SMPTE 304 HDTV CONNECTION SYSTEM 3K.93C.Y SERIES



New design, less components

The FS contact used in the 3K.93C.Y series is a re-design of the original F2 contact developed in 1992. The new FS has a reduced number of components and fits into a new designed connector.

This new product line has less components and makes no compromise on quality and the new version is still fully SMPTE 304 interface compatible. The insulator is now made in two parts with sideways insertion of the FS optical contact meaning a dedicated contact extraction tool is no longer required.

Advantages:

- New design allows easy fibre length adjustment
- No half-shells are required
- Increased internal space for the fibres and electrical conductors
- Epoxy curing time for the optical contacts halved to 20 minutes.





Precision modular connectors to suit your application

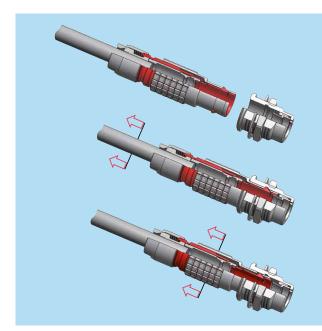
Since its creation in Switzerland in 1946 the LEMO Group has been recognized as a global leader of circular Push-Pull connectors and connector solutions. Today LEMO and its affiliated companies, REDEL and COELVER, are active in more than 80 countries with the help of over 40 subsidiaries and distributors.

Over 75000 connectors

The modular design of the LEMO range provides over 75000 connectors from miniature Ø 3 mm to Ø 50 mm, capable of handling cable diameters up to 30 mm and for up to 114 contacts. This vast portfolio enables you to select the ideal connector configuration to suit almost any specific requirement in most markets, including medical devices, test and measurement instruments, machinery, audio video broadcast, telecommunications and military.

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 C€

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.

RoHS

LEMO connector specifications conforms the requirements of the RoHS directive (2011/65/EU) of the European Parliament and the latest amendments. This directive specifies the restrictions of the use of hazardous substances in electrical and electronic equipment marketed in Europe.

Product safety notice & disclaimers

Please read and follow all instructions specified on the last page or on our <u>website</u> 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.



3

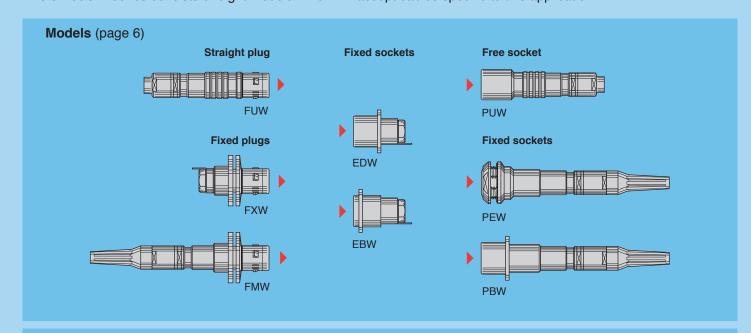
3K.93C.Y Series

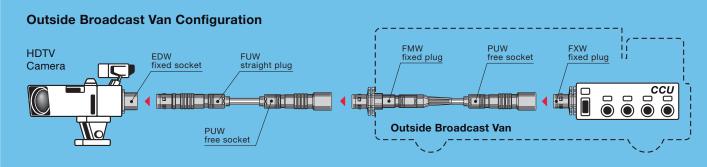
The LEMO 3K.93C.Y connectors with keys (W), ideal for blind mating, were developed to meet the critical requirements of the new generation of digital HDTV cameras.

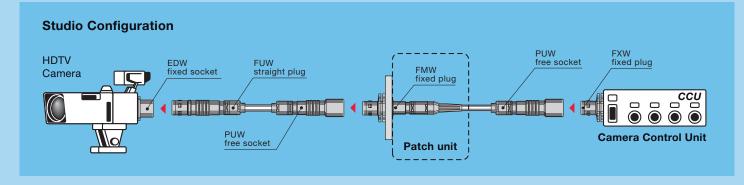
- The main features of this series are as follows:

 Security of the LEMO Push-Pull self-latching system
- Fitted with the new LEMO FS fibre optic contacts.
- Conforms to the Japanese ARIB technical report BTA S-1005B, to the SMPTE 304 standard and to the European EBU Technical Recommendation R100-1999.
- Qualified for use in UL approved equipment such as those specified in UL 1977 (UL file E119802). Cabled connectors have obtained the EC Attestation of conformity No: N8 00 03 39058 001 from the German TÜV Product Service.

The 3K.93C.Y series consists of eight models which will accept cables specific to this application.

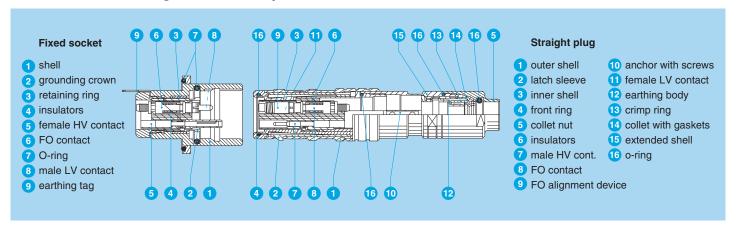








Part section showing internal components



Technical characteristics

Materials and treatments

| Component | Material (Standard) | | Surface chrome Cu Ni Cr | | treatment nickel Cu Ni | | gold | | Au |
|--|-----------------------------------|-----|-----------------------------------|------|--------------------------------|-------|------|-----|-----|
| Outomakall, asllations | Brass (UNS C 38500) | 0.5 | | 0.3 | Ou | IVI | Ou | 141 | Au |
| Outer shell, collet nut and oversized collet | Stainless steel (AISI 303) | | | | thout treatment | | | | |
| Grounding crown | Special brass | | | | 0.5 | 3 | | | |
| Latch sleeve | Stainless steel (AISI 416) | | | with | nout ti | eatm | ent | | |
| Locking washer | Bronze (UNS C 52100) | | | | 0.5 | 3 | | | |
| Hexagonal nut or round nut | Brass (UNS C 38500) | | | | 0.5 | 3 | | | |
| Male crimp contact | Brass (UNS C 34500) | | | | | | 0.5 | 3 | 1.0 |
| Female crimp contact | Bronze (UNS C 54400) | | | | | | 0.5 | 3 | 1.5 |
| Clips | Cu-Be (FS-QQ-C-530) | | | with | nout ti | eatm | ent | | |
| Insulator | PEEK | | | | | | | | |
| Crimping tube | Copper (UNS C 18700) | | | | 0.5 | 3 | | | |
| Other metallic components | Brass (UNS C 38500) | | | | 0.5 | 3 | | | |
| Other metallic components | Stainless steel (AISI 304L) | | | with | nout ti | reatm | ent | | |
| O-ring and gaskets | Silicone MQ/MVQ, FPM/FKM (Viton®) | | | | | | | | |

Electrical

| Characteristics | | Value | Standard |
|-----------------------------|--------------------|-------------------------|---------------------|
| Insulation resistance | | $> 10^{12} \Omega$ | IEC 60512-2 test 3a |
| Shell electrical continuity | | $< 1.6 \text{m}\Omega$ | IEC 60512-2 test 2f |
| Contact resistance (signal) | | $<$ 4.8 m Ω | IEC 60512-2 test 2a |
| Contact resistance (power) | | $< 3.6 \text{m}\Omega$ | IEC 60512-2 test 2a |
| Radiated | freq. 30-220 MHz | $<$ 30 dB μ V/m | EN 55022 class B |
| emission | freq. 220-1000 MHz | $<$ 37 dB μ V/m | EN 55022 class B |

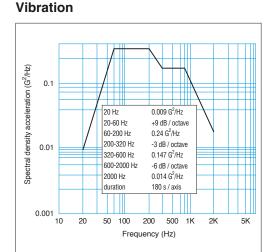
Optical

| Characteristics | Value | Standard | Method |
|--|---------|-----------------|--------------------------|
| Average insertion loss fibre 9/125 μ m | 0.10 dB | IEC 61300-03-04 | Insertion Method B |
| Return loss fibre 9/125 μ m (UPC) | ≥ 45 dB | IEC 61300-03-06 | Branching Device Met. |



Mechanical and environmental

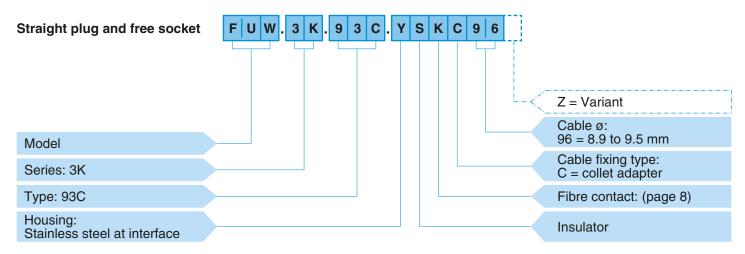
| Characteristics | Value | Standard | |
|---|------------------------------|----------------------|--|
| Mating durability (Stainless steel+St. steel) | 20000 cycles | IEC 61300-02-02 | |
| Damp heat steady state | up to 95% at 60°C | IEC 61300-02-19 | |
| High temperature | +80°C | IEC 61300-02-18 | |
| Low temperature | -40°C | IEC 61300-02-17 | |
| Temperature cycling | -55°C + 90°C | | |
| Cable retention | 1000 N | IEC 61300-02-04 | |
| Impact (Method A) | 2 m onto concrete floor | IEC 61300-02-12 | |
| Shock (3 cycles in 2 directions) | 100 g, 10-50 ms; 20 g 6-9 ms | IEC 61300-02-09 | |
| Water resistance (Depth of 1.8 for 48 h) | IP 68 ¹⁾ | IEC 60529 | |
| Salt spray corrosion test 2) | > 1000 h | IEC 60512-6 test 11f | |



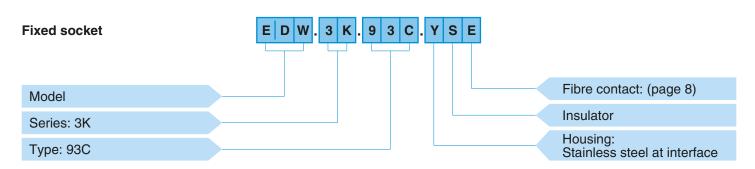
Note: ¹) except FX• and FM• models.

2) for chrome plated product («C» material code).

Part number example



FUW.3K.93C.YSKC96 = Straight plug with keys (W), 3K series, hybrid type to accept 2 FS type fibre optic contacts, 2 power and 2 signal electrical contacts, stainless steel housing, PEEK insulator, female crimp signal contacts, cable fixing type C for 9.2 mm diameter cable.



EDW.3K.93C.YSE = Fixed socket with rear square flange, keys (W), 3K series, hybrid type to accept 2 FS type fibre optic contacts, 2 power and 2 signal electrical contacts, stainless steel housing, PEEK insulator, male crimp signal contacts.





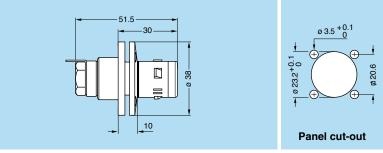
FUW.3K.93C.YSKC96 Straight plug, cable collet adapter and long shell for fitting a bend relief with cap



Note: The bend relief must be ordered separately (see page 9).

FXW.3K.93C.YSE Fixed plug, round flange (4 holes mounting), without collet

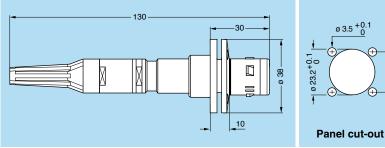




Note: Only available for IP 50 in mated condition.

FMW.3K.93C.YSKC96Z Fixed plug, round flange (4 holes mounting), cable adapter, for bend relief

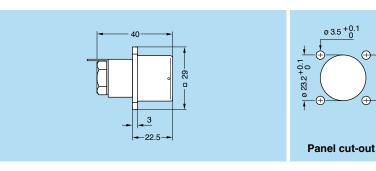




Note: Only available for IP 50 in mated condition. The bend relief must be ordered separately (see page 9).

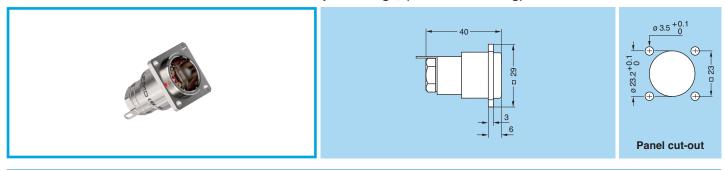
EDW.3K.93C.YSE Fixed socket with rear square flange, (4 holes mounting), and earthing tag



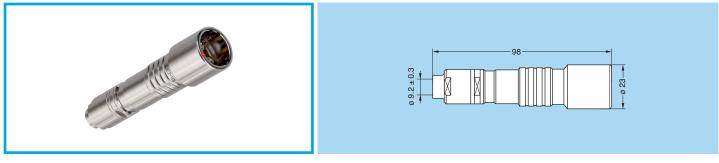




EBW.3K.93C.YSE Fixed socket with front square flange, (4 holes mounting)

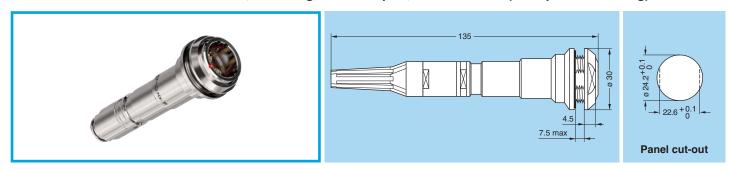


PUW.3K.93C.YSKC96 Free socket, cable collet adapter and long shell for fitting a bend relief with cap



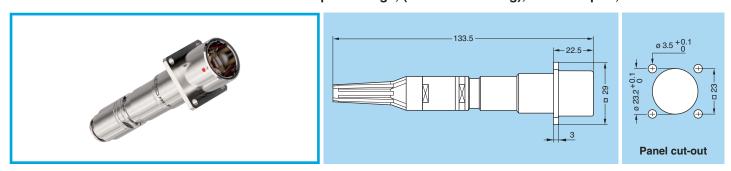
Note: The bend relief must be ordered separately (see page 9).

PEW.3K.93C.YSKC96Z Fixed socket, nut fixing, cable adapter, for bend relief (back panel mounting)



Note: The bend relief must be ordered separately (see page 9).

PBW.3K.93C.YSKC96Z Fixed socket with rear square flange, (4 holes mounting), cable adapter, for bend relief



Note: The bend relief must be ordered separately (see page 9).

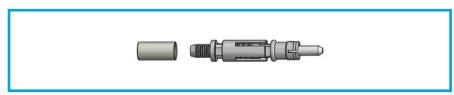




| | | | | Fibre | optic c | ontact | | | Ele | ectrica | al crimp | contac | ct | | |
|-----------------------------------|----------------|------------------|-----------|-----------------------|--------------------------|----------------------------|--------------------|------------------|-----------------------|----------------|-----------|---|-------------------------|----------------------|-------------------|
| Number of fibre optic contacts | Plug insulator | Socket insulator | Reference | Contact type for plug | Fibre core/cladding (µm) | Ferrule bore inside ø (µm) | Number of contacts | Contact function | Contact type for plug | Contact ø (mm) | AWG range | Creepage distance and air clearance (mm) | Working voltage (V rms) | Test voltage (V rms) | Rated current (A) |
| 2 | | | 93C | fem. | 9/125 | 125 | 2 | signal | LV male | 0.9 | 20-24 | | ≤ 42 | 1000 | 3 |
| | | | 930 | ieiii. | 9/125 | 125 | 2 | power | HV male | 1.3 | 14-18 | > 6.5 | ≤ 600 | 2250 | 10 |

| | Fibre optic contact | |
|--|---------------------|--|
|--|---------------------|--|

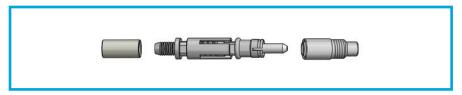
FFS.FS Male FS Fibre Optic Contact



| Ref. | Contact | Ferrule hole | Model | Gender | Note |
|------|------------------|------------------|-----------------|--------|------|
| E | FFS.FS.BA2.YCE30 | 125 <i>µ</i> m | EDW / EBW | Male | • |
| K | FFS.FS.BA2.YCT10 | 125 μm | PUW / PEW / PBW | Male | • |
| X | FFS.FS.BX2.YCE30 | 125.5 <i>µ</i> m | EDW / EBW | Male | • |
| V | FFS.FS.BX2.YCT10 | 125.5 <i>µ</i> m | PUW / PEW / PBW | Male | • |

• First choice - highest performance

PSS.FS Female FS Fibre Optic Contact



| Ref. | Contact | Ferrule hole | Model | Gender | Note |
|------|------------------|------------------|-----------|--------|------|
| E | PSS.FS.BA2.YCE30 | 125 <i>µ</i> m | FXW | Female | • |
| K | PSS.FS.BA2.YCT10 | 125 <i>µ</i> m | FUW / FMW | Female | • |
| X | PSS.FS.BX2.YCE30 | 125.5 <i>µ</i> m | FXW | Female | • |
| V | PSS.FS.BX2.YCT10 | 125.5 <i>µ</i> m | FUW / FMW | Female | 0 |

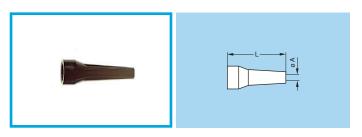
First choice - highest performanceAlternative - tight-fitting fibre





Accessories

GMA Bend relief



| Part number | Dim. (mm) | | | |
|---------------|-----------|----|--|--|
| Fait number | Α | L | | |
| GMA.3B.090.DN | 9 | 42 | | |

Note: Other diameters and colours available upon request.

GMF Bend relief with cap for FUW plug

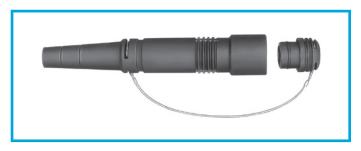


Part number

GMF.3K.085.EANZ

Material: black ALCRYN®

GMP Bend relief with cap for PUW free socket

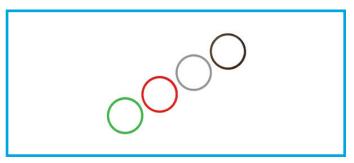


Part number

GMP.3K.085.EANZ

Material: black ALCRYN®

GMF Coloured ring for bend relief with cap

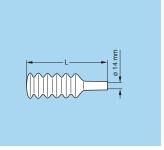


| Part number | Colour |
|---------------|--------|
| GMF.3K.265.RG | grey |
| GMF.3K.265.RN | black |
| GMF.3K.265.RR | red |
| GMF.3K.265.RV | green |

Material: Silicone

GM Gaiters



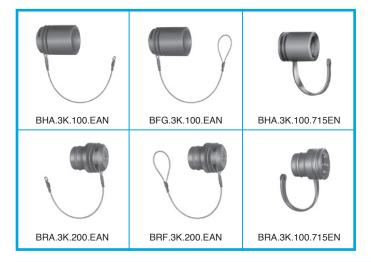


| Part number | Colour | Dimension L (mm) | For connector model |
|-------------------|--------|---------------------|---------------------|
| GMP.3K.140.165PER | red | 165 | PUW |
| GMP.3K.140.165PEN | black | 165 | PUW |
| GMF.3K.140.156PEV | green | 156 | FUW |
| GMF.3K.140.156PEN | black | 156 | FUW |

Material: PVC



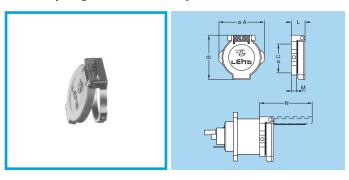
Boo Blanking caps



| Part number | For connector model |
|------------------|---------------------|
| BHA.3K.100.EAN | FMW, FXW |
| BRA.3K.200.EAN | EDW, PEW |
| BFG.3K.100.EAN | FUW |
| BRF.3K.200.EAN | PUW |
| BHA.3K.100.715EN | FMW, FXW |
| BRA.3K.100.715EN | EBW, EDW, PBW, PEW |

Material: black ALCRYN®

BRR Spring loaded dust cap for EDW and EBW



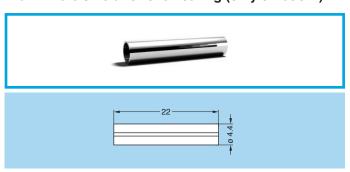
| Part number | Dimensions (mm) | | | | | | | |
|-----------------|-----------------|----|----|-----|---|------|--|--|
| Fait Hullibel | Α | В | С | L | М | N | | |
| BRR.3K.200.PZSG | 29 | 29 | 23 | 8.1 | 3 | 33.2 | | |

Material: Polyoxymethylene (POM) grey (or black)



Tooling

WST Fibre shield for oven curing (only 3K.93C.Y)



Part number

WST.TU.194.LN

Material: Nickel plated brass

DCS.F2.035.PN Alignment device tool



Simple tool with two threaded end for installation/extraction of the F2/FS contact alignment device. For use with WST.KI.125.34 kit above.

WST.KI.125.34 Cleaning kit F2/FS contact



Fibre optic cleaning kit of 2 cotton buds, 1 dry and 1 being soaked in IPA (Isopropyl Alcohol) used for cleaning the fibre optic contacts.



DCS.F2.N02.PA Fibre Optic one-click cleaner



Insert the one-click cleaner into the insulator and push until an audible "click" is heard. The cleaner uses a mechanical push action to advance an optical grade cleaning tape. More than 500 cleaning per cleaner. Product includes special LEMO F2/FS ferrule adaptor.

WST.FB.CI1.10US2 Video inspection viewer



A portable fibre optic viewer for F2/FS contact consisting of handset probe, LCD display, ferrule tips for LEMO contacts & software & United States - AC power supply all in a rugged case. European power supply version (WST.FB.CI1.10EU2). An optional USB capture device is also available (part number: WST.FB.CI1.00USB2).

DCS.3K.175.72LN Cable puller



The LEMO cable puller, is a pull through tool that allows passing the cable through narrow sections and protects the optical fibre during installation.

WST.TE.HDTV HD cable tester



This cable tester provides a quick and easy means of checking the functionality of HD hybrid fibre cables and cable systems. A laser source checks the fibres giving an indication of the attenuation through the whole cable or cable system, and electrical tests check for continuity of both the power and control conductors.

Note: Available on request.

Repair kit for plug FUW.3K.93C.YSKC96, free socket PUW.3K.93C.YSKC96, fixed plug FXW.3K.93C.YSE and socket EDW.3K.93C.YSE



Repair kit part number for FUW plug

FUW.3K.93C.ZSMY96

Repair kit part number for FXW plug

FXW.3K.93C.ZSM



Repair kit part number for PUW socket

PUW.3K.93C.ZSCY96

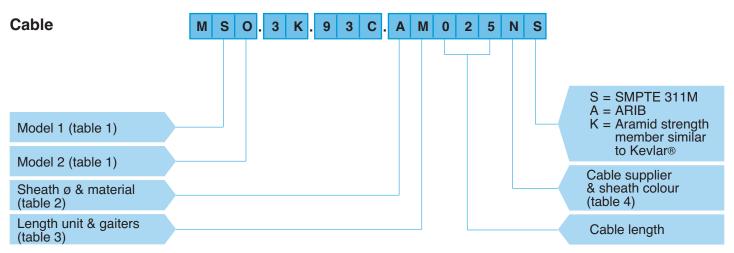
Repair kit part number for EDW socket

EDW.3K.93C.ZSC





Part Number Example



MSO.3K.93C.AM025NS = 1 FUW plug and 1 PUW socket (key W), 3K.93C.Y series, on a SMPTE 311M screened cable, 25 m length, sheath o 9.2 mm, black RAL 9005 jacket colour, with GMF/GMP bend relief with cap.

| Table 1 Model | | Table 2 Sheath ø & material | | | Table Length & gaite | n unit | | | | C | ab | le 4 le supplier neath colour |
|-------------------------|------|--|-------|-----|----------------------------|--------|------------------------|---------|----------|---|------|-------------------------------------|
| Model | | Sheath ø | Co | ode | | No | Red gaiter free socket | | 2 yellow | | | Cable supplier |
| 1 & 2 | Code | (mm) | PVC1) | PUR | | Gaiter | Green gaiter plug | gaiters | gaiters | Ç | 2000 | & sheath colour |
| FUW | S | 9.2 | Α | R | cm | С | Е | | | ı | 1 | Northwire Black |
| FXW | N | 4.2 | В | S | dm | D | F | | | C | à | Northwire Grey |
| PUW | 0 | 6.8 | С | Т | m | M | G | N | J | A | 4 | Northwire Blue |
| EDW | Υ | 12.0 | D | U | km | K | L | | | F | = | Furukawa Black |
| FMW | Α | 16.0 | Е | V | inch | - 1 | | | | E | 3 | Belden Black |
| PEW | С | | | | feet | Т | | | | | | |
| PBW | J | | | | | | | | | | | |

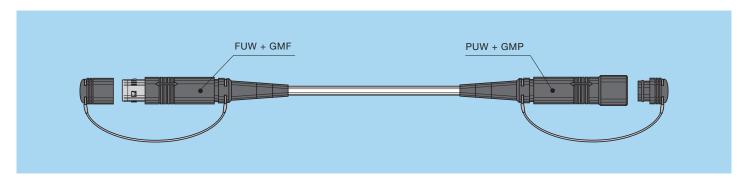
| Code | Cable supplier & sheath colour |
|------|--------------------------------|
| N | Northwire Black |
| G | Northwire Grey |
| Α | Northwire Blue |
| F | Furukawa Black |
| В | Belden Black |

Note: 1) PVC not recommended for temperatures below -20°C.



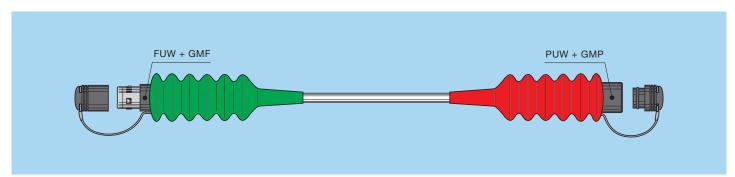
MSO Outside broadcast cable assembly

Cable assembly with one straight plug (FUW) and one straight socket (receptacle) (PUW), both complete with GMF/GMP bend relief with cap.



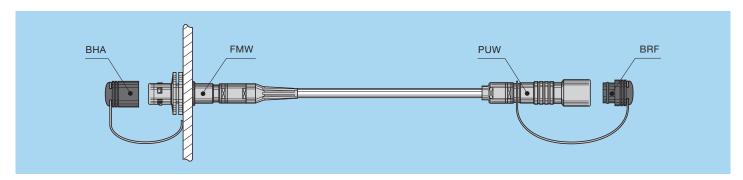
MSO Outside broadcast cable assembly

Cable assembly with one straight plug (FUW) and one straight socket (receptacle) (PUW), both complete with GMF/GMP bend relief with cap and gaiters.



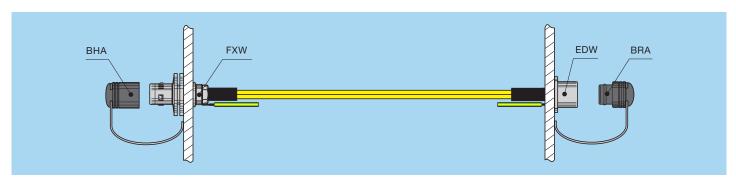
MAO Internal OB van cable assembly

Cable assembly with one fixed plug (FMW) and one straight socket (receptacle) (PUW), both complete with BHA/BRF caps.



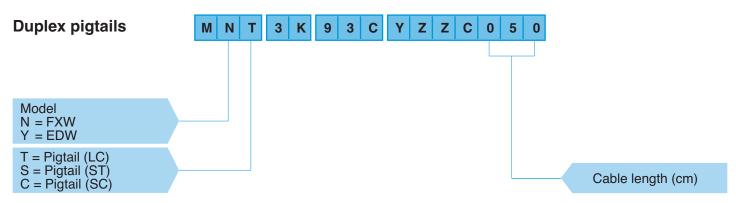
MNY Studio/Infrastructure cable assembly

Cable assembly with one fixed plug (FXW) and one straight socket (receptacle) (EDW), complete with BHA cap.





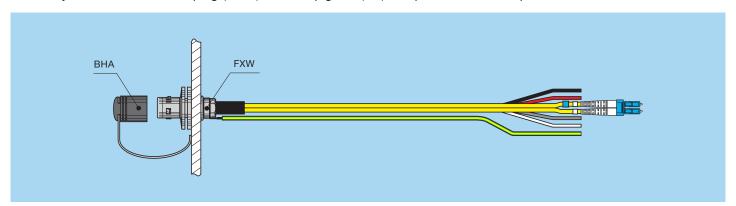
Part Number Example



MNT.3K.93C.YZZC050 = 1 FXW plug (key W), 3K.93C.Y series and two pigtails (LC) on the other side, 50 cm length.

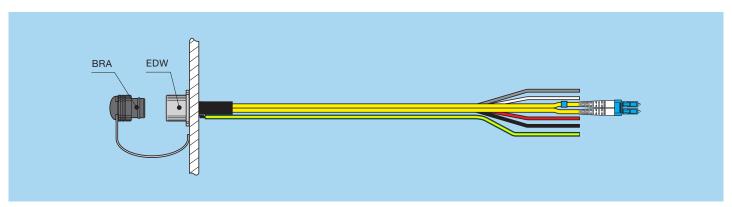
MNT ECU side duplex pigtails

Assembly cable with one fixed plug (FXW) and two pigtails (LC) complete with BHA cap.



MYT Camera side duplex pigtails

Assembly cable with one fixed socket (EDW) and two pigtails (LC) complete with BRA cap.





SMPTE 311 standard cable assemblies

Outside Broadcast FUW-PUW

| Part number | Description |
|--------------------|------------------|
| MSO.3K.93C.AM025NS | 25 metre length |
| MSO.3K.93C.AM050NS | 50 metre length |
| MSO.3K.93C.AM100NS | 100 metre length |
| MSO.3K.93C.AM200NS | 200 metre length |
| MSO.3K.93C.AM300NS | 300 metre length |
| MSO.3K.93C.AM400NS | 400 metre length |
| MSO.3K.93C.AM500NS | 500 metre length |

Internal OB van

| Part number | Description |
|--------------------|-----------------|
| MNO.3K.93C.AM003NS | 3 metre length |
| MNO.3K.93C.AM005NS | 5 metre length |
| MNO.3K.93C.AM010NS | 10 metre length |
| MNO.3K.93C.AM015NS | 15 metre length |
| MNO.3K.93C.AM020NS | 20 metre length |

Studio/Infrastructure

| Part number | Description |
|--------------------|-----------------|
| MNY.3K.93C.AM020NS | 20 metre length |
| MNY.3K.93C.AM050NS | 50 metre length |

ARIB standard cable assemblies Outside Broadcast FUW-PUW

| Part number | Description |
|--------------------|------------------|
| MSO.3K.93C.AM025NA | 25 metre length |
| MSO.3K.93C.AM050NA | 50 metre length |
| MSO.3K.93C.AM100NA | 100 metre length |
| MSO.3K.93C.AM200NA | 200 metre length |
| MSO.3K.93C.AM300NA | 300 metre length |
| MSO.3K.93C.AM400NA | 400 metre length |
| MSO.3K.93C.AM500NA | 500 metre length |

Internal OB van

| Part number | Description |
|--------------------|-----------------|
| MNO.3K.93C.AM003NA | 3 metre length |
| MNO.3K.93C.AM005NA | 5 metre length |
| MNO.3K.93C.AM010NA | 10 metre length |
| MNO.3K.93C.AM015NA | 15 metre length |
| MNO.3K.93C.AM020NA | 20 metre length |

Studio/Infrastructure

| Part number | Description |
|--------------------|-----------------|
| MNY.3K.93C.AM020NA | 20 metre length |
| MNY.3K.93C.AM050NA | 50 metre length |

Other cable assemblies, patch cords and pigtails available on request.



Notes



Notes



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 () means that the appliance or equipment bearing it complies with the protection requirements of one or several European safety directives.

CE marking $\zeta \in$ 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. MARNING (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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