



# Sun 747 Series Hazardous Location Coils

## **FLeX COMPATIBLE**

*Works with Sun FLeX Series  
Solenoid Valves*

## **GLOBAL CERTIFICATION FOR HAZARDOUS LOCATIONS**

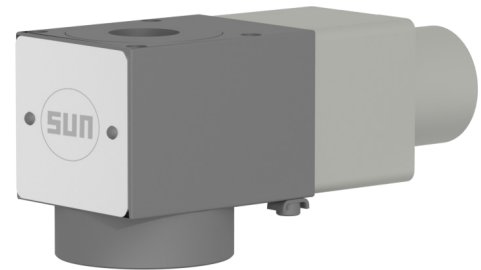
*ATEX, IECEx, CSA*

## **DC & AC VOLTAGES**

*12/24 Vdc and 115/230 Vac*

## **ELECTRICAL CONNECTION OPTIONS**

*M20 x 1.5 or 1/2" NPT*



# 747 SERIES

## HAZARDOUS LOCATION COILS 12-/24-Vdc or 115-/230-Vac

### TABLE OF CONTENTS

<b>Technical Features</b>	<b>2</b>
<b>Certifications</b>	<b>3</b>
<b>Technical Specifications</b>	<b>4</b>
<b>Dimensional Drawings</b>	<b>5</b>
<b>Models &amp; Configurations</b>	<b>6</b>
<b>Valve Compatibility</b>	<b>7</b>
<b>Additional Information</b>	<b>8</b>

[sunhydraulics.com/models/  
electronics/coils/747-series-explosion-proof](https://www.sunhydraulics.com/models/electronics/coils/747-series-explosion-proof)



**MODEL 747 HAZARDOUS LOCATION COILS****12-/24-VDC, 115-/230-VAC**

- Designed to fit all Sun FLeX Series on/off and proportional valves (see Page 7).
- Global certifications include ATEX, IECEx, CSA (see “Hazardous Certifications” table on Page 3).
- All hazardous location coils are certified for gas and dust environments (T4 compliant for gas and T135° C for dust).
- The coil is CE compliant.
- These coils are fully RoHS compliant. Restricted materials comprise less than 0.1% total weight.
- IP66 rating (with suitable certified cable entry or conduit per IEC 60529).
- 1/2” NPT or M20 x 1.5 female thread for electrical connections are available.
- Includes vibration-resistant push-to-connect terminal block. Power cable with mating connector is required and not included with this product.
- The external steel shell is zinc-nickel plated (1000-hour salt fog protection).
- Fin-free design prevents build up of grease, dust and debris.
- The coil is magnetically symmetrical and can be mounted in either direction on the solenoid tube without affecting performance.
- A transient voltage suppression (TVS) diode is built into the DC coils and offers a 48-Vdc breakdown voltage. The AC coils are internally rectified.
- For optimum performance when used on a proportional valve, an amplifier with current feedback and adjustable dither should be used. Dither should be adjustable between 80-250 Hz.

## MODEL 747 HAZARDOUS LOCATION COILS

### 12-/24-VDC, 115-/230-VAC

#### HAZARDOUS CERTIFICATIONS

CERTIFICATION AGENCY	LIQUIDS & GASES	DUSTS
North America (NEC, CEC/CSA) (CSA 22.2 - 60079-0:11, 60079-1:11, 60079-31:1) (UL 60079-0:09, 60079-1:09, 60079-31:08)	Class I, Div 1, GRP B, C, D, T4 Class I, Zone 1, AEx d IIC T4 Gb Ex d IIC T4 Gb	Class II, Div 1, GRP E, F, G Class II, Zone 21, AEx tb IIIC T135°C Db Ex tb IIIC T135°C Db
IECEX (IEC 60079-0:2011, 60079-1:2014, 60079-31:2013)	Ex db IIC T4 Gb	Ex tb IIIC T135°C Db
ATEX (EN60079-0:2011, 60079-1:2014, 60079-31:2013)	CE 0518  II 2G	CE 0518  II 2D

#### SPECIFIC CONDITIONS FOR SAFE USE

The temperature of the fluid flowing through the valve and the solenoid must not exceed the ambient temperature specified on the nameplate.

The temperature at the entry point may be as high as 130° C (266° F) for T4. This should be taken into account when selecting suitable cable and entry devices.

Do not open the cover while solenoid is energized.

The special fasteners that are used in these devices are type M4 x 0.7 with a yield stress of 700 MPa; any replacement fasteners must conform to these requirements.

North American application: Internal electrical connections must be factory installed.

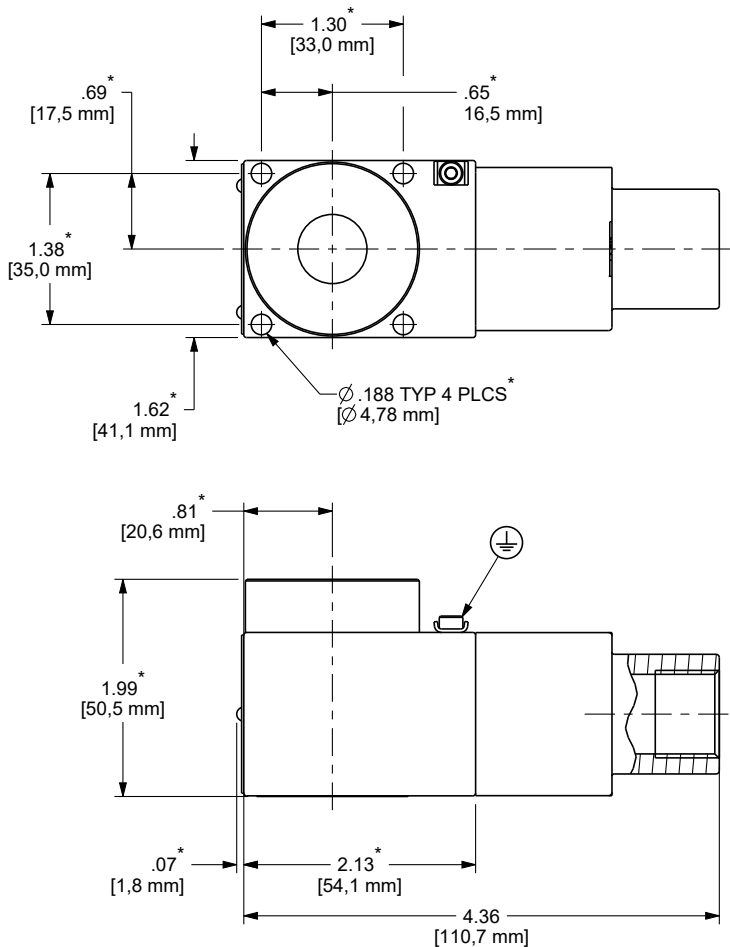
**Warning:** Failure or improper selection or improper use of the products described herein or related items can cause death, personal injury and property damage. Users, through their own analysis and testing, are solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met.

## MODEL 747 HAZARDOUS LOCATION COILS

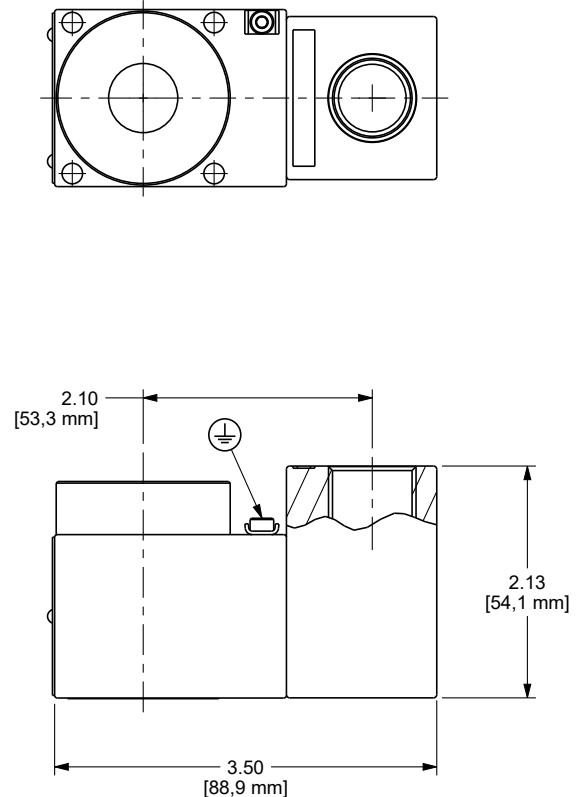
12-/24-VDC, 115-/230-VAC

TECHNICAL SPECIFICATIONS	
Power Consumption (@ 20° C) at Rated Voltage	30 W
Ambient Temperature Range	-40° to +50° C (-40° to +122° F)
Fluid Temperature Through Valve (Maximum)	50° C (+122° F)
Voltages (Vdc)	12 Vdc (13.5 Vdc max.) 24 Vdc (27.0 Vdc max.)
Voltages (Vac, 50/60-Hz operation)	115 Vac (130 Vac max.) 230 Vac (262 Vac max.)
Duty Cycle Rating	100%
Electrical Connector Options	M20 x 1.5 (180° or 90°) 1/2" NPT (180° or 90°)
Ingress Protection Rating (IEC 60529)	IP66 (w/ suitable cable entry/conduit)
Corrosion Resistance (ASTM B117, ISO 9227 5% saline)	1000 hours salt fog (zinc-nickel)
Seal & Nut Kit - Coil	990-747-006
Solenoid Tube Diameter	0.63" (16 mm)
Coil Nut Torque	4.5 lbf in. (0.51 N-m)
Coil Weight	1.8 lb (816 g)

**Model 747-J\*\*\*CD**  
(90° connector)



**Model 747-J\*\*\*BD**  
(180° connector)



747-J\*\*\*CD (90°)

747-J\*\*\*BD (180°)

\*THESE DIMENSIONS ARE COMMON ON ALL 747-J\*\*\*\* COILS

## INSTALLATION INSTRUCTIONS

1. Mount coil onto spool (tube) body.
2. A cable entry hole is provided to accommodate any suitable certified flameproof cable entry device. Cable entry temperature may exceed 70° C (158° F).
3. Remove terminal box cover and connect electrical supply and earth to terminal block. Conductors according to Note 4. Note coil is polarity insensitive. The center terminal is the internal ground. Replace cover and secure with the four screws. Torque to min 1.92 ft-lbs (2.6 N-m).
4. Connect external ground. North American applications: external earth (ground) connections. Use where local codes or authorities permit or require external earth (ground) connections. Torque to 1.25 ft-lbs (1.7 N-m).
5. When installing with multiple coils, the coils must spaced a minimum of 0.875" (22.23 mm) apart to ensure adequate heat dissipation.

## NOTE

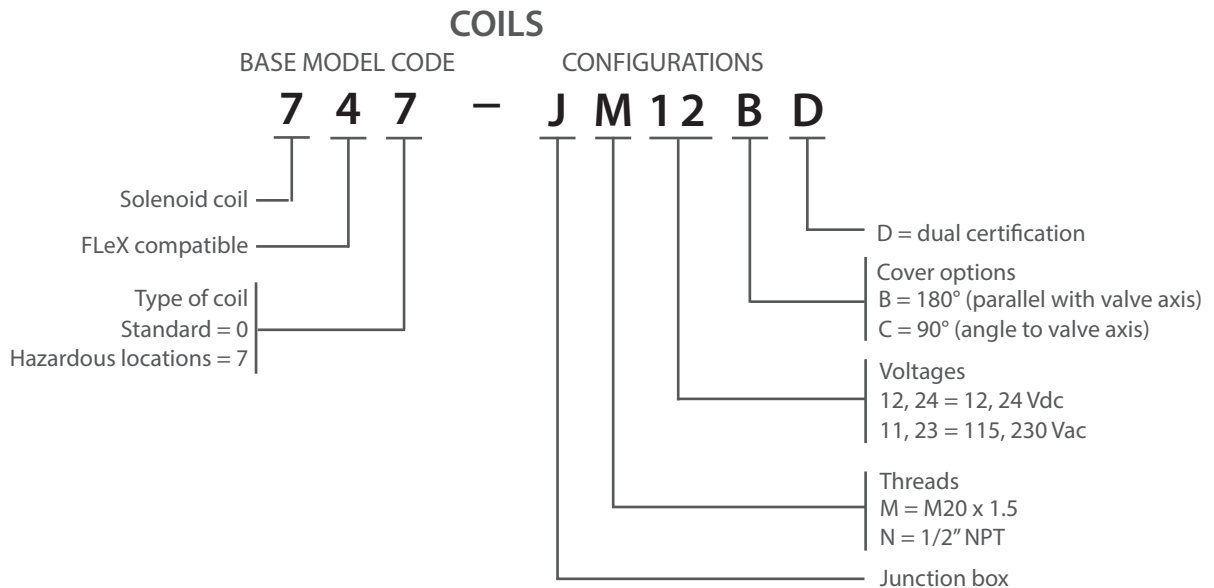
Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances. An additional 2.00" (50,8 mm) beyond the valve extension is needed for coil installation and removal.

## MODEL 747 HAZARDOUS LOCATION COILS 12-/24-VDC, 115-/230-VAC

### MODEL CODE EXPLANATION

Sun 747 Series Hazardous Location Solenoid Coils have a three-digit base model number. Each of the digits in the sequence has significance as shown in the model code

explanation below. Configurations codes identify connection option, voltages and cover options.



### MODEL CODES BY VOLTAGE & CONNECTOR TYPE

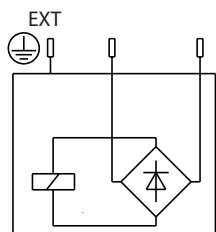
	M20 x 1.5 180°	M20 x 1.5 90°	1/2" NPT 180°	1/2" NPT 90°	Wattage @ 20° C	Resistance (±5%) @ 20° C	Circuitry
12 Vdc	747-JM12BD	747-JM12CD	747-JN12BD	747-JN12CD	29.6 W	4.9 Ω	W/DIODE
24 Vdc	747-JM24BD	747-JM24CD	747-JN24BD	747-JN24CD	29.9 W	19.3 Ω	W/DIODE
115 Vac 50/60 Hz	747-JM11BD	747-JM11CD	747-JN11BD	747-JN11CD	29.7 W	358.8 Ω	RECTIFIED
230 Vac 50/60 Hz	747-JM23BD	747-JM23CD	747-JN23BD	747-JN23CD	28.9 W	1477.0 Ω	RECTIFIED

NOTE: 180° connector axis of entry is parallel to the coil axis plane;  
90° connector axis of entry is perpendicular to the coil axis plane.

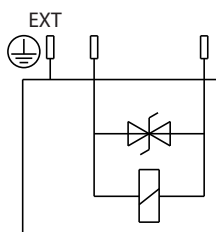
Symbol	Description	Model	Cavity	Pressure	Capacity (nominal)	Coil Options			Function
						Low-Power	High Power	Exp. Proof	
	2-way, direct-acting, solenoid-operated directional blocking poppet valve, normally closed (Max. capacity: 10 gpm/40 L/min)	DTAF-*C*	T-8A	5000 psi (350 bar)	2.2 gpm (8.3 L/min)	YES	YES (High flow)	YES	Directional
		DTBF-*C*	T-162A	5000 psi (350 bar)	2.0 gpm (7.6 L/min)	YES	YES (High flow)	YES	Directional
	2-way, direct-acting, solenoid-operated directional blocking poppet valve, normally open (Max. capacity: 10 gpm/40 L/min)	DTAF-*H*	T-8A	5000 psi (350 bar)	1.6 gpm (6.1 L/min)		YES	YES	Directional
		DTBF-*H*	T-162A	5000 psi (350 bar)	0.9 gpm (3.4 L/min)		YES	YES	Directional
	2-way, 2-stage, solenoid-operated directional poppet valve - control flow 2-1, normally closed	DFBD-*C*	T-162A	3000 psi (210 bar)	10 gpm (40 L/min)	YES		YES	Directional
		DFBF-*C*	T-162A	5000 psi (350 bar)	10 gpm (40 L/min)		YES	YES	Directional
	2-way, 2-stage, solenoid-operated directional poppet valve - control flow 2-1, normally open	DFBD-*H*	T-162A	3000 psi (210 bar)	10 gpm (40 L/min)	YES		YES	Directional
		DFBF-*H*	T-162A	5000 psi (350 bar)	10 gpm (40 L/min)		YES	YES	Directional
	2-way, 2-stage, solenoid-operated directional poppet valve with reverse flow check - control flow 2-1, normally closed	DFBE-*C*	T-162A	3000 psi (210 bar)	10 gpm (40 L/min)	YES		YES	Directional
		DFBG-*C*	T-162A	5000 psi (350 bar)	10 gpm (40 L/min)		YES	YES	Directional
	2-way, 2-stage, solenoid-operated directional poppet valve with reverse flow check - control flow 2-1, normally open	DFBE-*H*	T-162A	3000 psi (210 bar)	10 gpm (40 L/min)	YES		YES	Directional
		DFBG-*H*	T-162A	5000 psi (350 bar)	10 gpm (40 L/min)		YES	YES	Directional
	Pilot-operated, normally closed, electro-proportional throttle - control flow 2-1	FPBF-XD*	T-162A	5000 psi (350 bar)	5 gpm (20 L/min)		YES	YES	Proportional
		FPBD	T-162A	3000 psi (210 bar)	5 gpm (20 L/min)	YES		YES	Proportional
	Pilot-operated, normally closed, electro-proportional throttle with reverse flow check - control flow 2-1	FPBG-XD*	T-162A	5000 psi (350 bar)	5 gpm (20 L/min)		YES	YES	Proportional
		FPBE	T-162A	3000 psi (210 bar)	5 gpm (20 L/min)	YES		YES	Proportional
	Pilot-operated, normally open, electro-proportional throttle - control flow 2-1	FPBI-XD*	T-162A	5000 psi (350 bar)	5 gpm (20 L/min)		YES	YES	Proportional
		FPBM	T-162A	3000 psi (210 bar)	5 gpm (20 L/min)	YES		YES	Proportional
	Pilot-operated, normally open, electro-proportional throttle with reverse flow check - control flow 2-1	FPBJ-XD*	T-162A	5000 psi (350 bar)	5 gpm (20 L/min)		YES	YES	Proportional
		FPBN	T-162A	3000 psi (210 bar)	5 gpm (20 L/min)	YES		YES	Proportional
	2-way, direct-acting, electro-proportional throttle blocking poppet valve	FPBU	T-162A	5000 psi (350 bar)	2.6 gpm (9.8 L/min)		YES	YES	Proportional

# ADDITIONAL INFORMATION

## INTERNAL WIRING DIAGRAM CIRCUITRY



CIRCUIT DIAGRAM AC COIL



CIRCUIT DIAGRAM DC COIL

NOTE: Coil is polarity insensitive.

### TERMINAL BLOCK SPECIFICATIONS

Simple push-in termination of solid and ferruled conductors.

Connection technology: Cage Clamps

Conductor Size

Solid: 0.2–2.5 mm<sup>2</sup>

Fine stranded: 0.2–2.5 mm<sup>2</sup>

Fine stranded (with insulated ferrule): 0.25–1.5 mm<sup>2</sup>

Fine stranded (with insulated ferrule): 0.25–2.5 mm<sup>2</sup>

AWG 24-12 (4.1 mm max outside diameter)

### RECOMMENDATION

For installation in above-ground electrical systems in explosive atmospheres, procedures for all applicable codes must be observed. All work must be carried out by an electrician with adequate qualifications for hazardous locations.

A common practice to protect the internal bridge rectifier from unknown incoming voltage conditions is to install a TVS diode. For the 115-Vac coil, diode part number 1.5KE250CA is recommended; for the 230-Vac coil, diode part number 1.5KE400CA is recommended. Depending on the application, diodes higher than 1500 W are recommended.



Sun Hydraulics Headquarters  
Sarasota, Florida USA  
(1) 941 362 1200

Sun Hydraulics Limited  
Coventry England  
+44 2476 217 400  
[sales@sunuk.com](mailto:sales@sunuk.com)

Sun Hydraulik GmbH  
Erkelenz Germany  
+49 2431 80910  
[sales@sunhydraulik.de](mailto:sales@sunhydraulik.de)

Sun Hydraulics Corp. (India)  
Bangalore India  
+91 8028 456325  
[sunindiainfo@sunhydraulics.com](mailto:sunindiainfo@sunhydraulics.com)

Sun Hydraulics Korea Corp.  
Incheon Korea  
+82 3281 31350  
[sales@sunhydraulics.co.kr](mailto:sales@sunhydraulics.co.kr)

Sun Hydraulics China Co. Ltd.  
Shanghai P.R. China  
+86 2151 162862  
[sunchinainfo@sunhydraulics.com](mailto:sunchinainfo@sunhydraulics.com)

Sun Hydraulics Corp. (S.America)  
Rosario, Argentina  
+54 9 341 584 3075  
[ventas@sunhydraulics.com](mailto:ventas@sunhydraulics.com)

July 2018