



# Sun FLeX Series Solenoid Valves

## HIGH RELIABILITY

*Designed & tested to 10-million operational cycles at full rated pressure*

## LOW INTERNAL LEAKAGE

*Less than one drop per minute*

## USES 740 SERIES COILS

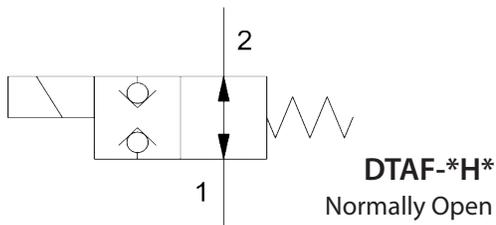
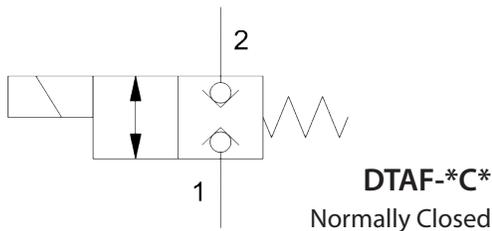
*Low-Power, high-power & hazardous location coils*



# DTAF

5000 psi (350 bar)  
T-8A cavity

2-WAY, DIRECT-ACTING,  
SOLENOID-OPERATED DIRECTIONAL  
BLOCKING POPPET VALVE



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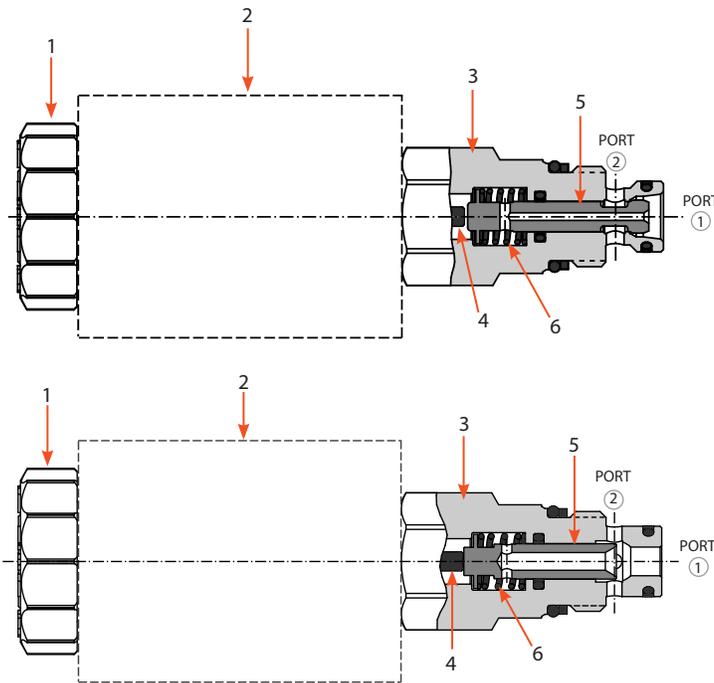
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[sunhydraulics.com/model/DTAF](http://sunhydraulics.com/model/DTAF)

## DTAF 2-WAY, DIRECT-ACTING, SOLENOID-OPERATED DIRECTIONAL BLOCKING POPPET VALVE

### SERIES P, CAVITY: T-8A

The 2/2 directional poppet valves are direct acting and feature a pressure-balanced design. Both ports can be loaded with an operating pressure up to 5000 psi (350 bar). They comprise a hex body (3), solenoid with coil (2), poppet (5), pin (4), spring (6), and coil nut (1).



#### DTAF-\*C\* (normally closed)

**Function:** When de-energized, the poppet (5) is pulled against the valve seat (3) by the spring (6), closing the valve and blocking flow. When energized, the solenoid with coil (2) pushes the poppet off the seat and opens the valve, allowing bi-directional flow.

#### DTAF-\*H\* (normally open)

**Function:** When the coil (2) is de-energized, the spring (6) holds the poppet (5) away from the seat (3), allowing bi-directional flow. When energized, the poppet is pushed into the seat by the solenoid, and the valve is closed, blocking flow.

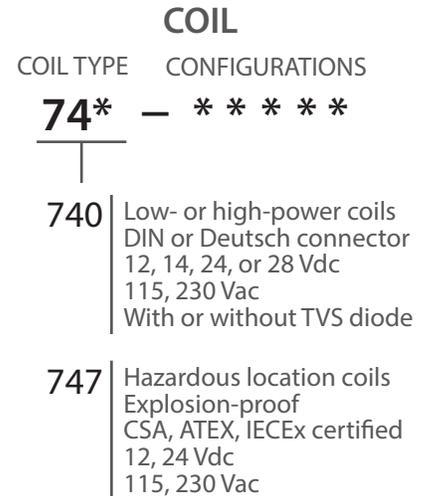
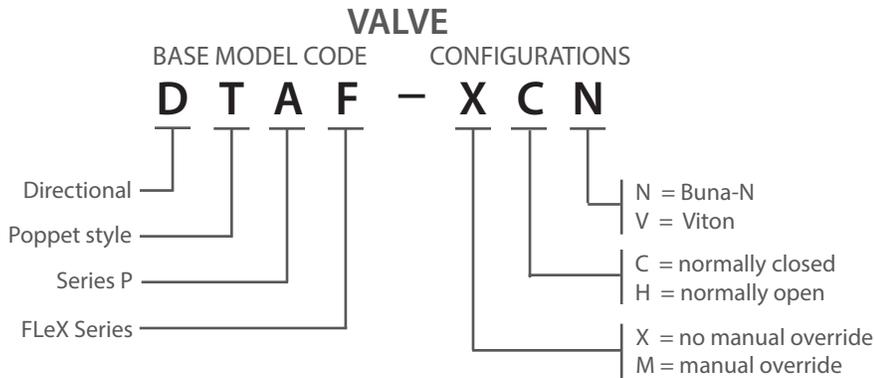
## TECHNICAL FEATURES

- All FLeX Series valves incorporate the Sun floating-style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.
- Designed and tested to 10-million operational cycles at full rated pressure.
- Exceeds the new NFPA test standard T2.6.1 R2014 for fatigue and burst pressure ratings.
- Higher flow rates than competing valves of similar size.
- Extremely low leakage – 0.004 in<sup>3</sup> (0.07 cc<sup>3</sup>)/min (1 drop/min)
- Designed using CFD fluid simulation for optimized geometries.
- Zinc-nickel plating standard for 1000-hour salt fog protection.
- Direct actuated and requires no minimum hydraulic pressure for operation.
- Can be used to pilot larger Sun cartridge valves that have an integral T-8A control cavity.
- Available with a manual push-version override option.
- Suitable for load-holding applications when using the normally closed option. In the event of power failure, the valve will close.
- A wide variety of coil termination and voltage options are available, with and without surge protection. See the CONFIGURATION section.
- Normally closed DTAF valves can be used with any of the 740 Series coils, which includes low-power, high-power and explosion-proof coils. Normally open DTAF valves can be used with the high-power and explosion-proof coils.
- Coil connector options offer ratings up to IP69K. See individual coil product pages for details.

## MODEL CODE EXPLANATION

Sun cartridges have a base seven-digit part number. Each of the digits in the sequence has significance as shown in the model code explanation below. Available options and

modifiers for specific cartridges, manifolds, and valve packages are shown on the individual product pages and data sheets. All modifiers are not applicable for every model.



**Important Note:**

When performing model code searches on [www.sunhydraulics.com](http://www.sunhydraulics.com), do not include setting(s). When ordering, no spaces or dashes are used.

See individual coil data sheets for full coil configuration.

## COMPATIBLE COILS

Note that the normally closed version (DTAF-\*C\*) is compatible with both low- and high-power coils and the hazardous location coils. The normally open version (DTAF-\*H\*) is compatible with the high-power coils and the hazardous location coils.

### Low-Power (17-W) & High-Power (25-W) Coils

Voltage	DIN 43650 Form A (IP65/IP67)		Deutsch DT04-2P (IP69K)		Resistance @20°C (ohms) ±10% (with diode*)		TVS Diode (Nominal Breakdown Voltage (with diode*))
	High-Power	Low-Power	High-Power	Low-Power	High-Power	Low-Power	
12 Vdc	740-212	740-212L	740-912	740-912L	5.8 Ω	8.5 Ω	68 Vdc
14 Vdc	740-214	740-214L	740-914	740-914L	7.8 Ω	11.5 Ω	68 Vdc
24 Vdc	740-224	740-224L	740-924	740-924L	23.0 Ω	33.9 Ω	68 Vdc
28 Vdc	740-228	740-228L	740-928	740-928L	31.4 Ω	46.1 Ω	68 Vdc
115 Vac	740-211	740-211L	N/A	N/A	416 Ω	612 Ω	250 Vac
230 Vac	740-223	740-223L	N/A	N/A	1686 Ω	2479 Ω	400 Vac

\* Above model codes are shown without transient voltage suppression (TVS) diodes. To order 740 Series coils with a TVS diode, append model code with "D" (Example: 740-212LD).

### Hazardous Location, Explosion-Proof (30-W) Coils

Voltage	M20 x 1.5 180°	M20 x 1.5 90°	1/2" NPT 180°	1/2" NPT 90°	Wattage @ 20°C	Circuitry
12 Vdc	747-JM12BD	747-JM12CD	747-JN12BD	747-JN12CD	29.6 W	With diode
24 Vdc	747-JM24BD	747-JM24CD	747-JN24BD	747-JN24CD	29.9 W	With diode
115 Vac	747-JM11BD	747-JM11CD	747-JN11BD	747-JN11CD	29.7 W	Rectified
230 Vac	747-JM23BD	747-JM23CD	747-JN23BD	747-JN23CD	28.9 W	Rectified



2-WAY, DIRECT-ACTING, SOLENOID-OPERATED  
DIRECTIONAL BLOCKING POPPET VALVE

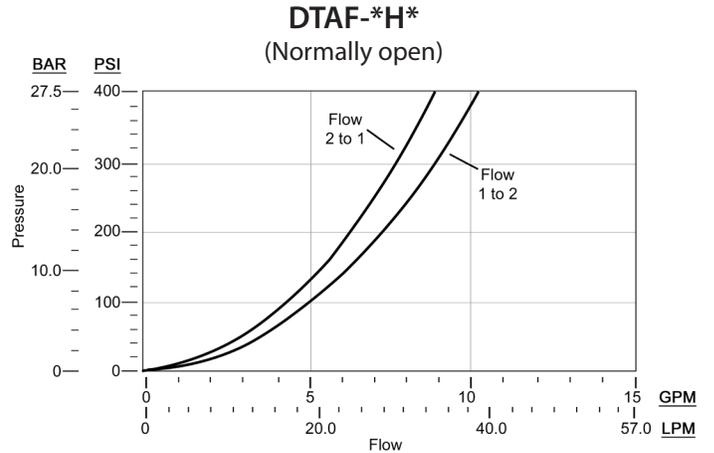
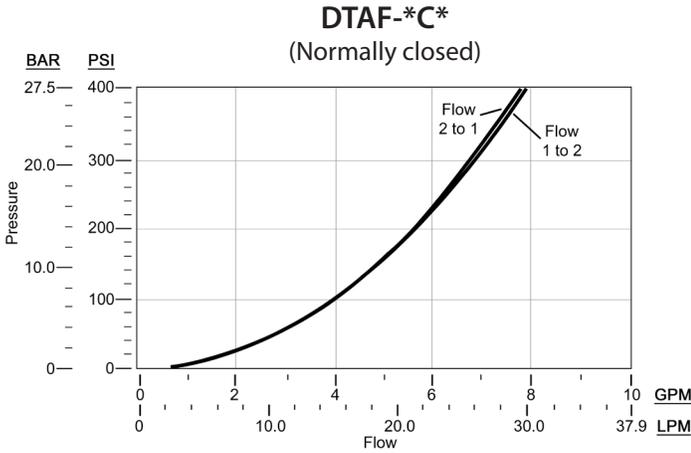
SERIES P, CAVITY: T-8A

TECHNICAL SPECIFICATIONS	
Sun Cavity	T-8A
Sun Cartridge Series	Series P
Maximum Flow Rate/Capacity	7 gpm (26.5 L/min)*
Nominal Flow Rate/Capacity	Low-power coil (normally closed): 0.9 gpm (3.4 L/min)** High-power coil (normally closed): 2.2 gpm (8.3 L/min) High-power coil (normally open): 1.6 gpm (6.1 L/min)
Maximum Operating Pressure	5000 psi (350 bar)
Response Time - Typical	50 ms (open & close)
Maximum Internal Leakage at 110 SUS (24 cSt) at 5000 psi (350 bar)	0.004 in <sup>3</sup> (0.07 cc <sup>3</sup> )/min (1 drop/min)
Switching Frequency - Maximum	4.17 Hz (15,000 cycles/hour)
Manual Override Option	Yes
Viscosity Range	2,8 to 380 cSt or 35 to 2000 SUS
Filtration	Minimum cleanliness (ISO 4406 1999, 4/6/14 µm) 19/17/14
Valve Hex Size	0.75 in (19,1 mm)
Valve Installation Torque	20–25 lbf ft (27–34 N-m)
Mounting Position	No restrictions
Valve Weight (excluding coil)	5.6 oz (159 g)
Seal Kit - Viton	990-608-006
Seal Kit - Buna	990-608-007

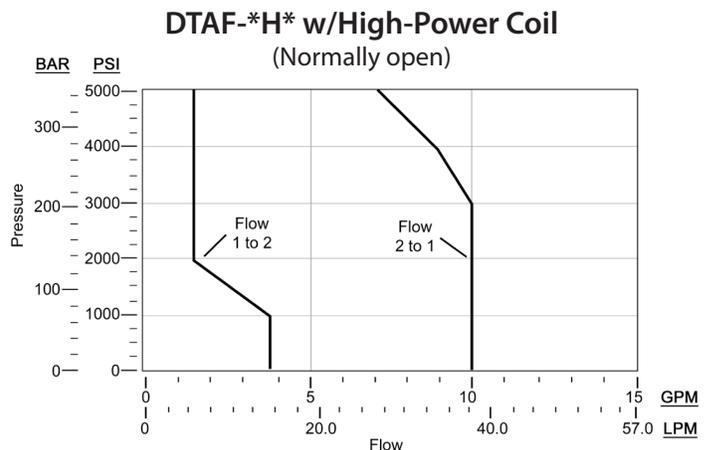
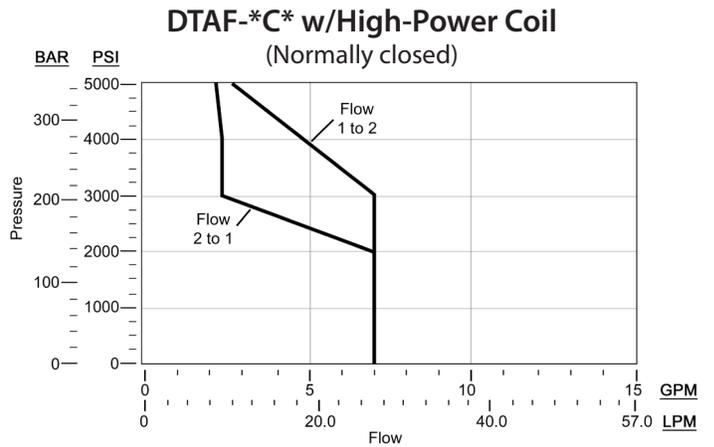
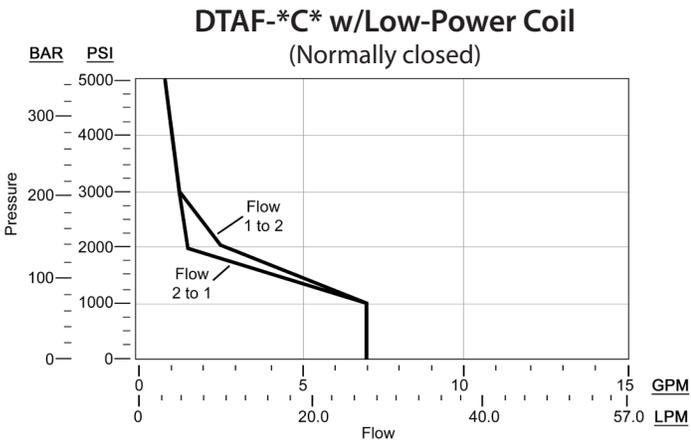
\* See performance curves on P 5 for more details.

\*\* The low-power coil can be used only on the DTAF-\*C\* normally closed version of the valve.

## TYPICAL PERFORMANCE CURVES

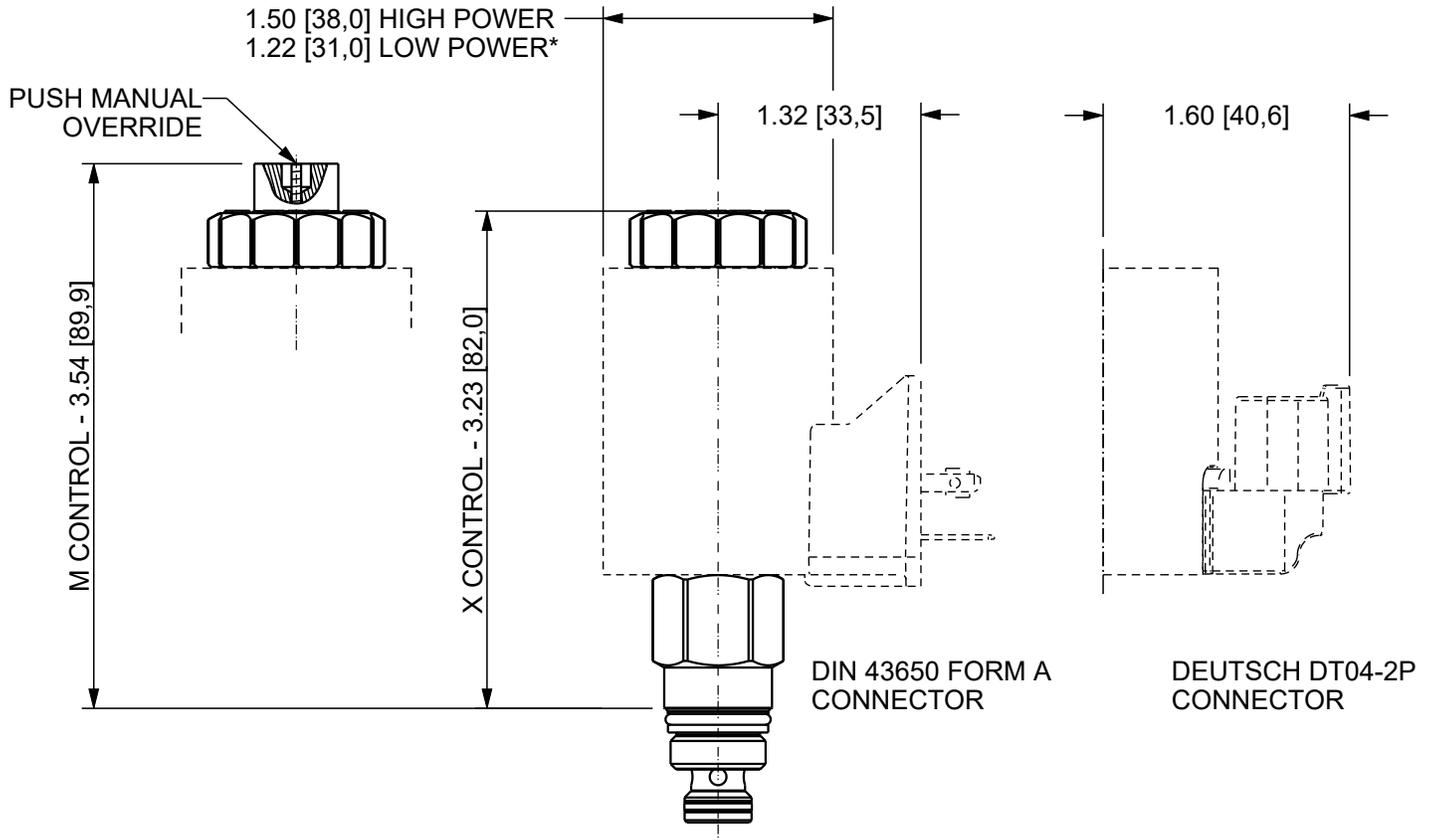


## PERFORMANCE LIMITS @15% UNDERVOLTAGE & STABILIZED COIL TEMP

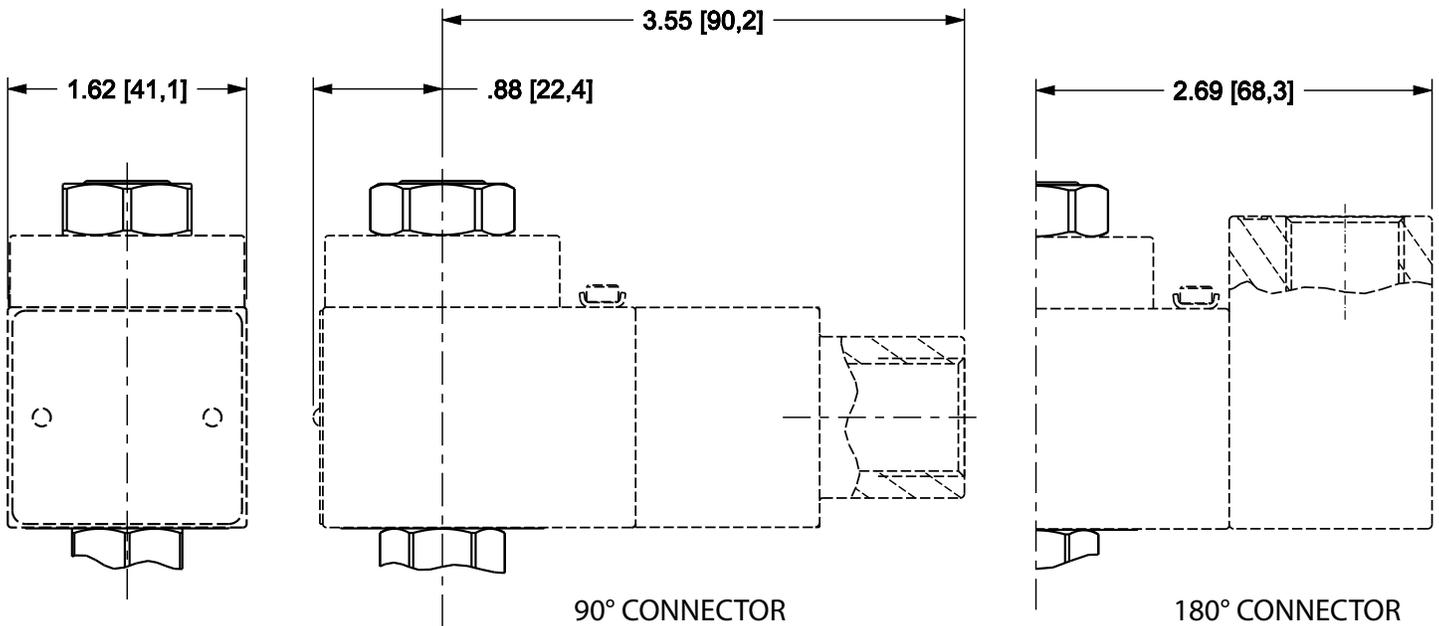


Note: The DTAF-\*H\* normally open valve cannot use the low-power coil.

## DTAF WITH 740 SERIES LOW- & HIGH-POWER COILS



## 747 SERIES HAZARDOUS LOCATION COILS

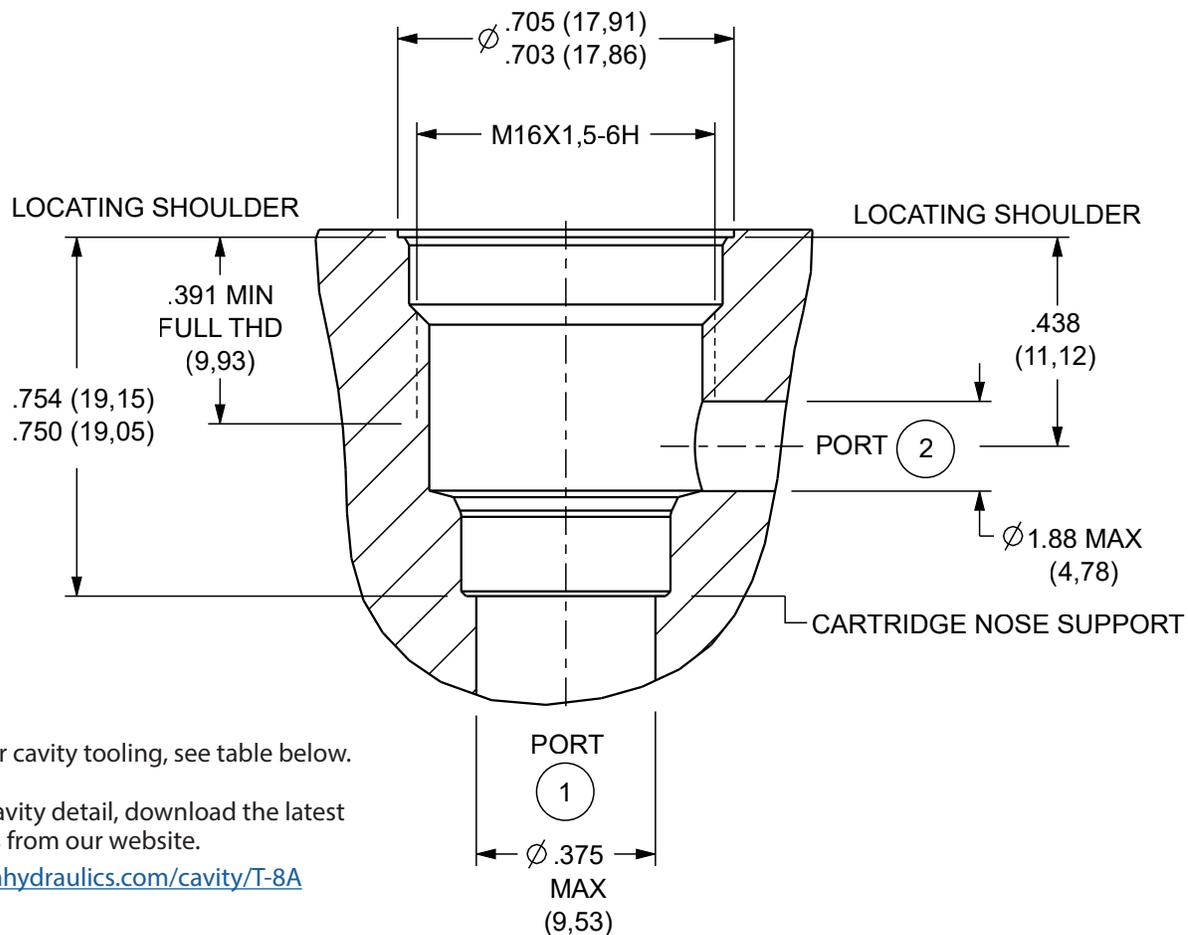


\* The low-power coil can be used only on the DTAF-\*C\* normally closed version of the valve.

NOTE: Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances. An additional minimum 2.0 in. (50,8 mm) beyond the valve extension is needed for coil installation and removal.

## T-8A CAVITY DIMENSIONAL DRAWING

T-8A CAVITY



## T-8A CAVITY TOOLING

DESCRIPTION	HIGH-SPEED STEEL	TITANIUM COATED
M16 X 1.5-6H tap, straight shank	998991	998991101
Series P deep hex socket	998100006	
T-8A cavity form drill, morse taper	994008001	994008101
T-8A cavity form drill, straight shank	994008002	994008102
T-8A cavity form reamer, morse taper	995008001	995008101
T-8A cavity form reamer, straight shank	995008002	995008102

# ADDITIONAL INFORMATION

## ACCESSORIES

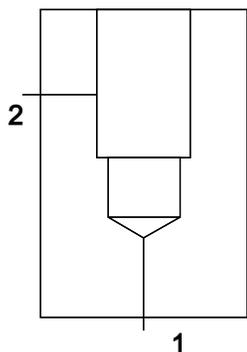
DESCRIPTION	PART NUMBER
Wire harness, 2-pin Deutsch-to-Metri-Pack Conversion	991-717
Wire harness, 2-pin Deutsch-to-Amp Jr Timer Conversion	991-718
Wire harness, 2-pin Deutsch-to-Twin-Lead Conversion	991-719

## T-8A-COMPATIBLE MAIN STAGE ELEMENTS

As a T-8A pilot stage cartridge, the DTAF can control any of Sun's 95 main stage cartridges with integral T-8A cavities. Main stage elements include relief, reducing, reducing/relieving, sequence, logic, directional and flow control functions. The combination of the DTAF and one of these main stage elements delivers accurate, high-speed control at capacities up to 300 gpm (1,100 L/min).

To see all Sun main stage cartridges with integral T-8A cavity, visit our website: [www.sunhydraulics.com](http://www.sunhydraulics.com). Use the "Cartridges" navigation to go to any category of cartridges (or click on the main "Cartridges" navigation to see all cartridges). Once you are on a product listing page, in the left column under "Descriptors," choose "Integral T-8A control cavity." This will filter the list and show those cartridges that include the cavity.

## STANDARD T-8A LINE-MOUNT & SANDWICH MANIFOLDS



Sun Hydraulics offers eight standard line-mount manifolds with T-8A cavity for the DTAF. These single-cavity manifolds include in a range of port sizes and interfaces. The popular WFN model line-mount 90° manifold (shown at left) has a single cavity and SAE 4 ports.

In sandwich manifolds, we offer 11 standard single-cavity bodies based on the T-8A cavity, including six with SAE 4 ports that include a range of ISO interfaces.

To search our complete line of more than 4000 standard manifolds, please visit our website: [www.SunHydraulics.com/models/manifolds](http://www.SunHydraulics.com/models/manifolds).



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