

**FIBER OPTIC PRESSURE SEAL  
MODEL F.O.P.S.-2000-C**

***SPECIFICATIONS***

**Type:** ..... Fiber Optic Pressure Transition Seal

**Channels:** .....16 single channel fibers total. A minimum of 14 channels shall comply individually to each performance specification in their entirety.

**Mechanical Configuration:** ..... 1.375 inch hex housing threaded 1.0 inch male N.P.T. both ends.

**Housing Material:** ..... Brass

**Optical Fiber:** ..... Ensign-Bickford Type HCNM0200TC01US12,200 Micron Step Index Fiber.

**Optical Connectors:** ..... AMP 501003-4 FSMA epoxy polish connector.

**Optical Attenuation:** ..... (-)6 dB maximum referenced at 820 nm, per channel.

**Operating Temperature:** ..... +10° C to +80° C.

**Static Pressure:** ..... Seal shall withstand 265 psi Helium Exposure for a minimum of 60 seconds.

**Leak Rate:** ..... Less than  $1 \times 10^{-5}$  cu. cm./sec. per test described in note no.1.

**Thermal Cycle:** ..... Seal shall meet performance specifications following three (3) successive thermal cycles from +10° C to +80° C @ 2 ° C/min.

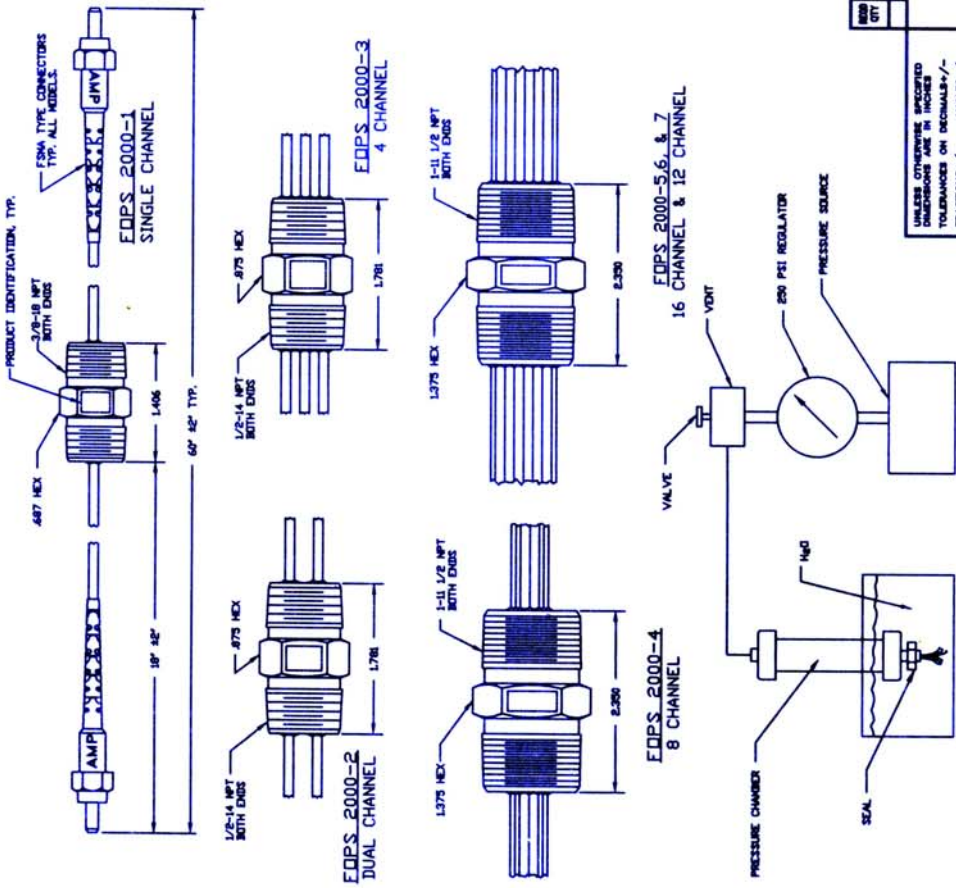
**Mandrel Wrap:** ..... Each Optical Fiber Termination shall withstand 3, 360° wraps around a 1.0 inch mandrel with no evidence of pistoning.

**Marking:** ..... Each seal shall be identified on hex flat with permanent engraving of Columbia logo, Columbia model number, serial number and style number.

**Note 1: Leak Test Procedure,**

The seal shall be installed into a pressure chamber utilizing Teflon pipe tape as illustrated in Figure 1 (drawing follows). The chamber shall be pressurized to 265 psi. Immerse the exposed end of the seal into a glass beaker of distilled water and watch for any continuous stream of bubbles emitted from any section of the seal. A continuous stream of bubbles shall be cause for rejection.

REVISES			
REV	DESCRIPTION	BY	DATE
A	REVISED FOR ECH HD. 90-167		8/2/78
B	REVISED FOR ECH HD. 92-092		



**COLUMBIA MODEL FOPS-2000 SERIES FIBER OPTIC PRESSURE SEAL SPECIFICATIONS**

**TYPE FIBER OPTIC TRANSITION PRESSURE SEAL OPTICAL CHANNELS:** FOPS-2000-1 -- 1 CHANNEL  
 FOPS-2000-2 -- 2 CHANNELS  
 FOPS-2000-3 -- 4 CHANNELS  
 FOPS-2000-4 -- 8 CHANNELS  
 FOPS-2000-5 -- 16 CHANNELS  
 FOPS-2000-6 -- 12 CHANNELS

**MECHANICAL CONFIGURATION:** FOPS-2000-1 -- 0.687 in. HEX BODY  
 3/8-18 NPT BOTH ENDS  
 FOPS-2000-2&3 -- 0.875 in. HEX BODY  
 1/2-14 NPT BOTH ENDS  
 FOPS-2000-4,5,6,8,7 -- 1.375 in. HEX BODY  
 1-11 1/2 NPT BOTH ENDS

**HOUSING MATERIAL:** BRASS

**OPTICAL FIBER:** ENSIGN-BICFORD TYPE HCR-214-11C, 200 MICRON STEP INDEX FIBER  
 OPTICAL CONNECTOR: AMP #501003-4 FSMA-1 SERIES  
 STATIC ATTENUATION: -8 DB MAXIMUM REFERENCED AT 820 NANOMETERS  
 STATIC PRESSURE: 250 PSI HELIUM  
 LEAK RATE: LESS THAN 1X 10<sup>-5</sup> CU. CM/SEC. PER FIGURE 1  
 OPERATING TEMPERATURE: +10 TO +40 DEGREES C. STANDARD UNIT  
 MANDREL WARP: EACH OPTICAL FIBER TERMINATION SHALL WITHSTAND 3 SUCCESSFUL WRAPS AROUND A 1.0 in. MANDREL WITH NO EVIDENCE OF FIBER PISTONING

**MARKING:** EACH SEAL SHALL BE PERMANENTLY ENGRAVED IDENTIFYING COLUMBIA LOGO, MODEL NUMBER AND SERIAL NUMBER.

**MODEL FOPS-2000-6:** THIS SPECIAL PRESSURE SEAL CONFIGURATION UTILIZES ENSIGN BICFORD TYPE CC-140-3.0 OPTICAL CONNECTORS MODIFIED WITH ENSIGN BICFORD TYPE CC-140-3.0 OPTICAL CONNECTORS ON ONE SIDE OF THE CONFIGURATION HAS 3 FEET OF FIBER ON THE OTHER. THIS PRESSURE FITTING AND 30 FEET ON THE OTHER. THIS CONFIGURATION INCORPORATED 12 OPTICAL FIBER CHANNELS

**MODEL FOPS-2000-7:** THIS SPECIAL PRESSURE SEAL CONFIGURATION UTILIZES ENSIGN BICFORD FIBRE TYPE HCP-M0125-C01US-12 MATED WITH ENSIGN BICFORD TYPE CC-140-3.0 OPTICAL CONNECTORS OR FSMA OPTICAL CONNECTORS. THIS SPECIAL PRESSURE FITTING AND 30 FEET OF FIBER ON THE OTHER. THIS CONFIGURATION HAS 3 FEET ON EACH SIDE OF THE PRESSURE FITTING AND 0.45 FEET ON THE OTHER. THIS CONFIGURATION INCORPORATED 12 OPTICAL FIBER CHANNELS

REV. NO.	REV. DATE	REV. BY	SCALE	SHEET
B			SD-386	

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USE THE DIMENSIONS INDICATED UNLESS OTHERWISE NOTED. DIMENSIONS ARE IN INCHES. TOLERANCES ON DECIMALS +/- FRACTIONS +/- ANGLES +/- MATERIAL

PARTS LIST  
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