

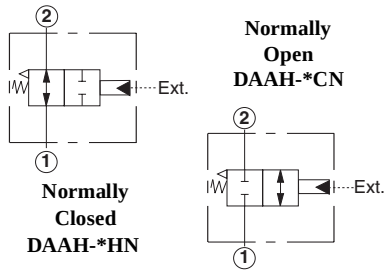
* *See page 167 for Solenoid Connector Options*

Maximum Leakage (drops/min. at 5000 psi with 150 SUS oil) = 10
Diameter Effective Orifice (inches) = .045
Operating Voltage Tolerance = ± 20%
Power (Watts) = 12
Typical response Time (ms) = 30

Visit www.sunhydraulics.com for detailed and complete technical information on our full line of products.

HYDRAULICALLY OPERATED, 2-POSITION 2-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY



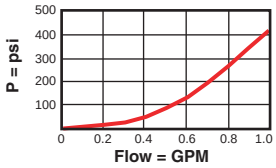


Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions* *a*	*b*	*c*	*Installation Torque lb. ft.*
.25 GPM	**DAAH – BCN**	T - 8A	.75	7/8”	1.66	25/30

Performance Curves

DAAH

Pressure vs. Flow



- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- Minimum pilot pressure to operate = 200 psi
- All ports will accept 5000 psi including the pilot control port.
- The preferred flow path through the valve is port 2 to port 1.
- 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.

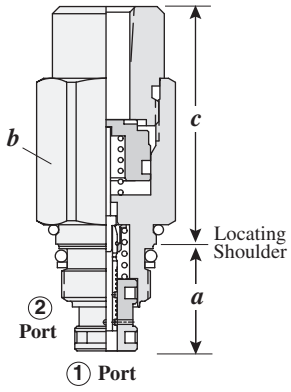
OPTION ORDERING INFORMATION

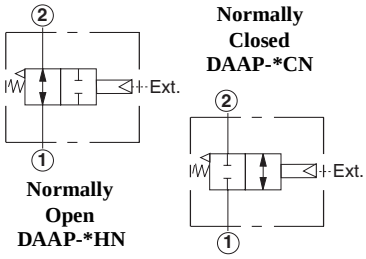
Model Codes printed in Red are Preferred Versions and most readily available

DA A H – ★ ★ ★

Nominal Capacity	*Pilot Port*	*Spool Configuration*	*Seal*
A .25 GPM	**A** 1/8-27 NPTF	**H** Normally Open	**N** Buna-N
	B SAE-4	**C** Normally Closed	**V** Viton
	D 1/8-28 BSPP		

AIR-OPERATED, 2-POSITION 2-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY



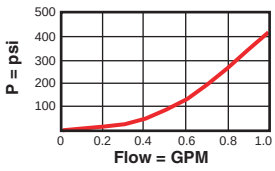


Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions*			*Installation Torque (lb. ft.)*
			a	*b*	*c*	
.25 GPM	**DAAP – FCN**	T - 8A	.75	7/8”	1.66	25/30

Performance Curves

DAAP

Pressure vs. Flow



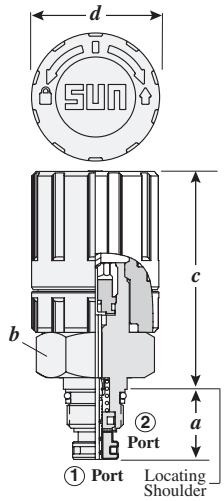
- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- Maximum pilot pressure = 70 psi
- Minimum pilot pressure to operate = 20 psi + port 1 pressure/100 psi
- All ports will accept 5000 psi with the exception of the pilot port which accepts 500 psi maximum.
- The preferred flow path through the valve is port 2 to port 1.
- 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.

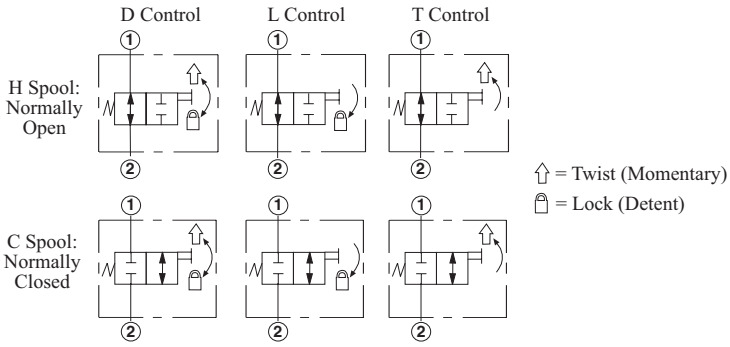
OPTION ORDERING INFORMATION **Model Codes printed in Red are Preferred Versions and most readily available**

DA A P – ✶ ✶ ✶

Nominal Capacity	*Pilot Port*	*Spool Configuration*	*Seal*
A .25 GPM	**E** SAE-4	**H** Normally Open	**N** Buna-N
	F 1/8-27 NPTF	**C** Normally Closed	**V** Viton
	P 1/8-28 BSPP		

MANUALLY OPERATED, 2-POSITION 2-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY



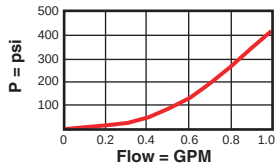


			Cartridge Dimensions				
Capacity	*Typical Cartridge Model Code*	*Cavity*	*a*	*b*	*c*	*d*	*Installation Torque lb. ft.*
.25 GPM	**DAAM - TCN**	T-8A	.75	1 1/8"	2.90	1.90	25/30

Performance Curves

DAAM

Pressure vs. Flow



- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- The preferred flow path through the valve is port 2 to port 1.
- 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

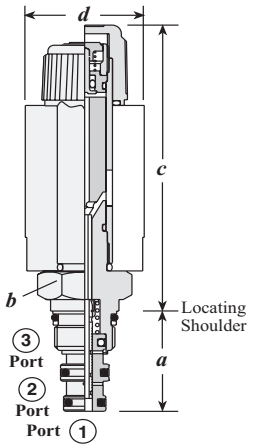
Model Codes printed in Red are Preferred Versions and most readily available

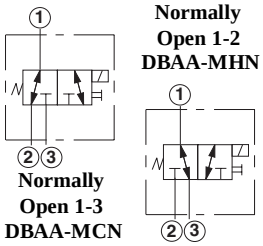
DA A M – ★ ★ ★

Nominal Capacity	*Pilot Port*	*Spool Configuration*	*Seal*
A .25 GPM	**D** Dual (Twist/Lock)	**C** Normally Closed	**N** Buna-N
	L Lock (Detent)	**H** Normally Open	**V** Viton
	T Twist (Momentary)		

NOTE: Designed for 10,000 cycles of operation maximum under normal conditions.

2-POSITION, 3-WAY SPOOL DIRECTIONAL VALVE – PILOT CAPACITY



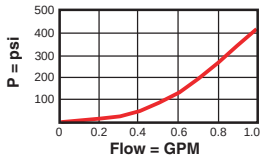


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions a	b	c M	c C	d	Installation Torque (lb. ft.)
.25 GPM	**DBAA – MCN**	T - 9A	1.09	7/8”	2.94	3.13	1.19	25/30
.25 GPM	**DBAA – MHN**	T - 9A	1.09	7/8”	2.94	3.13	1.19	25/30
.25 GPM	**DBAC – MCN**	T - 9A	1.09	7/8”	2.94	3.13	1.19	25/30
.25 GPM	**DBAC – MHN**	T - 9A	1.09	7/8”	2.94	3.13	1.19	25/30

Performance Curves

DBA*-M*N

Pressure vs. Flow



- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- Switching frequency = 15000 cycles/hour
- Proper installation of solenoid valves requires an extra deep socket to clear the solenoid tube. Sockets are available from Snap On tools (P/N SIML280) or Sun Hydraulics (P/N 998-100-006). See www.sunhydraulics.com for details.

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

D B A A – M ✶ ✶ – ✶ ✶ ✶

Nominal Capacity

A .25 GPM

Control

M Manual Override

C Concealed Override

Version

A Standard

C Canadian Standards Association Certified 3500 psi max.

Spool Configuration

H Normally Open Ports 1 to 2

C Normally Open Ports 1 to 3

Seal

N Buna-N

V Viton

Coil Configuration*

ISO/DIN

206 6 VDC
212 12 VDC
224 24 VDC
211 115 VAC
223 230 VAC

SAE J858

506 6 VDC
512 12 VDC
524 24 VDC

Twin Lead

706 6 VDC
712 12 VDC
724 24 VDC

* *See page 167 for Solenoid Connector Options*

Maximum Leakage (drops/min. at 5000 psi with 150 SUS oil) = 10
Diameter Effective Orifice (inches) = .045
Operating Voltage Tolerance = ± 10%

Power (Watts) = 12
Typical response Time (ms) = 30

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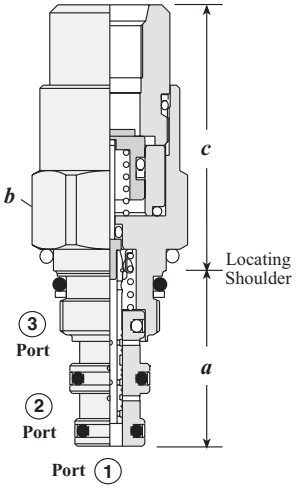
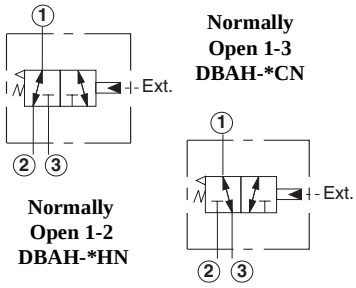
HYDRAULICALLY OPERATED, 2-POSITION 3-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY



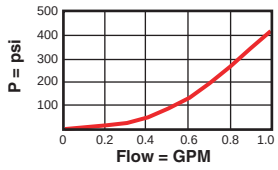


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions a	b	c	Installation Torque lb. ft.
.25 GPM	**DBAH – BCN**	T - 9A	1.09	7/8”	1.66	25/30

Performance Curves

DBAH

Pressure vs. Flow



- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- Minimum pilot pressure to operate = 200 psi
- All ports will accept 5000 psi including the pilot control port.

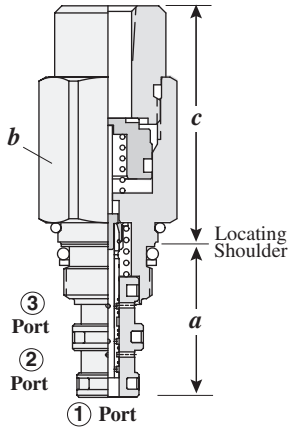
OPTION ORDERING INFORMATION

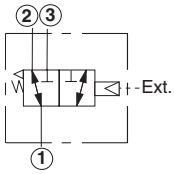
Model Codes printed in Red are Preferred Versions and most readily available

DB A H – ★ ★ ★

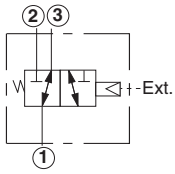
Nominal Capacity	*Pilot Port*	*Spool Configuration*	*Seal*
A .25 GPM	**A** 1/8-27 NPTF	**H** Normally Open Ports 1 to 2	**N** Buna-N
	B SAE-4	**C** Normally Open Ports 1 to 3	**V** Viton
	D 1/8-28 BSPP		

AIR-OPERATED, 2-POSITION 3-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY





Normally Open 1-2 DBAP-*HN



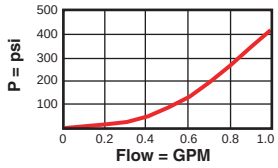
Normally Open 1-3 DBAP-*CN

Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions* *a*	*b*	*c*	*Installation Torque (lb. ft.)*
.25 GPM	**DBAP – FCN**	T - 9A	1.09	7/8”	1.66	25/30

Performance Curves

DBAP

Pressure vs. Flow



- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi.
- Maximum pilot pressure = 70 psi
- Minimum pilot pressure to operate = 20 psi + port 1 pressure/100 psi
- All ports will accept 5000 psi with the exception of the pilot port which accepts 500 psi maximum.

OPTION ORDERING INFORMATION

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

D B A P – ✶✶✶

Nominal Capacity

A .25 GPM

Pilot Port

E SAE-4

F 1/8-27 NPTF

P 1/8-28 BSPP

Spool Configuration

H Normally Open Ports 1 to 2

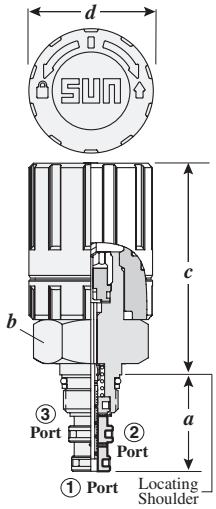
C Normally Open Ports 1 to 3

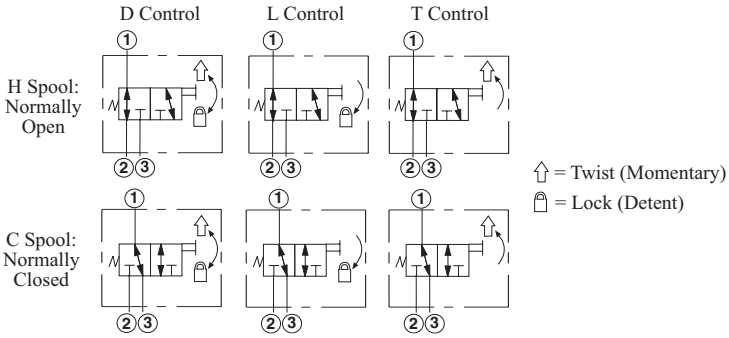
Seal

N Buna-N

V Viton

MANUALLY OPERATED, 2-POSITION 3-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY



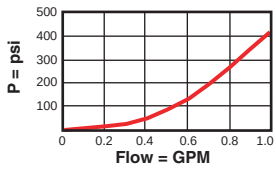


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions a	b	c	d	Installation Torque (lb. ft.)
.25 GPM	**DBAM– TCN**	T - 9A	1.09	1 1/8"	2.40	1.40	25/30

Performance Curves

DBAM

Pressure vs. Flow



- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- All ports will accept 5000 psi.

OPTION ORDERING INFORMATION

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

D B A M – ★★★

Nominal Capacity

A .25 GPM

Pilot Port

D Dual (Twist/Lock)

L Lock (Detent)

T Twist (Momentary)

Spool Configuration

C Normally Open 1-3

H Normally Open 1-2

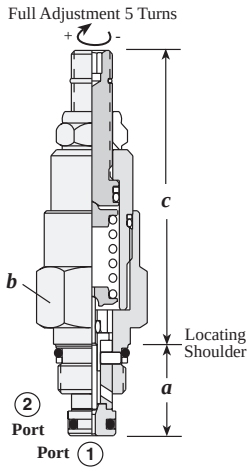
Seal

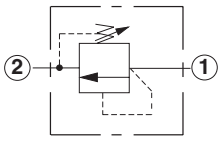
N Buna-N

V Viton

NOTE: Designed for 10,000 cycles of operation maximum under normal conditions.

DIRECT ACTING, ADJUSTABLE PILOT RELIEF



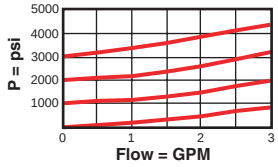


Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions*					*Installation Torque (lb. ft.)*
			a	*b*	*c*			
					L	**C**	**K**	
2.5 GPM	**RBAE – LAN**	T - 8A	.75	7/8”	2.38	2.47	2.66	25/30

Performance Curves

RBAE

Pressure vs. Flow



- Maximum operating pressure = 5000 psi
- Maximum leakage = 5 drops/min. at reseat (reseat = 85% of cracking pressure).
- Ports 1 and 2 may be pressured to 5000 psi.
- Back pressure at port 2 (outlet) is directly additive to the pressure setting at port 1 (inlet).
- 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

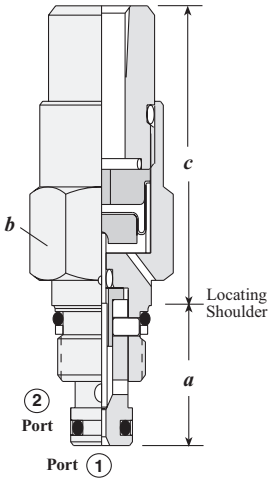
R B A E – ✶✶✶

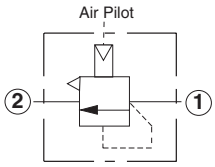
Nominal Capacity	*Control***	*Adjustment Range*	*Seal*
A 2.5 GPM	**L** Standard Screw	**A** 25 - 3000 psi	**N** Buna-N
	C Concealed	**B** 25 -1500 psi	**V** Viton
	K Handknob	**C** 25 - 6000 psi	
		D 25 - 800 psi	
		E 25 - 400 psi	
		W 25 - 4500 psi	

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

Adjustment Range Options:
A, B, C, 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.

AIR-CONTROLLED, DIRECTING ACTING PILOT RELIEF

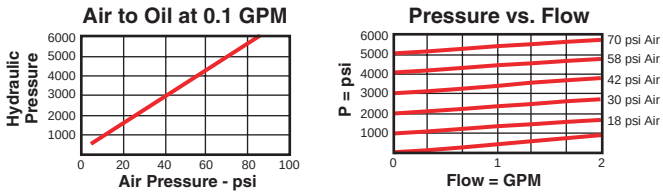




Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions a	b	c	Installation Torque (lb. ft.)
2.5 GPM	**RBAR – AWN**	T - 8A	.75	7/8”	1.60	25/30
2.5 GPM	**RBAR – AYN**	T - 8A	.75	1 1/8”	1.60	25/30

Performance Curves

RBAR



- Maximum operating pressure = 5000 psi
- Maximum leakage = 5 drops/min. at 5000 psi
- Maximum pilot pressure = 150 psi
- Ports 1 and 2 may be pressured to 5000 psi.
- Back pressure at port 2 has no effect on the valve setting.
- 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.

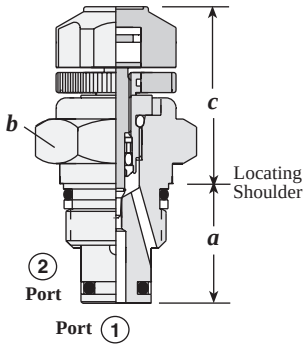
OPTION ORDERING INFORMATION

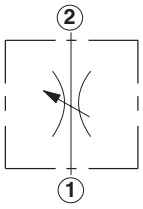
Model Codes printed in Red are Preferred Versions and most readily available

R B A R – ✶✶✶

Nominal Capacity	*Port*	*Air Pilot Ratio*	*Seal*
A 2.5 GPM	**A** 1/8-27 NPTF Pilot Port	**W** 50:1	**N** Buna-N
	B SAE-4 Pilot Port	**Y** 75:1	**V** Viton
	D 1/8-28 BSPP Port		

FULLY ADJUSTABLE NEEDLE VALVE - PILOT CAPACITY





Maximum Orifice	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions*			*Installation Torque (lb. ft.)*
			a	*b*	*c*	
.035 in.	**NFAB – KXN**	T - 8A	.75	7/8”	1.10	25/30

- Maximum operating pressure = 5000 psi
- Maximum leakage at shutoff = less than 5 drops/min. at 5000 psi
- Effective orifice size = .035 in.
- Number of counterclockwise turns fully closed to fully open = 3
- Ports 1 and 2 may be pressured to 5000 psi.

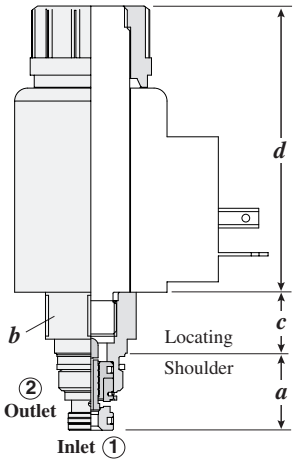
OPTION ORDERING INFORMATION

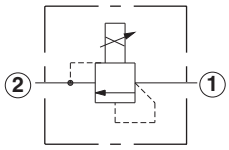
Model Codes printed in Red are Preferred Versions and most readily available

N F A B – K X ★

Model Code	*Control*	*Maximum Orifice*	*Seal*
NFAB-KXN	**K** Handknob	**X** .035 in.	**N** Buna-N
			V Viton

ELECTRO-PROPORTIONAL PILOT RELIEF

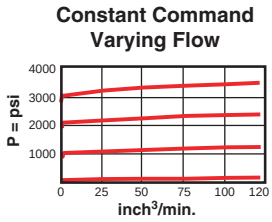


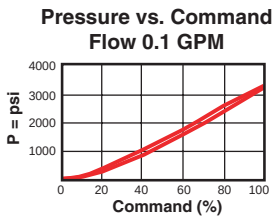


Capacity	*Typical Cartridge Model Code*	*Cavity*	*Cartridge Dimensions* a	b	c	d	*Installation Torque (lb. ft.)*
.25 GPM	**RBAP – MAN**	T - 8A	.75	7/8	.59	2.76	25/30

Performance Curves

RBAP





- Maximum operating pressure = 5000 psi
- Maximum leakage = 1.5 in^3/min at reseat
- Back pressure on the tank port (port 2) is directly additive at a 1:1 ratio to valve setting
- Reseat exceeds 85% of cracking pressure.
- Hysteresis with dither <4%
- Hysteresis with DC input <8%
- Linearity with dither <2%
- For optimum performance, an amplifier with current sensing and adjustable dither should be used. Dither should be adjustable between 100 - 250 Hz.

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

RB A P – ★ ★ ★

Nominal Capacity

A .25 GPM

Control

M Manual Override (Standard)

NOTE: Coil must be ordered separately. Use 12V DC or 24V DC (Series 770-*) coils only. See page 167.**

Adjustment Range

A 300 - 3000 psi

B 150 - 1500 psi

W 500 - 5000 psi

Seal

N Buna-N

V Viton

NOTES