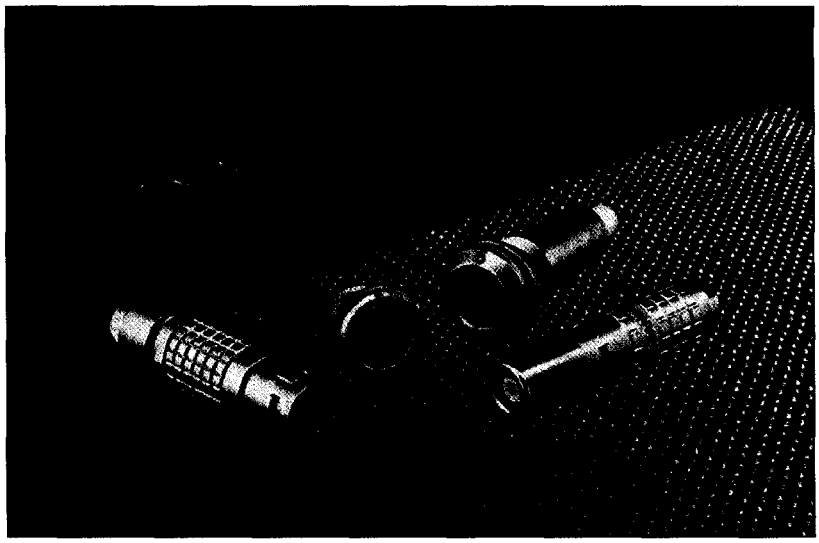
LEMO USA
Electronic Connectors

HIGH VOLTAGE CONNECTORS

- *Quick connect/disconnect design*
- *Available in a large range of sizes*
- *Single or multi high voltage contacts*
- *Operating voltage ratings from 5-50 KV dc*
- *PTFE inserts*



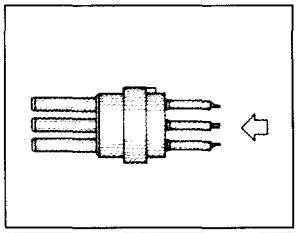
LEUIS00027

The Quality Choice

335 Tesconi Circle, Santa Rosa, CA 95401-4675 • P.O. Box 11488, Santa Rosa, CA 95406-1488
phone (800) 444-5366, (707) 578-8811 • fax (707) 578-0869 • e-mail lemous@lemo.ch • **website http: //www.lemo.ch**

NEW Multiple High Voltage

In response to requirements in the medical industry for increased creepage and air clearance, LEMO USA has developed four new inserts to fit into existing B or K Series, size 2 shell, product line.



	Reference (Insert)	Standard Group Watertight Group	No. of Contacts	∅ of Dielectric (mm)	AWG max.	Working Voltage Us (kV r.m.s.)[2]	Working Voltage Us (kV dc)[2]	Test Voltage Ue (kV dc)[1]	Rated current (A)
2B 2K	434	2B 2K	4	2.0	24	2.1	3	9	3.0
	435	2B 2K	5	2.0	24	2.1	3	9	3.0
	436	2B 2K	6	2.0	24	2.1	3	9	2.5
	437	2B 2K	7	2.0	24	2.1	3	9	2.0

Models

Model	Series B	Series K
EGG	●	●
ECG	●	—
EEG	●	●
FGG	●	●
PHG	●	●
PKG	●	●

See B or K Series Catalog for dimensions.

Note:

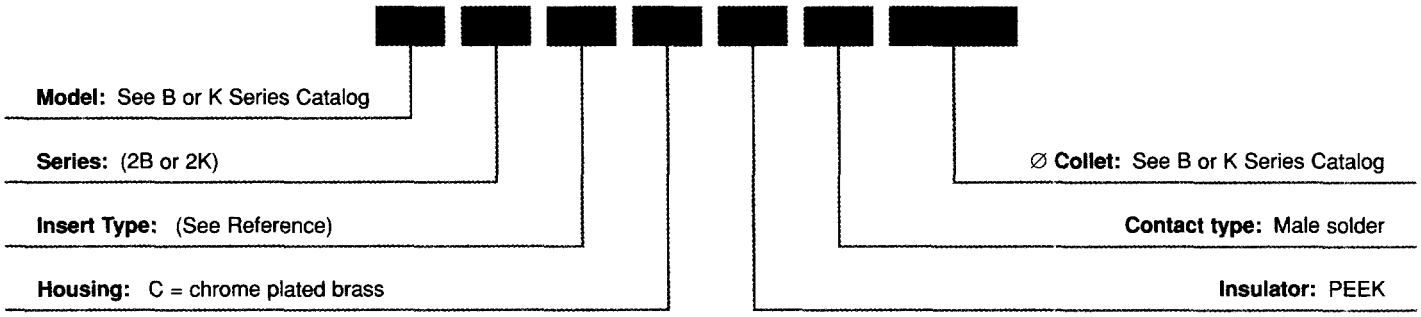
1) Test voltage (duration 1 min) per MIL-Std 1344A meth. 3001.1; for plug and socket mated. The cable dielectric and the HV insulator must be coated with an adhesive heat shrinking tube.

2) Working voltage (Us) is defined according to the following relation:

$$Us = \frac{Ue}{3}$$

WARNING: For many applications, more specific safety standards may apply regarding determination of the working voltage Us. Consider carefully when selecting connectors.

Part Number Example



Distance per IEC 664-1 and IEC 601-1

	Socket EGG	Plug FGG + Socket EGG
	Unmated	Fully Mated
	pins to finger	pins to shell
Creepage distance (mm)	2.5	9.6
Air clearance (mm)	2.5	9.6

Assembly Instructions:

To obtain the correct performances, the cable dielectric and the insulator on the back of the socket must be sealed with a resin after the conductor is soldered. We recommend the use of a heat shrink tubing with an inner melting coating to do this, such as: Raychem® heat shrink tubing ATUM 3-1.

High Voltage

Series Y

This family of unipole connectors are high voltage connectors designed for operating voltages ranging from 5 to 50 kV. They offer a great deal of security. The long housing permits a mechanical mating long before the contacts are engaged, thus ensuring safe mating even if carried out with the power on. Furthermore, the socket in the series 3Y can be provided with a microswitch to prevent power from being turned on before the plug is mated.

Mixed connectors combining high voltage and signal contacts are also available. Please see LEMO's B/S Series catalog for more information.

Series Y

Interconnections

Straight Plug

FFA

Fixed Socket

ERA

Straight Socket

PSA

Model Description

ERA Fixed socket, nut fixing

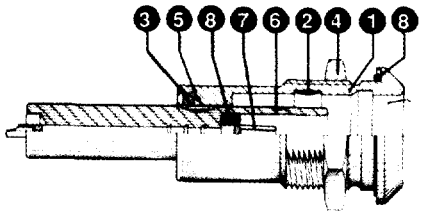
FFA Straight plug with cable collet
FFB Straight plug with cable collet and safety nut

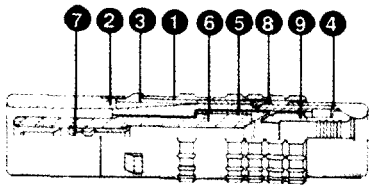
PSA Fixed socket, nut fixing, with cable collet

Part Section Showing Internal Components

Fixed Socket

1. shell
2. earthing crown
3. castellated nut
4. hexagonal nut
5. circlip
6. insulator
7. female contact
8. sealing ring





Straight Plug

1. outer shell
2. inner shell
3. latch sleeve
4. collet nut
5. center-piece
6. insulator
7. male contact
8. circlip
9. collet

Technical Characteristics

Material and Treatment

Component	Material (Standard)	Surface treatment (µm)			
		Cu	Ni	Cr	Au
Outer shell and collet nut	Brass (UNS C 385)	0.5	3	0.3	
Earthing crown	Cu-Be (FS-QQ-C-530)	0.5	3		0.15 min
Latch sleeve	Special brass	0.5	3	0.3	
Locking ring	Brass (UNS C 385)	0.5	3		
Inner sleeve	Brass (UNS C 385)	0.5	3		
Other metallic parts	Brass (UNS C 385)	0.5	3		
O-ring	Silicone rubber (UNS D 200)				
Insulator	PTFE (UNS D 1457-83)				
	PEEK (MIL-P-46183)				
Male contact	Brass (UNS C 385)	0.5	3		1.5
Female contact	Cu-Be (FS-QQ-C-530)	0.5	3		2.0

The surface treatment standards are as follows:
- Nickel FS-QQ-N-290A
- Chrome FS-QQ-C-320B
- Gold MIL-G-45204C type I, class 1

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Mechanical and Climatical

Characteristics	Unit	Series			Standard	Method
		1Y	3Y	6Y		
Contact retention force	N	> 24	> 60	— [1]	MIL-STD-1344A	2007.1
Cable retention force	N	> 400	> 600	> 800	MIL-STD-1344A	2009.1
Endurance	Cycles	> 1000			MIL-STD-1344A	2016
Operating temperature	°C	–55 +230 (–67°F +446°F)				

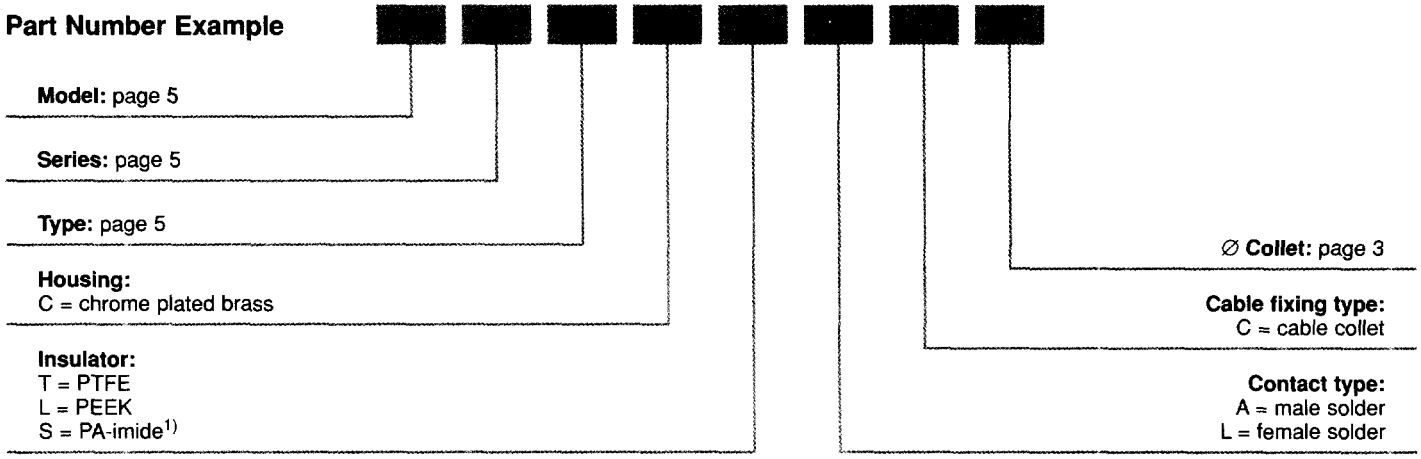
1) non captive contact
1N = 0.102 kg

Electrical

Characteristics	Unit	Series.Type					Standard	Method
		1Y.405	1Y.410	3Y.415	3Y.430	6Y.450		
Operating voltage	KV dc	7	10	15.0	28 [2]	—	IEC 130.1	§ 14.5
	KV rms	5	7	10.5	19 [2]	50 [1]		
Contact resistance	mΩ	< 3	< 3	< 2	< 2	< 0.4	MIL-STD-202	307
Insulation resistance	Ω	$> 10^{12}$					MIL-STD-1344A	3003.1

All values measured with PTFE insulator, plug and socket mated:
1) peak value for 1.2/50 working voltage pulse
2) value for male contact plug mated with female contact socket

Part Number Example



FFA.1Y.405.CTAC52 Straight plug with cable collet, series 1Y, 5 kV high voltage type, chrome plated brass housing, PTFE insulator, male solder contact, cable collet for a 5 mm max. OD cable.

Note:
As standard, plugs are fitted with a male contact and sockets with a female contact. On request these series Y models can be supplied with a female contact for plugs and a male contact for sockets except for PSA model of the series 3Y as well as FFB and ERA models of the series 6Y.

1) For series 6Y only.

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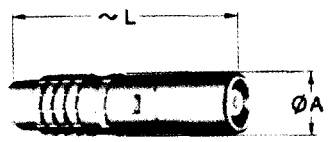
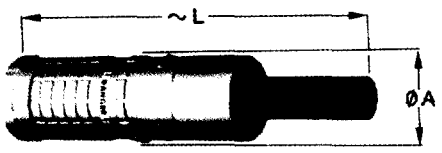
Models (See page 3 for Model Descriptions)

Note: All dimensions are in millimeters.

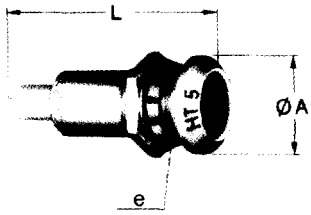
FFA



FFB

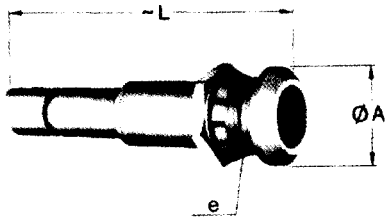


ERA



Model	Dim.	Series Types				
		1Y		3Y		6Y
		405	410	415	430	450
FFA	A	13	13	19	19	–
	L	54 (66)	63 (83)	96 (105)	113 (198)	–
FFB	A	–	–	–	–	47
	L	–	–	–	–	224
ERA	A	20	20	31	31	65
	e	M16x1	M16x1	M24x1	M24x1	M55x2
	L	51 (61)	69 (79)	77 (109)	108 (150)	206
PSA	A	20	20	–	31	–
	e	M16x1	M16x1	–	M24x1	–
	L	71 (74)	81 (93)	–	146	–

PSA



Note:

Dimensions in brackets indicate the dimensions of plugs fitted with female contact – sockets with a male contact.
As standard FFA and FFB plugs are fitted with a male contact.
As standard ERA and PSA sockets are fitted with a female contact.

Types

Reference	Series	Contact Ø (mm)	Contact Type		Cable Dimension		Working Voltage (kV rms)[2]	Working Voltage (kV dc)[2]	Test Voltage (kV rms)[3]	Test Voltage (kV dc)[3]	Rated Cur. (A)[1]
			Plug	Socket	Dielectric max. OD	Cond. max. OD					
405	1Y	1.3	A/L	L/A	3.2	1.15	5	7	7.5	10.5	8
410		1.3	A/L	L/A	3.2	1.15	7	10	10.5	15.0	8
415	3Y	4.5	A[5]	L[5]	7.3	2.45	10.5	15	16	22.5	15
430		4.5	A[5]	L[5]	7.3	2.45	19[6]	28[6]	29[6]	42[6]	15
450	6Y	7.0	A	L	23	6.6	50[4]	–	70[4]	–	25

A = male solder
L = female solder
Notes: value measured plug and socket mated
1) As per IEC 512-3
2) As per IEC 130.1 § 14.5 b
3) As per MIL-STD-1344A method 3001.1
4) Peak value for 1/2 50 µs normalized voltage shock
5) See table and note above regarding reverse contact availability
6) Value for male contact plug mated with female contact socket

Collets

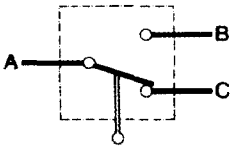
Reference		Series	Cable OD	
Type	Ø		max.	min.
C	17	1Y	1.6	1.3
C	27		2.6	2.2
C	32		3.1	2.6
C	37		3.6	2.7
C	42		4.1	3.3
C	47		4.6	3.8
C	52		5.1	4.3
C	57		5.6	4.8
C	62		6.1	5.3
C	66		6.5	5.9
C	68		6.7	6.5

Reference		Series	Cable OD	
Type	Ø		max.	min.
C	42	3Y	4.0	3.1
C	52		5.0	4.1
C	62		6.0	5.1
C	72		7.0	6.1
C	82		8.0	7.1
C	92		9.0	8.1
C	97		9.5	9.1
C	11		10.5	10.1
C	12	6Y	12.0	11.1
C	14		14.0	13.1
C	21		21.0	20.0
C	29		28.8	24.5

On request, other collet diameters covering the range between indicated max. and min. diameters are available.

Accessories

Microswitch for fitting onto ERA.3Y fixed socket

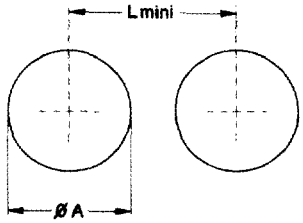


Part Number
ERA.3Y.260.CZZ

Other accessories and tooling are available for series Y connectors.
Please refer to corresponding sections.

Cut-out

Panel cut-out and fixing nut torque



Series	Dimensions		Torque (nm)
	A	L	
1Y	16.1	22.0	14
3Y	24.2	35.5	25
6Y	55.3	67.5	55

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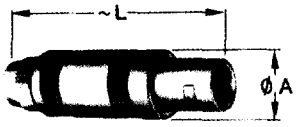
Single Contact High Voltage

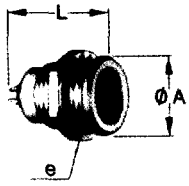
Series 0S - 1S

Interconnections

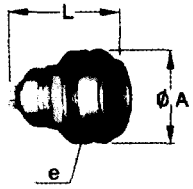
FFB Straight plug with cable collet and safety nut



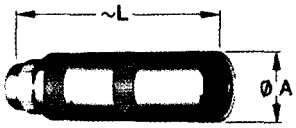
ERA Fixed receptacle



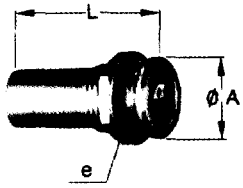
ERD Fixed receptacle (back panel mounting)



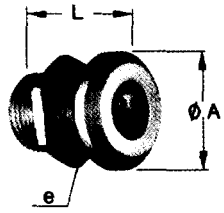
PCA Free receptacle with cable collet



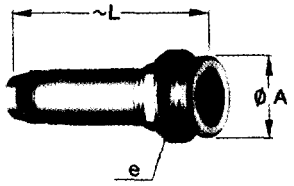
RAD Fixed coupler, nut fixing



HGP Fixed receptacle, nut fixing, vacuum tight



PSA Fixed receptacle with cable collet nut fixing



The maximum leakage rate of the vacuum tight model is 1×10^{-6} torr - liters/sec. (as per MIL-STD-1S44A standard method 1008). An epoxy resin is used to seal the vacuum tight model.

Dimensions

Model	Dim.	Series				
		0S	1S	2S	3S	4S
FFB	A	9.0	12.0	14.8	17.8	24.8
	L	36.8	45.0	55.5	65.0	81.5
ERA	A	10.0	14.0	18.0	22.0	28.0
	e	M9×0.6	M12×1	M15×1	M18×1	M25×1
	L	17.5	21.5	24.0	27.2	32.3
ERD	A	12.0	16.0	20.0	24.0	–
	e	M9×0.6	M12×1	M15×1	M18×1	–
	L	17.5	21.5	24.0	27.2	–
PCA	A	8.9	11.9	14.8	17.8	24.8
	L	33.5	40.5	50.0	59.0	75.0
PSA	A	10.0	14.0	18.0	22.0	28.0
	e	M9×0.6	M12×1	M15×1	M18×1	M25×1
	L	33.5	40.5	50.0	59.0	75.0
RAD	A	10.0	14.0	–	–	–
	e	M9×0.6	M12×1	–	–	–
	L	25.0	28.5	–	–	–
HGP	A	18.0	20.0	20.0	28.0	–
	e	M12×1	M14×1	M16×1	M20×1	–
	L	22.0	25.5	28.0	35.5	–

Types (all Single Contacts)

Reference	Series	Contact Ø (mm)	AWG max.		Working Voltage (kV rms)[1]	Working Voltage (kV dc)[1]	Test Voltage (kV rms)[2]	Test Voltage (kV dc)[2]	Rated Cur. (A)[3]
			Solid	Stranded					
403	**0S-0E**	0.9	20	22	2.8	4	4.2	6.0	4
405	**1S-1E**	1.3	18	20	5.0	7	7.5	10.5	8
408	**2S-2E**	2.0	14	16	5.5	8	8.5	12.0	10
405	**3S**	4.0	10	12	5.0	7	7.5	10.5	15
410	**3S-3E**	2.0	12	14	7.0	10	10.5	15.0	10
415	**3S**	1.3	16	18	10.0	15	15.0	21.0	8
410	**4S**	2.5	6	8	7.0	10	10.5	15.0	12

Maximum Torquing Value of Collet Nut

Series	Maximum Torque	Wrench Part #
0S	4 in.-lbs.	MTZ.0S.035.USA
1S	7 in.-lbs.	MTZ.1S.062.USA
2S	11 in.-lbs.	MTZ.2S.101.USA
3S	15 in.-lbs.	MTZ.35.163.USA

Note: All dimensions are in millimeters.

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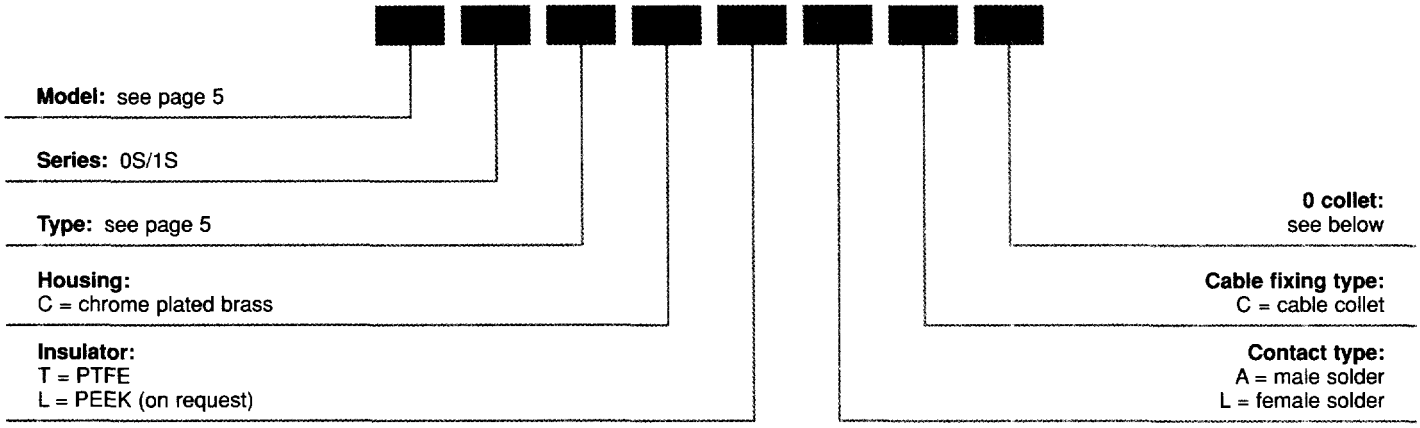
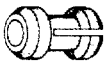
Part Number Example



FFB.1S.405.CTAC52 Straight plug with cable collet, series 1S, 5 kV high voltage type, chrome plated brass housing, PTFE insulator, male solder contact, cable collet for a 5 mm max. OD cable.

Note:
As standard, plugs are fitted with a male contact and receptacles with a female contact. On request these series S models can be supplied with a female contact for plugs and a male contact for receptacles.

Collets

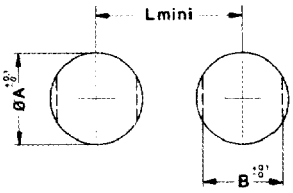


Reference Type	Reference ∅	Series	Cable OD max.	Cable OD min.
C	17	0S	1.6	1.3
C	22		2.1	1.7
C	27		2.6	2.2
C	32		3.1	2.7
C	37		3.6	3.0
C	42		4.1	3.3
C	44		4.3	3.5
C	17	1S	1.6	1.3
C	22		2.1	1.7
C	27		2.6	2.2
C	32		3.1	2.6
C	37		3.6	2.7
C	42		4.1	3.3
C	47		4.6	3.8
C	52		5.1	4.3
C	57		5.6	4.8
C	62		6.1	5.3
C	66		6.5	5.9
C	68		6.7	6.0
C	17	2S	1.5	1.3
C	27		2.5	1.7
C	32		3.0	2.5
C	42		4.0	3.1
C	52		5.0	4.1
C	62		6.0	5.1
C	72		7.0	6.1
C	77		7.5	7.1
C	82		8.0	7.6
C	87		8.5	8.1

Reference Type	Reference ∅	Series	Cable OD max.	Cable OD min.
C	42	3S	4.0	3.1
C	52		5.0	4.1
C	62		6.0	5.1
C	72		7.0	6.1
C	77		7.5	7.1
C	82		8.0	7.6
C	92		9.0	8.1
C	97		9.5	9.1
C	10		10.0	9.6
C	11		10.5	10.1
C	52	4S	5.1	4.2
C	62		6.1	5.2
C	72		7.1	6.2
C	82		8.1	7.2
C	92		9.1	8.2
C	10		10.1	9.2
C	11		11.1	10.2
C	12		12.1	11.2
C	13		12.6	12.2
C	13		13.1	12.2

Cut-out

Panel cut-out and fixing nut torque



Models: ERA, ERD, RAD, PSA

Series	Dimensions (mm) 0A	B	L	Torque (in.-lbs)
0S	9,1	8,3	13,5	44.2
1S	12,1	10,6	17,0	79.6
2S	15,1	13,6	21,5	106.2
3S	18,2	16,6	27,0	159.3
4S	25,2	23,6	34,0	221.2

Model: HGP

Series	Dimensions (mm) 0A	B	L
0S	12,1	–	17,0
1S	14,1	–	20,5
2S	16,1	–	22,5
3S	20,2	–	28,5

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High Voltage (New Generation) Series S-Y-B

In response to the requirements of the nuclear industry for high voltage connectors, LEMO has created a new range of products in the series 0S,1S, 1Y, 3Y, 4B and 5B which are distinguished by their very favorable size to voltage relationship. All these connectors are fitted with the LEMO self-latching system for easy operation in very limited space. All the plugs in this new series have a safety locking ring, which prevents accidental manual unmating while power is being transmitted.

The inserts are made of polyetheretherketone (PEEK) as well as silicone thus allowing LEMO to develop connectors with test voltages of 12 kV rms in the series 0S and up to 52 kV rms in the series 3Y. These new connectors are available as single contact high voltage connectors for applications requiring working voltages of 5,8,16 and 25 kV rms and in multi-contact high voltage configurations with up to 8 kV rms working voltage per contact.

General Technical Characteristics

Material and Treatment

Component	Material (Standard)	Surface treatment (µm)			
		Cu	Ni	Cr	Au
Outer shell, collet nut	Brass (UNS C 385)	0.5	3	0.3	
Earthing crown	Brass (UNS C 385)	0.5	3		1.5
	Bronze (UNS C 544)	0.5	3		1.5
	Cu-Be (FS-QQ-C-530)	0.5	3		1.5[1)]
Latch sleeve	Special Brass	0.5	3	0.3[1)]	
Crimping sleeve	Copper (UNS C 187)	0.5	3		
Tapered washer	Bronze (UNS C 521)	0.5	3		
Other metallic parts	Brass (UNS C 385)	0.5	3		
Insulator	PEEK (MIL-P-46183)				
	Silicone rubber (UNS D 200)				
Cable strain relief	Polyurethane				
Male contact	Brass (UNS C 385)	0.5	3		1.5
Female contact	Bronze (UNS C 544)	0.5	3		2.0
	Cu-Be (FS-QQ-C-530)	0.5	3		2.0

The surface treatment standards are as follows:
- Nickel FS-QQ-N-290A
- Chrome FS-QQ-C-320B
- Gold MIL-G-45204C type I, class 1

1) For series 1Y-3Y

Mechanical and Climatical

Characteristics	Unit	Series						Standard	Method
		0S	1S	1Y	3Y	4B	5B		
Contact retention force	N	—[1)]	—[1)]	—[1)]	—[1)]	> 30	> 100	MIL-STD-1344A	2007.1
Cable retention force	N	> 40	> 70	> 70	> 90	> 40	> 40	MIL-STD-1344A	2009.1
Endurance	Cycles	> 1000						MIL-STD-1344A	2016
Operating temperature	°C	–40 +80 (–40°F +176°F)							

1) non captive contact
1N = 0.102 kg

Electrical

Characteristics	Unit	Series							Standard	Method
		0S	1S	1Y	3Y	4B		5B		
Operating voltage per contact	kV dc	5.0	8.0	16.0	25.0	5.0[1)]	8.0	8.0	IEC 130.1	§14.5
	kV rms	3.5	5.6	11.2	17.5	3.5[1)]	5.6	5.6		
Contact resistance	mΩ	< 6.0	< 4.5	< 4.5	< 4.5	< 4.5	< 4.5	< 4.5	MIL-STD-202	307
Insulation resistance	Ω	$> 10^{12}$							MIL-STD-1344A	3003.1

1) Type 460

Note: Operating and test voltages have been measured with plug and socket mated at sea level.

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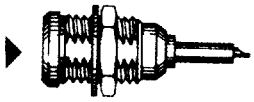
Series 0S - 1S (New Generation)

Interconnections

Straight Plug

FFR

Fixed Socket



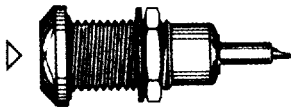
ERA

Straight Sockets

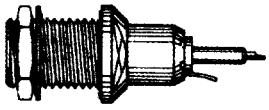
PCS

Watertight or Vacuumtight Models

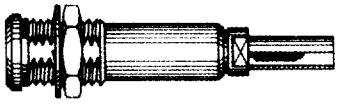
Fixed Sockets



EWB



EWF

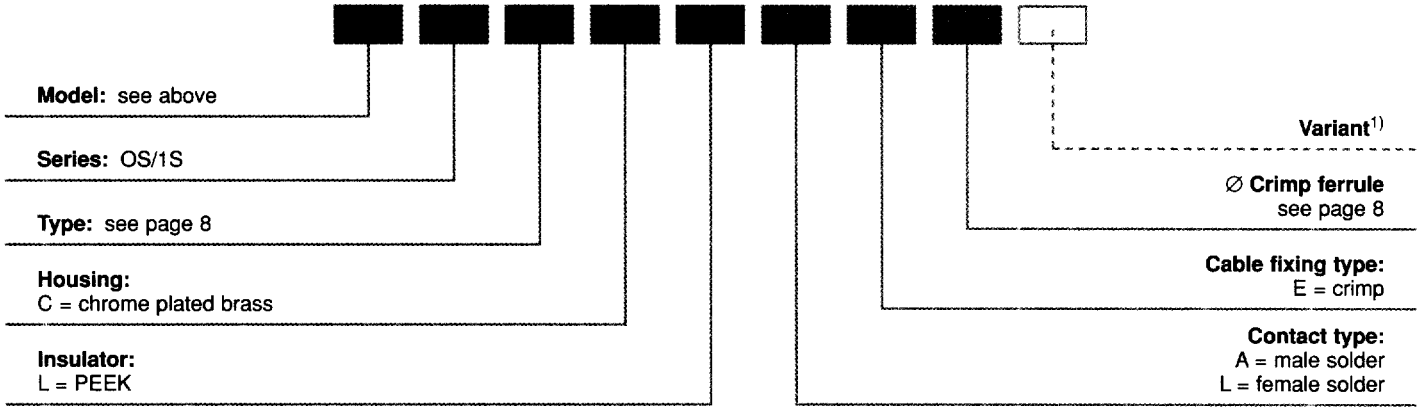


PSS

Model Description

ERA Fixed socket, nut fixing
EWB Fixed socket, nut fixing, vacuumtight, with two flats on flange
EWF Fixed socket, nut fixing, vacuumtight, with two flats on flange and tag (back panel mounting)
FFR Straight plug for cable crimping with safety ring
PCS Free socket for cable crimping
PSS Fixed socket for cable crimping, nut fixing

Part Number Example



FFR.0S.405.CLAE33 Straight plug with safety ring, series 0S, 5 kVdc single high voltage type, chrome plated brass housing, PEEK insulator, male solder contact, crimp ferrule for a 3.3 mm OD cable.

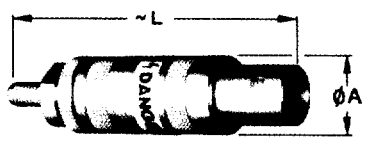
Note:
Plugs are fitted with male contact and sockets with female contact.
1) Models with cable collet can be fitted with a strain relief. For ordering, add a 'Z' in the 'variant' position and order the strain relief separately as explained in the 'Accessories' section (page 11).

Dimensions

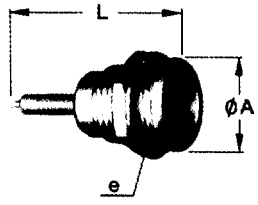
Model	Dim.	Series 0S	Series 1S
FFR	A	9	12
	L	42	53
ERA	A	10	14
	e	M9×0.6	M12×1
	L	25	30

Note: All dimensions are in millimeters.

FFR



ERA



Models and Series

Model	Series 0S	Series 1S
ERA	●	●
EWB	●	●
EWF	●	●
FFR	●	●
PCS	●	●
PSS	●	●

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Types

Reference	Series	Contact ∅	Contact Type		Working Voltage (kV rms)[1]	Working Voltage (kV dc)[1]	Working Voltage (kV rms)[2]	Working Voltage (kV dc)[2]	Test Voltage (kV rms)[3]	Test Voltage (kV dc)[3]	Rated Cur. (A)[4]
			Plug	Socket							
405	**0S**	0.7	A	L	3.5	5	5.6	8	8.5	12	4
408	**1S**	0.9	A	L	5.6	8	8.5	12	12.7	18	6

A = male solder contact
L = female solder contact

1) As per IEC 130.1 § 14.5 a)
2) As per IEC 130.1 § 14.5 b)
3) As per MIL-STD 1344A method 3001.1
4) As per IEC 512-3

Note:
Values have been measured with plug and socket mated

Crimp Ferrules

Reference		Connector		Cable Dimensions			
				Sheath OD		Max dielectric	Max conductor
Type	∅	Series	Type	Max.	Min.	∅	∅
E	33	**0S**	405	3.3	2.6	1.6	0.55
	48			4.8	4.2	3.0	0.55
	46	**1S**	408	4.6	4.0	2.3	0.75

Note: All dimensions are in millimeters.

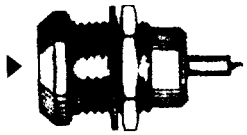
Series 1Y - 3Y (New Generation)

Interconnections

Straight Plug

FFR

Fixed Socket



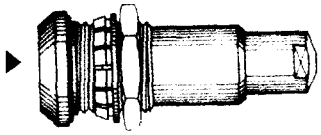
ERA

Straight Socket

PEP

Watertight or Vacuumtight Model

Fixed Socket

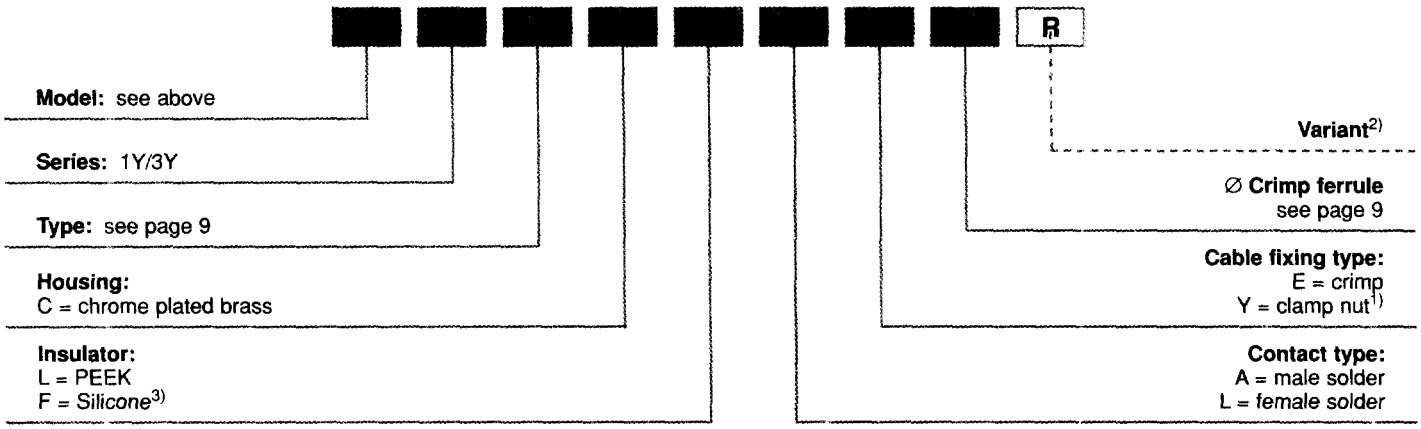


HGP

Model Description

ERA Fixed socket, nut fixing
FFR Straight plug for cable crimping with strain relief and safety ring
PEP Fixed socket, nut fixing, with cable collet nut (back panel mounting)
HGP Fixed socket, nut fixing, watertight

Part Number Example



FFR.3Y.425.CFAE76R Straight plug with safety ring, series 3Y, 25 kV dc single high voltage type, chrome plated brass housing, silicone insulator, male solder contact, crimp ferrule for a 7.6 mm OD cable, red strain relief.

Note:
Plugs are fitted with male contact and sockets with female contact.
1) For PEP model only.
2) *The strain reliefs are available in nine colors, the corresponding reference letters and colors are to be found in the 'Accessories' section (page 13).*
3) For plugs only.

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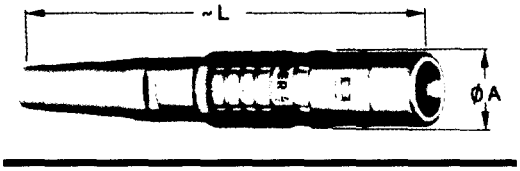
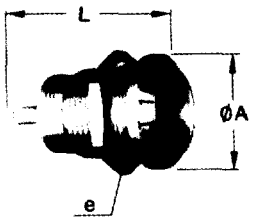
Dimensions

Model	Dim.	Series 1Y	Series 3Y
FFR	A	13	19
	L	83	114
ERA	A	20	31
	e	M16×1	M24×1
	L	34	50

FFR



ERA



Note: All dimensions are in millimeters.

Models and Series

Model	Series 1Y	Series 3Y
ERA	●	●
FFR	●	●
PEP	●	●
HGP	●	●

Types

Reference	Series	Contact Ø	Contact Type: Plug	Contact Type: Socket	Working Voltage (kV rms)[1]	Working Voltage (kV dc)[1]	Working Voltage (kV rms)[2]	Working Voltage (kV dc)[2]	Test Voltage (kV rms)[3]	Test Voltage (kV dc)[3]	Rated Cur. (A)[4]
416	**1Y**	0.9	A	L	11.2	16	16.0	23	25	35	6
425	**3Y**	1.6	A	L	17.5	25	24.5	35	37	52	8

A = male solder contact
L = female solder contact

1) As per IEC 130.1 § 14.5 a)
2) As per IEC 130.1 § 14.5 b)
3) As per MIL-STD 1344A method 3001.1
4) As per IEC 512-3

Note:
Values have been measured plug and socket mated

Fixing System

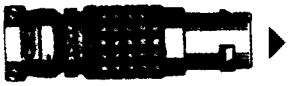
Reference Type	Reference Ø	Connector Series	Connector Type	Cable Dimensions: Sheath OD Max.	Sheath OD Min.	Max dielectric Ø[1]	Max conductor Ø
E	63	**1Y**	416	6.6	5.5	3.7	0.75
	64						1.35
Y	10			10.0	7.0		1.35
E	55	**3Y**	425	5.7	5.2	4.1	1.35
	76			7.6	7.0	4.7	1.35
Y	09			9.0	7.0		1.35
	15			15.0	12.0		1.35

1) Nominal value, ±0.1 tolerance

Series 4B - 5B (New Generation)

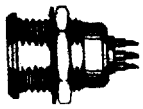
Interconnections

Straight Plug



FCJ

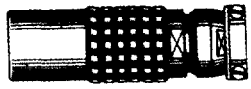
Fixed Sockets



EGJ

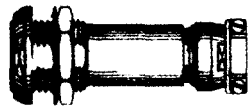
ECJ

Straight Sockets



PHJ

PKJ



PFJ

Vacuumtight Model

Fixed Socket

VEJ

Straight Socket

VPJ

Model Description

ECJ Fixed socket, with two nuts and keyway (J) (back panel mounting)
EGJ Fixed socket, nut fixing, with keyway (J)
FCJ Straight plug with cable clamp and safety ring, keyway (J)
PFJ Fixed socket, with two nuts, cable clamp and keyway (J) (back panel mounting)
PHJ Fixed socket with cable clamp and keyway (J)
PKJ Fixed socket, nut fixing, with cable clamp and keyway (J)
VEJ Fixed socket, nut fixing, with keyway (J) vacuumtight (back panel mounting)
VPJ Fixed socket, nut fixing, with cable clamp and keyway (J), vacuumtight (back panel mounting)

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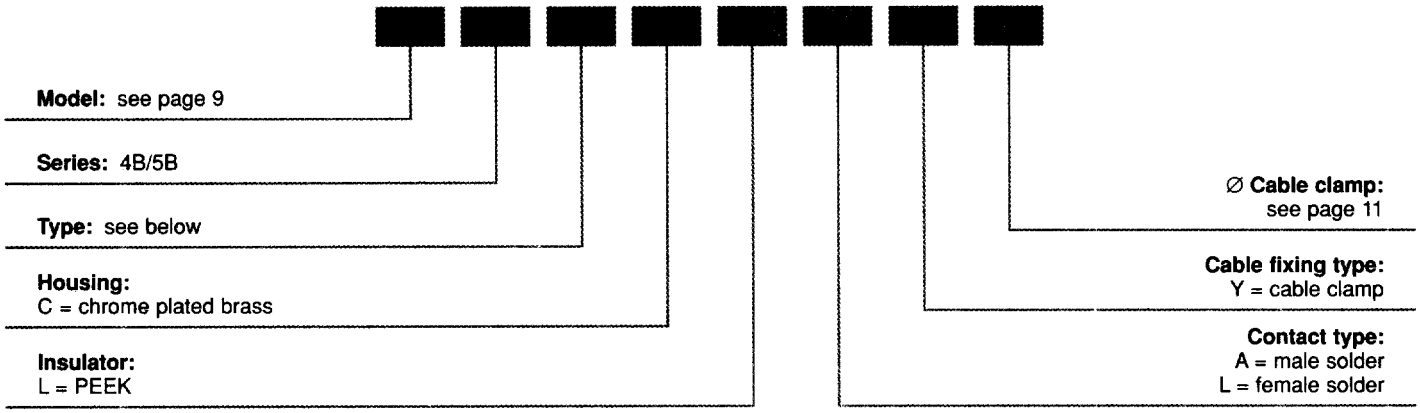
Part Number Example



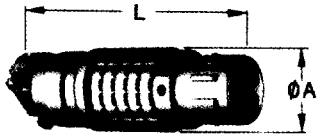
FCJ.4B.467.CLLY15 Straight plug with cable clamp and safety ring, keyway (J), series 4B, 8 kV dc multi high voltage type (7 contacts), chrome plated brass housing, PEEK insulator, female solder contacts.

Note: Plugs are fitted with female contacts and sockets with male contacts.

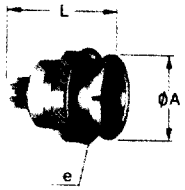
Dimensions

Model	Dim.	Series 4B	Series 5B
FCJ	A	25	35
	L	77	107
EGJ	A	28	40
	e	M25×1	M35×1
	L	38	43

FCJ



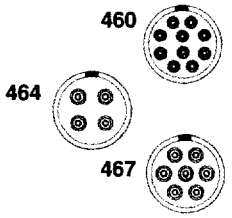
EGJ



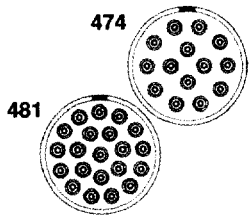
Models and Series

Model	Series 4B	Series 5B
ECJ	●	●
EGJ	●	●
FCJ	●	●
PFJ	●	●
PHJ	●	●
PKJ	●	●
VEJ	●	●
VPJ	●	●

4B Series



5B Series



Types

Reference	Series	Contact No.	Contact Ø	Contact Type: Plug	Contact Type: Socket	Working Voltage (kV rms)[1]	Working Voltage (kV dc)[1]	Working Voltage (kV rms)[2]	Working Voltage (kV dc)[2]	Test Voltage (kV rms)[3]	Test Voltage (kV dc)[3]	Rated Cur. (A)[4]
460	4B	10	0.9	L	A	3.5	5	5.6	8	8.5	12	3
464		4	0.9	L	A	5.6	8	8.5	12	12.7	18	4
467		7	0.9	L	A	5.6	8	8.5	12	12.7	18	4
474	5B	14	0.9	L	A	5.6	8	8.5	12	12.7	18	4
481		21	0.9	L	A	5.6	8	8.5	12	12.7	18	4

A = male solder contact
L = female solder contact

1) As per IEC 130.1 § 14.5 a)
2) As per IEC 130.1 § 14.5 b)
3) As per MIL-STD 1344A method 3001.1
4) As per IEC 512-3

Note:
Values have been measured plug and socket mated

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Series S – Y – B

Series 4B - 5B (New Generation)

Cable Clamp

Reference		Connector		Cable Dimensions		
				OD[1]		Max. cond
Type	Ø	Series	Type	Max.	Min.	Ø
Y	15	4B	460	15	12	0.75
	9		464	9	7	0.75
	15		467	15	12	0.75
	18	5B	474	18	15	0.75
	22		481	22	18	0.75

1) These diameters refer to either the sheath of a multicore cable or a group of individual cables.

Accessories

Bend relief colors available

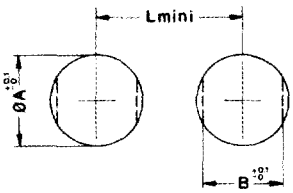
Ref.	Color	Ref.	Color
A	blue	N	black
B	white	R	red
G	grey	S	orange
J	yellow	V	green
M	brown		

Cut-out

Panel cut-out and fixing nut torque

Series	Dimensions (mm)			Torque (Nm)
	Ø A	B[1]	L	
0S	9.1	8.3	13.5	7
1S	12.1	10.6	17.0	12
1Y	16.1	14.6	22.0	22
3Y	24.2	22.6	35.5	35
4B	25.2	23.6	34.0	25
5B	35.2	33.6	44.0	35

1N = 0.102 kg



Crimp Tools

Part Number	Crimp Tool with Die
FFR.0S.405.CLAE33	DPA.99.004.4K
FFR.0S.405.CLAE48	DPA.99.005.5K
FFR.1S.408.CLAE46	DPA.99.005.2K
FFR.1Y.416.CLAE63	DPA.99.007.4K
FFR.1Y.416.CLAE64	DPA.99.007.4K
FFR.3Y.425.CLAE76	DPA.99.009.5K

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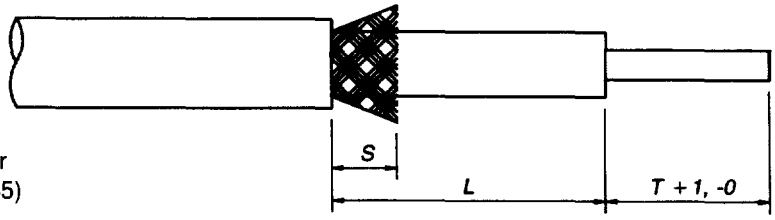
Assembly Instructions

1Y.405 / 410 Series and 3Y.415 / 430 Series

Straight Plug, Model FFA

1. The connector must be completely clean.
2. Strip the cable according to the given dimensions.
3. Slide the collet nut over the cable.
4. Slide the collet over the screen, and fold the screen around the collet end.
5. Fill the space between cable dielectric and insulator inner diameter with silicone compound (Dow Corning RTV 3145) or equivalent.
6. Slide the cable dielectric into the insulator, solder the conductor to the contact, clean and remove excess of solder.
7. Make sure that the screen is clamped between earthing sleeve and collet.
8. Introduce the insulator into the innershell and tighten the collet nut.

Cable Stripping



FFA	L	S	T
1Y.405	27	5	8
1Y.410	34	5	8
3Y.415	83	12	14
3Y.430	83	12	14

Fixed Socket, Model PSA

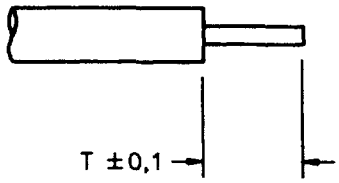
Same as above but first drill panel according to the given dimensions and mount outer shell into panel hole.

PSA	L	S	T
1Y.405	24	6	8
1Y.410	32	6	8

Fixed Socket, Model ERA

1. The connector must be completely clean.
2. Slide the insulating tube over the cable outerjacket.
3. Strip the cable according to the given length.
4. Solder the conductor. Soldering must be clean, even and free from excess solder. Any excess shall be removed.
5. Fill the space between the contact, the insert and the insulating tube with silicone and the insulating tube with silicone compound (Dow Corning RTV 3145) or equivalent.
6. Install and tighten completely the insulating tube.

Cable Stripping



ERA	T
1Y	6.5
3Y	6.5

Important Notice

The user is responsible for selecting working voltage and conditions according to their specific needs.

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Assembly Instructions

0S.405 Series (New Generation)

Straight Plug, Model FFR, or Free Socket, Model PCS

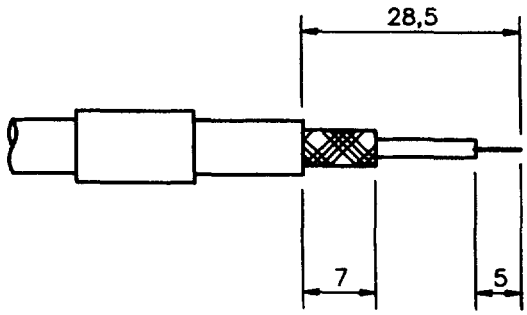
1. Slide crimp ferrule onto cable and strip cable according to the given dimensions.
2. Slide crimp backnut onto dielectric of cable by placing the knurled side under the screen.
3. Slide contact and insulator assembly onto dielectric of cable and solder the conductor.
4. Slide into place the second insulator.
5. Introduce mounted parts into the outershell and tighten backnut. Push crimp ferrule over screen and crimp with a hex die crimping tool.

(Tightening torque = 0.4 Nm)

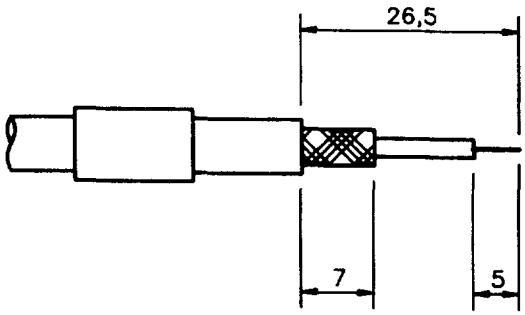
(Hex tool die opening = 3.2 mm/flat)
Crimping tool DPA.99.123.8K

(Hex tool die opening = 4.8 mm/flat)
Crimping tool DPA.99.005.5K

FFR



PCS / PSS



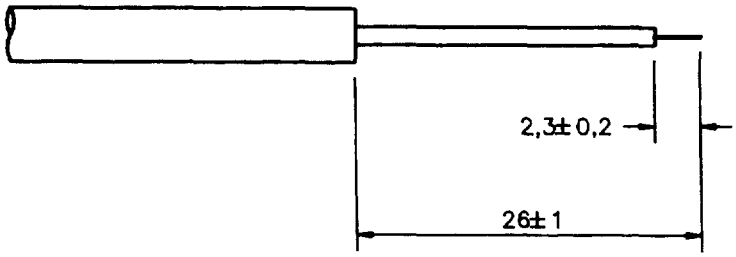
Fixed Socket, Model PSS

Same as above but first drill panel according to the given dimensions and mount outer shell into panel hole.

Fixed Socket, Model ERA, EWB, or EWF

1. Cut out panel according to the given dimensions.
2. Mount receptacle into panel hole.
3. Strip cable according to the given dimensions.
4. Slide a piece of fusible tubing onto dielectric of cable and slide over that a piece of heatshrink tubing of the right dimension.
5. Solder conductor, slide both pieces of fusible and shrink tubing onto insulator. With a heat gun, shrink until melting of the inner fusible tubing.

ERA / EWB / EWF



Important Notice

To obtain the correct performances, the cable dielectric and the insulator on the back of the socket must be sealed with a resin after the conductor soldering. We recommend the use of a heat shrink tubing with an inner melting coating such as:

- Raychem® heat shrink tubing ATUM or SCL, or
- Raychem® heat shrink tubing RNF-100 + melted tubing Hellermann® SFD-IL

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Assembly Instructions

1S.408 Series (New Generation)

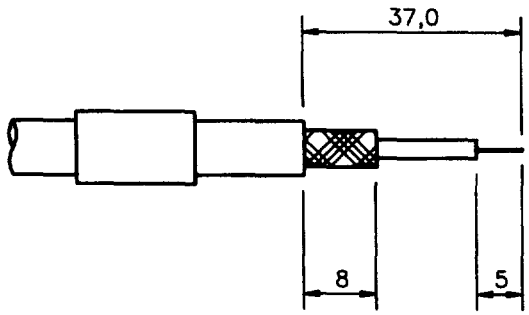
Straight Plug, Model FFR, or Free Socket, Model PCS

1. Slide crimp ferrule onto cable and strip cable according to the given dimensions.
2. Slide crimp backnut onto dielectric of cable by placing the knurled side under the screen.
3. Slide contact and insulator assembly onto dielectric of cable and solder the conductor.
4. Slide into place the second insulator.
5. Introduce mounted parts into the outershell and tighten backnut. Push crimp ferrule over screen and crimp with a hex dies crimping tool.

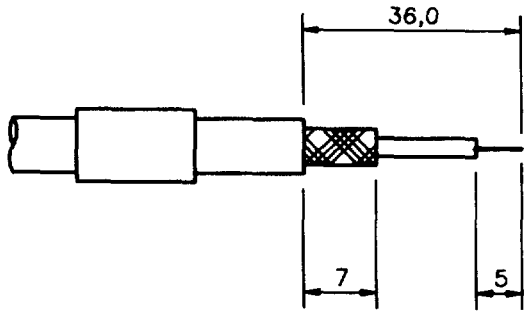
(Tightening torque = 1 Nm)

(Hex tool die opening = 4.5 mm/flat)
Crimping tool DPE.99.005.2K

FFR



PCS / PSS



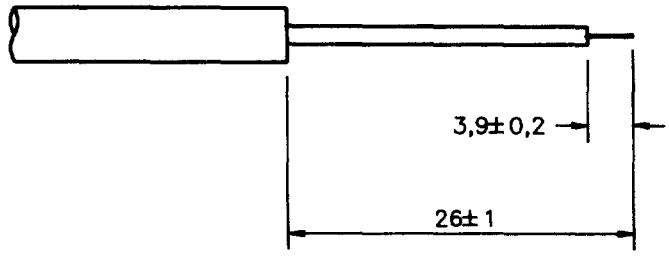
Fixed Socket, Model PSS

Same as above but first drill panel according to the given dimensions and mount outer shell into panel hole.

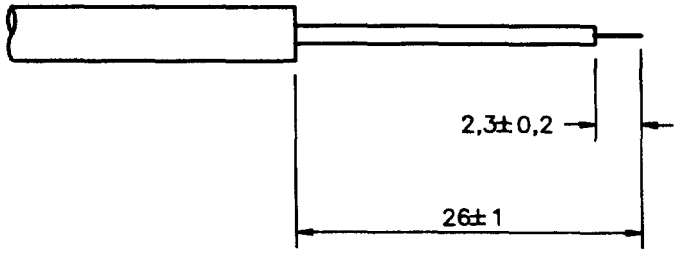
Fixed Socket, Model ERA, EWB, or EWF

1. Cut out panel according to the given dimensions.
2. Mount receptacle into panel hole.
3. Strip cable according to the given dimensions.
4. Slide a piece of fusible tubing onto dielectric of cable and slide over that a piece of heatshrink tubing of the right dimension.
5. Solder conductor, slide both pieces of fusible and shrink tubing onto insulator. With a heat gun, shrink until melting of the inner fusible tubing.

ERA



EWB



Important Notice

To obtain the correct performances, the cable dielectric and the insulator on the back of the socket must be sealed with a resin after the conductor soldering. We recommend the use of a heat shrink tubing with an inner melting coating such as:

- Raychem® heat shrink tubing ATUM or SCL, or
- Raychem® heat shrink tubing RNF-100 + melted tubing Hellermann® SFD-IL

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Assembly Instructions

1Y.416 Series (New Generation)

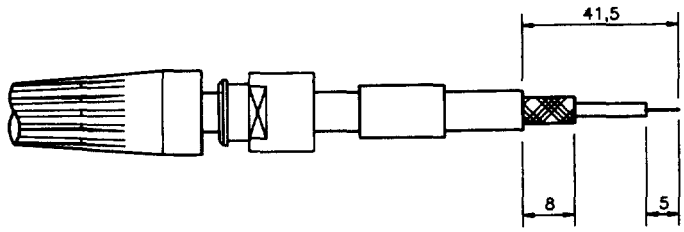
Straight Plug, Model FFR

FFR

1. Slide sleeve, backnut and crimp ferrule onto cable sheath. Strip cable according to the given dimensions. Completely take off the semi-conductive layer on the dielectric.
2. Slide the crimp sleeve onto dielectric of cable by placing the knurled side of crimp sleeve under the screen. Push crimp sleeve over the screen and crimp with a hex dies crimping tool. Solder contact.
3. Make sure to have the contact in perfect alignment with the cable axis. Slide and force the insulator onto the dielectric of cable until the insulator butts against the crimp sleeve. Introduce the mounted parts into the connector shell by locating the pin of crimp sleeve into the slot. Tighten the backnut and locate the sleeve into the slot of the backnut.

(Tightening torque = 1.5 Nm)

(Hex tool die opening = 6.4 mm/flat)
Crimping tool DPE.99.127.4K

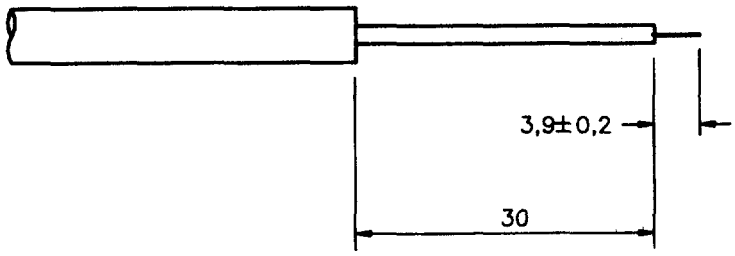


Straight Socket, Model ERA or HGP

ERA

1. Strip cable according to the given dimensions.
2. Cut out panel and mount receptacle shell into panel hole.
3. Slide insulating nut and force the cable insulator onto the dielectric of cable. Solder conductor.
4. Slide cable insulator forward and place it onto the rear insulator of the connector. Screw and tighten insulating nut.

(Tightening torque = 1.5 Nm)



Important Notice

To obtain the correct performances, a precise interference fit is necessary between the cable dielectric O.D. and the silicone insulator I.D. Existing models are designed to fit with cable dielectric O.D. = 3.7 ± 0.1 mm.

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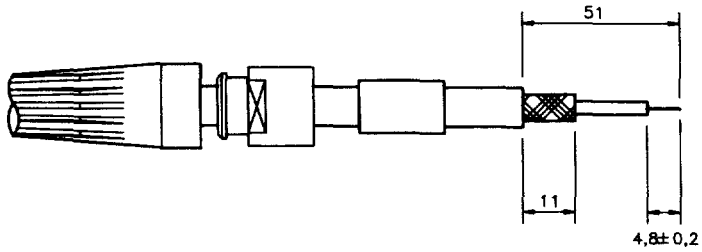
Assembly Instructions

3Y.425 Series (New Generation)

Straight Plug, Model FFR

FFR

1. Slide sleeve, backnut and crimp ferrule onto cable sheath. Strip cable according to the given dimensions. Completely take off the semi-conductive layer on the dielectric.
2. Slide the crimp sleeve onto the dielectric by placing the knurled side of crimp sleeve under the screen. Push crimp sleeve over the screen and crimp with a hex dies crimping tool. Solder contact.
3. Make sure to have the contact in perfect alignment with the cable axis. Slide and force the insulator onto the dielectric of cable until the insulator butts against the crimp sleeve. If necessary add some silicone grease onto the cable dielectric. Introduce the mounted parts into the connector shell by locating the pin of crimp sleeve into the slot. Tighten the backnut and locate the sleeve into the slot of the backnut.



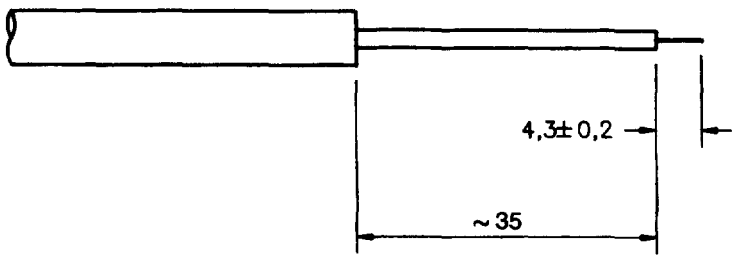
(Tightening torque = 3 Nm)

(Hex tool die opening = 8.3 mm/flat)
Crimping tool DPE.99.009.5K

Straight Socket, Model ERA or HGP

ERA

1. Strip cable according to the given dimensions. Completely take off the semi-conductive layer on the dielectric.
2. Cut out panel and mount receptacle shell into panel hole.
3. Slide insulating nut and force the cable insulator onto the dielectric of cable. Solder conductor.
4. Slide cable insulator forward and place it onto the rear insulator of the connector. Screw and tighten insulating nut.



(Tightening torque = 3 Nm)

Important Notice

To obtain the correct performances, a precise interference fit is necessary between the cable dielectric O.D. and the silicone insulator I.D. Existing models are designed to fit with cable dielectric O.D. = 4.7 ± 0.1 mm.

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Assembly Instructions

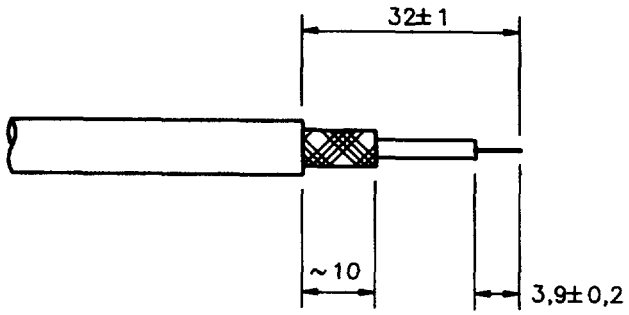
4B.464 / 467 Series (New Generation)

Straight Plug, Model FCJ, or Free Socket, Model PHJ

1. Strip the cable according to the given dimensions.
2. If using screened cable, fold the screen back onto the cable and solder an earth conductor; protect with a heat shrink tubing.
3. Slide the cable clamp nut and the retaining sleeve over all the cables.
4. Slide a piece of fusible tubing onto cable dielectric and over that a piece of heat shrink tubing of the correct dimension.
5. Solder conductor; slide both pieces of fusible and shrink tubing onto insulator. With a heat gun, shrink until melting of the inner fusible tubing.
6. Mount the two split insert carriers onto the main insulator.
7. Introduce the mounted parts into the outershell.
8. Tighten backnut and clamp cable.
9. Connect all earth conductors to a washer and fasten on one of the cable clamp screws.

(Tightening torque = 15 Nm)

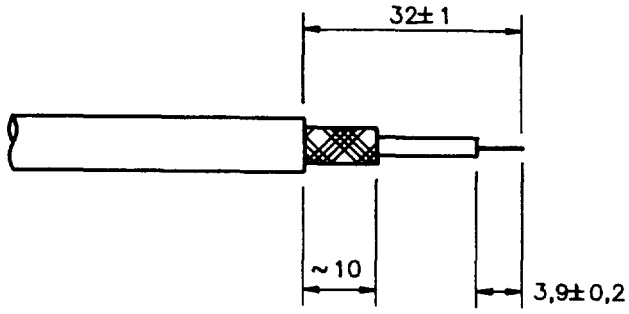
FCJ



Fixed Socket, Model PKJ or PFJ

Same as above, but first cut out panel according to the given dimensions and mount outershell into panel hole.

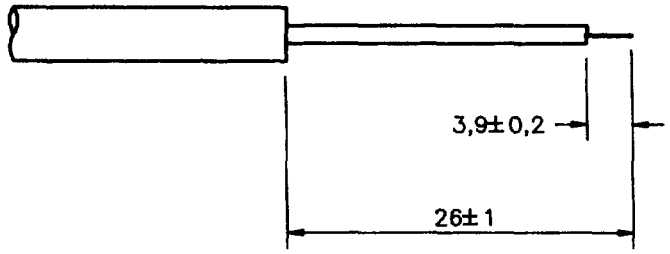
PHJ / PFJ



Fixed Socket, Models EGJ, ECJ or VEJ

1. Cut out panel according to the given dimensions.
2. Mount receptacle into panel hole.
3. Strip cable according to the given dimensions.
4. Slide a piece of fusible tubing onto cable dielectric and over that a piece of heat shrink tubing of the correct dimension.
5. Solder conductor; slide both pieces of fusible and shrink tubing onto insulator. With a heat gun, shrink until melting of the inner fusible tubing.

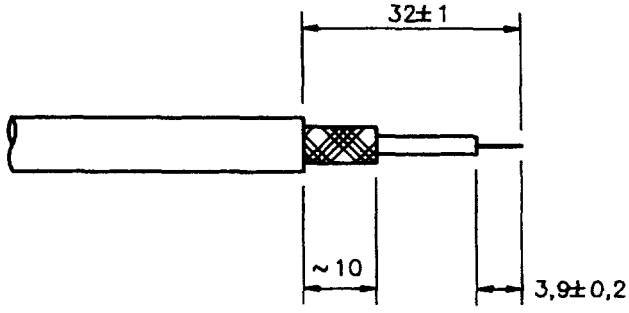
EGJ / ECJ



Fixed Socket, Vacuum Tight, Model VPJ

1. Strip the cable according to the given dimensions.
2. If using screened cable, fold the screen back onto the cable jacket and solder an earth conductor; protect with a heat shrink tubing.
3. Slide the cable clamp nut and the outer backshell over the cables.
4. Slide a piece of fusible tubing onto cable dielectric and over that a piece of heat shrink tubing of the correct dimension.
5. Solder conductor; slide both pieces of fusible and shrink tubing onto insulator. With a heat gun, shrink until melting of the inner fusible tubing.
6. Tighten outer backshell.
7. Tighten backnut and clamp cable.
8. Connect all earth conductors to a washer and fasten on one of the cable clamp screws.
9. Cut out panel according to the given dimensions.
10. Mount socket into panel hole.

VPJ



Important Notice

To obtain the correct performances, the cable dielectric and the insulator on the back of the socket must be sealed with a resin after the conductor soldering (see drawing). We recommend the use of a heat shrink tubing with an inner melting coating, such as:

- Raychem® heat shrink tubing ATUM or SCL, or
- Raychem® heat shrink tubing RNF-100 + melted tubing Hellermann® SFD-IL

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LEMO's Family of Quality Connectors

LEMO manufactures precision engineered circular self-latching quick connect-disconnect electronic connectors for a wide variety of applications.

Keyed Connectors
(multi and mixed contact configurations)

B Series Features:
- Contact arrangements from 2-64 pins and mixed configurations including coaxial, triaxial, fiber optic, fluidic/pneumatic and high voltage
- Wire gauges range from 8-30 AWG.
- Vacuum sealed shells
- Alignment key on the shell which prevents errors in alignment.
- Polarized keying system which enables keying exclusivity and prevents accidental cross mating of similar connectors.
- High contact density in a small amount of space.
- Contact terminations in either solder, crimp, or printed circuit.

S Series Features:
- Contact arrangements from 1-106 pins and mixed configurations including coaxial, triaxial, fluidic/pneumatic and high voltage.
- Wire gauges from 4-26 AWG.
- Hermaphroditic inserts which assure proper contact alignment and quick-disconnect design.
- Contact terminations in solder or printed circuit.
- Vacuum sealed shells.

C & G Series (compact) Connectors: Multiple and coaxial contact connectors in a specially designed short shell for space saving applications.

Environmentally Sealed Keyed Connectors

K Series Features:
- Environmental connectors with triple wall construction to provide water and dust resistance.
- Mechanically keyed.
- Contact configurations identical to the B Series Connectors.

E Series Features:
- Environmental connectors with triple wall construction to provide water and dust resistance.
- Hermaphroditic inserts.
- Contact configurations identical to the S Series Connectors.

NIM-CAMAC Coaxial Miniature Connectors

00-NIM-CAMAC - 50 ohm: (Nuclear Instrumentation Module, Computer Automated Measurement and Control). Recommended cables:

RG.58C/U	RG.180B/U	RG.316/U
RG.174A/U	RG.187A/U	CCE.99.281.505
RG.178B/U	RG.188A/U	CCH.99.281.505
RG.179B/U	RG.196A/U	HF-2114 Dätwyler

Other Coaxial/Triaxial Connectors

01-MINAX Series - 50 ohm: LEMO's smallest coaxial connectors. Recommended cables:

RG.174A/U	RG.196A/U	CCE.99.281.505
RG.178B/U	RG.316 /U	CCH.99.281.505
RG.188A/U		

OA-Telecommunications Series 50 & 75 ohm: Designed with contacts to accommodate the following cables:

RG.58C/U	CCH.99.281.505 LEMO
RG.59B/U	2YCY (0.4/2.5) Siemens
RG.174A/U	2YCCY (0.4/2.5) Siemens
RG.179B/U	0722 102 11 001 Philips
RG.316/U	0722 102 29 011 Philips
CCE.99.281.505 LEMO	HF-5408/1 Dätwyler

Standard Series Coaxial and Triaxial Connectors: Other 50 and 75 ohm coaxial and triaxial connectors are available to accommodate cables up to .886"/22.0mm. These are also available in an environmentally sealed design.

Video Triax Connectors: LEMO's triaxial series is designed for video camera applications. Recommended cables:

8232-Belden	12766601-F&G
HF-2426-Dätwyler	8233-Belden
12765700-F&G	9232-Belden
9267-Belden	10070-C-G14-BIW
10069-C-G20-BIW	12766700-F&G
12766400-F&G	4.6/1.0EFTX-Fujikura

Other LEMO Connectors

Underwater Connectors - 03 Series and V Series:
- Available in 50 ohm coaxial, triaxial, mixed and multicontact configurations up to 48 pins.
- Accommodates a maximum cable of 23.5mm.
- O-ring seals and locking nut to assure against water penetration and accidental unmating.
- Watertightness and stability guaranteed for up to 870 psi or severe vibration conditions.

High Voltage Series:
- S Series High Voltage Connectors available in a large range of sizes featuring teflon inserts and a time proven design.
- Y Series High Voltage Connector in a long shell design insuring mechanical mating prior to contact engagement.
- 0S and 1S Series High Voltage Connectors distinguished by their favorable size to voltage relationship.
- Multi High Voltage Connectors in sizes 4B and 5B for applications where multiple high voltage contacts are desired.

Fiber Optic Connectors: LEMO's fiber optic connectors are designed for single mode and multimode transmission on single or multi-fibers. Terminations are made by the cut and epoxy/polish method. A full range of fiber sizes are available.

Plastic Connectors: Plastic connectors in PSU or autoclavable PEI shells ranging in contact arrangements from 2-18 contacts accommodating a cable Ø of 2.7-9mm.

Fluidic Connectors: Available in single or multiple tubes as well as mixed with electrical contacts with working pressure up to 2 bar (29 psi).

Thermocouple Series: LEMO's Thermocouple connectors are designed to assure continuous and accurate monitoring of hostile environments where extreme surface or ambient temperatures, gases or liquids must be controlled.

Cable Assemblies: LEMO manufactures complete cable assemblies with both coaxial and multi-conductor cables. Assemblies can be fabricated from customer-owned cables or LEMO can provide all materials. LEMO capabilities include cable assembly design, fabrication, continuity and capacitance testing, and heat stamped cable or shrink marker identification.

Custom Designs: For more information please contact LEMO.

5/98 2500

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