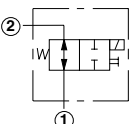
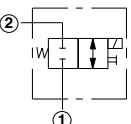
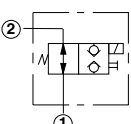
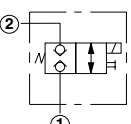
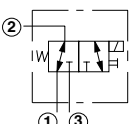
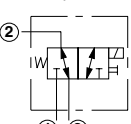
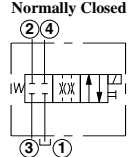
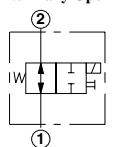
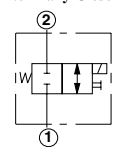
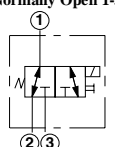
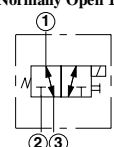
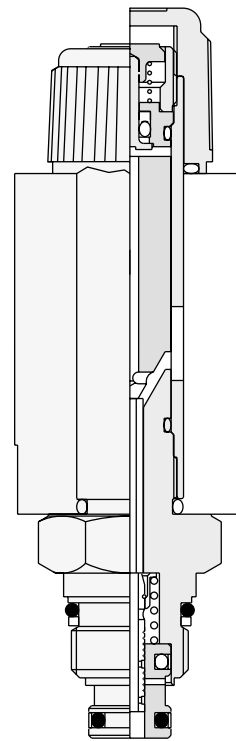


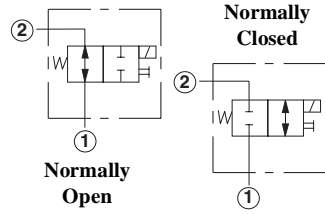
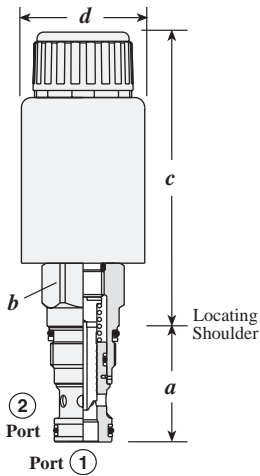
# Solenoid Operated Cartridge Valves

		<i>Cartridge Type</i>	<i>Page</i>
Normally Open 	Normally Closed 	2-position, 2-way Spool Directional Valve	114
Normally Open 	Normally Closed 	Direct Acting, 2-position, 2-way Poppet Directional Valve	115
Normally Open 	Normally Closed 	2-position, 3-way Spool Directional Valve	116
Normally Closed 		2-position, 4-way Spool Directional Valve	117
Normally Open 	Normally Closed 	2-position, 2-way Spool Directional Valve – Pilot Capacity	118
Normally Open 1-3 	Normally Open 1-2 	2-position, 3-way Spool Directional Valve – Pilot Capacity	119



# Solenoid Operated Cartridge Valves

## 2-POSITION, 2-WAY SPOOL DIRECTIONAL VALVE

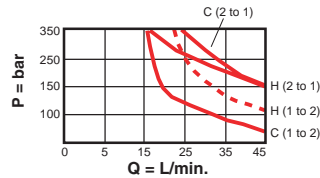


Nominal Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	c	d	
40 L/min.	<b>DLDA – MHN</b>	T - 13A	34,9	22,4	90	38	40/50

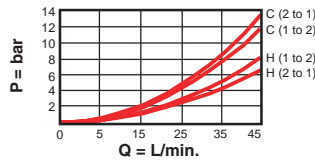
### Performance Curves

#### DLDA-M\*\*

Valve Performance Limits at 10% Undervoltage and Stabilized Coil Temp.



Typical Performance Pressure Differential vs. Flow



- Maximum operating pressure = 350 bar\*\*
- Maximum Leakage at 32 cSt = 81,9 cc/min. at 210 bar
- Switching frequency = 15000 cycles/hr
- 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.

\*\*For valves produced before January 1, 2004 (date code A041), the maximum operating pressure is 350 bar at port 2 and 250 bar at port 1.  
NOTE: While the valve will operate reliably with pressures up to 350 bar at Port 1, solenoid tube fatigue life is reduced.

### DLDA - \* \* \* - \* \* \*

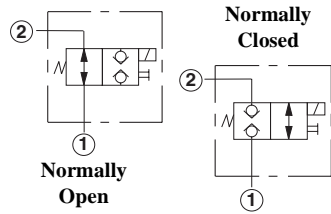
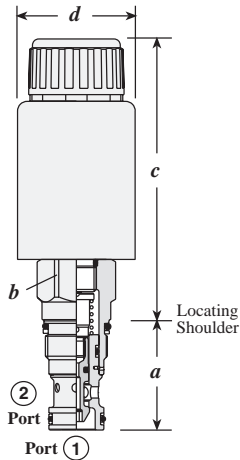
<p><b>Nominal Capacity</b></p> <p><b>D</b> 40 L/min.</p>	<p><b>Control</b></p> <p><b>M</b> Manual Override</p> <p><b>X</b> No Manual Override</p>	<p><b>Spool Configuration</b></p> <p><b>H</b> Normally Open</p> <p><b>C</b> Normally Closed</p> <p><b>Seal</b></p> <p><b>N</b> Buna-N</p> <p><b>V</b> Viton</p>	<p><b>Coil Configuration*</b></p> <p><b>ISO/DIN</b></p> <p><b>212</b> 12 VDC</p> <p><b>224</b> 24 VDC</p> <p><b>211</b> 115 VAC</p> <p><b>223</b> 230 VAC</p> <p><b>AMP® Junior Timer</b></p> <p><b>612</b> 12 VDC</p> <p><b>624</b> 24 VDC</p> <p><b>Twin Lead</b></p> <p><b>712</b> 12 VDC</p> <p><b>724</b> 24 VDC</p> <p><b>Deutsch</b></p> <p><b>912</b> 12 VDC</p> <p><b>924</b> 24 VDC</p> <p><b>948</b> 48 VDC</p> <p><b>Metri-Pack</b></p> <p><b>812</b> 12 VDC</p> <p><b>824</b> 24 VDC</p> <p><b>Twin Spade</b></p> <p><b>524</b> 24 VDC</p>
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Maximum Leakage (cc/min. at 210 bar at 32 cSt oil) = 80  
 Power (Watts) = 22  
 Operating Voltage Tolerance = ± 10%  
 Typical response Time (ms) = 50

\* See page 167 for Solenoid Connector Options

# Solenoid Operated Cartridge Valves

## DIRECT ACTING, 2-POSITION, 2-WAY POPPET DIRECTIONAL VALVE

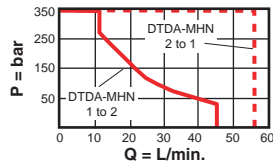
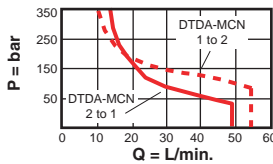


Nominal Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	c	d	
40 L/min.	DTDA - MHN	T - 13A	34,9	22,4	90	38	40/50

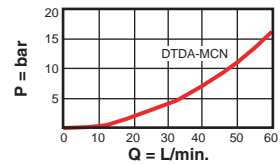
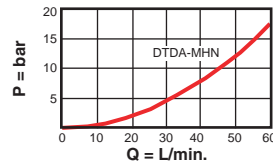
### Performance Curves

#### DTDA-M\*N

Valve Performance Limits at 10% Undervoltage and Stabilized Coil Temperature



Typical Performance Pressure Differential vs. Flow



- Maximum operating pressure = 350 bar\*\*
- Maximum Leakage at 32 cSt = 10 drops/min.
- Switching frequency = 15000 cycles/hr.
- 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.

\*\* For valves produced before January 1, 2004 (date code A041), the maximum operating pressure is 350 bar at port 2 and 250 bar at port 1. NOTE: While the valve will operate reliably with pressures up to 350 bar at Port 1, solenoid tube fatigue life is reduced.

### DTDA - \* \* \* - \* \* \*

<p><b>Nominal Capacity</b></p> <p><b>D</b> 40 L/min.</p>	<p><b>Control</b></p> <p><b>M</b> Manual Override</p> <p><b>X</b> No Manual Override</p>	<p><b>Spool Configuration</b></p> <p><b>H</b> Normally Open</p> <p><b>C</b> Normally Closed</p> <p><b>Seal</b></p> <p><b>N</b> Buna-N</p> <p><b>V</b> Viton</p>	<p><b>Coil Configuration*</b></p> <p><b>ISO/DIN</b></p> <p><b>212</b> 12 VDC</p> <p><b>224</b> 24 VDC</p> <p><b>211</b> 115 VAC</p> <p><b>223</b> 230 VAC</p> <p><b>AMP® Junior Timer</b></p> <p><b>612</b> 12 VDC</p> <p><b>624</b> 24 VDC</p> <p><b>Twin Lead</b></p> <p><b>712</b> 12 VDC</p> <p><b>724</b> 24 VDC</p> <p><b>Deutsch</b></p> <p><b>912</b> 12 VDC</p> <p><b>924</b> 24 VDC</p> <p><b>948</b> 48 VDC</p> <p><b>Metri-Pack</b></p> <p><b>812</b> 12 VDC</p> <p><b>824</b> 24 VDC</p> <p><b>Twin Spade</b></p> <p><b>524</b> 24 VDC</p>
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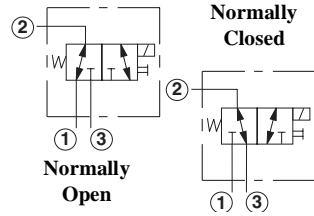
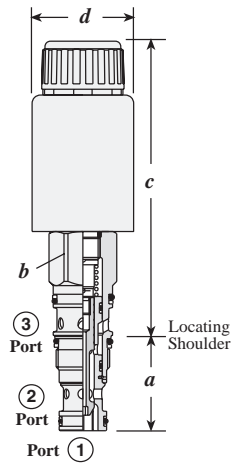
Power (Watts) = 22  
 Operating Voltage Tolerance = ± 10%  
 Typical response Time (ms) = 50

\* See page 167 for Solenoid Connector Options



# Solenoid Operated Cartridge Valves

## 2-POSITION, 3-WAY SPOOL DIRECTIONAL VALVE

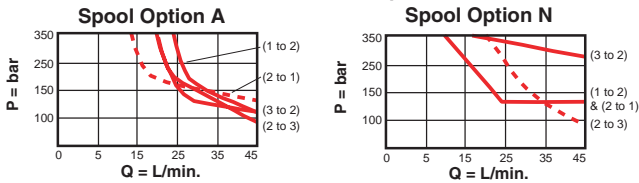


Nominal Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	c	d	
40 L/min.	DMDA - MNN	T - 11A	34,9	22,4	109	38	40/50

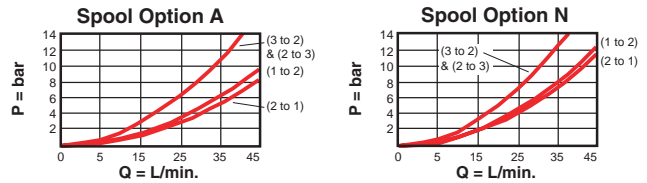
### Performance Curves

#### DMDA-MNN

Valve Performance Limits at 10% Undervoltage and Stabilized Coil Temperature



Typical Performance Pressure Differential vs. Flow



- Maximum operating pressure = 350 bar\*\*
- Maximum Leakage at 32 cSt = 81,9 cc/min. @ 210 bar
- Switching frequency = 15000 cycles/hr
- 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.

\*\*For valves produced before January 1, 2004 (date code A041), the maximum operating pressure is 350 bar at ports 2 and 3 and 250 bar at port 1.  
NOTE: While the valve will operate reliably with pressures up to 350 bar at Port 1, solenoid tube fatigue life is reduced.

### D M D A - \* \* \* - \* \* \*

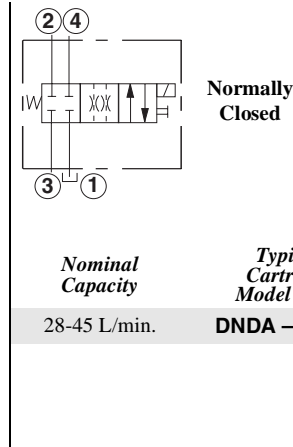
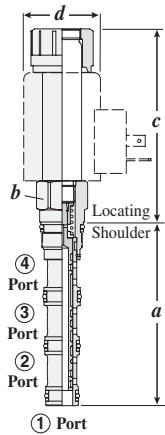
Nominal Capacity	Control	Spool Configuration	Coil Configuration*
<b>D</b> 40 L/min.	<b>M</b> Manual Override	<b>A</b> Normally Open Ports 2 to 1	<b>ISO/DIN</b>
	<b>X</b> No manual Override	<b>N</b> Normally Open Ports 2 to 3	<b>212</b> 12 VDC
		<b>Seal</b>	<b>224</b> 24 VDC
		<b>N</b> Buna-N	<b>211</b> 115 VAC
		<b>V</b> Viton	<b>223</b> 230 VAC
			<b>AMP® Junior Timer</b>
			<b>612</b> 12 VDC
			<b>624</b> 24 VDC
			<b>Twin Lead</b>
			<b>712</b> 12 VDC
			<b>724</b> 24 VDC
			<b>Deutsch</b>
			<b>912</b> 12 VDC
			<b>924</b> 24 VDC
			<b>948</b> 48 VDC
			<b>Metri-Pack</b>
			<b>812</b> 12 VDC
			<b>824</b> 24 VDC
			<b>Twin Spade</b>
			<b>524</b> 24 VDC

Maximum Leakage (cc/min. at 210 bar at 32 cSt oil) = 80  
Power (Watts) = 22  
Operating Voltage Tolerance = ± 10%  
Typical response Time (ms) = 30-50

\* See page 167 for Solenoid Connector Options

# Solenoid Operated Cartridge Valves

## 2-POSITION, 4-WAY SPOOL DIRECTIONAL VALVE

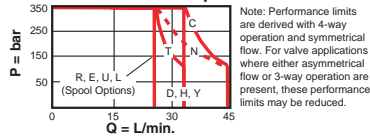


Nominal Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	c	d	
28-45 L/min.	<b>DNDA - MCN</b>	T - 31A	34,9	22,4	90	38	40/50

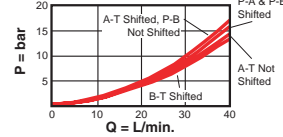
### Performance Curves

#### DNDA-MCN

Valve Performance Limits at 10% Undervoltage and Stabilized Coil Temperature



Typical Performance Pressure Differential vs. Flow



- Maximum operating pressure = 350 bar\*\*
- Maximum Leakage at 32 cSt = 163 cc/min. at 210 bar
- Switching frequency = 15000 cycles/hr
- 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.

\*\*For valves produced before January 1, 2004 (date code A041), the maximum operating pressure is 350 bar at ports 2, 3 and 4 and 250 bar at port 1. NOTE: While the valve will operate reliably with pressures up to 350 bar at Port 1, solenoid tube fatigue life is reduced.

### DNDA - \* \* \* - \* \* \*

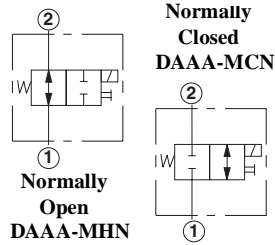
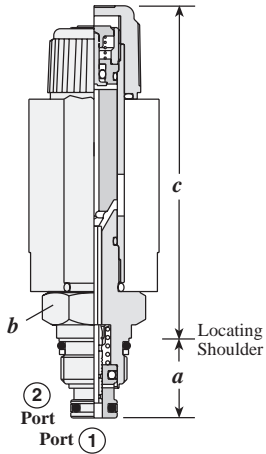
<p><b>Nominal Capacity</b></p> <p><b>D</b> 28-45 L/min.</p>	<p><b>Control</b></p> <p><b>M</b> Manual Override</p> <p><b>X</b> No manual Override</p>	<p><b>Spool Configuration</b></p> <p><b>C</b> </p> <p><b>D</b> </p> <p><b>E</b> </p> <p><b>H</b> </p> <p><b>L</b> </p> <p><b>N</b> </p> <p><b>R</b> </p> <p><b>T</b> </p> <p><b>U</b> </p> <p><b>Y</b> </p>	<p><b>Coil Configuration*</b></p> <p><b>ISO/DIN</b></p> <p><b>212</b> 12 VDC</p> <p><b>224</b> 24 VDC</p> <p><b>211</b> 115 VAC</p> <p><b>223</b> 230 VAC</p> <p><b>AMP® Junior Timer</b></p> <p><b>612</b> 12 VDC</p> <p><b>624</b> 24 VDC</p> <p><b>Twin Lead</b></p> <p><b>712</b> 12 VDC</p> <p><b>724</b> 24 VDC</p> <p><b>Deutsch</b></p> <p><b>912</b> 12 VDC</p> <p><b>924</b> 24 VDC</p> <p><b>948</b> 48 VDC</p> <p><b>Metri-Pack</b></p> <p><b>812</b> 12 VDC</p> <p><b>824</b> 24 VDC</p> <p><b>Twin Spade</b></p> <p><b>524</b> 24 VDC</p>
		<p><b>Seal</b></p> <p><b>N</b> Buna-N</p> <p><b>V</b> Viton</p>	

Maximum Leakage (cc/min. at 210 bar at 32 cSt oil) = 163  
 Power (Watts) = 22  
 Operating Voltage Tolerance = ± 10%  
 Typical response Time (ms) = 30-50

\* See page 167 for Solenoid Connector Options

# Solenoid Operated Cartridge Valves

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

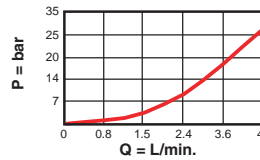


Nominal Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions					Installation Torque (Nm)
			a	b	c		d	
1 L/min.	DAAA – MCN	T - 8A	19,1	22,4	75	80	31	35/40
1 L/min.	DAAA – MHN	T - 8A	19,1	22,4	75	80	31	35/40
1 L/min.	DAAC – MCN	T - 8A	19,1	22,4	75	80	31	35/40
1 L/min.	DAAC – MHN	T - 8A	19,1	22,4	75	80	31	35/40

### Performance Curves

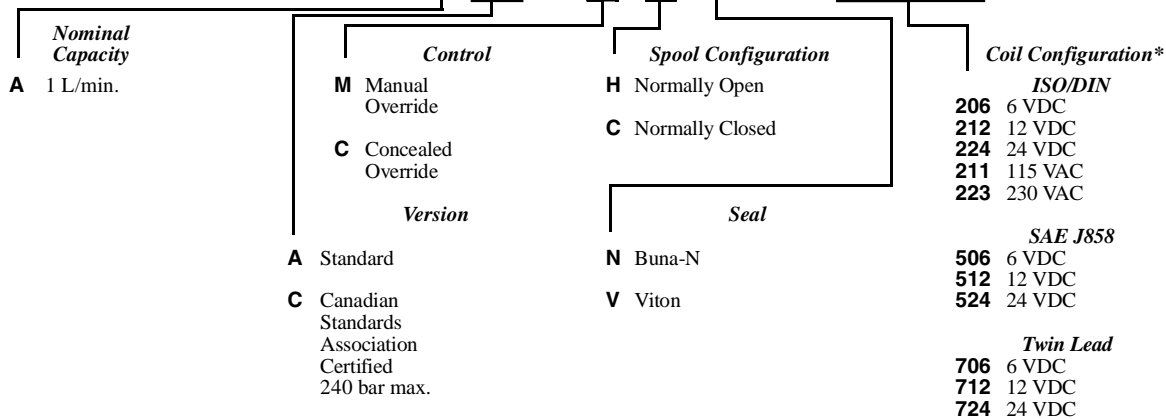
#### DAA\*-M\*N

Pressure vs. Flow



- Maximum operating pressure = 350 bar
- Maximum Leakage at 32 cSt = 10 drops/min.
- Switching frequency = 15000 cycles/hr.
- 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.

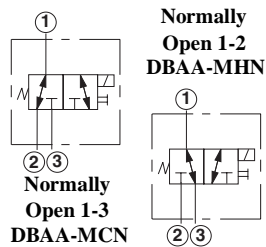
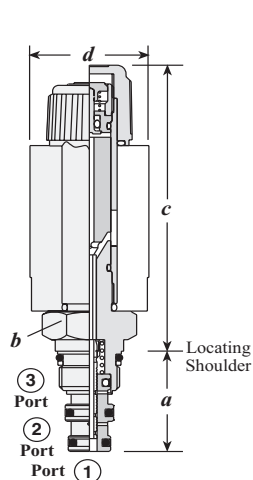
### D A A \* - \* \* \* - \* \* \*



Diameter Effective Orifice (mm) = 1,1  
 Operating Voltage Tolerance = ± 10%  
 Power (Watts) = 12  
 Typical response Time (ms) = 30

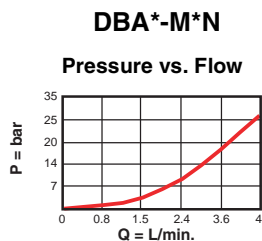
\* See page 167 for Solenoid Connector Options

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

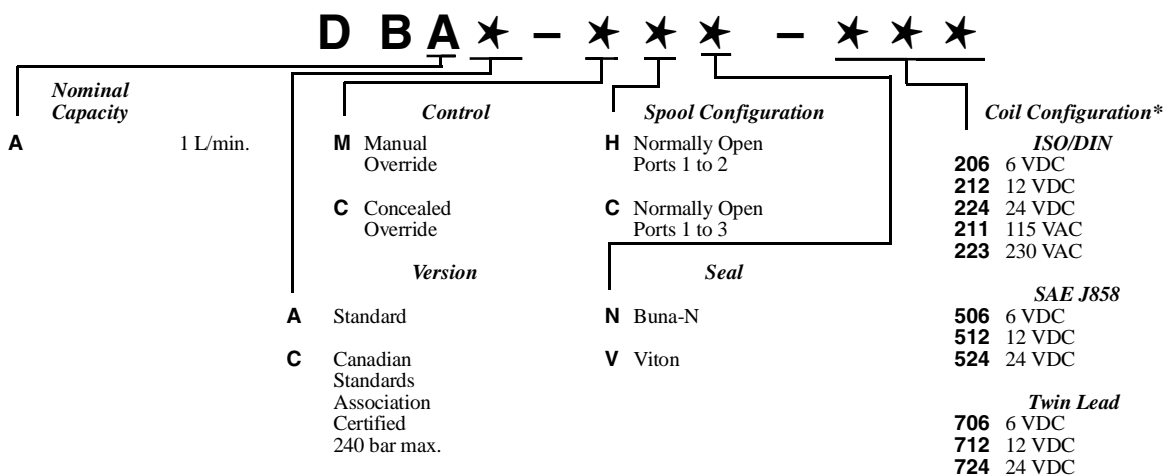


Nominal Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	M	C	
1 L/min.	DBAA – MCN	T - 9A	27,7	22,4	75	80	35/40
1 L/min.	DBAA – MHN	T - 9A	27,7	22,4	75	80	35/40
1 L/min.	DBAC – MCN	T - 9A	27,7	22,4	75	80	35/40
1 L/min.	DBAC – MHN	T - 9A	27,7	22,4	75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

Performance Curves



- Maximum operating pressure = 350 bar
- Maximum Leakage at 32 cSt = 10 drops/min.
- Switching frequency = 15000 cycles/hr
- 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.



Diameter Effective Orifice (mm) = 1,1  
 Operating Voltage Tolerance = ± 10%  
 Power (Watts) = 12  
 Typical response Time (ms) = 30

\* See page 167 for Solenoid Connector Options

