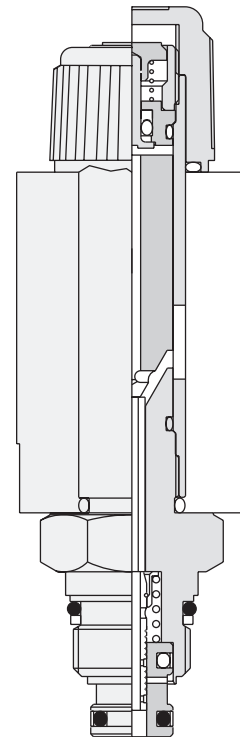
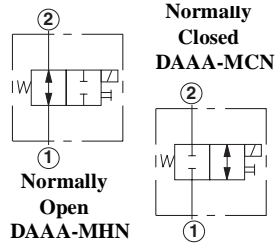
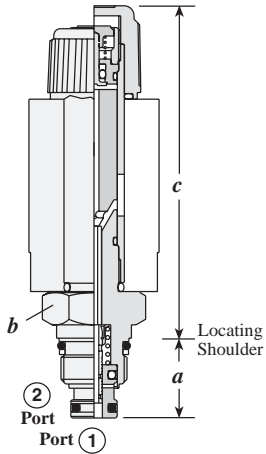


# Pilot Control Valves

		<i>Cartridge Type</i>	<i>Page</i>
Normally Open	Normally Closed	2-position 2-way, Spool Directional Valve - Pilot Capacity	122
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2-POSITION, 2-WAY SPOOL DIRECTIONAL VALVE – PILOT CAPACITY

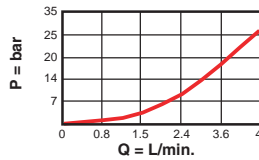


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	M	C	
1 L/min.	DAAA – MCN	T - 8A	19,1	22,4	75	80	35/40
1 L/min.	DAAA – MHN	T - 8A	19,1	22,4	75	80	35/40
1 L/min.	DAAC – MCN	T - 8A	19,1	22,4	75	80	35/40
1 L/min.	DAAC – MHN	T - 8A	19,1	22,4	75	80	35/40

Performance Curves

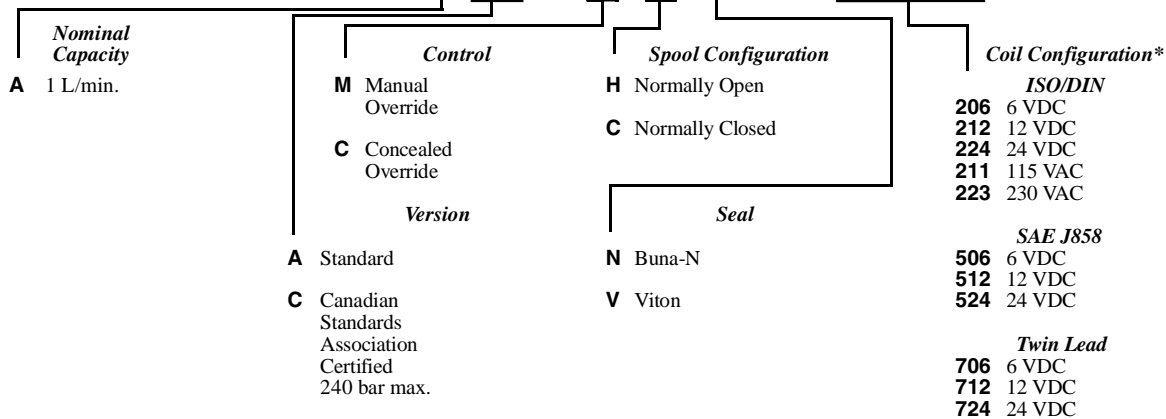
DAA\*-M\*N

Pressure vs. Flow



- Maximum operating pressure = 350 bar
- Maximum leakage at 32 cSt = 10 drops/min. at 350 bar
- 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](http://www.sunhydraulics.com) for details.

D A A A – M \* \* – \* \* \*



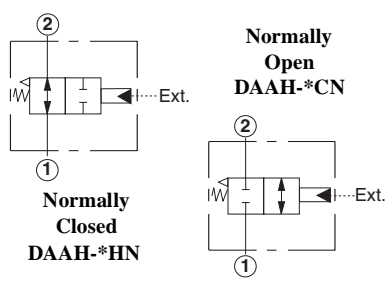
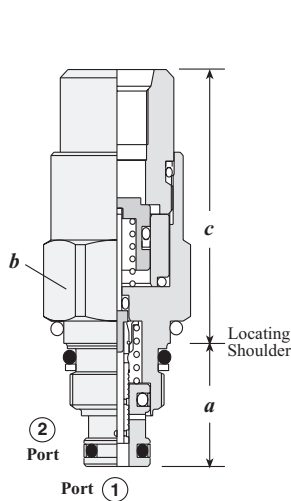
\* See page 167 for Solenoid Connector Options

Maximum Leakage (drops/min. at 350 bar at 32 cSt / 43° C) = 10  
 Diameter Effective Orifice (mm) = 1,1  
 Operating Voltage Tolerance = ± 20%

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

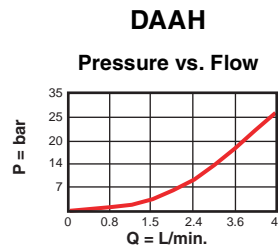
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**HYDRAULICALLY OPERATED, 2-POSITION 2-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY**



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
1 L/min.	DAAH - BCN	T - 8A	19,1	22,4	43	35/40

Performance Curves



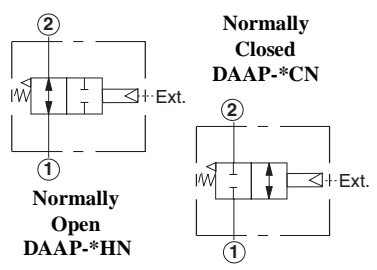
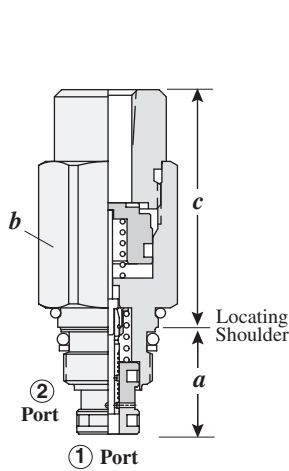
- Maximum operating pressure = 350 bar
- Maximum leakage at 32 cSt = 0,6 cc/min at 350 bar.
- Minimum pilot pressure to operate = 14 bar
- All ports will accept 350 bar including the pilot control port.
- The preferred flow path through the valve is port 2 to port 1.
- The main stage valve should first 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.

**DA A H - \* \* \***

Nominal Capacity	Pilot Port	Spool Configuration	Seal
<b>A</b> 1 L/min.	<b>A</b> 1/8-27 NPTF	<b>H</b> Normally Open	<b>N</b> Buna-N
	<b>B</b> SAE-4	<b>C</b> Normally Closed	<b>V</b> Viton
	<b>D</b> 1/8-28 BSPP		

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

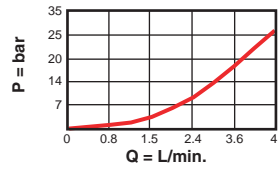


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
1 L/min.	DAAP – FCN	T - 8A	19,1	22,2	42,2	35/40

Performance Curves

**DAAP**

Pressure vs. Flow



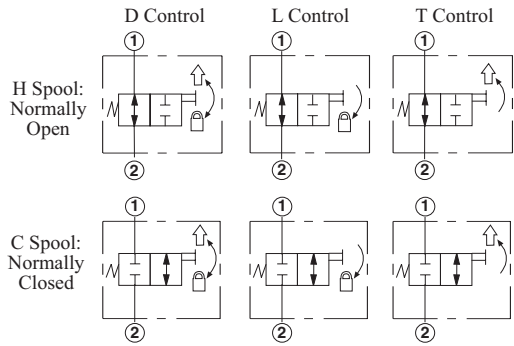
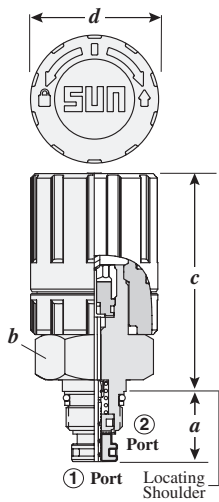
- Maximum operating pressure = 350 bar
- Maximum leakage at 32 cSt = 0,6 cc/min. at 350 bar
- Maximum pilot pressure = 5 bar
- Minimum pilot pressure to operate = 1,5 bar + port 1 pressure/7 bar
- All ports will accept 350 bar with the exception of the pilot port which accepts 35 bar maximum.
- The preferred 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.

**DAAP - \* \* \***

Nominal Capacity	Pilot Port	Spool Configuration	Seal
<b>A</b> 1 L/min.	<b>E</b> SAE-4	<b>H</b> Normally Open	<b>N</b> Buna-N
	<b>F</b> 1/8-27 NPTF	<b>C</b> Normally Closed	<b>V</b> Viton
	<b>P</b> 1/8-28 BSPP		

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



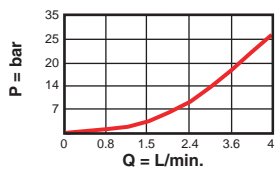
↑ = Twist (Momentary)  
 ☒ = Lock (Detent)

Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	c	d	
1 L/min.	<b>DAAM - TCN</b>	T-8A	19,1	28,6	61	35,6	35/40

**Performance Curves**

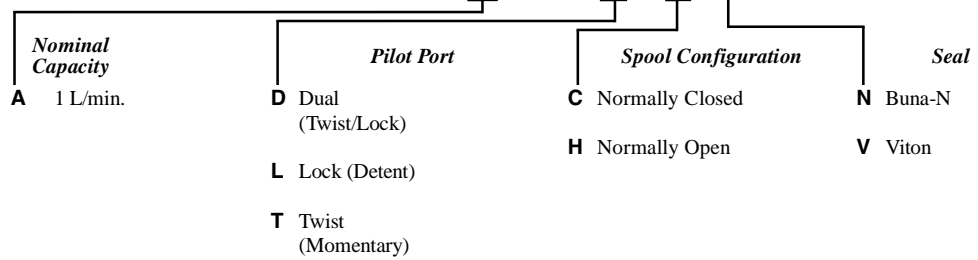
**DAAM**

Pressure vs. Flow



- Maximum operating pressure = 350 bar
- Maximum leakage at 32 cSt = 0,6 cc/min. at 350 bar
- 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.

**DAAM - ★ ★ ★**

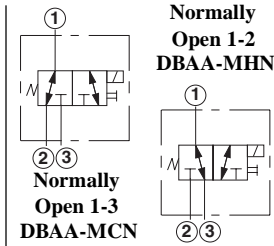
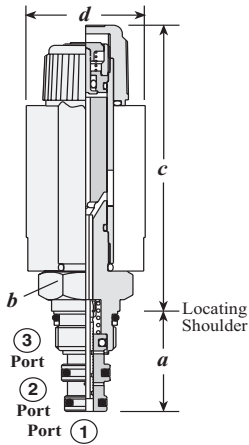


**NOTE: Designed for 10,000 cycles of operation maximum under normal conditions.**

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

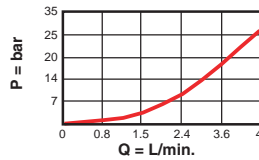


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	M	C	
1 L/min.	DBAA – MCN	T - 9A	27,7	22,4	75	80	35/40
1 L/min.	DBAA – MHN	T - 9A	27,7	22,4	75	80	35/40
1 L/min.	DBAC – MCN	T - 9A	27,7	22,4	75	80	35/40
1 L/min.	DBAC – MHN	T - 9A	27,7	22,4	75	80	35/40

Performance Curves

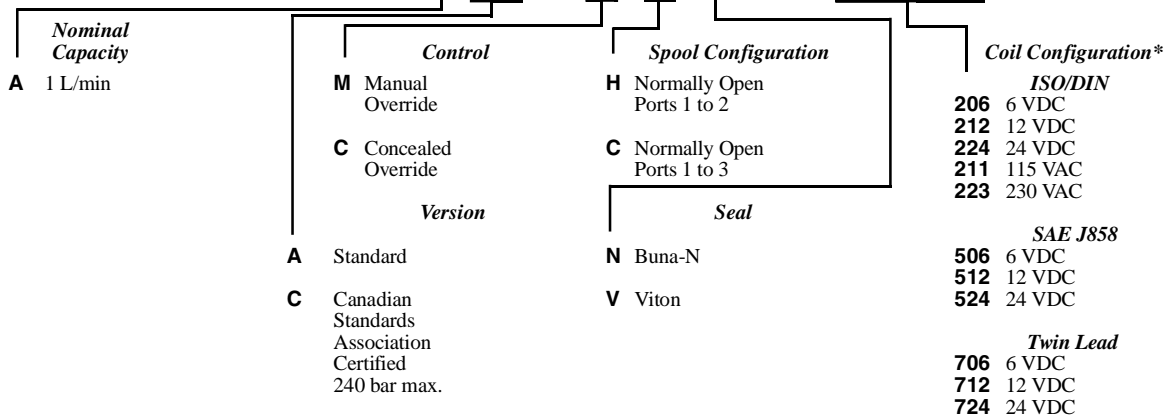
DBA\*-M\*N

Pressure vs. Flow



- Maximum operating pressure = 350 bar
- Maximum leakage at 32 cSt = 0,6 cc/min. at 350 bar
- 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](http://www.sunhydraulics.com) for details.

**D B A A – M \* \* – \* \* \***



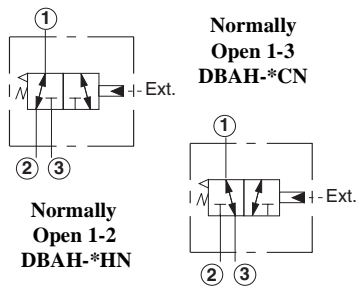
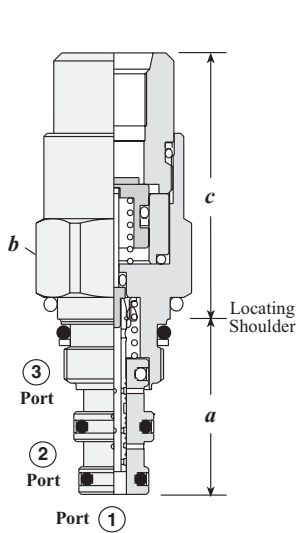
\* See page 167 for Solenoid Connector Options

Maximum Leakage (drops/min. at 350 bar at 32 cSt / 43° C) = 10  
 Diameter Effective Orifice (mm) = 1,1  
 Operating Voltage Tolerance = ± 10%

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

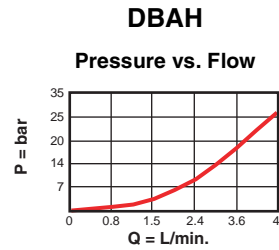
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**HYDRAULICALLY OPERATED, 2-POSITION 3-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY**



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			<i>a</i>	<i>b</i>	<i>c</i>	
1 L/min.	DBAH – BCN	T - 9A	27,7	22,2	43	35/40

Performance Curves



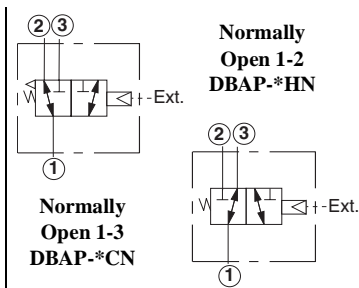
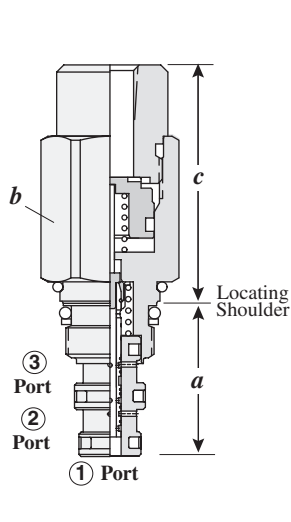
- Maximum operating pressure = 350 bar
- Maximum leakage at 32 cSt = 0,6 cc/min. at 350 bar
- Minimum pilot pressure to operate = 14 bar
- All ports will accept 350 bar including the pilot control port.

**DBAH – ★ ★ ★**

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

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

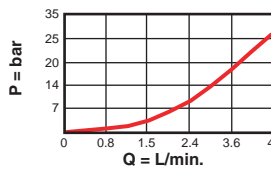


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
1 L/min.	DBAP - FCN	T - 9A	27,7	22,2	42,2	35/40

Performance Curves

**DBAP**

Pressure vs. Flow



- Maximum operating pressure = 350 bar
- Maximum leakage at 32 cSt = 0,6 cc/min. at 350 bar
- Maximum pilot pressure = 5 bar
- Minimum pilot pressure to operate = 1,5 bar + port 1 pressure/7 bar
- All ports will accept 350 bar with the exception of the pilot port which accepts 35 bar maximum.

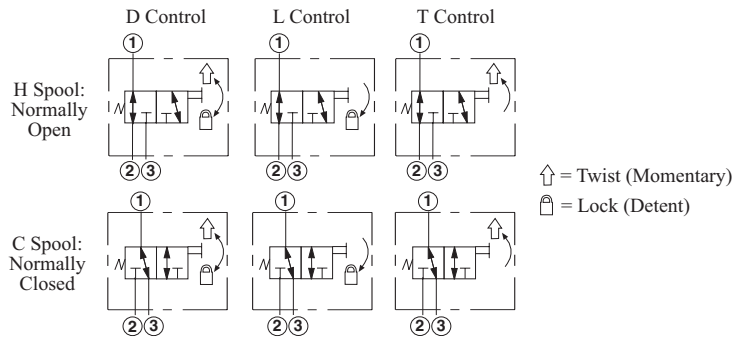
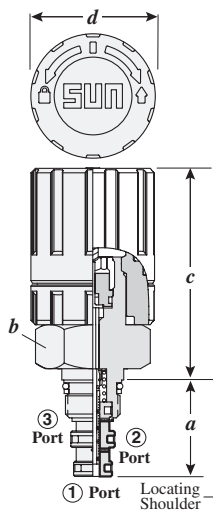
**D B A P - \* \* \***

Nominal Capacity	Pilot Port	Spool Configuration	Seal
<b>A</b> 1 L/min.	<b>E</b> SAE-4	<b>H</b> Normally Open Ports 1 to 2	<b>N</b> Buna-N
	<b>F</b> 1/8-27 NPTF	<b>C</b> Normally Open Ports 1 to 3	<b>V</b> Viton
	<b>P</b> 1/8-28 BSPP		

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

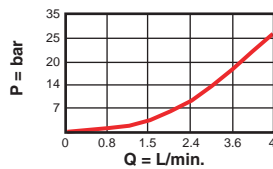


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	c	d	
1 L/min.	<b>DBAM - TCN</b>	T - 9A	27,7	28,6	61	35,6	35/40

Performance Curves

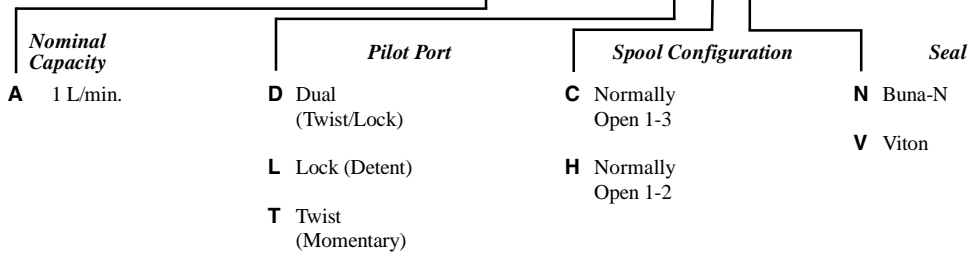
**DBAM**

Pressure vs. Flow



- Maximum operating pressure = 350 bar
- Maximum leakage at 32 cSt = 0,6 cc/min. at 350 bar
- All ports will accept 350 bar.

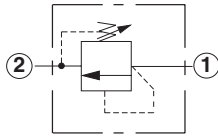
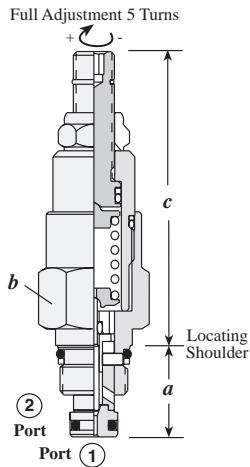
**D B A M - \*\*\***



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

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**DIRECT ACTING, ADJUSTABLE PILOT RELIEF**

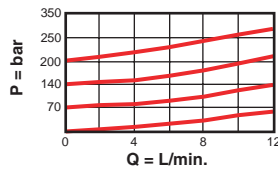


Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions					Installation Torque (Nm)
			a	b	c			
					L	C	K	
10 L/min.	<b>RBAE – LAN</b>	T - 8A	19,1	22,2	61	63	68	35/40

Performance Curves

**RBAE**

Pressure vs. Flow



- Maximum operating pressure = 350 bar
- Maximum leakage = 0,3 cc/min. at reseal (reseal = 85% of cracking pressure).
- Ports 1 and 2 may be pressured to 350 bar.
- 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.

**R B A E - ★★**

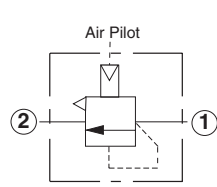
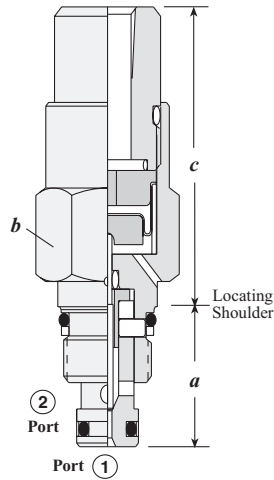
Nominal Capacity	Control**	Adjustment Range	Seal
<b>A</b> 10 L/min.	<b>L</b> Standard Screw	<b>A</b> 2 - 210 bar	<b>N</b> Buna-N
		<b>B</b> 2 - 105 bar	<b>V</b> Viton
	<b>C</b> Concealed	<b>C</b> 2 - 420 bar	
	<b>K</b> Handknob	<b>D</b> 2 - 55 bar	
		<b>E</b> 2 - 25 bar	
		<b>W</b> 2 - 315 bar	

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

Adjustment Range Options:  
 A, B, C, 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.

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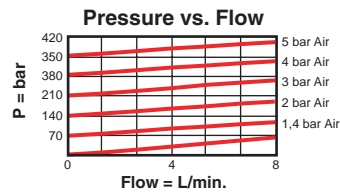
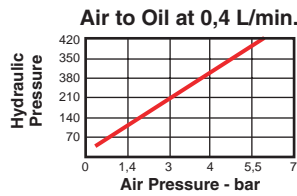
**AIR-CONTROLLED, DIRECTING ACTING PILOT RELIEF**



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
10 L/min.	<b>RBAR – AWN</b>	T - 8A	19,1	22,2	41	35/40
10 L/min.	<b>RBAR – AYN</b>	T - 8A	19,1	28,6	41	35/40

Performance Curves

**RBAR**



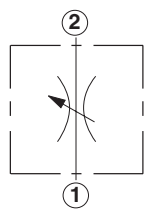
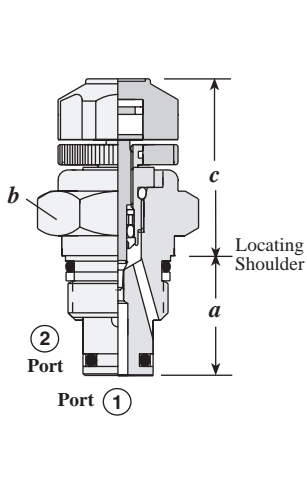
- Maximum operating pressure = 350 bar
- Maximum leakage = 0,3 cc/min. at 350 bar
- Maximum pilot pressure = 10,5 bar
- Ports 1 and 2 may be pressured to 350 bar.
- Back pressure at port 2 has no effect on the valve setting.
- The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.

**R B A R – \*\*\***

Nominal Capacity	Port	Air Pilot Ratio	Seal
<b>A</b> 10 L/min.	<b>A</b> 1/8-27 NPTF Pilot Port	<b>W</b> 50:1	<b>N</b> Buna-N
	<b>B</b> SAE-4 Pilot Port	<b>Y</b> 75:1	<b>V</b> Viton
	<b>D</b> 1/8-28 BSPP Port		

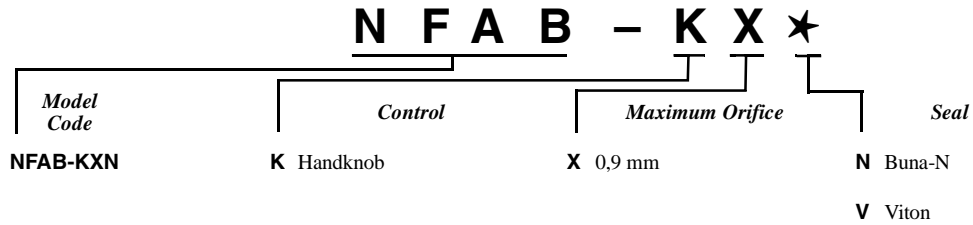
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**FULLY ADJUSTABLE NEEDLE VALVE - PILOT CAPACITY**



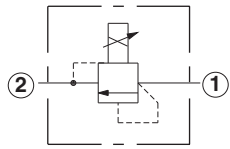
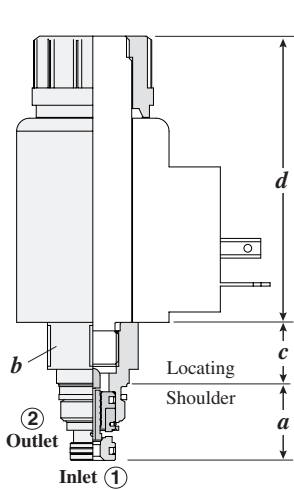
Maximum Orifice	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (Nm)
			a	b	c	
0,9 mm	<b>NFAB – KXN</b>	T - 8A	19,1	22,2	27,9	35/40

- Maximum operating pressure = 350 bar
- Maximum leakage at shutoff = 0,4 cc/min. at 350 bar
- Effective orifice size = 0,9 mm
- Number of counterclockwise turns fully closed to fully open = 3
- Ports 1 and 2 may be pressured to 350 bar.



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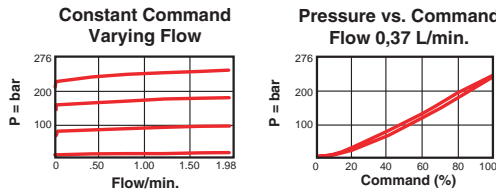
**ELECTRO-PROPORTIONAL PILOT RELIEF**



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	c	d	
1 L/min.	<b>RBAP – MAN</b>	T - 8A	18,8	22,2	15,0	70,1	35/40

Performance Curves

**RBAP**



- Maximum operating pressure = 350 bar
- Maximum leakage = 24,6 cc/min at reseal
- Back pressure on the tank port (port 2) is directly additive at a 1:1 ratio to the valve setting
- Reseat exceeds 85% of crack
- 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.

**RBAP – ★★**

Nominal Capacity	Control	Adjustment Range	Seal
<b>A</b> 1 L/min.	<b>M</b> Manual Override (Standard)	<b>A</b> 20 - 210 bar	<b>N</b> Buna-N
		<b>B</b> 10 - 105 bar	<b>V</b> Viton
		<b>W</b> 35 - 350 bar	

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

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