High-speed data transfer
Twisted pairs connectors

LEMO

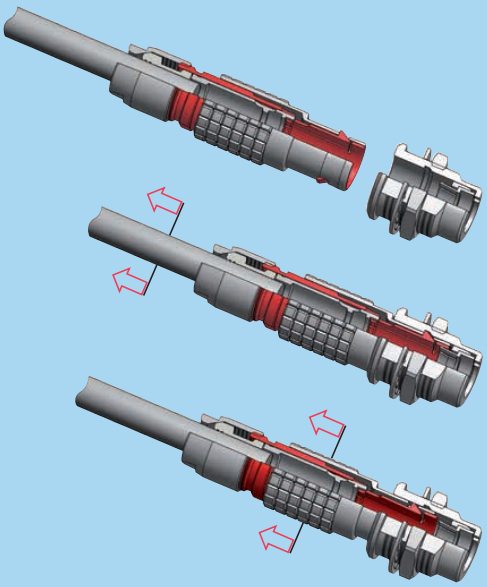
Precision modular connectors to suit your application

LEMO's Original Push-Pull connector range fulfils most specific & stringent requirements for many market segments, including but not limited to Test & Measurement, Industrial, Automotive, Semi-conductor, Medical, Aerospace & Defence. Constantly upgraded with the latest technologies since LEMO's invention of the Push-Pull connector (patented), it has been the trusted solution to build long lasting, safe and high precision interconnect solutions for more than 75 years. Its highly recognizable chocolate design pattern represents the LEMO brand and its outstanding reputation built over time for unrivalled quality and reliability.

LEMO's Original Push-Pull connector range is highly configurable and goes from ultra miniature to larger sizes, from low to high voltages, in electrical, fibre optics, fluidics or mixed configurations covering more than 90'000 combinations. It's the perfect all-rounder cost effective connector assortment built to last and protect any device it is connected to.

LEMO's Push-Pull Self-Latching Connection System

This self-latching system is renowned worldwide for its easy and quick mating and unmating features. It provides absolute security against vibration, shock or pull on the cable, and facilitates operation in a very limited space.



The LEMO self-latching system allows the connector to be mated by simply pushing the plug axially into the socket.

Once firmly latched, connection cannot be broken by pulling on the cable or any other component part other than the outer release sleeve.

When required, the connector is disengaged by a single axial pull on the outer release sleeve.
This first disengages the latches and then withdraws the plug from the socket.

UL Recognition

LEMO connectors are recognized by the Underwriters Laboratories (UL). The approval of the complete system (LEMO connector, cable and your equipment) will be easier because LEMO connectors are recognized.

CE marking

CE marking means that the appliance or equipment bearing it complies with the protection requirements of one or several European safety directives. CE marking applies to complete products or equipment, **but not to electromechanical components, such as connectors**.

REACH and RoHS

LEMO connector specifications comply with the requirements of the RoHS directive (2011/65/EU) and REACH regulation (1907/2006/EU) of the European Parliament and latest amendments. These REACH and ROHS regulations specify the restrictions of the use of hazardous substances in LEMO products marketed in Europe.

Product safety notice & disclaimers

Please read and follow all instructions specified on the last page or on our website carefully and consult all relevent national and international safety regulations for your application. Improper handling, cable assembly, or wrong use of connectors can result in hazardous situations.

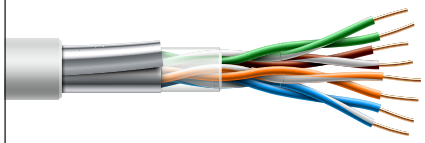
LEMO products and services are provided "as is." LEMO makes no warranties or representations with regard to LEMO product & services or use of them, express, implied or statutory, including for accuracy, completeness, or security.

In no event shall LEMO be liable for any direct, indirect, punitive, incidental, special consequential damages, to property or life, whatsoever arising out of or connected with the use or misuse of LEMO's products.

High-speed data transfer introduction

Equipped with more and more sensors, objects, vehicles and machines are more and more communicating with each other and with the outside world thanks to the emergence of the Internet of Things (IoT). The reliable transfer of more and more data in the shortest possible time is becoming increasingly important.

High-speed data transfer can be achieved with different cable technologies, mainly twisted pairs ①, coaxial ② and fibre optic ③ cables. Environmental conditions, distance, cost and application are key decision criteria to select the appropriate cable technology; twisted pairs being by far the most commonly used one.

① 

Twisted pair cables

② 

Coaxial cables

③ 

Fibre optic cables

Data protocols such as Ethernet, USB, are providing the normative framework defining key parameters of the data transmission channel (e.g. Insertion Loss, Return Loss, Crosstalk, Noise). Specific limits to theses parameters are defined for each element / component of a transmission line (connector, cable, cable lengths etc...). This ultimately ensures that, when parameters are respected, the transmission line can perform to its maximum specified data transfer speed (in Mb/s or Gb/s).

Over time connector designs have been standardized for each data transmission protocol (e.g. RJ45, USB 2.0 Type A, etc.). These standard connectors are widely used in many applications but are often not robust and durable enough when subjected to demanding conditions. LEMO recognized this gap and developed specific inserts matching the electrical parameters required by the various high-speed norms, while leveraging its high quality and environmental resistant optimized housing designs.

Over the years data transfer protocols have continually progressed in speed, security and quality to meet evolving network requirements. LEMO has been providing reliable high-speed proprietary connectors for twisted pairs since early 2000s complying with the various evolutions of both Ethernet and USB protocols. Many of these connectors are included in this catalogue, but LEMO is also providing custom high-speed solutions, combining high-speed data transfer with other signal or power requirements. LEMO also has a broad range of connectors for coaxial and fiber optics cables, though not included in this catalogue.

Cable assembly High-speed

While connectors are playing a key role in securing data integrity and transfer speed, related cables also must comply to the same protocols, and last but not least cable assembly have to be properly executed. Interconnect solutions should then be tested and certified to guarantee full compliancy. LEMO is fully equipped to perform all these steps including performance testing and can thus provide full end to end solutions.

LEMO High-speed data transfer connectors

	USB		
	USB 3.1	USB 2.0	
	542 	304 	U2A 
Series	B, K, T	B, K, T, W	M
Sizes	2	0 & 1	L
Insert configuration	Proprietary interface	Proprietary interface	Type A
Maximum data transfer speed	10 Gb/s	480 Mb/s	
Contacts	2 SuperSpeed pairs	–	
	1 High speed pair	1 High speed pair	
	2 Low Voltage	2 Low Voltage	

	Ethernet				
	10G Base-T4	1000 Base-T4		1000 Base-T1	
	514 	308 	514 	511 (SPE) 	512 (2x SPE) 
Series	B, K, T, W	B, T	M	B, T	
Sizes	2	1	2	0	1
IEEE standard	IEEE 802.3an	IEEE 802.3ab		IEEE 802.3bp	
Maximum data transfer speed	10 Gb/s	1 Gb/s		1 Gb/s	
Number of twisted pairs	4	4		1	2
Cable category	CAT 6A	CAT 5e	CAT 6	CAT 5e	

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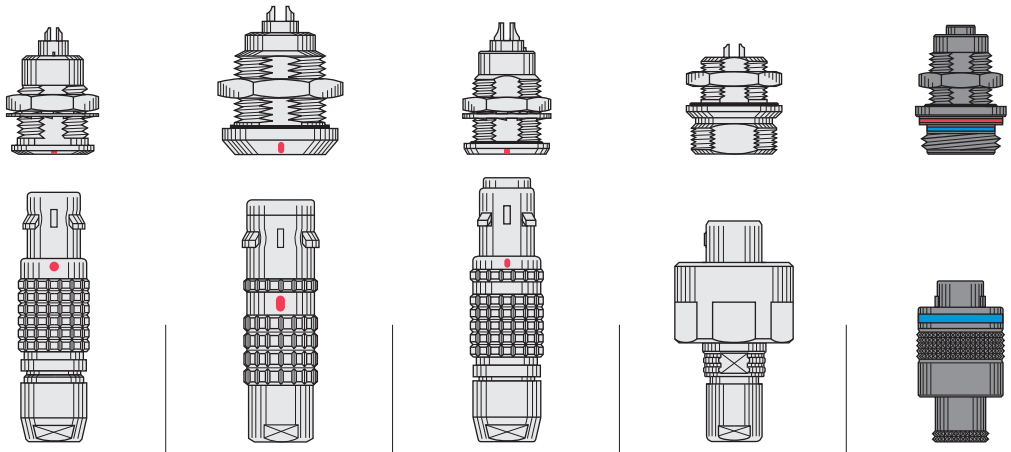
Technical characteristics



Series	B			K			T			W			M		
Sizes	0	1	2	0	1	2	0	1	2	0	1	2	2	L	
Plug ø (mm)	9.5	12.0	15.0	11.0	13.0	16.0	9.5	12.0	15.0	17.2	19.3	23.5	18.9	29.4	
Socket ø (mm)	12.5	16.0	20.0	18.0	20.0	25.0	12.0	16.0	20.0	16.2	19.5	22.5	17.2	28.0	
Shell material	Stainless steel or brass												Aluminium or brass		
Shell plating	Chrome or black chrome									Chrome			Antracite nickel or chrome		
Insulator material	PEEK / FEP														
Male contact material	Brass (UNS C 34500 or 38500)														
Female contact material	Bronze (UNS C 54400) or Cu-Be (Fs QQ-C-530)														
Locking mechanism	Push-Pull									Screw locking			Ratchet 3/4 turn locking		
Mating cycles	> 5000						> 3000			> 1000			> 3000		
Operating temperatures (Standard)	-55°C to 250°C			-55°C to 200°C						-20°C to 200°C			-55°C to 200°C		
Operating temperature (Watertight or vacuumtight)	-20°C to 80°C												-20°C to 80°C		
Ingress protection (mated)	IP50 (vacuum. socket avail.)			IP66 to IP68						IP68 30 bars			IP68		
Environment	Indoor			Outdoor or harsh environment											

Electrical performance

Characteristics	B Series	K Series	T Series	W Series	M Series
Data protocols / Standard	USB 2.0 / USB 3.1 / Eth Cat6a / SPE				USB 2.0 / Eth Cat6
Test voltage / Rated current	See tables pages 7, 11, 13, 17, 22, 24 and 29				

Note: to take advantage of the increased bandwidth the data protocols provide, all components must be compatible with the respective data protocol. The bandwidth performance is determined by the lowest rated component, i.e. wiring an Ethernet 10000 Base T4 connector to a CAT 5 cable will only provide a data speed of 1 Gb/s.

For more detailed technical characteristics, please contact LEMO or refer to the following catalogues:

- https://www.lemo.com/catalog/ROW/UK_English/unipole_multipole.pdf
- https://www.lemo.com/catalog/ROW/UK_English/T_series_en.pdf
- https://www.lemo.com/catalog/ROW/UK_English/W_series_en.pdf
- https://www.lemo.com/catalog/ROW/UK_English/M_series.pdf

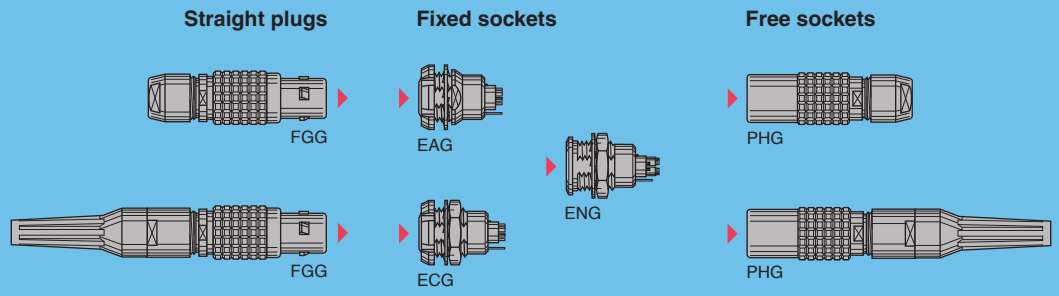
High-speed USB 3.1 (10 Gb/s) (542)

LEMO's USB 3.1 connectors are meeting the stringent requirements of the USB protocol for High-speed data transfer up to 10 Gb/s. These products are specifically designed to work in demanding environments (e.g. extreme temperature, high humidity, vibration) for applications such as industry, food processing, industrial automation, technical equipment in buildings, data communication, defence and instrumentation.

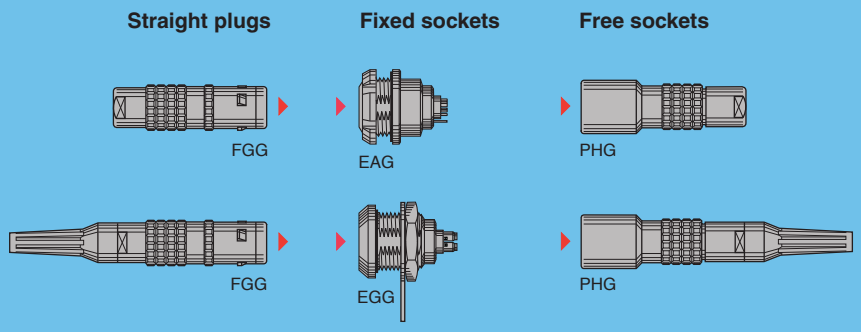
While using a proprietary interface guaranteeing high quality signal within a very robust casing, the LEMO connectors can be used in conjunction with standard USB type interfaces (e.g. Type-C) in a cable assembly.

This new USB 3.1 contact configuration can be built into various LEMO product lines with metal housing, including B Series, K Series and T Series.

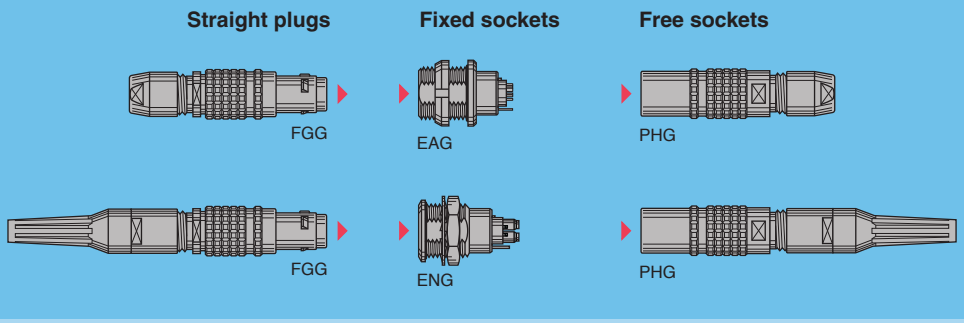
2B Series models



2K Series models



2T Series models

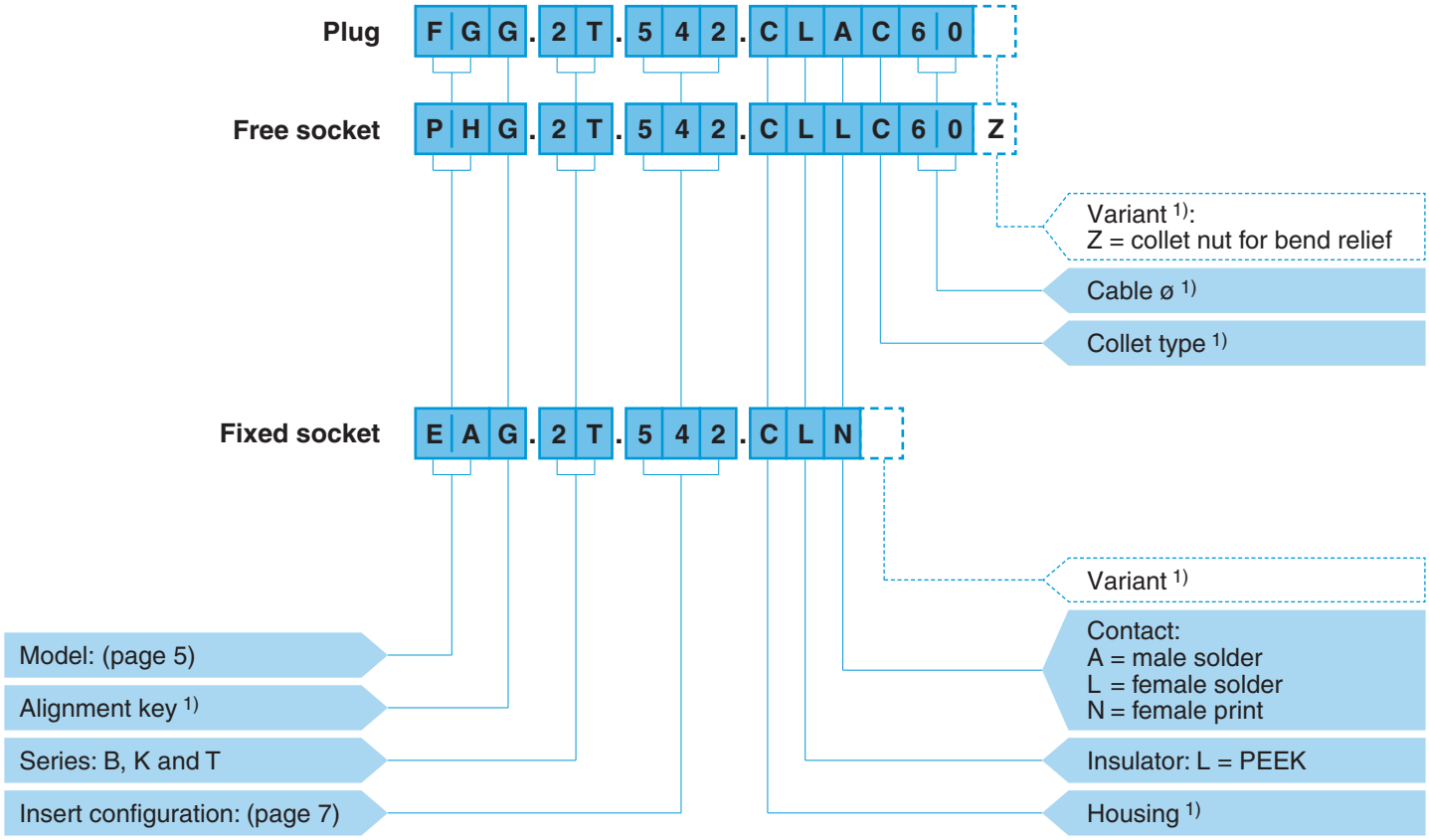


Model Description

EAG Fixed socket with earthing tag, nut fixing, key (G) (back panel mounting)
ECG Fixed socket with two nuts, key (G) (back panel mounting)
EGG Fixed socket with earthing washer, nut fixing, key (G)
ENG Fixed socket with earthing tag, nut fixing, key (G)
FGG Straight plug, key (G), cable collet
FGG Straight plug, key (G), cable collet and nut for fitting a bend relief
PHG Free socket, key (G), cable collet
PHG Free socket, key (G), cable collet and nut for fitting a bend relief

Note: for others models please reach out to LEMO. Print contact are highly recommended to limit risk of signal deterioration.
See Unipole-Multipole and T series catalogues for connectors dimensions.

Part Numbering System (e.g. 2T series)



FGG.2T.542.CLAC60 = straight plug with key (G) and cable collet, 2T Series, USB 3.1 type, outer shell in chrome-plated brass, PEEK insulator, male solder contacts, C type collet for 6.0 mm diameter cable.

PHG.2T.542.CLLC60Z = free socket with key (G) and cable collet, 2T Series, USB 3.1 type, outer shell in chrome-plated brass, PEEK insulator, female solder contacts, C type collet for 6.0 mm diameter cable and nut for fitting a bend relief.

EAG.2T.542.CLN = fixed socket, nut fixing, with key (G), 2T Series, USB 3.1 type, outer shell in chrome-plated brass, PEEK insulator, female print contacts.

Note: 1) see Unipole-Multipole and T series catalogues for alternatives.

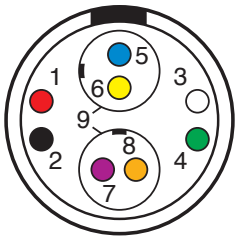
Insert configuration

5 4 2

USB 3.1

Male solder contacts	Female solder contacts	Reference	Series	A ø (mm)	AWG Solder (max.)	Solder	Print	Test voltage (kV DC)[1] Contact-contact	Test voltage (kV DC)[2] Contact-shell	Rated current (A)[1] [3]
		**542**	2B-2K-2T	0.5	22	●	●	0.35	0.7	5

Note: USB 3.1 insulators can be built into the 2B, 2K and 2T (IP68) Series.
[1] see calculation method, caution and suggested standard on unipole-multipole catalogue.
[2] test voltage (kV) contact-shell is slightly lower for T series (values here are for B series).
[3] rated current for contacts 1 & 2.

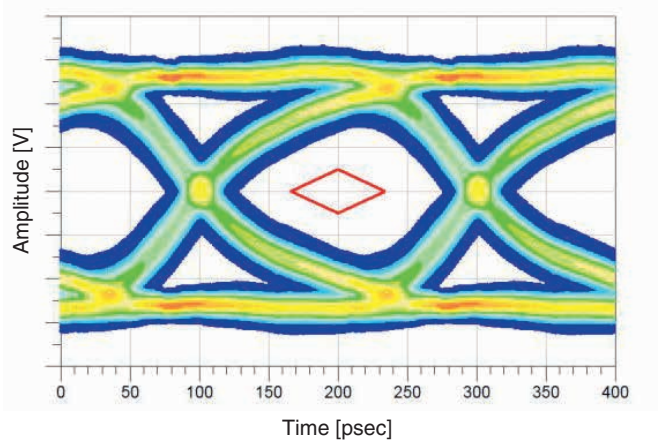


USB Signal name

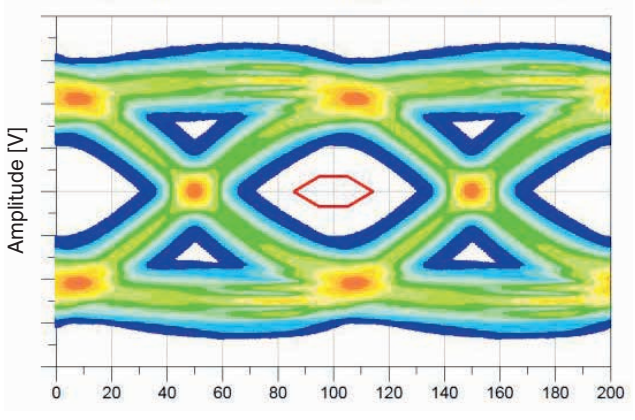
1) Vbus 5V (PWR)
2) Vbus GND
3) USB 2.0 D-
4) USB 2.0 D+
5) SS TX-
6) SS TX+
7) SS RX-
8) SS RX+
9) SS Drain/Shield

Compliance and signal quality of USB 3.1 LEMO connectors

The eye diagram generated by the superposition of several traces of the signal allows to quickly:
• Validate signal quality
• Measure noise and distortion (eye opening)
• And synchronization efficiency

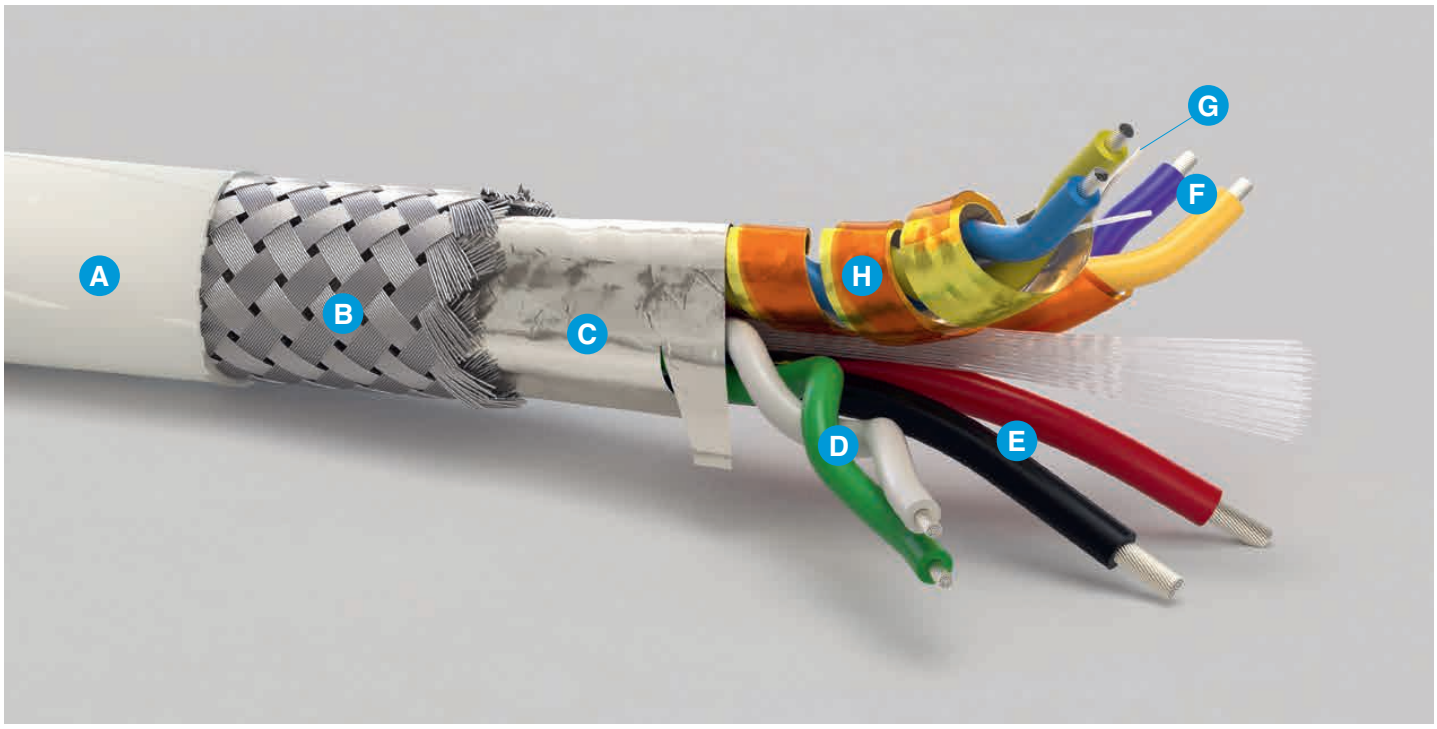


LEMO USB 3.1 Gen.1 compliant with data transfert speed 5 Gb/s



LEMO USB 3.1 Gen.1 compliant with data transfert speed 10 Gb/s corresponding to a USB 3.1 gen.2

Cable construction and recommended cable



A: Jacket
B: Braided shield
C: Cable foil shield
D: High-speed wires (2x)
E: Low voltage wires (PWR + GND)
F: SuperSpeed wires (4x)
G: Drain wire (2x)
H: SuperSpeed wires foil shield (mandatory)

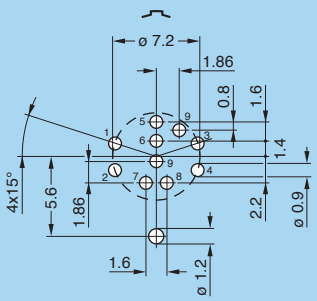
Recommended USB cable: PIC USB3-2624 (PTFE jacket) of PIC Wire & Cable

The LEMO proprietary interface is compliant with the Universal Serial Bus specification 3.1 and can be used for 10 Gb/s applications with cables up to 1.5 m.
To take advantage of the increased bandwidth the data protocols provide; all components must be compatible with the respective data protocol. The bandwidth performance is determined by the lowest rated component, i.e. wiring a USB 3.1 connector to a USB 2.0 cable will only give USB 2.0 speeds.
Connector assembly and installation should only be carried out by properly trained personnel. Proper tools must be used during installation and / or assembly in order to obtain safe and reliable performance. LEMO is specialized in cable assemblies and is available to provide wired and certified solutions. Please don't hesitate to contact us for quotes.

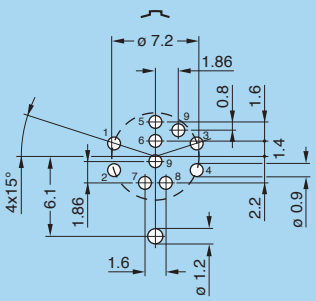
PCB drilling pattern

Fixed socket with straight print contact

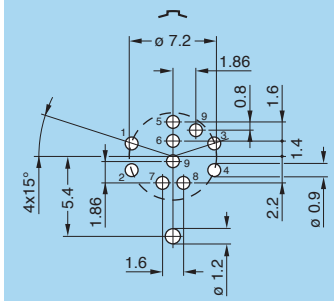
2B.542 (EA●+ EC●)



2K.542 (EA●)



2T.542 (EA●)

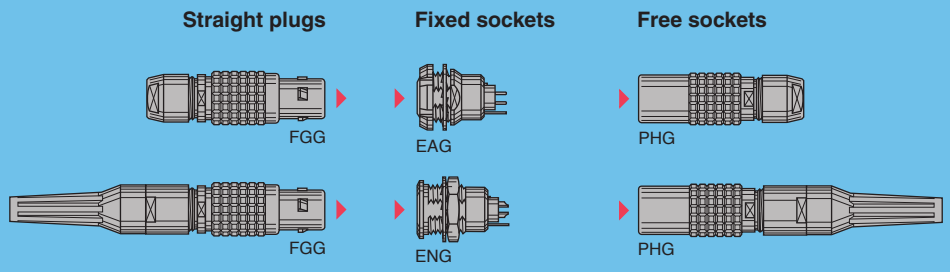


Note: contact numbering is for female contact version only.

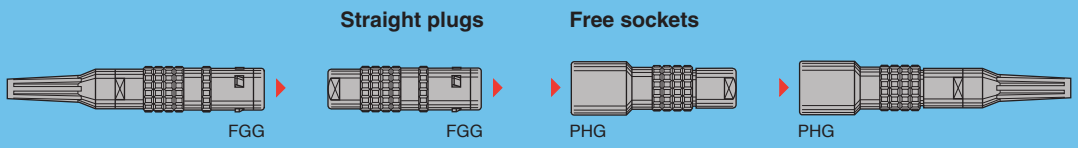
High-speed USB 2.0 (480 Mb/s) (304)

Each protocol requires a specific design rules for the connector. For instance, the LEMO connectors have a specific insert configurations that deliver USB 2.0 speeds (up to 480 Mb/s). The proprietary 4 pins interface allow to reduce the size of the physical connector while delivering the data speed demanded by several markets.

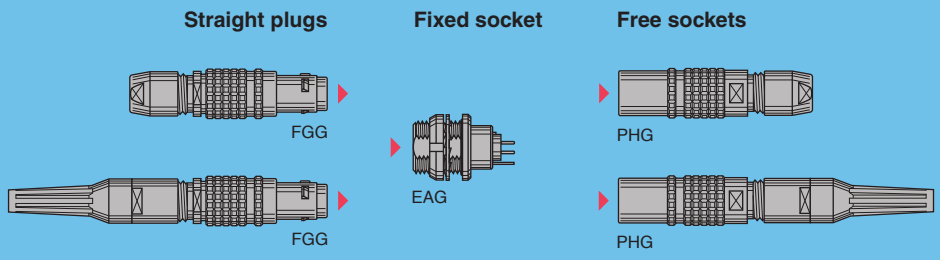
0B-1B Series models



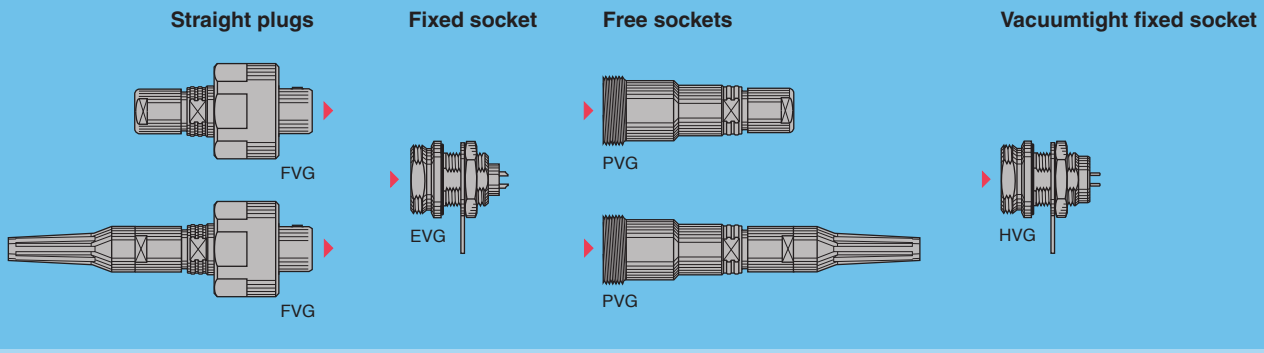
0K-1K Series models



0T-1T Series models



0W-1W Series models

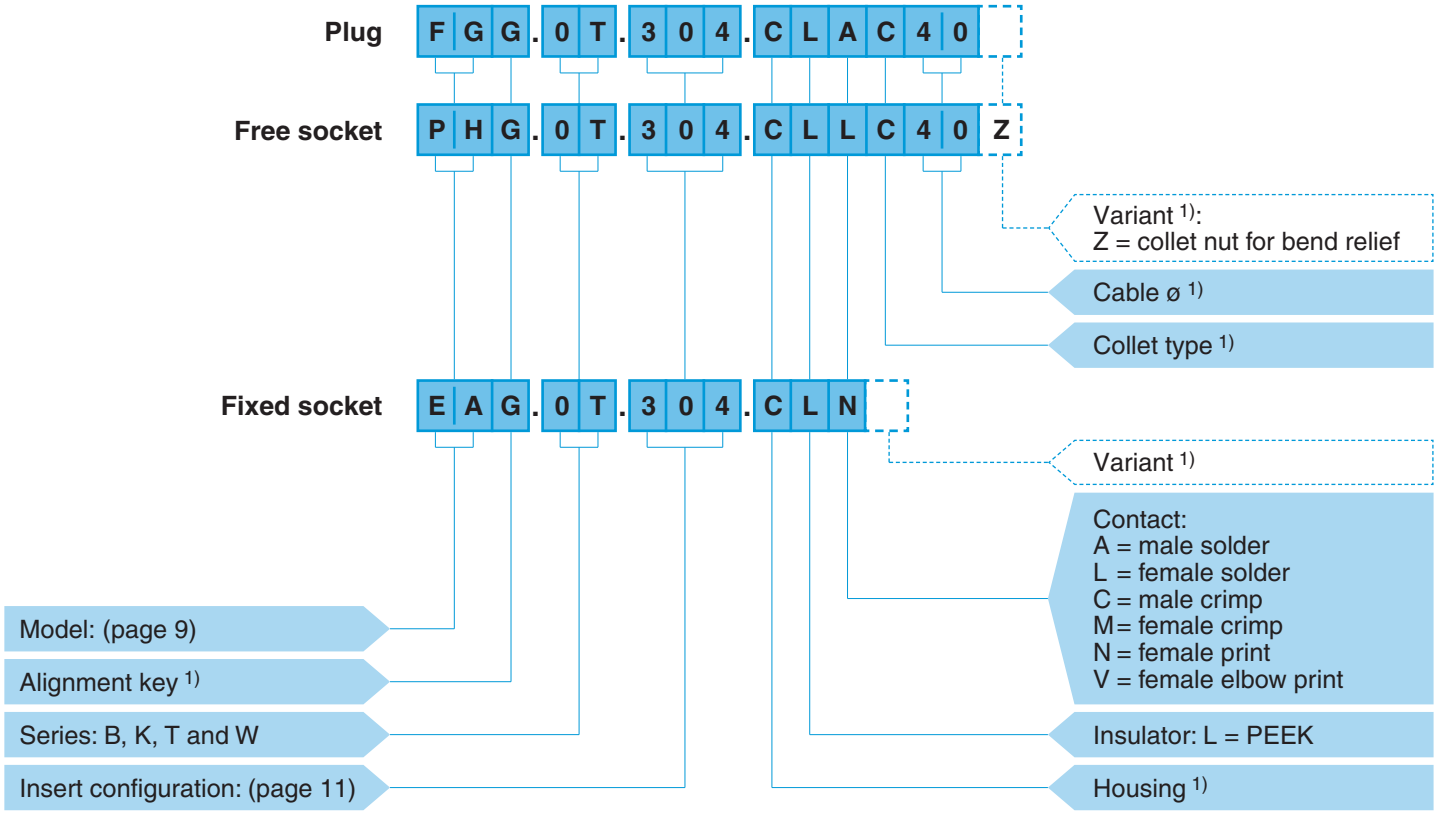


Model Description

EAG Fixed socket with earthing tag, nut fixing, key (G) (back panel mounting)
ENG Fixed socket with earthing tag, nut fixing, key (G)
EVG Fixed socket with earthing washer, nut fixing, key (G)
FGG Straight plug, key (G), cable collet
FGG Straight plug, key (G), cable collet and nut for fitting a bend relief
FVG Straight plug, key (G), cable collet
FVG Straight plug, key (G), cable collet and nut for fitting a bend relief
HVG Fixed socket with earthing washer, nut fixing, key (G), vacuumtight
PHG Free socket, key (G), cable collet
PHG Free socket, key (G), cable collet and nut for fitting a bend relief
PVG Free socket, key (G), cable collet
PVG Free socket, key (G), cable collet and nut for fitting a bend relief

Note: for others models please reach out to LEMO. Print contact are highly recommended to limit risk of signal deterioration.
See Unipole-Multipole, T series and W series catalogues for connectors dimensions.

Part Numbering System (e.g. 0T series)



FGG.0T.304.CLAC40 = straight plug with key (G) and cable collet, 0T Series, USB 2.0 type, outer shell in chrome-plated brass, PEEK insulator, male solder contacts, C type collet for 4.0 mm diameter cable.

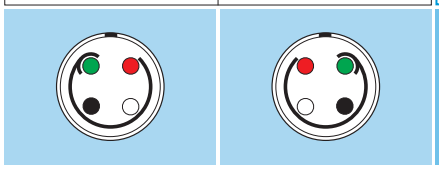
PHG.0T.304.CLLC40Z = free socket with key (G) and cable collet, 0T Series, USB 2.0 type, outer shell in chrome-plated brass, PEEK insulator, female solder contacts, C type collet for 4.0 mm diameter cable and nut for fitting a bend relief.

EAG.0T.304.CLN = fixed socket, nut fixing, with key (G), 0T Series, USB 2.0 type, outer shell in chrome-plated brass, PEEK insulator, female print contacts.

Note: 1) see Unipole-Multipole, T series and W series catalogues for alternatives.

Insert configuration

USB 2.0

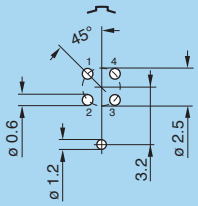
Solder contacts / Crimp contacts	Reference	Series	Contact ø (mm)	Contact type: Solder	Contact type: Crimp	Contact type: Print (straight)	Contact type: Print (elbow)	AWG: Solder (max.)	AWG: Crimp min.	AWG: Crimp max.	Solder contact: Test voltage (kV DC)[1] Contact-contact	Solder contact: Test voltage (kV DC)[2] Contact-shell	Crimp contact: Test voltage (kV DC)[1] Contact-contact	Crimp contact: Test voltage (kV DC)[2] Contact-shell	Rated current (A)[1]
	304	0B-0K 0T-0W	0.7	●	●	●	●	22	32	22	0.60	0.49	0.95	0.78	7.0
		1B-1K 1T-1W	0.9	●	●	●	●	22	32	20	0.95	1.02	1.20	1.27	10.0

Note:
[1] see calculation method, caution and suggested standard on unipole-multipole catalogue.
[2] test voltage (kV) contact-shell is slightly lower for T series (values here are for B series).

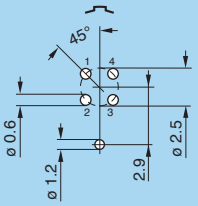
PCB drilling pattern

Fixed socket with straight print contact

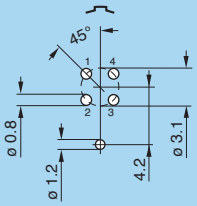
0B.304 (EA●)



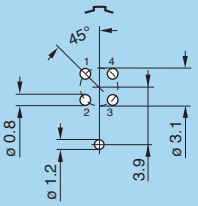
0T.304 (EA●)



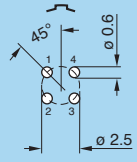
1B.304 (EA●)



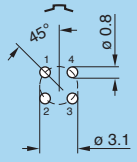
1T.304 (EA●)



0W.304 (HV●)



1W.304 (HV●)

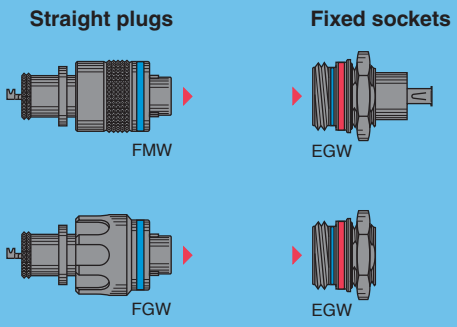


Note: contact numbering is for female contact version only.

High-speed USB 2.0 (480 Mb/s) (U2A)

A USB type A connector encapsulated into a ratchet coupling M series product offers a robust solution for harsh environments meeting the IP68 rating when mated.
This connector is designed for outdoor utilization in Defense, Oil & Gas or Automotive industries to name a few, essential applications requiring a standard USB interface in a protective casing. The complete product line includes straight plugs, panel mounted sockets and watertight caps.

LM Series models



Model Description

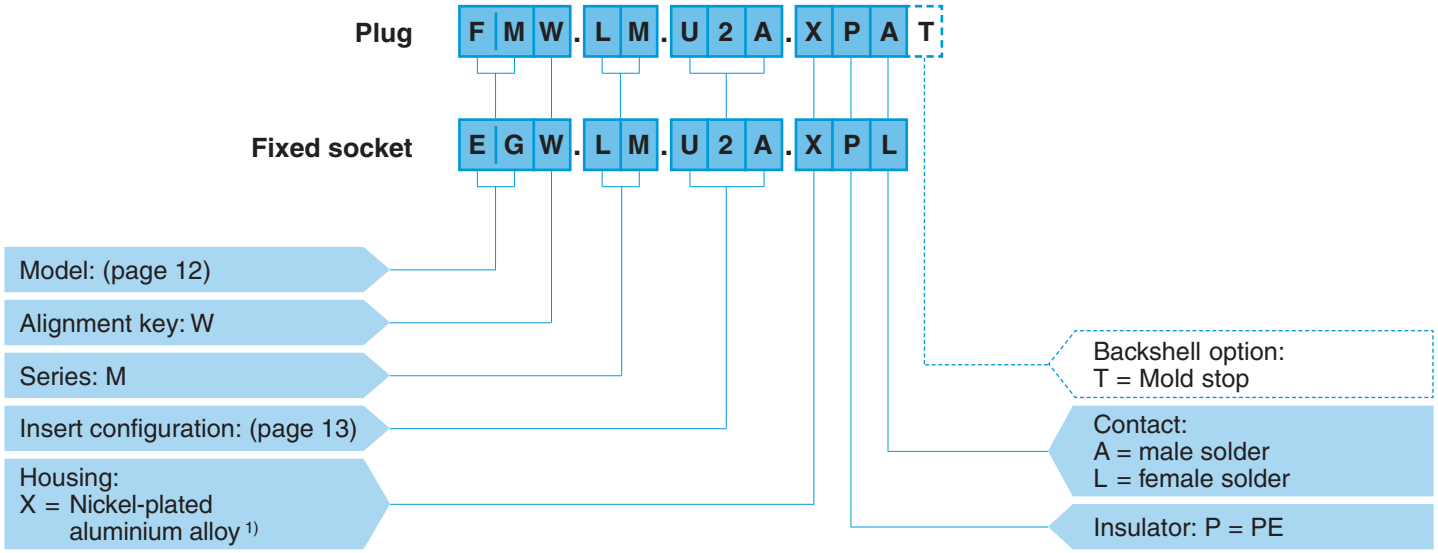
EGW Fixed socket, female to female, nut fixing, key (W)
EGW Fixed socket, nut fixing, key (W)

FMW Straight plug, key (W) with knurled grip and mold stop

FGW Straight plug, key (W) with arctic grip and mold stop

Note: for others models please reach out to LEMO. Print contact are highly recommended to limit risk of signal deterioration.
See M series catalogue for connectors dimensions.

Part Numbering System (LM series)



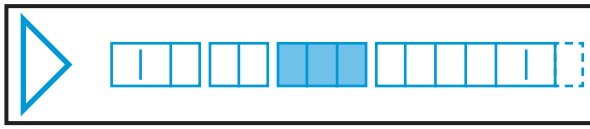
FMW.LM.U2A.XPAT = straight plug with key (W), LM series, USB 2.0 type, outer shell in anthracite nickel-plated aluminium alloy, male insert, with knurled grip and mold stop.

FGW.LM.U2A.XPAT = straight plug with key (W), LM series, USB 2.0 type, outer shell in anthracite nickel-plated aluminium alloy, male insert, with arctic grip and mold stop.

EGW.LM.U2A.XPP = fixed socket, nut fixing, with key (W), LM series, USB 2.0 type, outer shell in anthracite nickel-plated aluminium alloy, female to female insert.

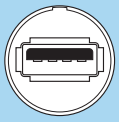
EGW.LM.U2A.XPL = fixed socket, nut fixing, with key (W), LM series, USB 2.0 type, outer shell in anthracite nickel-plated aluminium alloy, female insert.

Note: 1) anthracite colour / 48 hours salt fog resistance.



Insert configuration

USB 2.0

Male insert front view	Female insert front view	Reference	Series	Number of contacts	Solder contact	Test voltage (kV DC)[1] Contact-contact	Test voltage (kV DC)[1] Contact-shell	Rated current (A)
		**U2A**	LM	4	●	0.85	0.67	n.a.

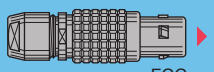
Note: 1) test voltage according to IEC 60512-2 test 4a. Altitude correction factor is given in IEC 60664-1 table A.2.

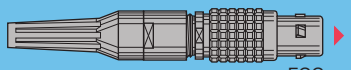
Ethernet 10G Base-T4 (514)

The Ethernet 10G Base-T4 protocol (IEEE 802.3an standard), allows High-speed data traffic over 4 pairs cable harnesses up to 10 Gb/s.

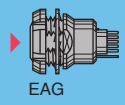
2B Series models

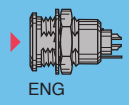
Straight plugs



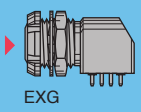


Fixed sockets

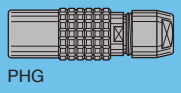


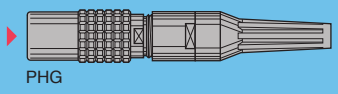


Elbow socket

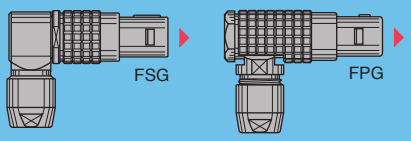


Free sockets

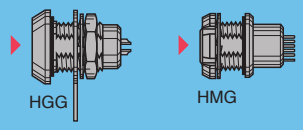




Elbow plugs

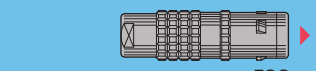


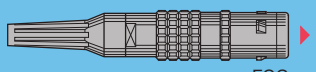
Watertight or vacuumtight fixed sockets



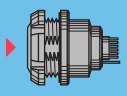
2K Series models

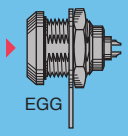
Straight plugs



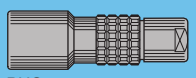


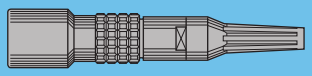
Fixed sockets



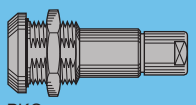


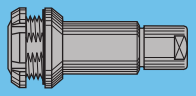
Free sockets



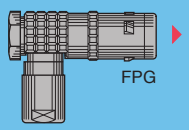


Fixed sockets

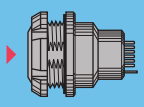




Elbow plug



Watertight or vacuumtight fixed socket



Model Description

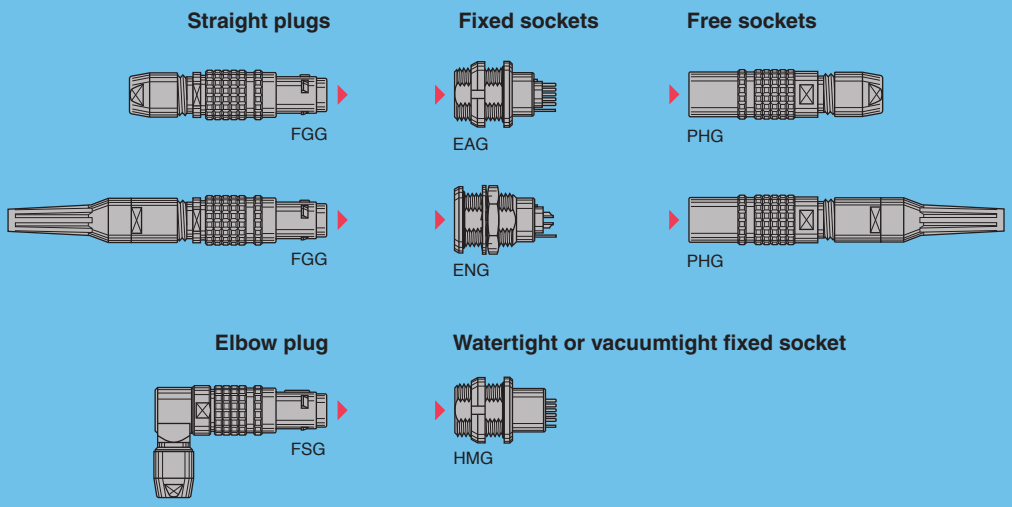
EAG Fixed socket with earthing tag, nut fixing, key (G) (back panel mounting)
EGG Fixed socket with earthing washer, nut fixing, key (G)
ENG Fixed socket with earthing tag, nut fixing, key (G)
EXG Elbow (90°) socket for printed circuit with two nuts, key (G)
FGG Straight plug, key (G), cable collet
FGG Straight plug, key (G), cable collet and nut for fitting a bend relief
FPG Elbow (90°) plug, key (G), cable collet
FSG Anglissimo right angle plug, key (G), cable collet
HGG Fixed socket with earthing washer, nut fixing, key (G), watertight or vacuumtight
HMG Fixed socket with earthing tag, nut fixing, key (G), watertight or vacuumtight
PEG Fixed socket, nut fixing, key (G), cable collet (back panel mounting)
PHG Free socket, key (G), cable collet
PHG Free socket, key (G), cable collet and nut for fitting a bend relief
PKG Fixed socket, nut fixing, key (G), cable collet

Note: for others models please reach out to LEMO. Print contact are highly recommended to limit risk of signal deterioration.
See Unipole-Multipole catalogue for connectors dimensions.

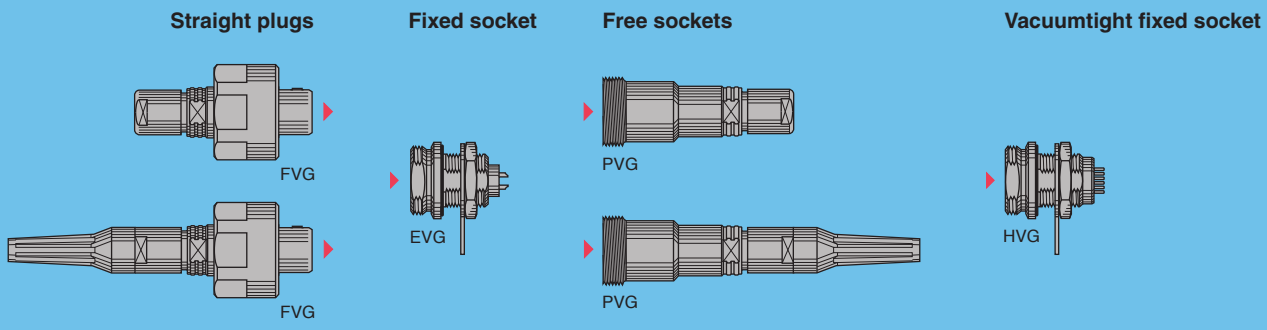
Ethernet 10G Base-T4 (514)

The Ethernet 10G Base-T4 protocol (IEEE 802.3an standard), allows High-speed data traffic over 4 pairs cable harnesses up to 10 Gb/s.

2T Series models



2W Series models

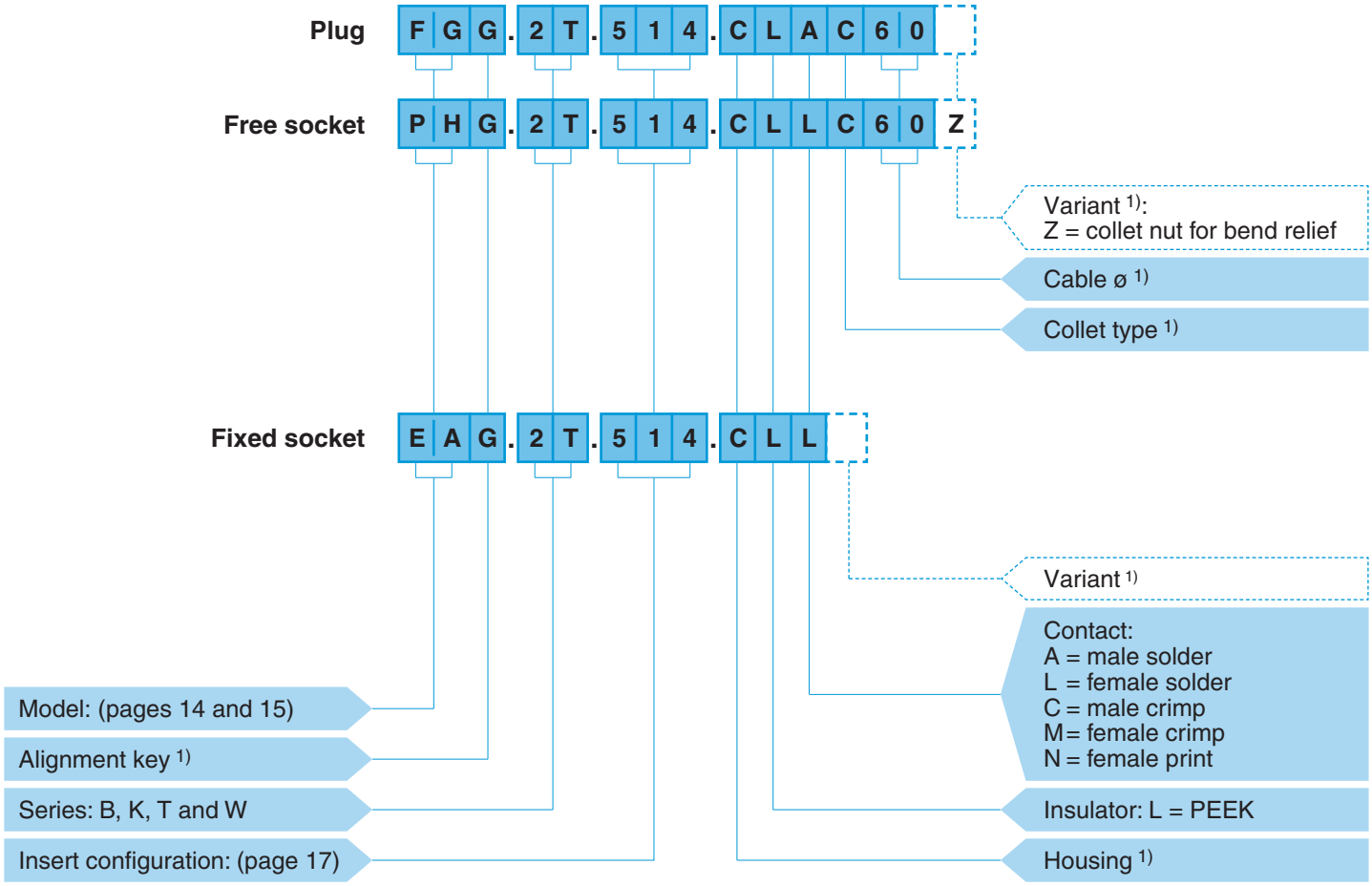


Model Description

EAG Fixed socket with earthing tag, nut fixing, key (G) (back panel mounting)
ENG Fixed socket with earthing tag, nut fixing, key (G)
EVG Fixed socket with earthing washer, nut fixing, key (G)
FGG Straight plug, key (G), cable collet
FGG Straight plug, key (G), cable collet and nut for fitting a bend relief
FSG Anglissimo right angle plug, key (G), cable collet
FVG Straight plug, key (G), cable collet
FVG Straight plug, key (G), cable collet and nut for fitting a bend relief
HMG Fixed socket with earthing tag, nut fixing, key (G), watertight or vacuumtight
HVG Fixed socket with earthing washer, nut fixing, key (G), vacuumtight
PHG Free socket, key (G), cable collet
PHG Free socket, key (G), cable collet and nut for fitting a bend relief
PVG Free socket, key (G), cable collet
PVG Free socket, key (G), cable collet and nut for fitting a bend relief

Note: for others models please reach out to LEMO. Print contact are highly recommended to limit risk of signal deterioration.
See T series and W series catalogues for connectors dimensions.

Part Numbering System (e.g. 2T series)

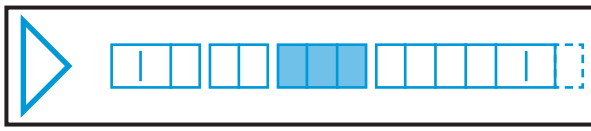


FGG.2T.514.CLAC60 = straight plug with key (G) and cable collet, 2T Series, Ethernet type, outer shell in chrome-plated brass, PEEK insulator, male solder contacts, C type collet for 6.0 mm diameter cable.

PHG.2T.514.CLLC60Z = free socket with key (G) and cable collet, 2T Series, Ethernet type, outer shell in chrome-plated brass, PEEK insulator, female solder contacts, C type collet for 6.0 mm diameter cable and nut for fitting a bend relief.

EAG.2T.514.CLL = fixed socket, nut fixing, with key (G), 2T Series, Ethernet type, outer shell in chrome-plated brass, PEEK insulator, female solder contacts.

Note: 1) see T series and W series catalogues for alternatives.

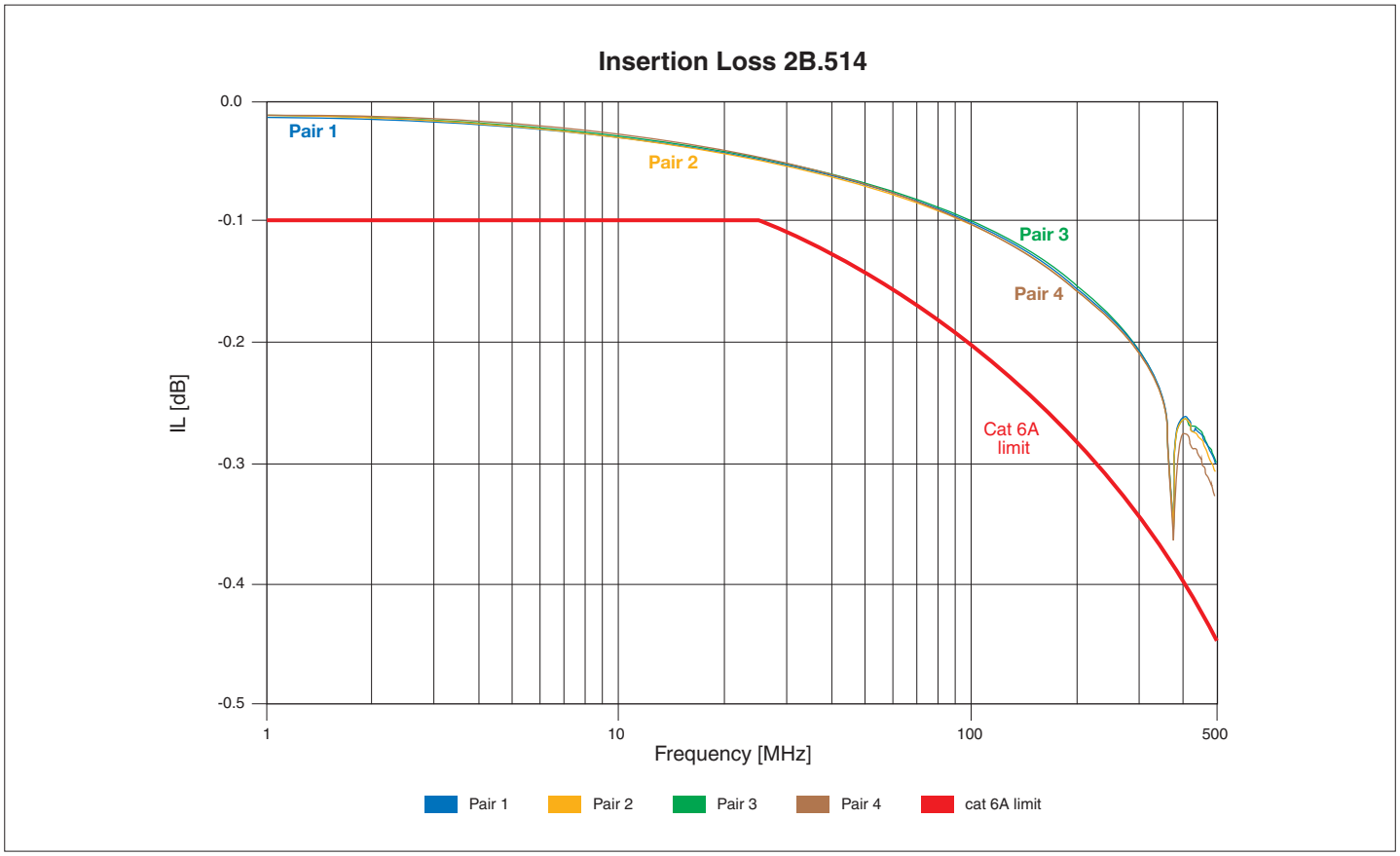


Insert configuration

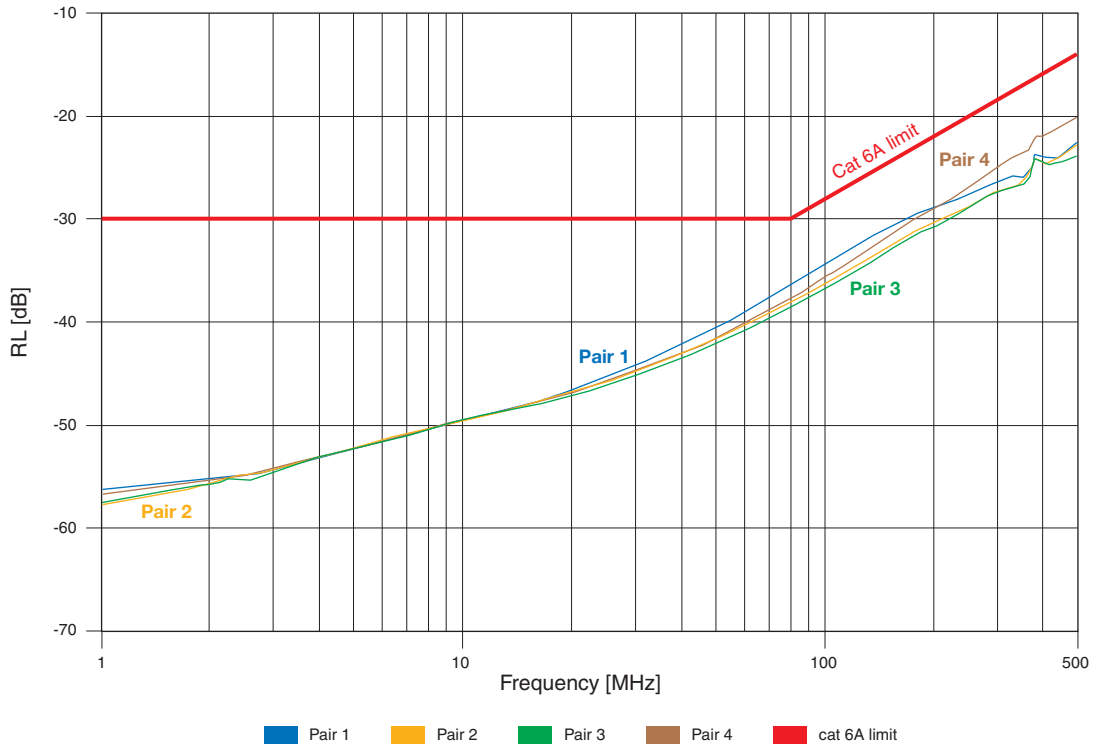
Ethernet

Male crimp contacts	Female crimp contacts	Reference	Series	Number of contacts	Contact ø (mm)	Solder	Crimp	Print	Test voltage (kV DC)[1] Contact-contact	Test voltage (kV DC)[2] Contact-shell	Rated current (A)[1]
		**514**	2B-2K 2T-2W	8	0.7	●	●	●	1.13	1.06	5

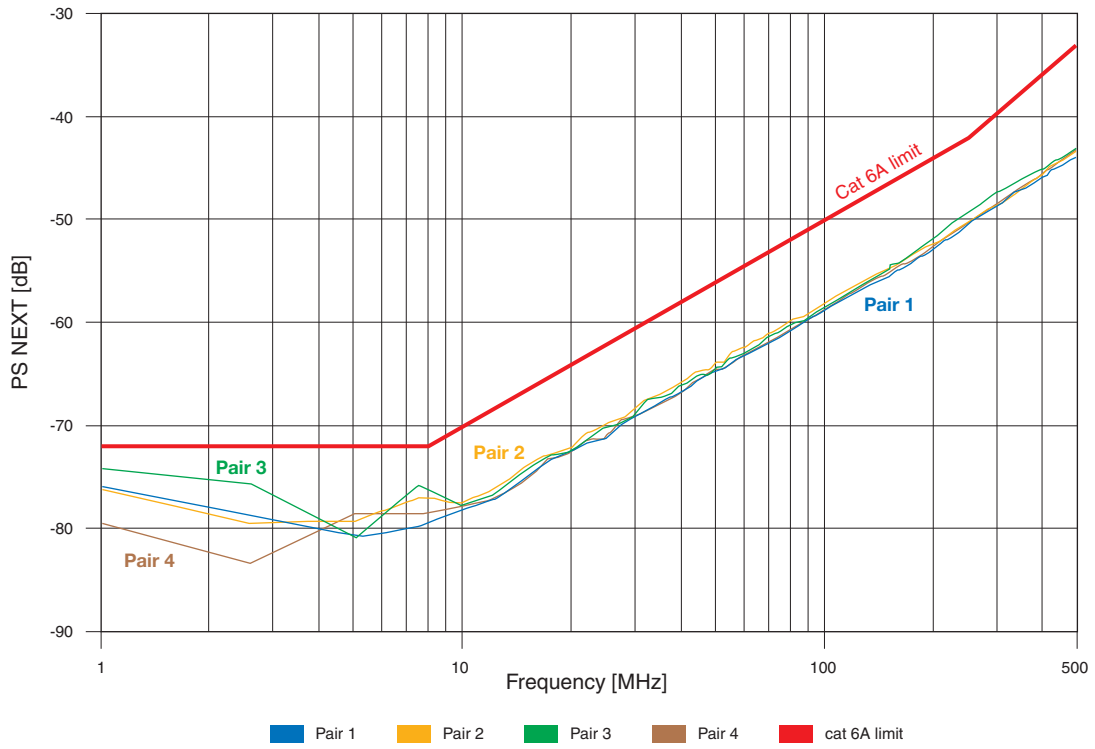
Note: [1] see calculation method, caution and suggested standard on unipole-multipole catalogue.
[2] test voltage (kV) contact-shell is slightly lower for T series (values here are for B series).



Return Loss 2B.514



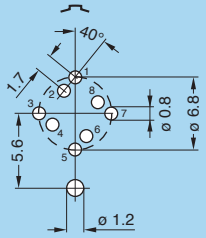
Power Sum Next (PS NEXT) 2B.514



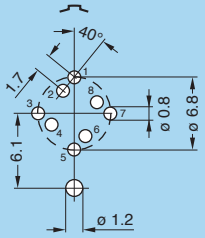
PCB drilling pattern

Fixed socket with straight print contact

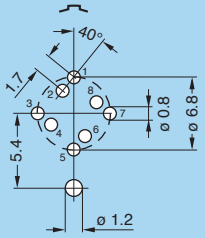
2B.514 (EA●+ HM●)



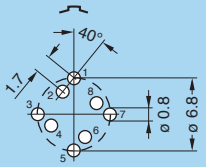
2K.514 (EA●+ HM●)



2T.514 (EA●+ HM●)

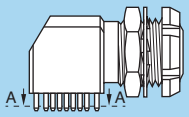


2W.514 (HV●)

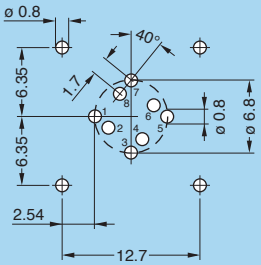


Note: contact numbering is for female contact version only.

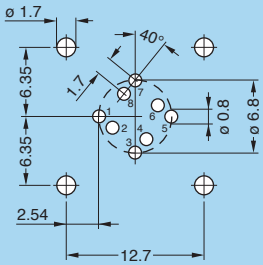
Elbow socket (90°) for printed circuit



EX●.2B.514 (solder mount)



EX●. 2B.514 (screw mount) (harpoon)

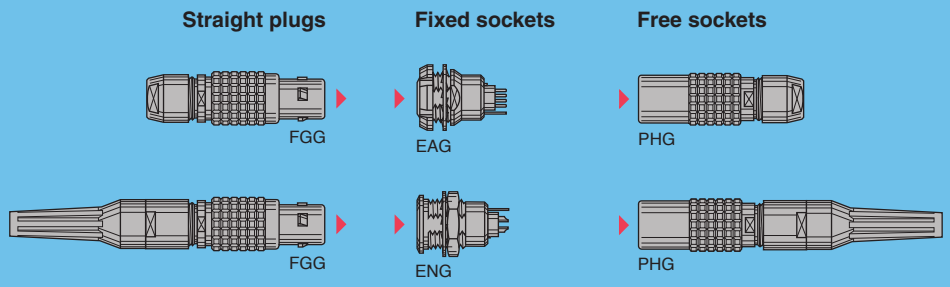


Note: contact numbering is for female contact version only.

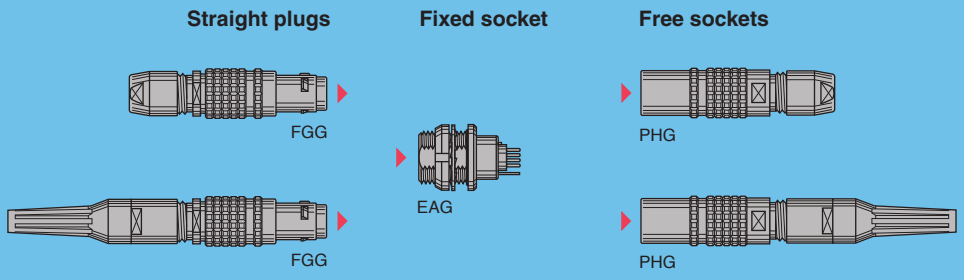
Ethernet 1000 Base-T4 (308)

Push-Pull Ethernet 1000 Base-T4 connectors (protocol IEEE 802.3ab) enable High-speed data traffic over 4 wire pairs cable harnesses up to 1 Gb/s. They are designed to operate with CAT 5e cables. Each of the four pairs supports an effective data rate of 250 Mb/s in each direction simultaneously. In addition to the well-known latching system, the proprietary interface makes them safer and lasting longer mating cycles.

1B Series models



1T Series models



Model Description

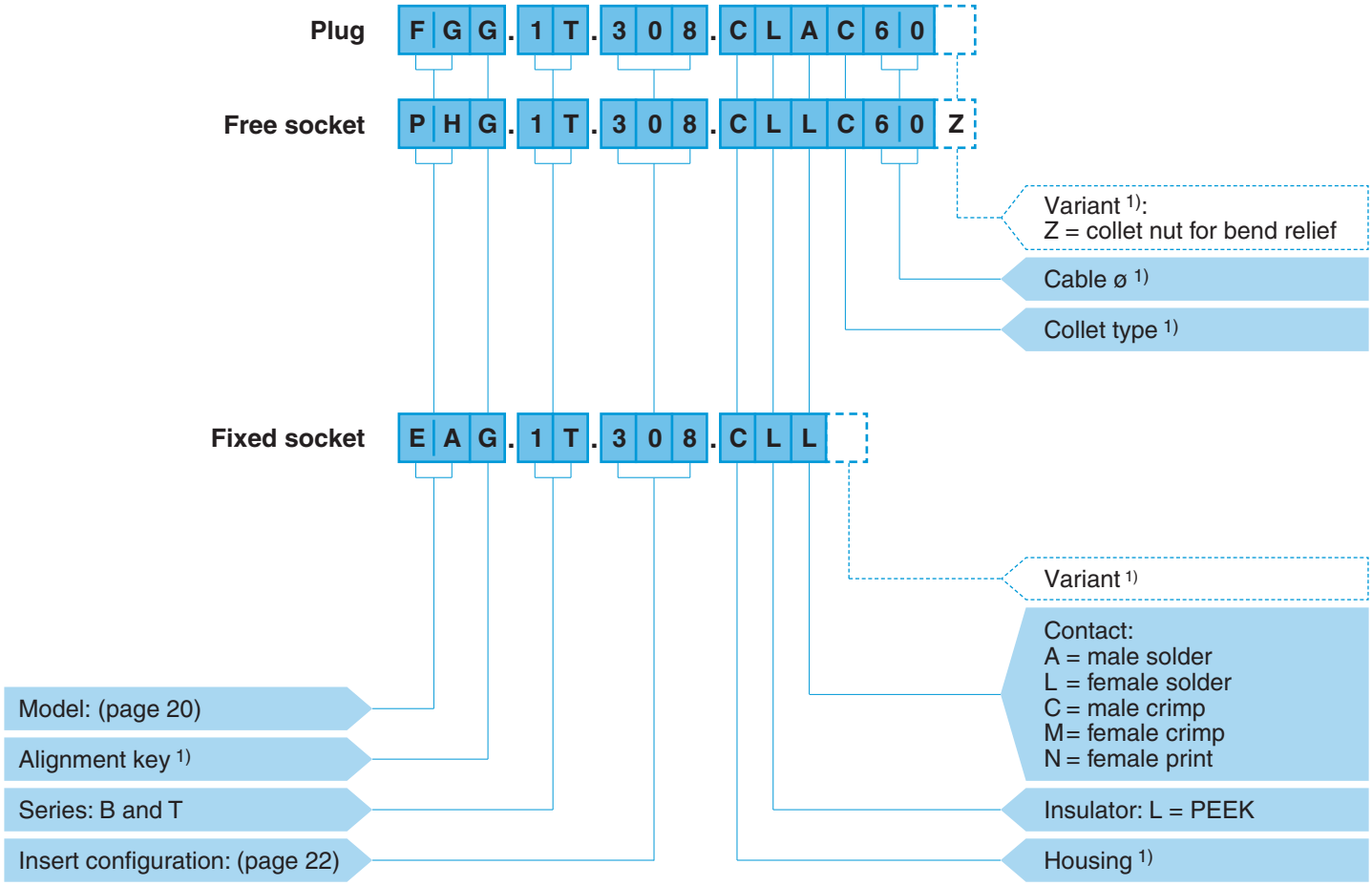
EAG Fixed socket with earthing tag, nut fixing, key (G) (back panel mounting)
ENG Fixed socket with earthing tag, nut fixing, key (G)

FGG Straight plug, key (G), cable collet
FGG Straight plug, key (G), cable collet and nut for fitting a bend relief

PHG Free socket, key (G), cable collet
PHG Free socket, key (G), cable collet and nut for fitting a bend relief

Note: for others models please reach out to LEMO. Print contact are highly recommended to limit risk of signal deterioration.
See Unipole-Multipole and T series catalogues for connectors dimensions.

Part Numbering System (e.g. 1T series)



FGG.1T.308.CLAC60 = straight plug with key (G) and cable collet, 1T Series, multipole type with 8 contacts, outer shell in chrome-plated brass, PEEK insulator, male solder contacts, C type collet for 6.0 mm diameter cable.

PHG.1T.308.CLLC60Z = free socket with key (G) and cable collet, 1T Series, multipole type with 8 contacts, outer shell in chrome-plated brass, PEEK insulator, female solder contacts, C type collet for 6.0 mm diameter cable and nut for fitting a bend relief.

EAG.1T.308.CLL = fixed socket, nut fixing, with key (G), 1T Series, multipole type with 8 contacts, outer shell in chrome-plated brass, PEEK insulator, female solder contacts.

Note: 1) see Unipole-Multipole and T series catalogues for alternatives.

Insert configuration

Ethernet

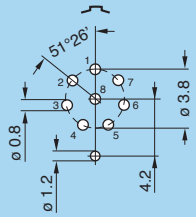
Solder contacts / Crimp contacts	Reference	Series	Contact ø (mm)	Contact type: Solder	Contact type: Crimp	Contact type: Print (straight)	AWG: Solder (max.)	AWG: Crimp min.	AWG: Crimp max.	Solder contact: Test voltage (kV DC)[1] Contact-contact	Solder contact: Test voltage (kV DC)[2] Contact-shell	Crimp contact: Test voltage (kV DC)[1] Contact-contact	Crimp contact: Test voltage (kV DC)[2] Contact-shell	Rated current (A)[1]
	**308**	1B-1T	0.7	●	●	●	22	32	22	0.67	0.81	0.92	0.92	5.0

Note: [1] see calculation method, caution and suggested standard on unipole-multipole catalogue.
[2] test voltage (kV) contact-shell is slightly lower for T series (values here are for B series).

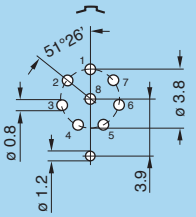
PCB drilling pattern

Fixed socket with straight print contact

1B.308 (EA●)



1T.308 (EA●)



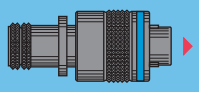
Note: contact numbering is for female contact version only.

Ethernet 1000 Base-T4 (514)

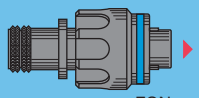
These High-speed connectors meets Category 6 cable specifications (protocol IEEE 802.3an) up to 250 MHz for 1 Gigabit Ethernet transmission up to 100 m or 10 Gb/s up to 55 m. They are specifically designed to work in harsh environments, i.e. extreme temperatures, humidity and vibrations. The ratchet coupling M series offers a reliable solution in Defense applications such as data & ground forces tactical communications.

2M Series models

Straight plugs

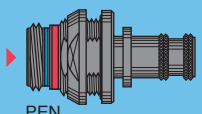


FMN



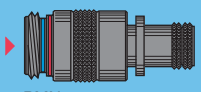
FGN

Fixed socket

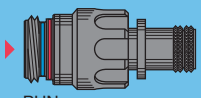


PEN

Free sockets



PMN



PHN

Watertight fixed socket

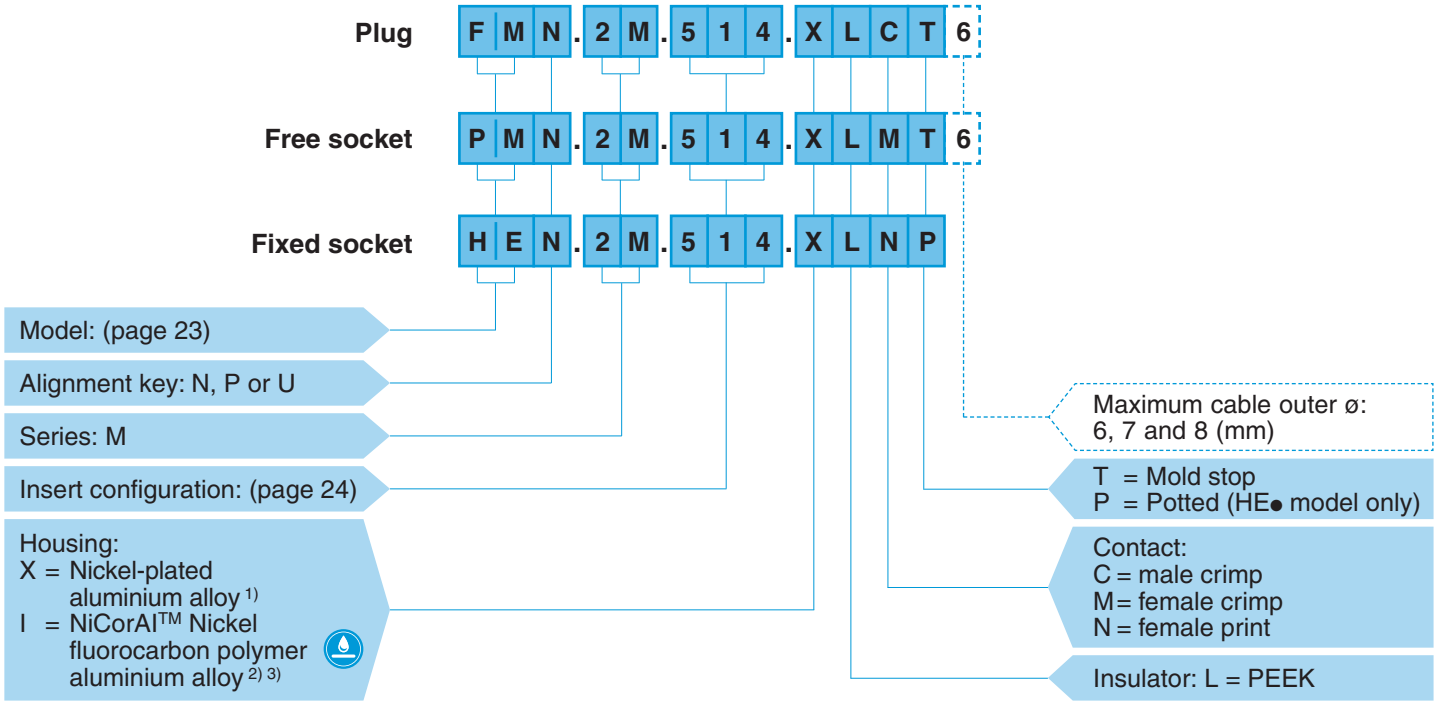
HEN

Model Description

FMN Straight plug, key (N) with knurled grip and mold stop
FGN Straight plug, key (N) with arctic grip and mold stop
HEN Fixed socket, nut fixing, key (N), printed circuit, watertight (back panel mounting)
PEN Fixed socket, key (N) with mold stop (back panel mounting)
PMN Free socket, key (N) with knurled grip and mold stop
PHN Free socket, key (N) with arctic grip and mold stop

Note: for others models please reach out to LEMO. Print contact are highly recommended to limit risk of signal deterioration.
See M series catalogue for connectors dimensions.

Part Numbering System (2M series)

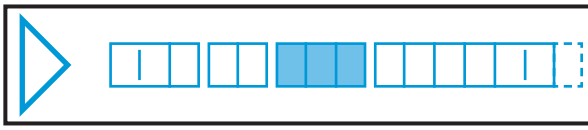


FMN.2M.514.XLCT6 = straight plug with key (N), knurled grip, 2M series, multipole type with 8 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, male crimp contacts.

PMN.2M.514.XLMT6 = free socket with key (N), knurled grip, 2M series, multipole type with 8 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, female crimp contacts and mold stop.

HEN.2M.514.XLNP = fixed socket, nut fixing, with key (N), 2M series, multipole type with 8 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, female print contacts, watertight.

Note: 1) anthracite colour / 48 hours salt fog resistance.
2) anthracite colour / 500 hours salt fog resistance RoHS 2/REACH.
3) NiCorAl™ nickel plating is not allowed with hermetic models.

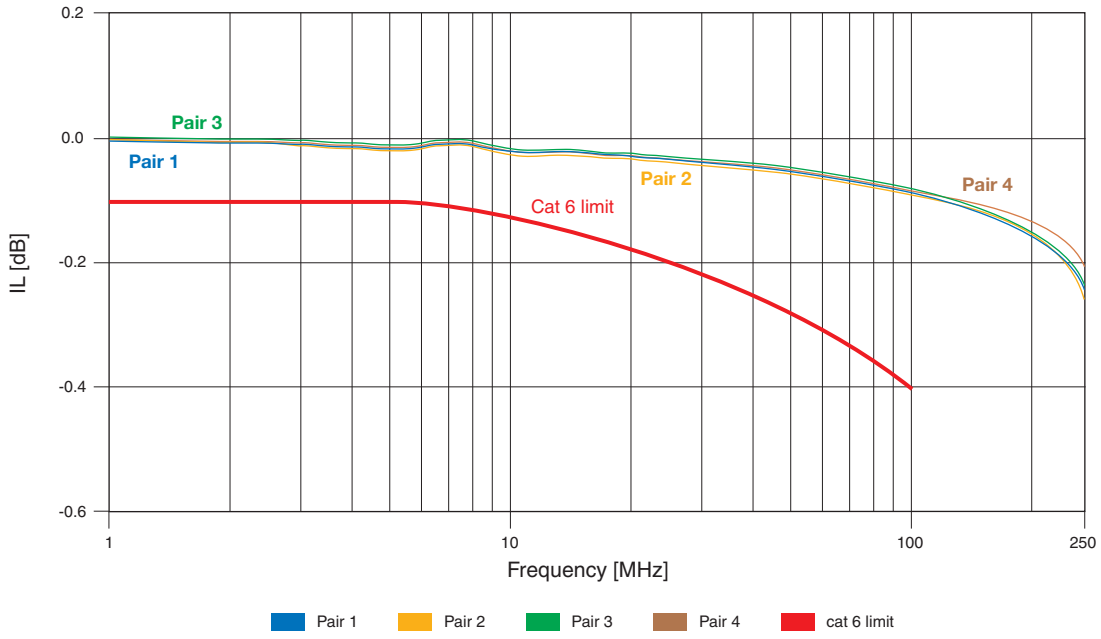


Insert configuration

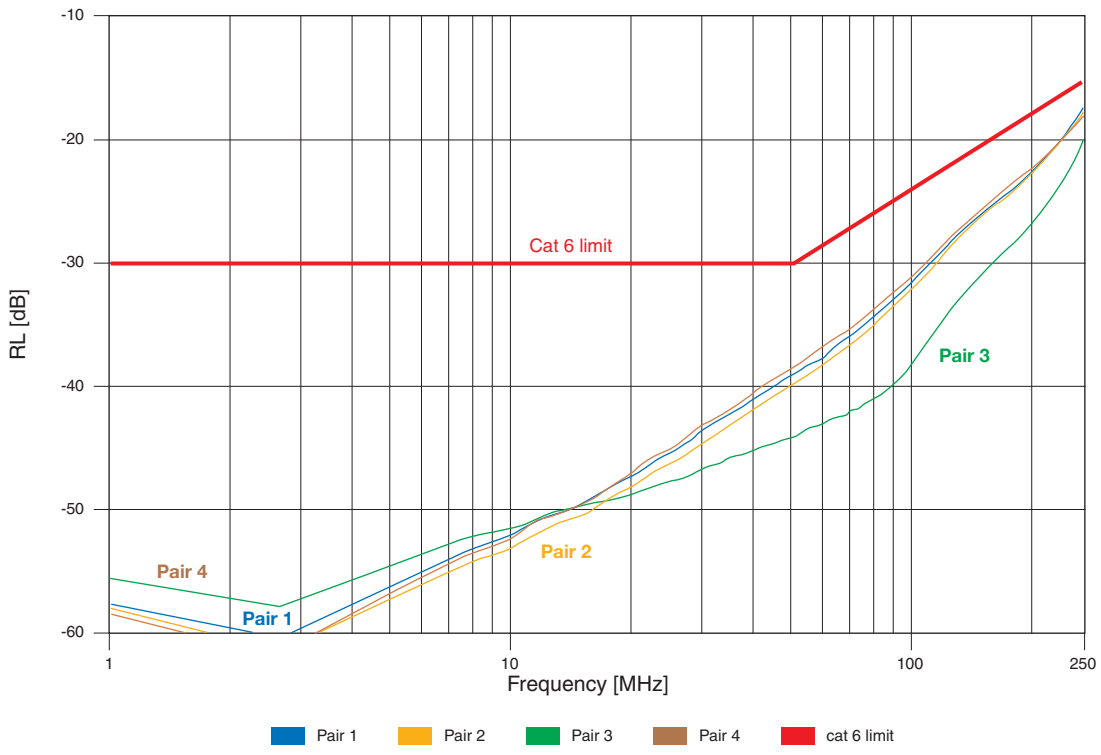
Ethernet

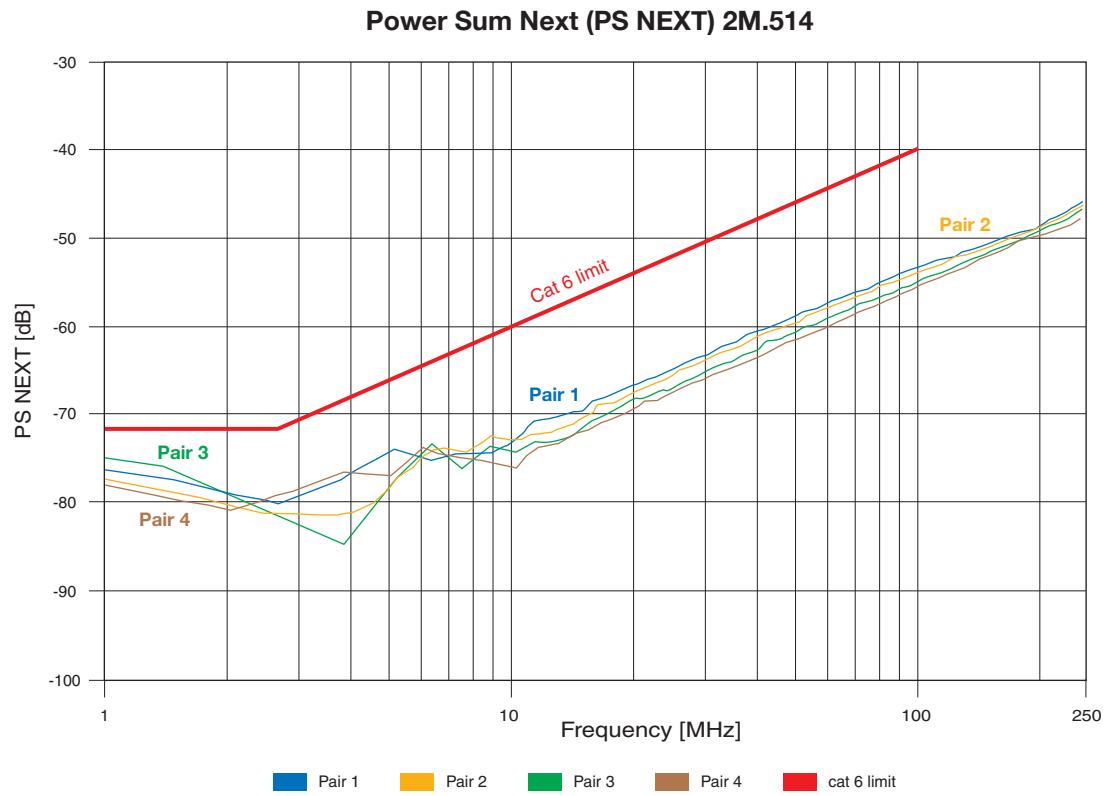
Male crimp contacts	Female crimp contacts	Reference	Series	Number of contacts	Contact ø (mm)	Crimp	Print	Test voltage (kV DC) Contact-contact	Test voltage (kV DC) Contact-shell	Rated current (A)
		**514**	2M	8	0.7	●	●	1.13	1.06	8

Insertion Loss 2M.514



Return Loss 2M.514

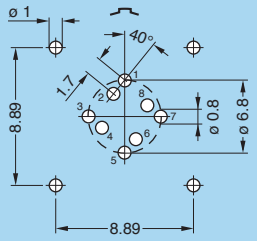




PCB drilling pattern

Fixed socket with straight print contact

2M.514 (HE●) (top view)



Note: contact numbering is for female contact version only.

(511)

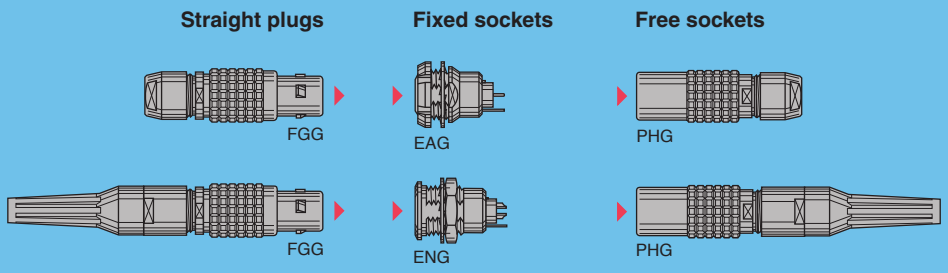
Ethernet 1000 Base-T1

(512)

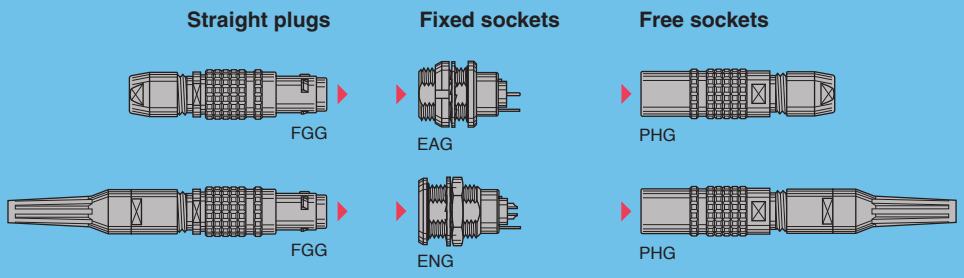
1000 Base-T1 (SPE - 511)

The Ethernet 1000 Base-T1 protocol (IEEE 802.3bp standard), also better known as Single Pair Ethernet (SPE), allows high speed and bi-directional data traffic over light weight, single pair cable harnesses up to 1 Gb/s.

0B Series models



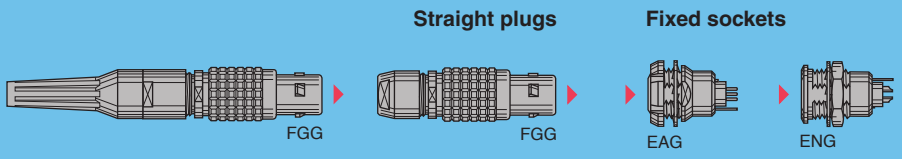
0T Series models



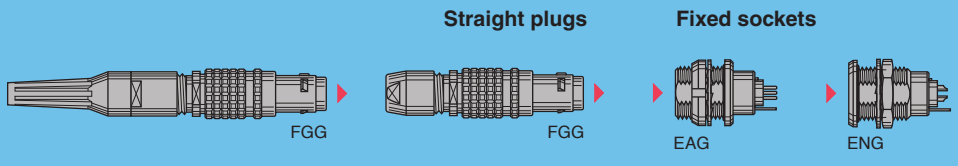
1000 Base-T1 (2 x SPE - 512)

The Ethernet 1000 Base-T1 protocol (IEEE 802.3bp standard), allows High-speed traffic over 2 pairs cable harnesses up to 1 Gb/s.

1B Series models



1T Series models



Model Description

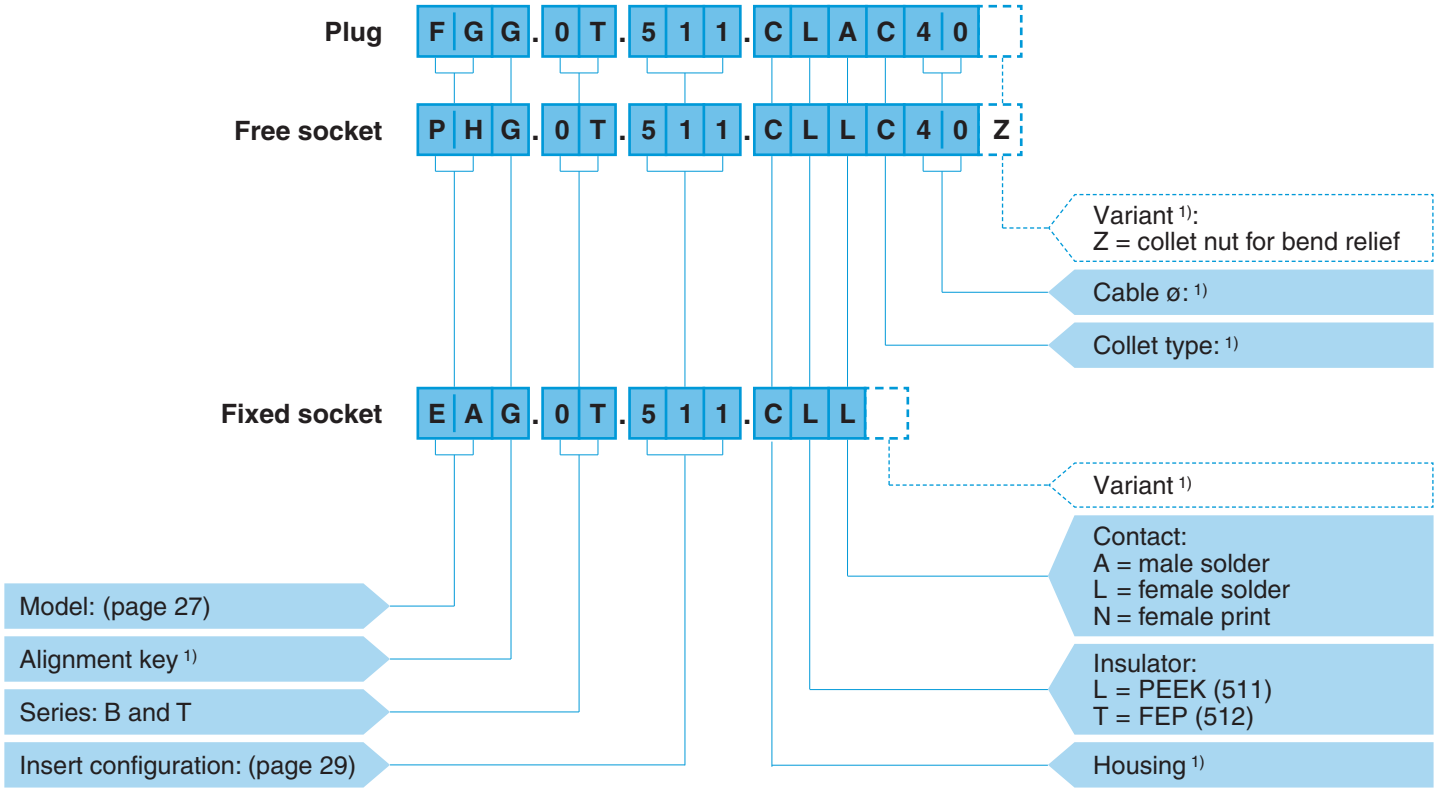
EAG Fixed socket with earthing tag, nut fixing, key (G) (back panel mounting)
ENG Fixed socket with earthing tag, nut fixing, key (G)

FGG Straight plug, key (G), cable collet
FGG Straight plug, key (G), cable collet and nut for fitting a bend relief

PHG Free socket, key (G), cable collet
PHG Free socket, key (G), cable collet and nut for fitting a bend relief

Note: for others models please reach out to LEMO. Print contact are highly recommended to limit risk of signal deterioration.
See Unipole-Multipole and T series catalogues for connectors dimensions.

Part Numbering System (e.g. 0T series)

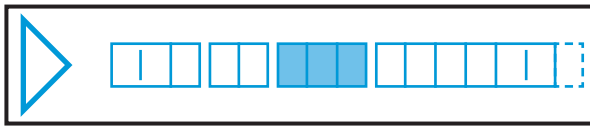


FGG.0T.511.CTAC40 = straight plug with key (G) and cable collet, 0T Series, Ethernet type, outer shell in chrome-plated brass, PEEK insulator, male solder contacts, C type collet for 4.0 mm diameter cable.

PHG.0T.511.CTLC40Z = free socket with key (G) and cable collet, 0T Series, Ethernet type, outer shell in chrome-plated brass, PEEK insulator, female solder contacts, C type collet for 4.0 mm diameter cable and nut for fitting a bend relief.

EAG.0T.511.CTL = fixed socket, nut fixing, with key (G), 0T Series, Ethernet type, outer shell in chrome-plated brass, PEEK insulator, female solder contacts.

Note: 1) see Unipole-Multipole and T series catalogues for alternatives.



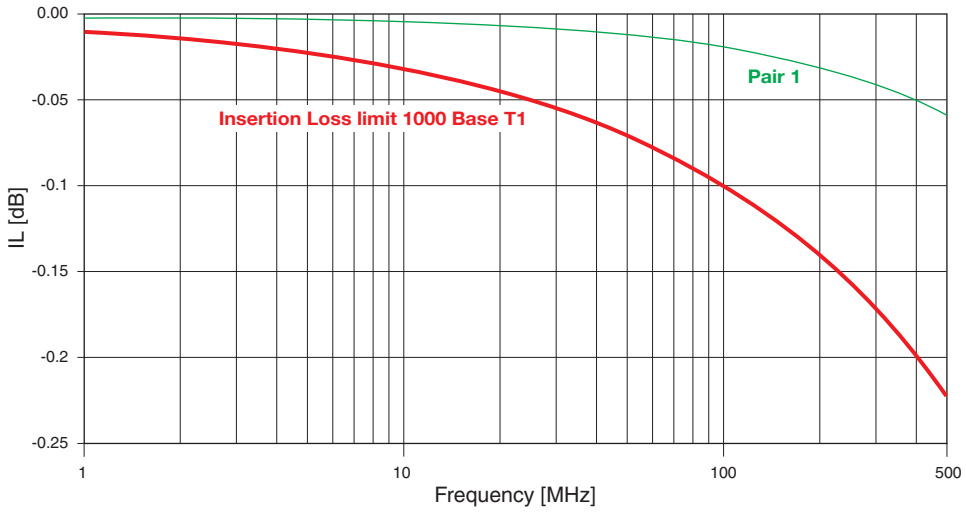
Insert configuration

Ethernet

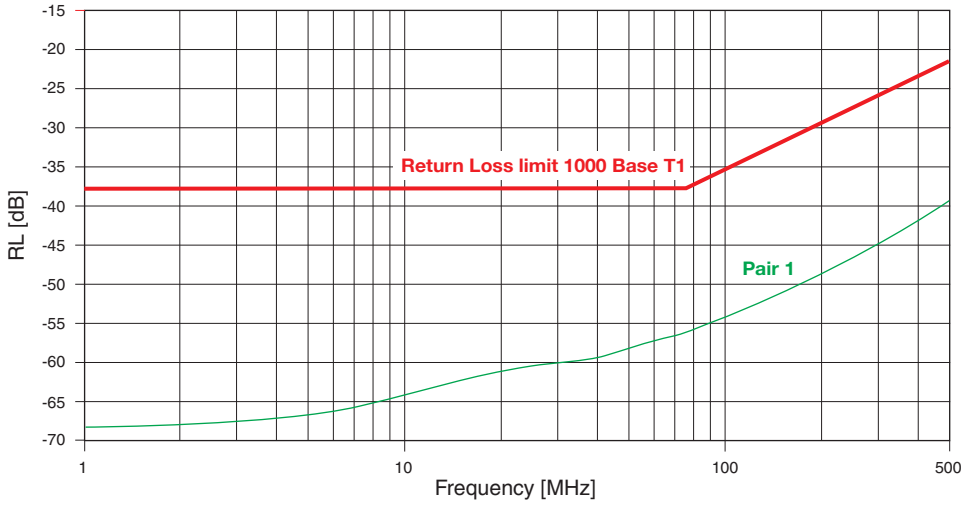
Male solder contacts	Female solder contacts	Reference	Series	Number of contacts	Contact ø (mm)	Solder contact	Print contact	AWG			Test voltage (kV DC) contact-contact	Rated current (A)[1)]
								Wire section (mm^2)	Solder			
									min.	max.		
		511	0B-0T	2	0.5	●	●	0.14	30	26[1)]	2.2	5
		**512**	1B-1T	7	0.5	●	●	0.14	30	26[1)]	1.5	3

Note: [1)] see calculation method, caution and suggested standard on unipole-multipole catalogue.
AWG 26, please check wire construction, wire section should be less than 0.14 mm^2.

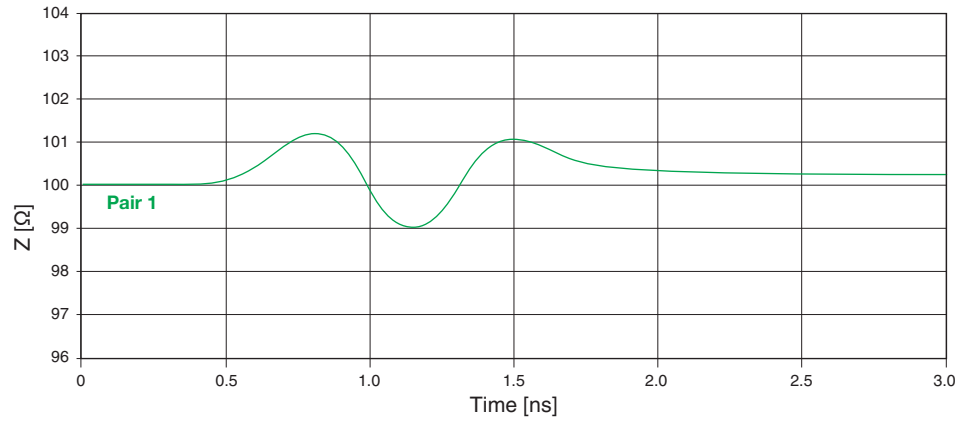
Insertion Loss 0B.511



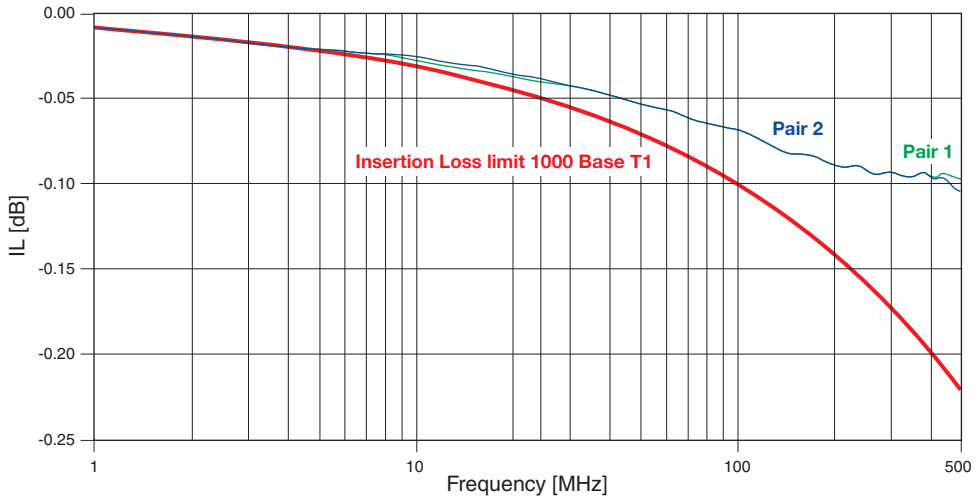
Return Loss 0B.511



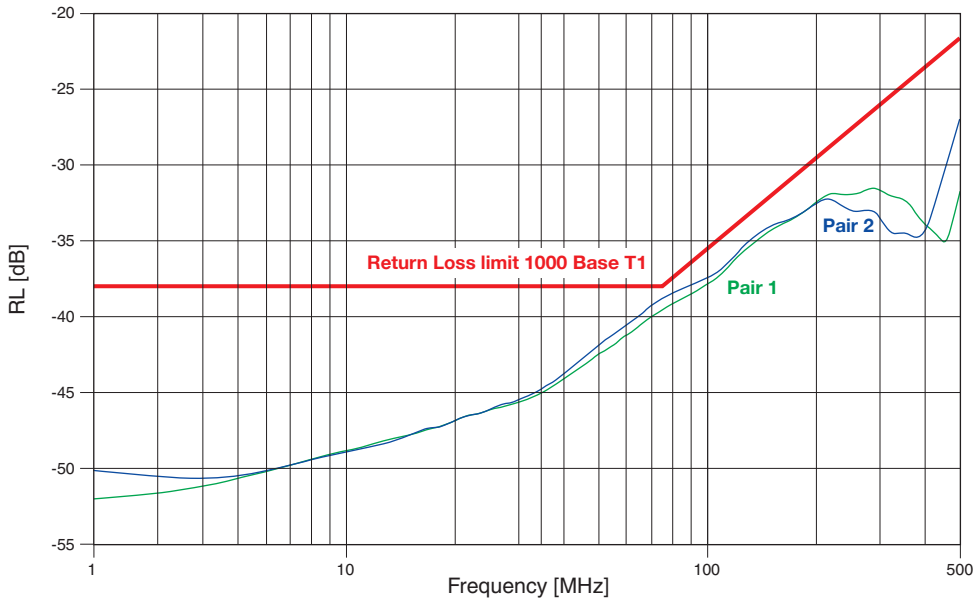
TDR Impedance 0B.511



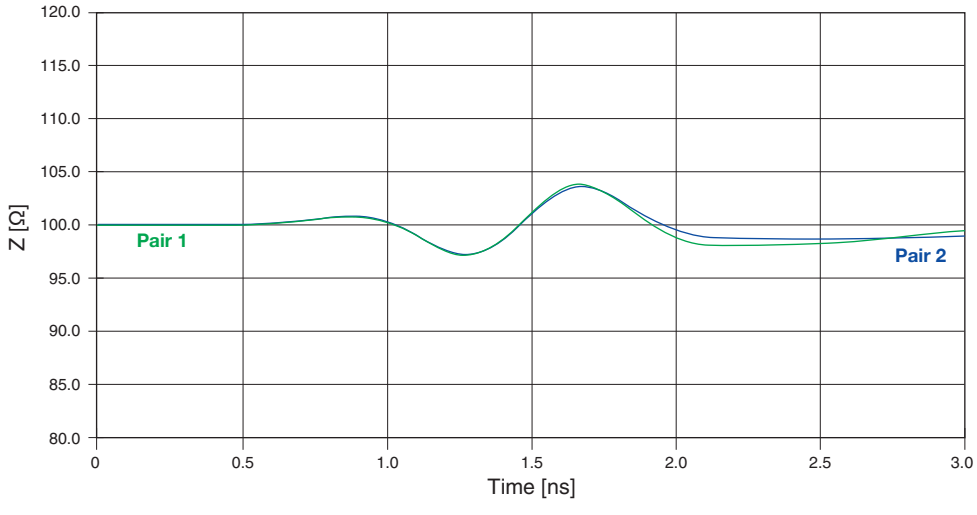
Insertion Loss 1B.512



Return Loss 1B.512



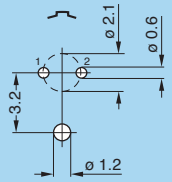
TDR Impedance 1B.512



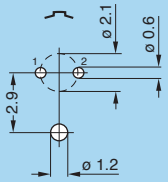
PCB drilling pattern

Fixed socket with straight print contact

0B.511 (EA●)

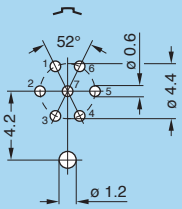


0T.511 (EA●)

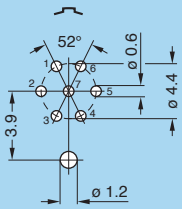


Note: contact numbering is for female contact version only.

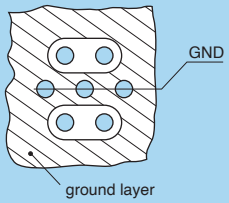
1B.512 (EA●)



1T.512 (EA●)



1B/1T.512



Note: contact numbering is for female contact version only.

Product safety notice

PLEASE READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY AND CONSULT ALL RELEVENT NATIONAL AND INTERNATIONAL SAFETY REGULATIONS FOR YOUR APPLICATION.
IMPROPER HANDLING, CABLE ASSEMBLY, OR WRONG USE OF CONNECTORS CAN RESULT IN HAZARDOUS SITUATIONS.

1. **SHOCK AND FIRE HAZARD**
   Incorrect wiring, the use of damaged components, presence of foreign objects (such as metal debris), and / or residue (such as cleaning fluids), can result in short circuits, overheating, and / or risk of electric shock.
   Mated components should never be disconnected while live as this may result in an exposed electric arc and local overheating, resulting in possible damage to components.

2. **HANDLING**
   Connectors and their components should be visually inspected for damage prior to installation and assembly. Suspect components should be rejected or returned to the factory for verification.
   Connector assembly and installation should only be carried out by properly trained personnel. Proper tools must be used during installation and / or assembly in order to obtain safe and reliable performance.

3. **USE**
   Connectors with exposed contacts should never be live (or on the current supply side of a circuit). Under general conditions voltages above 30 VAC and 42 VDC are considered hazardous and proper measures should be taken to eliminate all risk of transmission of such voltages to any exposed metal part of the connector.

4. **TEST AND OPERATING VOLTAGES**
   The maximum admissible operating voltage depends upon the national or international standards in force for the application in question. Air and creepage distances impact the operating voltage; reference values are indicated in the catalog however these may be influenced by PC board design and / or wiring harnesses.
   The test voltage indicated in the catalog is 75% of the mean breakdown voltage; the test is applied at 500 V/s and the test duration is 1 minute.

5. **CE MARKING** CE
   CE marking CE means that the appliance or equipment bearing it complies with the protection requirements of one or several European safety directives.
   CE marking CE applies to complete products or equipment, **but not to electromechanical components, such as connectors**.

6. **PRODUCT IMPROVEMENTS**
   The LEMO Group reserves the right to modify and improve to our products or specifications without providing prior notification.

7. ⚠ **WARNING (Prop 65 State of California)**
   Proposition 65 requires businesses to provide warnings to Californians about significant exposures to chemicals that cause cancer, birth defects or other reproductive harm. LEMO products are exempt from proposition 65 warnings because they are manufactured, marketed, and sold solely for commercial and industrial use. For further information, please visit https://www.lemo.com/quality/LEMO-Prop-65-compliance-declaration.pdf.

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