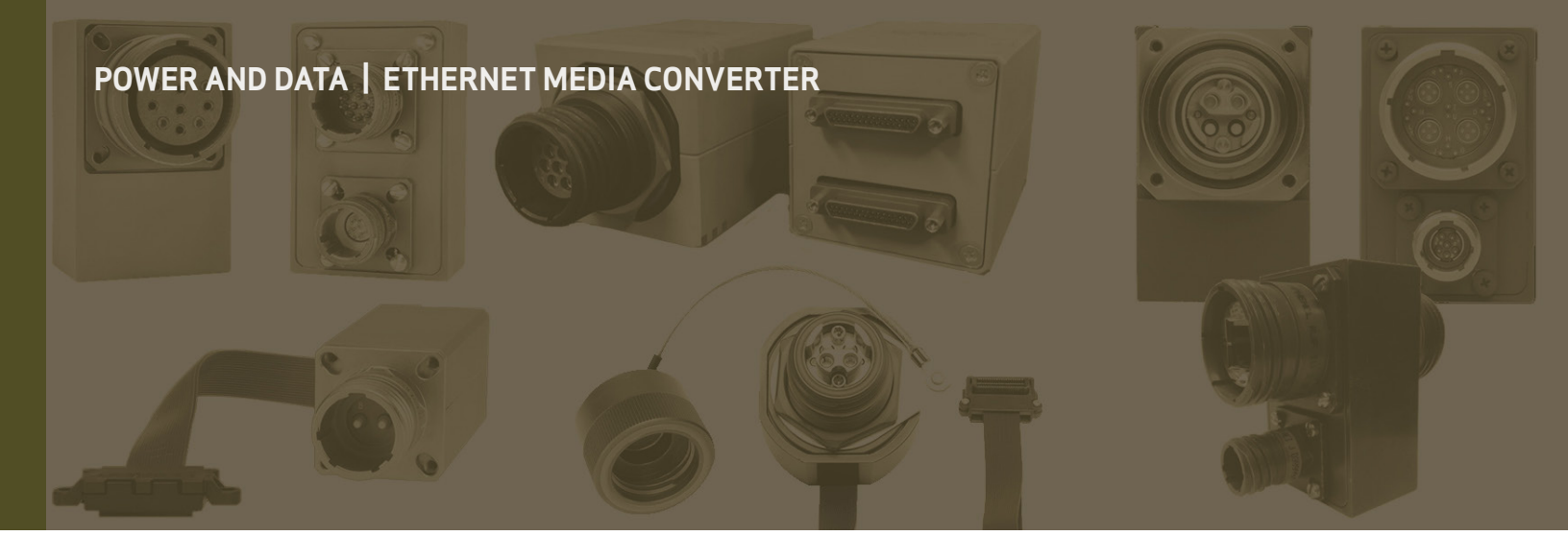
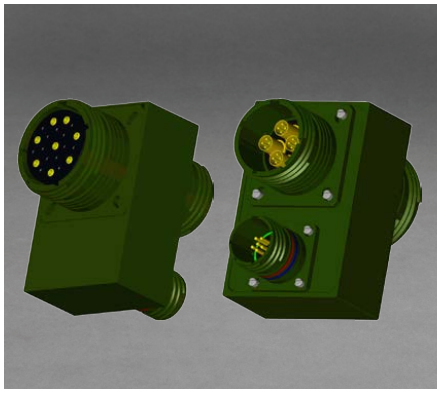


MERCURY SERIES

10/100BASE-TX/SX MEDIA CONVERTER, 28 VDC, ARINC 804, MULTIMODE, 850 NM, QUADRAX



Mercury series Fast Ethernet media converters consist of optoelectronic transmitter and receiver functions integrated along with the 10/100Base-TX Ethernet electrical to 100Base-SX optical media conversion circuitry into a bulkhead mounted MIL-DTL-38999 connector assembly.

The optical transmitters are high output 850 nM VCSEL's. The optical receivers consist of GaAs PIN and preamplifier assemblies and limiting post-amplifiers.

The electrical interface to the Mercury series bulkhead optical media converters is a MIL-DTL-38999 / Quadrax connector enabling interconnection to an external Quadrax cable interface.

Mercury series Fast Ethernet media converters are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

- Sealed against liquid and solid contaminants
- Shock and vibration resistant

MOOG

QUAD PORT MERCURY SERIES MIL-DTL-38999, 10/100BASE-TX TO 100BASE-SX, FAST ETHERNET MEDIA CONVERTER, QUADRAX, MULTIMODE, 28 VDC, 850 NM VCSEL'S

Quad Port, Flange Receptacles
D38999 to D38999 / Optical to Electrical Media Converter

FEATURES

- Compliant with IEEE-802.3u Fast Ethernet
- Optical fiber link distances up to 300 meters
- Maximum optical channel bit error rate less than 1×10^{-10}
- Operating temperature range from -40° to +85° C
- Shock, vibration and immersion resistant per MIL-STD-810 and MIL-STD-1344
- Olive drab cadmium plating meets stringent EMI / RFI performance specifications
- Aluminum alloy chassis and MIL-DTL-38999 housings are strong, durable, corrosion resistant and light weight
- MIL-T-29504 compliant optical fiber connector interface
- D38999 fiber optic insert configuration conforms to MIL-STD-1560
- D38999 / Quadrax electrical interface provides robust interconnection to internal chassis wiring or backbone

APPLICATIONS

Mercury series bulkhead mounted Fast Ethernet media converters enable high speed network communications over long distances in harsh environments.

- Fast Ethernet switches and peripherals
- Telecom and datacom switch / router rack-to-rack links
- Storage or computation clusters

The MIL-DTL-38999, series III shell provides a sealed optical interface that is water-tight to MIL-STD-810 / IP67 / NEMA-4x when mated.

The multimode optical fiber interface supports applications where copper cable link distance, bandwidth, weight or bulk make the use of twisted pair, twinax or quadrax copper conductors unacceptable.

ORDERING INFORMATION

Application	Part Number
10/100Base-TX to 100Base-SX, 28 VDC	M38R-8SAU-HW

See Appendix A3 for more part number options.

QUAD PORT MERCURY SERIES MIL-DTL-38999, 1000BASE-T TO 1000BASE-SX, GIGABIT ETHERNET MEDIA CONVERTER, MULTIMODE, 28 VDC, 850 NM VCSEL'S

ABSOLUTE MAXIMUM RATINGS

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Storage Temperature	T_S	-55		+100	°C
Supply Voltage	V_{CC}	-0.5		45.0	V
Data Input Voltage	V_I	-0.5		V_{CC}	V

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	T_A	-40		+85	°C
Supply Voltage	V_{CC}	+18.0	+28.0	+36.0	VDC
Power Supply Noise (p-p)	N_P			200	mV

INTERFACE SPECIFICATIONS COMPLIANCE

Requirement	Feature	Condition	Notes
MIL-STD-883	ESD	Class II	2200 V
MIL-STD-810	Vibration	$3.8g^2$ / Hz	43G rms
MIL-STD-810	Shock	40.0 g	6-9 mS
MIL-STD-1344	Flame Resistance	Method 1012	30 Seconds
MIL-STD-1344	Damp Heat	10 Cycles	24 Hours
MIL-STD-38999	Mating Durability	500 Cycles	< 0.5 dB Change
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

MATERIALS

Item	Detail	Notes
D38999 Cylindrical Shells	Aluminum Alloy	
Plating	Olive Drab Cadmium	
D38999 Inserts	Thermoplastic	
Interfacial Seals	Elastomer	
Optical Alignment Sleeves	Composite Polymer	
Printed Circuits	Polyimide / FR-4	MIL-P-31032 Type 4
Housing	Aluminum Alloy	

QUAD PORT MERCURY SERIES MIL-DTL-38999, 1000BASE-T TO 1000BASE-SX, GIGABIT ETHERNET MEDIA CONVERTER, MULTIMODE, 28 VDC, 850 NM VCSEL'S

OPTICAL TRANSMITTERS T_A = OPERATING TEMPERATURE RANGE

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power (BER<2.5x10^{-10}, ER>9.0)	P_O	-6.5		-1.0	dBm
Optical Output Wavelength	λ_{OUT}	830	850	860	nM
Spectral Width	$\Delta\lambda_{OUT}$			0.85	nM

OPTICAL RECEIVERS T_A = OPERATING TEMPERATURE RANGE

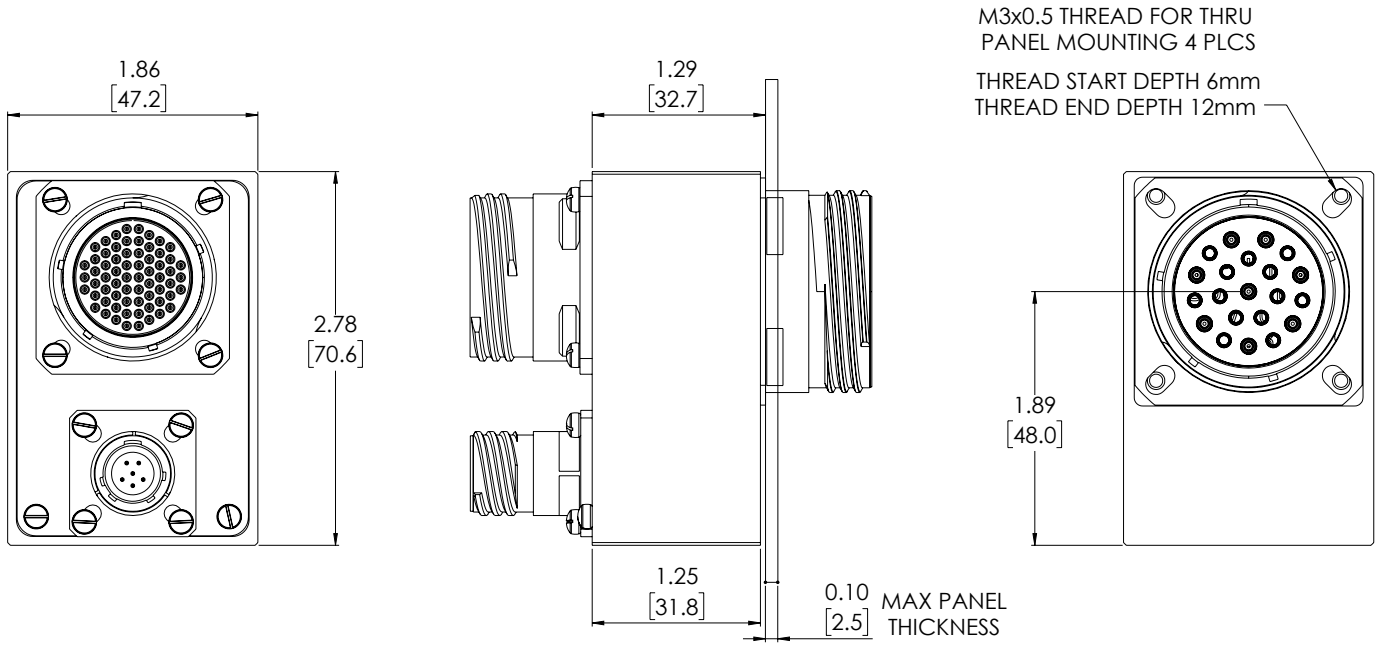
Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity (BER<2.5x10^{-10}, ER>9.0)	P_I	-17.0		-0.0	dBm
Optical Wavelength	λ_{IN}	830		860	nM

POWER SUPPLY CURRENT T_A = OPERATING TEMPERATURE RANGE

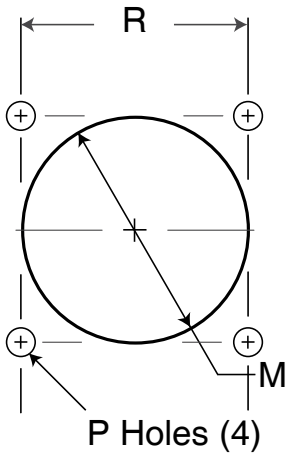
Parameter	Symbol	Typical	Maximum	Unit
Supply Current per Port @ 28 VDC	I_{CCT}	225	360	mA

QUAD PORT MERCURY SERIES MIL-DTL-38999, 1000BASE-T TO 1000BASE-SX, GIGABIT ETHERNET MEDIA CONVERTER, MULTIMODE, 28 VDC, 850 NM VCSEL'S

OUTLINE DRAWING



Dimensions are shown as: inches [mm]
Weight = 8.3 oz / 235 grams



PANEL CUTOUT DIMENSIONS - REAR PANEL MOUNTING ONLY

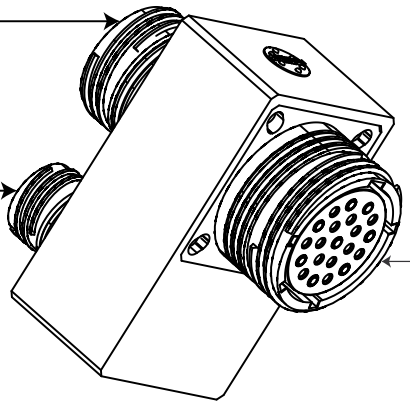
Shell Size Code	Shell Size	M Min	P Holes	R Bsc
H	23	1.547 (39.29)	0.159 (4.0) 0.149 (3.8)	1.375 (34.9)

QUAD PORT MERCURY SERIES MIL-DTL-38999, 1000BASE-T TO 1000BASE-SX, GIGABIT ETHERNET MEDIA CONVERTER, MULTIMODE, 28 VDC, 850 NM VCSEL'S

CONNECTOR REQUIREMENTS

J2 Mating Connector
TYCO Plug, Shell Size 19
38999 Style
Arrangement 4Q4, RR-RR
Part No. 1-1811902-0
Size 8 Quadrax Socket Contact:
Rear Release/Rear Remove Design
Part Number 1445693-3

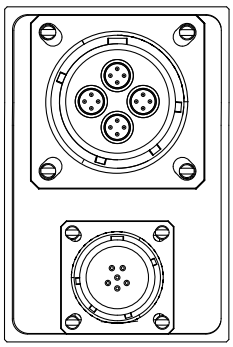
J3 Mating Connector
PN# D38999/26WA35SN

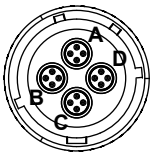
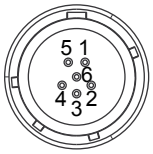


J1 Mating Connector
PN# D38999/26WH21PN

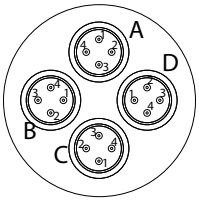
QUAD PORT MERCURY SERIES MIL-DTL-38999, 1000BASE-T TO 1000BASE-SX, GIGABIT ETHERNET MEDIA CONVERTER, MULTIMODE, 28 VDC, 850 NM VCSEL'S

MEDIA CONVERTER INSERT ARRANGEMENTS



	Media Converter Insert Pin Numbers	Media Converter Pin Functions	Mating Cable Plug Connector P/N
J2		**10/100Base-TX** Quadrax A = Port 0 Quadrax B = Port 1 Quadrax C = Port 2 Quadrax D = Port 3	Quadrax Cable TYCO 38999 Plug P/N: **1-1811902-0** TYCO Quadrax Contact P/N: **1445693-3**
J3		**Power Supply** Pin 1 = Case Ground Pin 2 = Case Ground Pin 3 = Case Ground Pin 4 = Case Ground Pin 5 = VEE Pin 6 = VCC	26-22 Guage Copper Wire **D38999 / 26WA35SN**

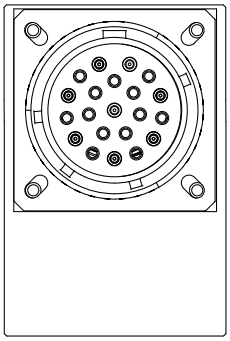
Media Converter Pin Numbers and Functions Shown - Mating Cable Plug Opposite

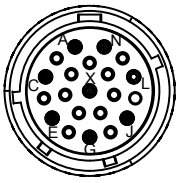


J2 Pin Functions (Port #)

Quadrax Contact A(0)	Quadrax Contact B(1)	Quadrax Contact C(2)	Quadrax Contact D(3)
Pin #1= RX- (0) Pin #2=TX- (0) Pin #3=RX+ (0) Pin #4=TX+ (0)	Pin #1= RX- (1) Pin #2=TX- (1) Pin #3=RX+ (1) Pin #4=TX+ (1)	Pin #1= RX- (2) Pin #2=TX- (2) Pin #3=RX+ (2) Pin #4=TX+ (2)	Pin #1= RX- (3) Pin #2=TX- (3) Pin #3=RX+ (3) Pin #4=TX+ (3)

Electrical TX+/- Pins are inputs to this device, RX+/- Pins are outputs from this device
Media Converter Pin Numbers and Functions Shown - Mating Cable Plug Opposite



	Media Converter Optical Pin Numbers	Media Converter Optical Functions	Mating Cable Plug Connector P/N
J3		**100Base-SX** **Port** **TX** **RX** 0 J L 1 N G 2 X A 3 E C	50 or 62.5µ / 125µ Optical Cable **D38999 / 26WH21PN** M29504 / 04

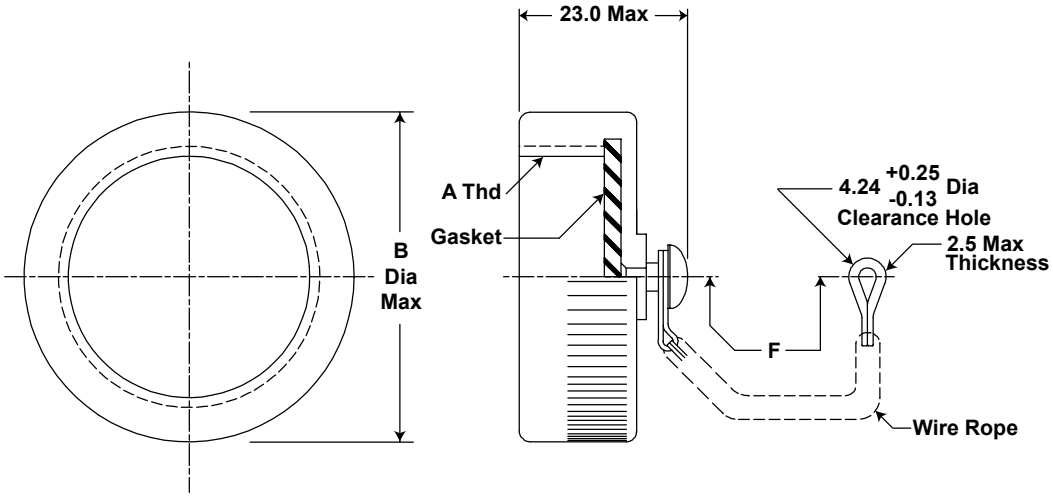
Optical TX pins are outputs from this device, optical RX pins are inputs to this device.
Media Converter Fiber Pin Numbers and Functions Shown - Mating Cable Plug Opposite

QUAD PORT MERCURY SERIES MIL-DTL-38999, 1000BASE-T TO 1000BASE-SX, GIGABIT ETHERNET MEDIA CONVERTER, MULTIMODE, 28 VDC, 850 NM VCSEL'S

APPENDIX A1 RECEPTACLE PROTECTION CAPS

*MIL-DTL-38999 / 33 Protection Cap Part Numbers

MS RECEPTACLE CAP P/N	*D38999 / 33W19R



*See DSCC or SAE QPL for Approved Suppliers
http://www.dscc.dla.mil/programs/qmlqpl/QPLdetail.asp?QPL=38999

MIL-DTL-38999 / 33 OUTLINE

Shell Size Code	Shell Size	A Thread (Inches)	B Max Dia.	F +13.0 -7.0
F	19	1.2500-0.1P-0.3LTS	39.0	127.00

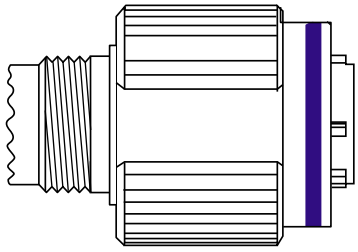
QUAD PORT MERCURY SERIES MIL-DTL-38999, 1000BASE-T TO 1000BASE-SX, GIGABIT ETHERNET MEDIA CONVERTER, MULTIMODE, 28 VDC, 850 NM VCSEL'S

APPENDIX A2 MIL-DTL-38999 FIBER OPTIC CABLE PLUG / MIL-T-29504 PIN TERMINI

*See DSCC or SAE QPL for Approved Suppliers
http://www.dscc.dla.mil/programs/qmlqpl/QPLdetail.asp?QPL=38999

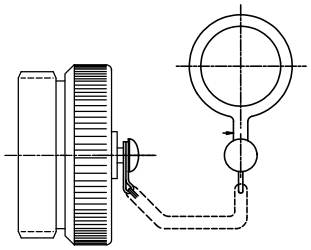
*D38999 PLUG - PIN INSERT
MIL-DTL-38999 CABLE PLUG

MS Plug P/N *D38999 / 26WH21PN



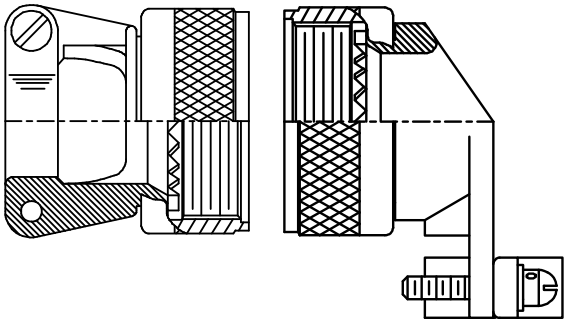
*CABLE PROTECTION CAP
D38999 / 32 PLUG PROTECTION CAP

MS Plug Cap P/N *D38999 / 32W23N



*CABLE BACKSHELL
MIL-C-85049 CABLE BACKSHELL

MS Backshell P/N *MS85049 / XXXXXX**



**Straight or angled backshell - defined by application / mounting configuration

*FIBER OPTIC PIN TERMINUS
MIL-T-29504 PIN TERMINUS

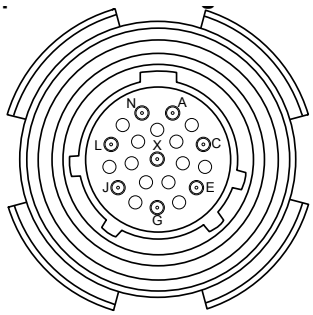
MS Pin Terminus P/N *M29504 / 04-xxxx**

**Defined by fiber optic cable configuration

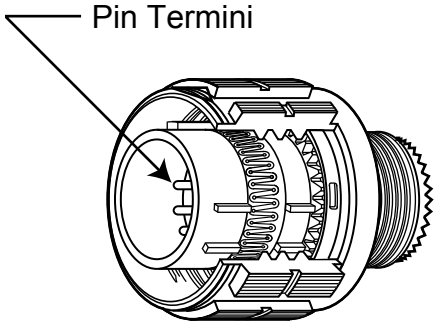
D38999 PLUG PORT FUNCTIONS

Port Number	TX	RX
0	J	L
1	N	G
2	X	A
3	E	C

TOP
Optical Cable Plug Interface



Front face of the optical cable plug pin insert shown. Transceiver insert oppostie.



QUAD PORT MERCURY SERIES MIL-DTL-38999, 1000BASE-T TO 1000BASE-SX, GIGABIT ETHERNET MEDIA CONVERTER, MULTIMODE, 28 VDC, 850 NM VCSEL'S

APPENDIX A4 PART NUMBER OPTIONS

SINGLE PORT, GIGABIT ETHERNET, 850 NM

M33R - 8 S A U - H x x

SHELL CONFIGURATION
M33R = 38999 Receptacle

CHANNELS (TX + RX)
8 = 4 TX + 4 RX

WAVELENGTH
S = 850 nM

POWER SUPPLY VOLTAGE
A = 28.0 VDC

FIBER OPTIC INTERFACE
U = 10/100 Fast Ethernet

SHELL SIZE CODE
H = 23

SHELL PLATING
F = NI
W = OD CD / NI
Z = ZN / NI

SHELL POLARIZATION
(Leave blank) = N
A = A
B = B
C = C
D = D

Other wavelength, mounting and port count options are available.

Please consult the Protokraft website for alternate configurations.

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www.moog.com