

GM modular connectors are bayonet coupling circular connectors for outdoor use. The GM48 has seven module chambers that are codeable and accept a variety of electrical, optical or blanking modules. There is also the optional GM40 that houses a four module chamber. These modules may be thought of as independent connectors-within-the-connector. Each module is capable of separate insertion into the modular housing, has their own crimpable EMI shielding adapters and includes a heat-shrinkable cable strain relief. Numbers marked on the insert identify the individual module chambers. The module mountings have special guide grooves in the module chambers to ensure that modules are precisely positioned. Each module can accept four, five, seven, or ten-pole crimped contacts.



## WATERPROOF

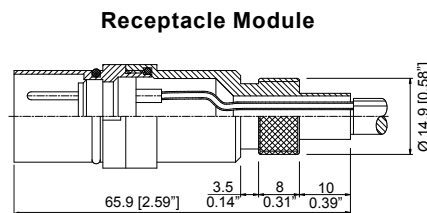
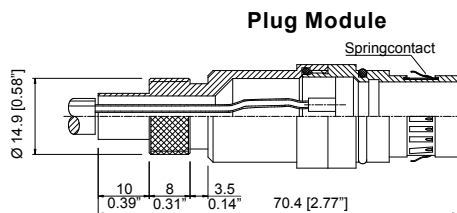
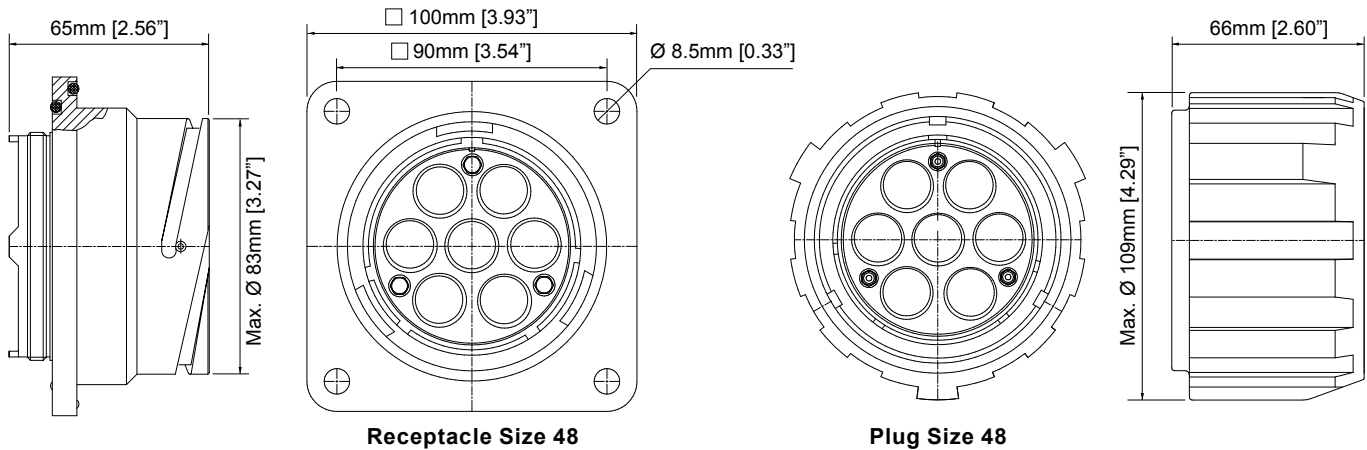
GM connectors comply with protection class IP67/68 (5bar) acc. to IEC/EN 60529. Each individual module is waterproofed with an o-ring in the module mounting. This design permits a highly waterproof system in the longitudinal direction. An o-ring may be inserted in the receptacle clearance groove during assembly to ensure a watertight seal between the receptacle flange and the panel to which it is fitted.

## MATERIAL

The shell parts are made of aluminum alloy. The outer shell and bayonet ring are protected by an epoxy-polyurethane surface coating and the single modules are electroless nickel plated. The bayonet ring is coated with a robust ethylene acrylate rubber that complies with fire protection class UL94-V0 (flame retardant, halogen-free & RoHS-compliant). The module housing is made of a thermoplastic.

## EMI SCREEN

Plug modules are EMI protected by means of a crimp-fit screen, with a 360° arrangement of spring contacts to provide screening continuity with the receptacle module. Receptacle modules use a similar crimp-fit shielding screen. The connector and receptacle modules together form a unit that ensures individual optimal 360° EMI shielding.



## ELECTRICAL CHARACTERISTICS

All electrical data are stated at sea level and at a temperature of 20 °C.

### Plug module / Receptacle module

Voltages		Insulation						
Voltage class	Operating voltage		Test voltage	Flashover	Creepage distance	CTI value	Insulation resistance	
	DC	AC						
[-]	[V]	[V]	[VAC]	[VAC]	≥ [mm]	IEC664	[MΩ]	
INST	MIL	250	200	1000	1400	1.6	≥300	≥5000
SPEC	---	750	600	1500	---	---	---	≥5000

### Requirements according to MIL-DTL-5015:

Safety precautions: Operating voltages stated in the table are allowed only when the connection parts are properly mated and the connector area is fully protected from soiling and moisture by means of an adequate cable clamp. With an unprotected connection area, the operating voltage to ground must not exceed 50V.

## MECHANICAL CHARACTERISTICS

### Connector

Bayonet coupling - torque 1			7 Modules
to lock	max.	[Nm]	10
to open	min.	[Nm]	5.9
	max.	[Nm]	10
Connector size			48

1) Verification according to VG95319 / 2 / Test 5.8.2

### Contacts

Contact Size			16S	20
Contact material			copper alloy	copper alloy
Gold plated: min. 0.5 μ Au over min. 2.5 μ Ni			<b>x</b>	<b>x</b>
Silver plated: min. 3.5 μ Ag			<b>o</b>	<b>o</b>
Contact mating force <sup>1)</sup>	max.	[N]	5	1.8
Contact separating force	min.	[N]	1	0.3

Electroplated contact surface: x = standard, o = on request

1) Verification according to VG95319 / 2 / Test 5.4 and 5.7

## THERMAL CHARACTERISTICS

	Module insert	Module support
Material	ethylene acrylate GXF	thermoplastic
Operating temperature	-55 to +125 °C -67 to +257 °F	-40 to +125 °C -40 to +257 °F
Fire protection class UL	UL94 V0 1)	---
Fire protection class NF	I3/F0 2)	I3/F0 2)

1) Flame retardant, halogen-free

2) According to NFF16-101/102

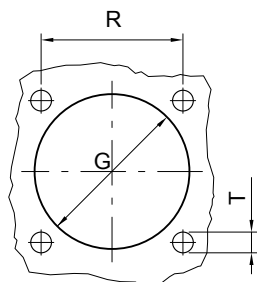
### Shell parts

1) Verification according to MIL 1344A Test 1001.1

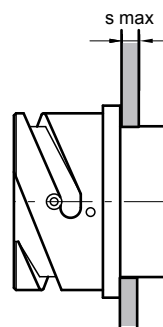
2) Verification according to MIL 1344A Test 3007

	Modular Connector Plug and Receptacle	Module
Surface treatment	epoxy-polyurethane varnished	electroless nickel
Surface code	C	E
Base material	aluminium alloy	aluminium alloy
Thickness of protective layer	13–16 μm	12 - 15 μm
Colour	black	black
Corrosion resistance 1)	500 h	48h
Operating temperature	-55 to +125 °C	-55 to +125 °C
	-67 to +257 °F	-55 to +125 °C
Electrical conductivity 2)	non-conductive	conductive

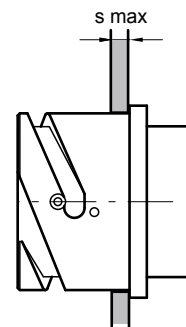
## PANEL CUT OUT SPECIFICATIONS



### Front Panel



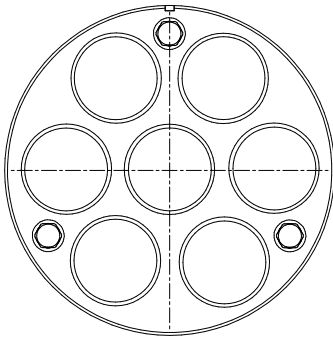
### Rear Panel



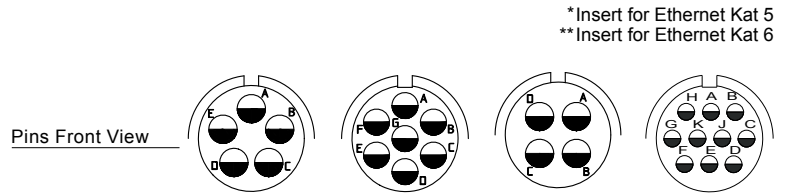
Size	R		G				T				Front panel mounting s max.		Rear panel mounting s max.	
	+/- 0.1	+/-0.004	Front Panel		Rear Panel		Flange with through holes		Flange with threaded holes		mm	inches	mm	inches
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
<b>48</b>	90.0	3.543	84.5	3.326	91.0	3.582	8.5	0.334	8.5	0.334	9.00	0.354	10.00	0.393

## MODULE HOUSING

## ELECTRICAL CONTACT INSERTS



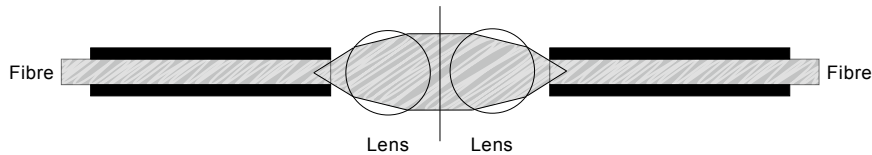
Layout	48-7
No. of Modules	7
Module Size	14.0



Layout	14S-5	14S-A7	14S-2 *	14SZ-10 **
No. of Contacts	5	7	4	10
Contacts Size	16	16	16	20
Voltage Index	INST	INST	INST	SPEC

## FIBER OPTIC EXPANDED BEAM MODULES

Fiber optic cable systems using Expanded Beam technology are physically expanding the light into an optical beam and are collimating the transmissions signal of approx. 0.5mm diameter. It is then refocused back down to the core of the receiving fiber. This concept provides ease of alignment and low sensitivity of thermal changes and contamination.



### CHARACTERISTICS

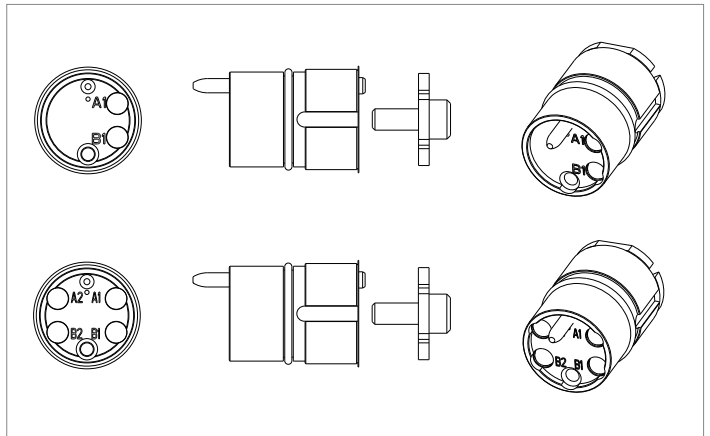
- Non-Contacting method of mating optical fibres
- No wear on fibre optic interface
- Very vibration resistant
- Easy handle, easy to clean Durable connection that is highly resistant to dirt / debris
- Low sensitivity to thermal fluctuations and interface contamination
- Available in Single or Multi-Mode
- Modules with 2 or 4 channels

### PERFORM SPECIFICATION

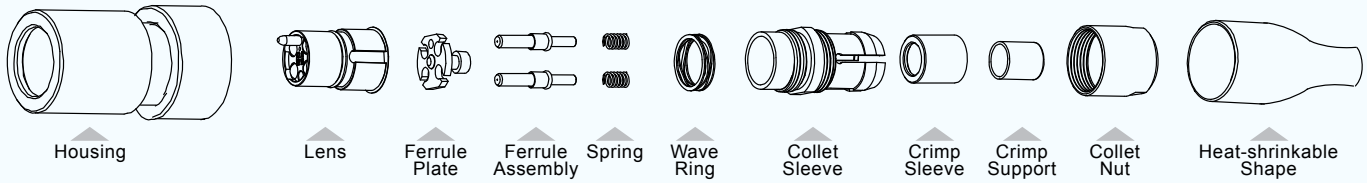
- **Optical loss multi mode:** max. 1.0 dB at 1300 nm
- **Optical loss single mode :** max. 1.0 dB at 1310 nm
- **Return loss:** 34 dB at 1310 nm or 1550 nm
- **Operation temperature:** -40°C / + 85°C [-40°F / + 185°F]

### OPTICAL FIBRE AND WAVELENGTH

Fibre typ	Wavelength	
Multimode	50/125 µm	850 nm
Multimode	50/125 µm	1300 nm
Multimode	62.5/125 µm	850 nm
Multimode	62.5/125 µm	1300 nm
Singlemode	9/125 µm	1310 nm
Singlemode	9/125 µm	1550 nm



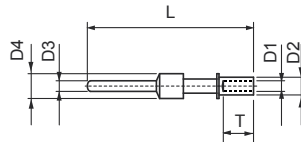
## MODULE HOUSING & CONTACT INSERTS



## PINS & SOCKET CONTACTS

Material of contacts: **Cu-Alloy** Surface of contacts: **AU** = gold plated: min. 0.5  $\mu$  over 2.5  $\mu$  Ni **AG** = silver plated: min. 3.5  $\mu$

### PINS



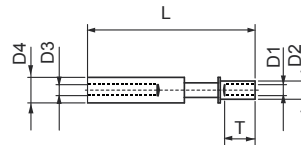
#### Dimensions in (mm)

Contact size	Conductor mm <sup>2</sup>	Stripping	D1 $\pm 0.05$	D2 $\pm 0.1$	D3 $\pm 0.05$	D4 $\pm 0.1$	T $\pm 0.5$	L $\pm 1.0$
16S	0.5	7.0	1.10	2.15	1.6	3.1	6.4	27.0
16S	0.75 - 1.5	7.0	1.75	2.62	1.6	3.1	6.4	27.0
20	0.5	4.5	1.30	1.90	1.0	2.0	4.3	20.4

#### Dimensions in (inches)

Contact size	Conductor AWG	Stripping	D1 $\pm 0.002$	D2 $\pm 0.004$	D3 $\pm 0.002$	D4 $\pm 0.004$	T $\pm 0.019$	L $\pm 0.039$
16S	20-22	0.275	0.043	0.084	0.063	0.122	0.251	1.062
16S	18-16	0.275	0.068	0.103	0.063	0.122	0.251	1.062
20	20-22	0.177	0.051	0.074	0.039	0.078	0.169	0.803

### SOCKET



#### Dimensions in (mm)

Contact size	Conductor mm <sup>2</sup>	Stripping	D1 $\pm 0.05$	D2 $\pm 0.1$	D3 $\pm 0.05$	D4 $\pm 0.1$	T $\pm 0.5$	L $\pm 1.0$
16S	0.5	7.0	1.10	2.15	1.60	3.1	6.4	27.0
16S	0.75 - 1.5	7.0	1.75	2.62	1.60	3.1	6.4	27.0
20	0.5	4.5	1.30	1.90	1.15	2.0	4.3	20.2

#### Dimensions in (inches)

Contact size	Conductor AWG	Stripping	D1 $\pm 0.002$	D2 $\pm 0.004$	D3 $\pm 0.002$	D4 $\pm 0.004$	T $\pm 0.019$	L $\pm 0.039$
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20	20-22	0.177	0.051	0.074	0.039	0.078	0.169	0.803

## CONTACTS ELECTRICAL PROPERTIES

### Contacts

Contact size			16S	20
Nominal current	continuous	[A]	13	7.5
Maximum current	short term	[A]	22	x
Test current		[A]	20	7.5
Contact resistance <sup>1)</sup>		[M $\Omega$ ]	$\leq 6$	x

<sup>1)</sup> Verification according VG95234 / 2 / Test 5.10.1 and VG95210 / 37