



Amphenol

Fiber Optic Solutions

CTOS-CTOL

Fiber Optic Field Connectors

expanded beam connectors
harsh environment

Introduction



CTOS and CTOL series are robust optical connectors for rapid deployment of high-speed transmission links under harsh environments. The hermaphroditic mating makes it possible to "daisy chain" cable assemblies without using any interconnect adapters. The specific lens design guarantees a large beam diameter and a low loss connection, less sensitive to dirt and dust. A specific front design and ergonomic keys ensure blind mating. The flat protective window mounted on shock absorbers provides an easy to clean surface for improved performances and protection. CTOS and CTOL harnesses are easily and cost effective field maintainable with the FTOS splice kit.

Amphenol unique CTOS and CTOL design have already gained worldwide acceptance in the military. CTOS has been qualified by NATO according to STANAG 4290 requirements. These products are also widely used in geophysical, civil safety, railway, broadcast and industrial markets.

In the CTOS, 1, 2 or 4 channels are inserted in a small size design (o.d. 38mm). CTOL is a CTOS larger version up to 8 channels (o.d. 52mm). CTOL is intermateable with CTO, the first expanded beam connectors version.

- Hermaphroditic interface with rapid ramp coupling
- Design for gloved handling and blind mating in difficult conditions
- Large expanded beam
- Anti-reflective protective window easily reached and cleaned
- The rubber ergonomic shell allows an easy handling with or without gloves and ensures a high protection against shocks
- Up to 8 channels
- Cost effective field repairs
- Wavelength 850 - 1300 nm (Z version); 1300 nm (Y version)
- Multimode (for single mode, consult us)

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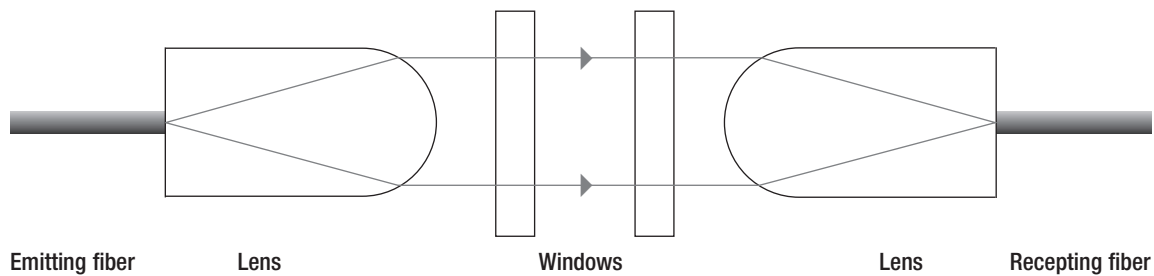
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Expanded Beam

CTOS AND CTOL EXPANDED BEAM TECHNOLOGY ASSETS

With AMPHENOL expanded beam technology, fibers are not in physical contact. The beam is expanded through the first lens and refocused through the second lens then into the fiber. By increasing the light beam surface (680 times for multimode technology), the connector becomes highly resistant to vibrations, shocks, small debris contamination and optical misalignment. A coated protective window makes the connectors easy to clean and easily field maintainable should any damage occurs.



TECHNICAL SPECIFICATIONS

- Plugs and Receptacles (straight and 90°), Tactical Harnesses and Test caps for maintenance
- Hermaphroditic interface with rapid ramp coupling
- Large expanded beams with protective windows
- Stainless steel body with ergonomic rubber shell
- Termination and Maintenance FTOS tool kits available
- Tactical drums and accessories available

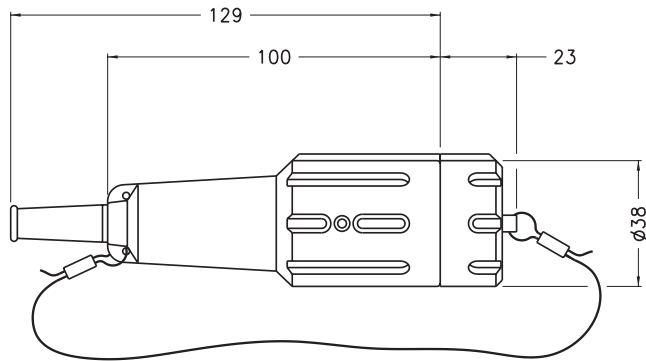
| | CTOS | CTOL | STANDARD |
|--|---|--------------|----------------|
| Number of channel | 1, 2 or 4 | 2, 4, 6 or 8 | |
| Insertion loss (per mated pair of plug) | Multimode 50/125 @ 1300 nm DEL source : 1.5dB typical ; 2dB max Single mode LASER source: 0.8dB typ ; 1.2dB max | | |
| Durability | 10000 mating min | | MIL-STD-810E |
| Operating temperature | -40°C, + 85°C | | MIL-STD-810D |
| Vibrations | 10 to 2000Hz, 10g, 1.5 mm p/p, 3 directions | | MIL-STD-810E |
| Bump resistance | 4000 Bumps, 40g, 6ms, 6 directions | | |
| Mechanical shock | 50g, 1/2 sinus, 3 shocks by direction, 3 axes | | MIL-STD-810E |
| Mud resistance | Compliant | | MIL-C-83526 13 |
| Free drops | 26 drops 1.2m on concrete (plugs) | | MIL-STD-810D |
| Water immersion | > 5m depth | | |
| Salt frog | 500 hours | | MIL-STD-810D |
| Low pressure | 85 mbars 48 hours | | NFC 20706 |
| Storage temperature | -55°C, +85°C | | MIL-STD-810E |
| Crush resistance | 1 tonne, 10sec | | NF 93810 |
| Tensile load (cable dependant) | Short time: 2200 N Permanent: 1300 N | | DOD-STD-1678 |
| Decontamination Fluid Resistance | Compliant | | DOD-STD-1678 |



CTOS: XXXXXXXXXX SMALL OPTICAL FIELD CONNECTOR

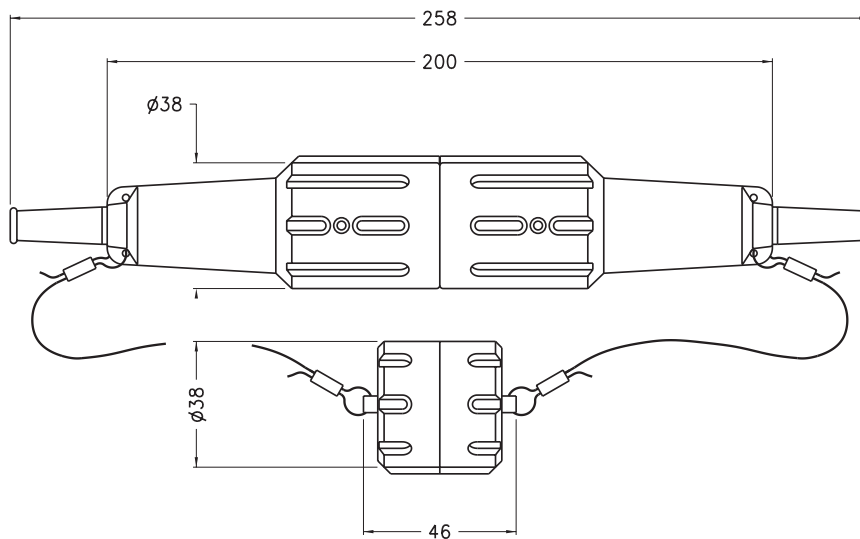


■ CTOS PLUG WITH PROTECTIVE CAP (06M) - CTOS 06M



The CTOS plug provides hermaphroditic optical links between two points. This plug is designed to be used in harsh environment applications. It can be terminated by a 1, 2, 4 fibers tactical cable.

The tensile strength between plug and cable can reach 200 daN (depending on cable performance)



Channel arrangements :



1 Channel



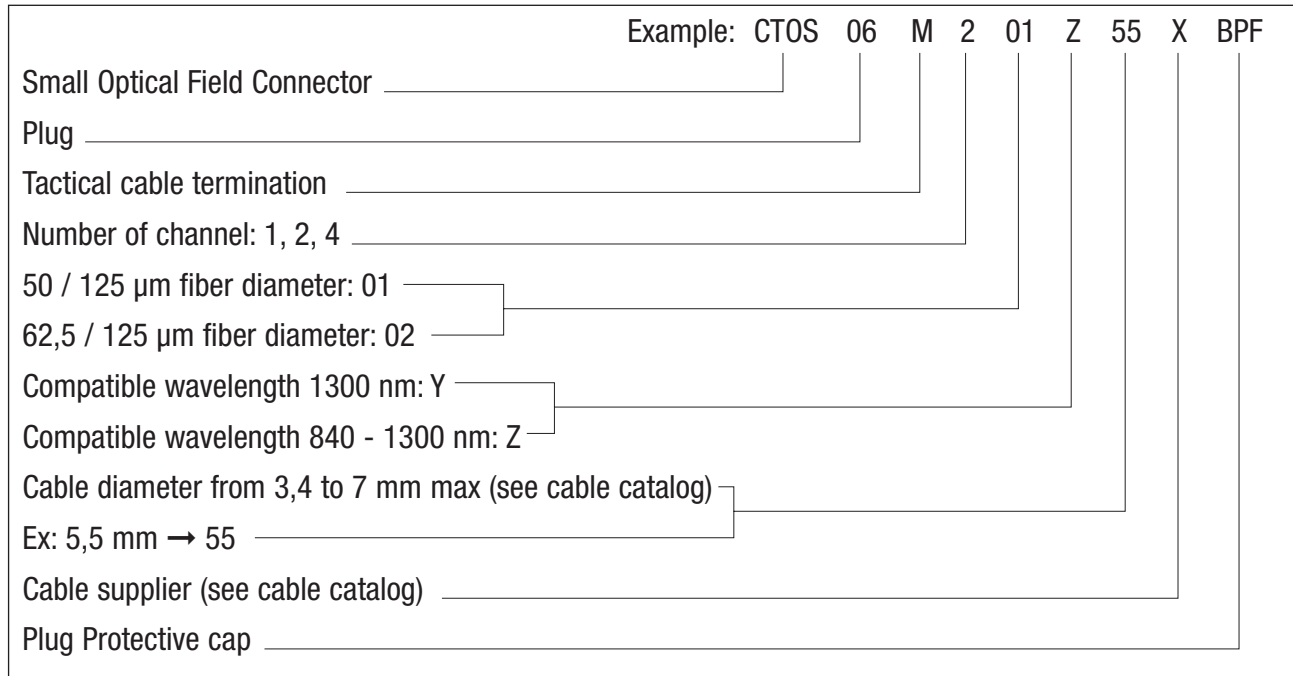
2 Channels



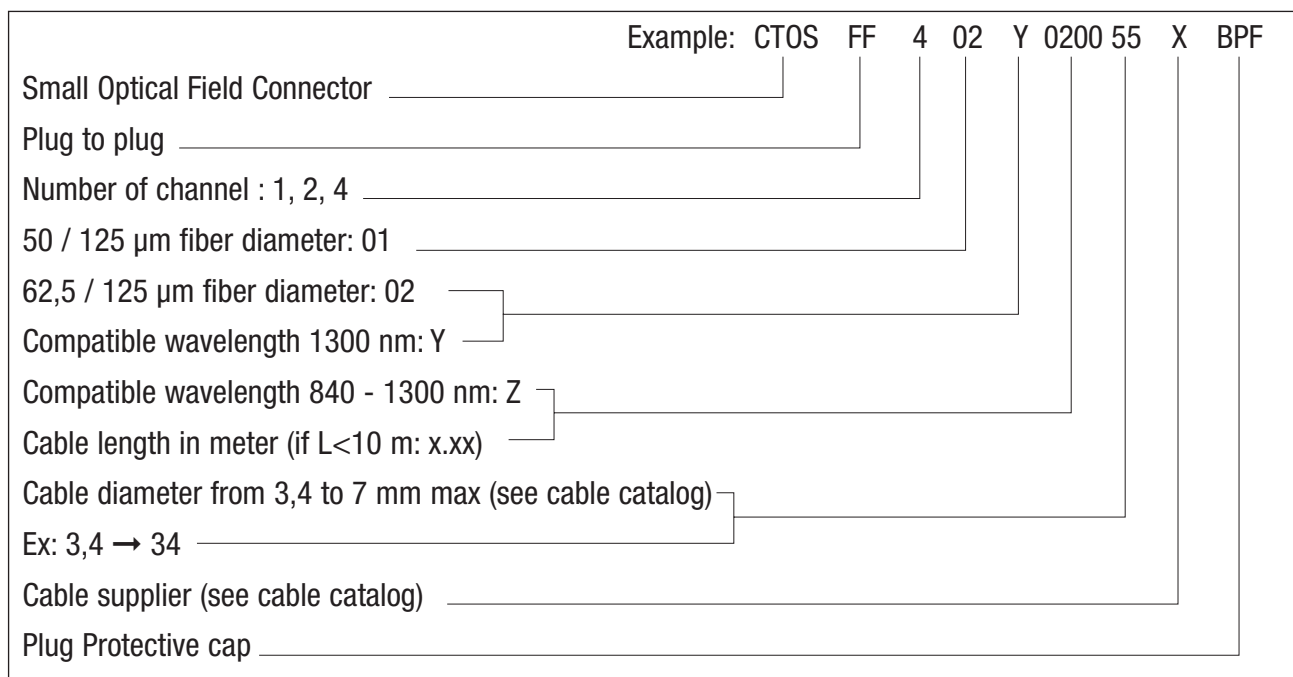
4 Channels



■ HOW TO ORDER CTOS PLUG PIECE PARTS



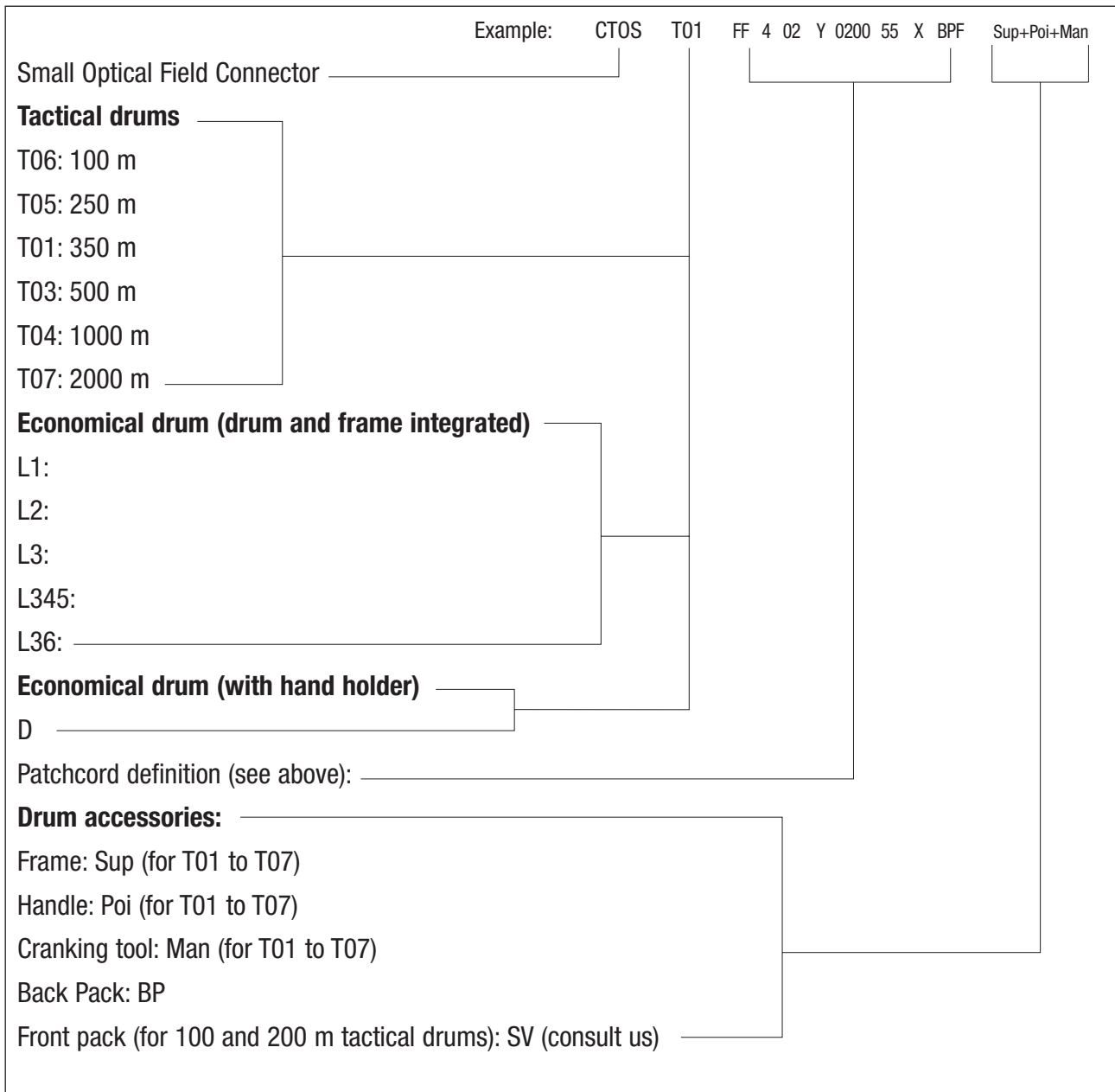
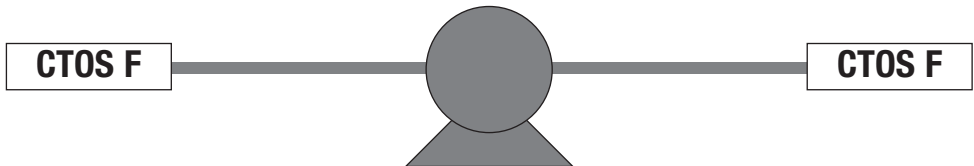
■ HOW TO ORDER PLUG TO PLUG PATCHCORD





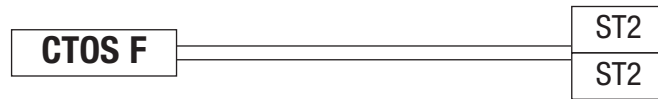
■ HOW TO ORDER PLUG TO PLUG PATCHCORD REELED ON A DRUM WITH OR WITHOUT ACCESSORIES

See tactical and economical drum description on to the crums catalog





■ CTOS PLUG - CTOS F (TERMINATED)



How to order plug patchcord

Example: CTOS F 2 01 Y 2.50 28 X BPF ST2

| | | | | | | | | | | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Small Optical Field Connector | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Plug terminated | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Channel number : 1, 2, 4 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 50 / 125 μm fiber fiber: 01 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 62,5 / 125 μm fiber fiber: 02 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 1300 nm: Y | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 840 - 1300 nm: Z | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable length in meter (if L<10 m: x.xx) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable diameter from 2,8 to 7 mm max (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Ex: 2,8 mm → 28 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Others: consult us. | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable supplier (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle protective cap | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Patchcord other end connectors | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| STA, TVOP, AXOS, CTOS, ST, SC,FC, SC duplex | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Others consult us | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |



■ CTOS “JAM NUT” RECEPTACLE – REAR MOUNT (77) - CTOS 77P

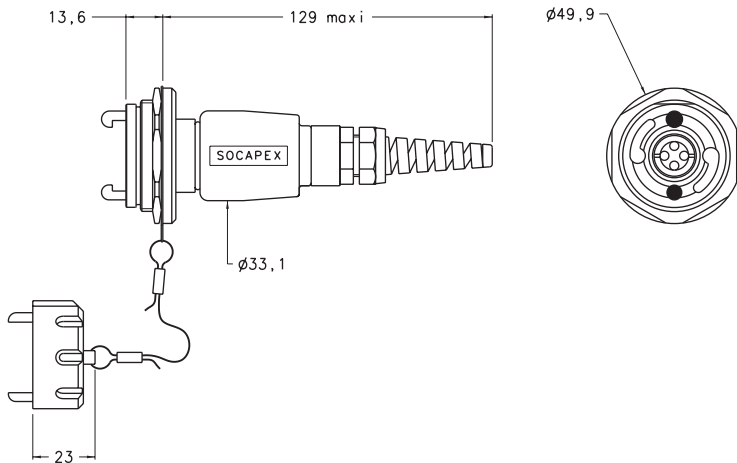
How to order CTOS receptacle patchcord

| | |
|-----------------|-----|
| CTOS 77P | ST2 |
| | ST2 |

| | Example: CTOS 77 P 4 01 Y 2.50 230 X BPE ST2 |
|---|--|
| Small Optical Field Connector _____ | |
| Jam nut receptacle _____ | |
| Pig tails termination _____ | |
| Number of chanel : 1, 2, 4 _____ | |
| 50 / 125 µm fiber diameter : 01 _____ | |
| 62,5 / 125 µm fiber diameter : 02 _____ | |
| Compatible wavelength 1300 nm: Y _____ | |
| Compatible wavelength 840 - 1300 nm: Z _____ | |
| Cable length in meter (if L<10 m: x.xx) _____ | |
| Cable diameter from 1,5 to 3 mm max (see cable catalog) _____ | |
| Ex: 1,5 mm → 15 | |
| Others: consult us. _____ | |
| Cable supplier (see cable catalog) _____ | |
| Jam nut receptacle protective cap _____ | |
| Patchcord other end connectors _____ | |
| ST2, SC, FC, LC, duplex SC, duplex LC, MTRJ | |
| Others consult us _____ | |

■ CTOS “JAM NUT” RECEPTACLE – REAR MOUNT (77)

CTOS 77C00: straight backshell receptacle for tactical cable



Backshell main use:

To be used inside a vehicle or on a box to connect CTOS receptacle to the electro-optic transceivers, in a non protected area.

Unsealed straight backshell to be used with 1 or 2 tactical cables (1,2 or 4 number of channels) inside a vehicle.

The rear part is made of 2 half shells molded in aluminum alloy.

Possibility to add a multi channel connector at the other cable end.

Cable/receptacle tensile strength: 100 daN (depending on cable performance).

How to order CTOS receptacle piece parts

| | Example: CTOS | 77 | C | 00 | 2 | 01 | Z | 55 | X | BPE |
|---|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Small Optical Field connector | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Two half shells rear part for tactical cable | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Straight backshell | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Number of channel : 1, 2, 4 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 50 / 125 µm fiber diameter : 01 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 62,5 / 125 µm fiber diameter : 02 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 1300 nm : Y | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 840 - 1300 nm : Z | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable diameter from 3,4 to 7 mm (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Ex: 5,5 mm → 55 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable supplier (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle protective cap | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

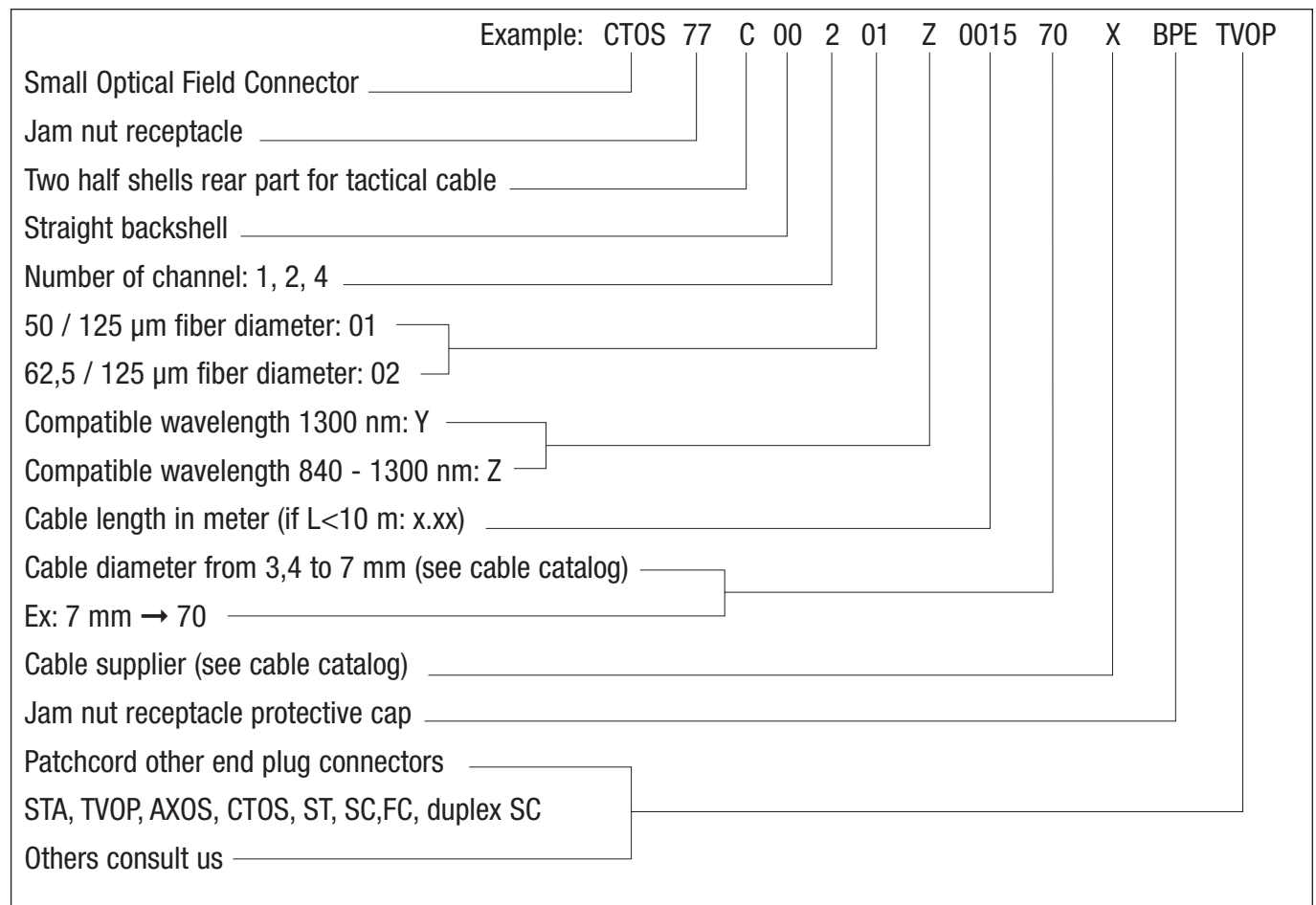


■ CTOS “JAM NUT” RECEPTACLE – REAR MOUNT (77) - CTOS 77C00

How to order receptacle patchcord

CTOS 77C00

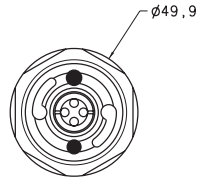
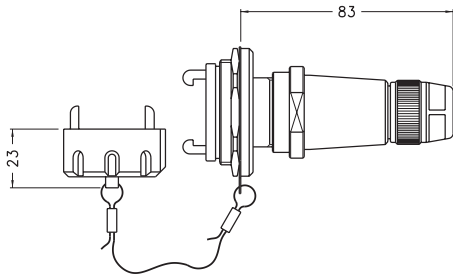
TVOP



For other configurations consult us.

■ CTOS “JAM NUT” RECEPTACLE – REAR MOUNT (77)

CTOS 77M00: sealed straight backshell receptacle for tactical cable



Backshell main use:

To be used inside and outside a vehicle to connect CTOS receptacle to the electro-optic transceivers, in a non protected and humid area. Straight backshell to be used with a 1, 2, 4 fibers tactical cables inside or outside a vehicle.

The rear part is made of an aluminum alloy shell with a cable retention clamp.

Complete front and rear sealing.

Possibility to add a multi channel connector at the other cable end.

Cable/receptacle tensile strength: 100 daN (depending on cable performance).

How to order CTOS receptacle piece parts

| | Example: CTOS | 77 | M | 00 | 2 | 01 | Z | 55 | X | BPE |
|---|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Small Optical Field Connector | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Tactical cable sealed termination | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Straight backshell | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Number of channel: 1, 2, 4 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 50 / 125 μm fiber diameter: 01 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 62,5 / 125 μm fiber diameter: 02 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 1300 nm: Y | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 840 - 1300 nm: Z | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable diameter from 3,4 to 7 mm (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Ex: 5,5 mm → 55 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable supplier (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle protective cap | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

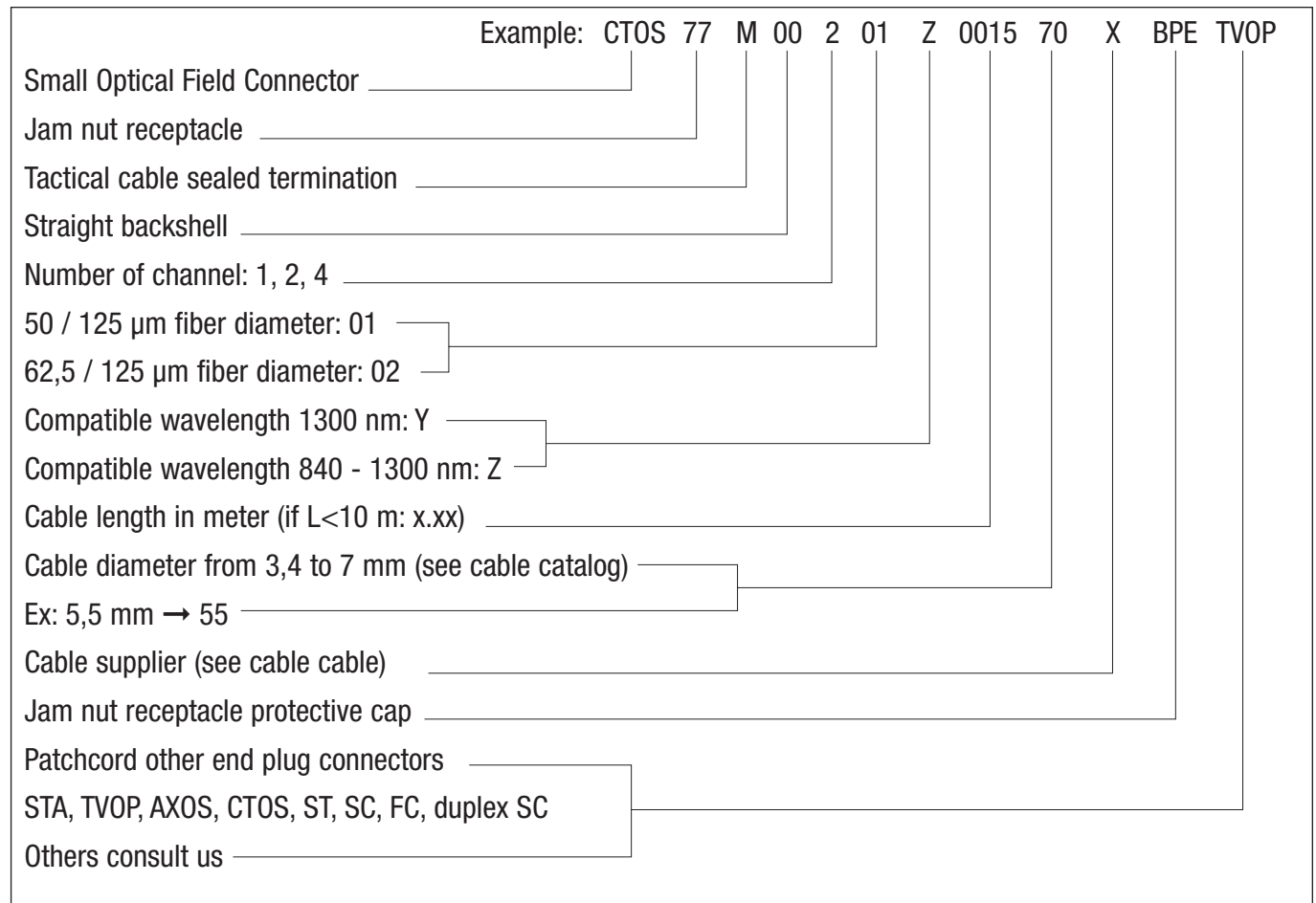


■ CTOS “JAM NUT” RECEPTACLE – REAR MOUNT (77) - CTOS 77M00

How to order receptacle patchcord

CTOS 77M00

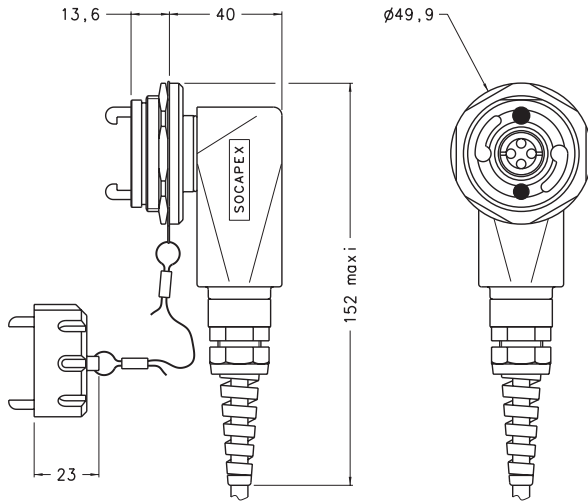
TVOP



For other configurations consult us.

■ CTOS “JAM NUT” RECEPTACLE – REAR MOUNT (77)

CTOS 77C90: 90° backshell receptacle for tactical cable



Backshell main use:

To be used inside a vehicle or on a box to connect CTOS receptacle to the electro-optic transceivers, in non protected area, or when the rear space is too narrow.

90° backshell not sealed to be used with a 1, 2, 4 fiber tactical cable inside a vehicle.

The rear part is made of 2 half shells molded in aluminum alloy.

Backshell with reduced overall dimensions.

Possibility to add a multi channel connector at the other cable end.

Cable/receptacle tensile strength: 50 daN (depending on cable performance).

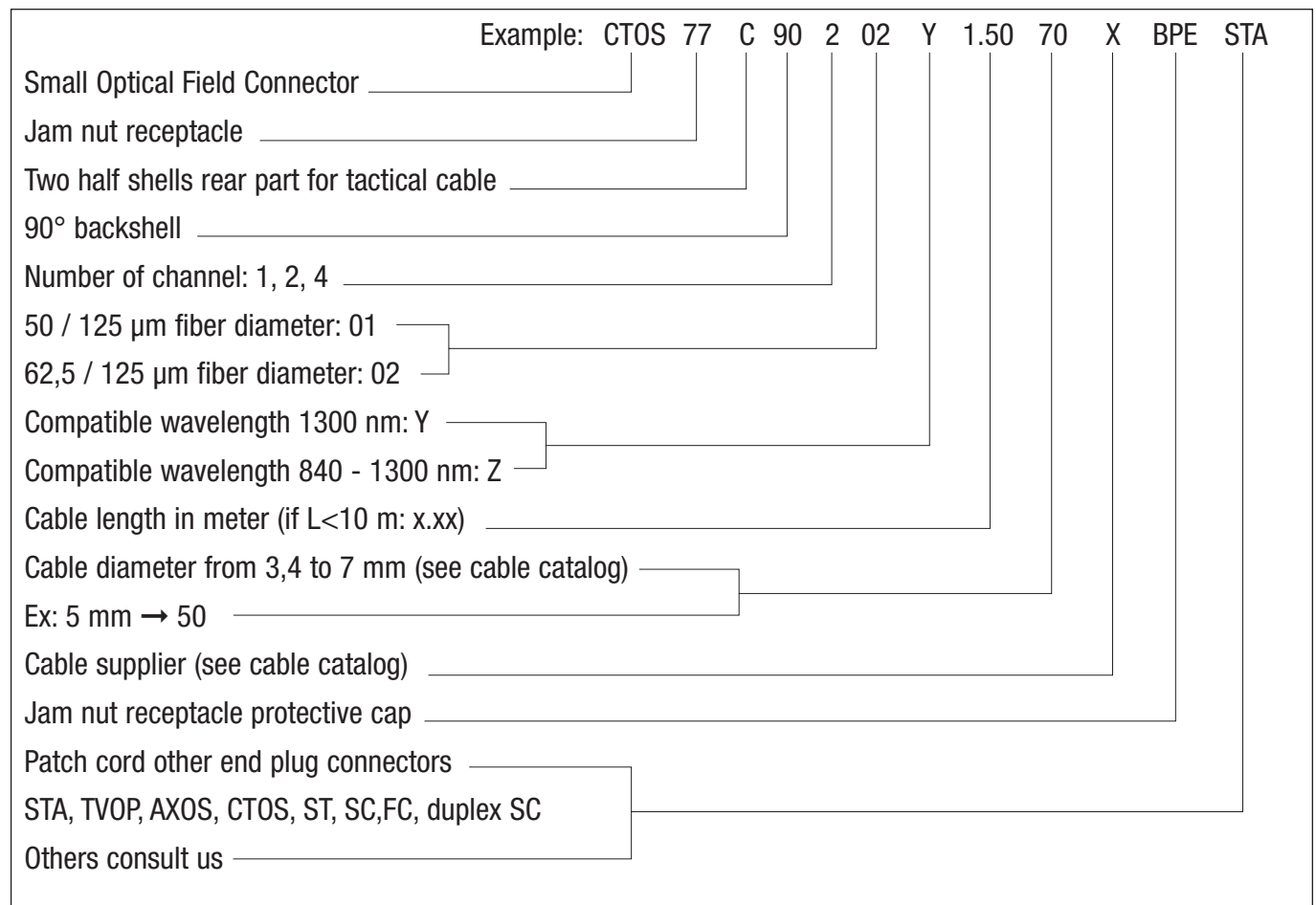
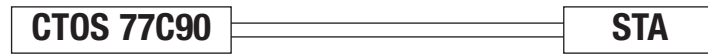
How to order CTOS receptacle piece parts

| | Example: CTOS | 77 | C | 90 | 2 | 01 | Z | 55 | X | BPE |
|---|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Small Optical Field Connector | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Two half shell rear part for tactical cable | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 90° backshell | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Number of channel: 1, 2, 4 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 50 / 125 µm fiber diameter: 01 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 62,5 / 125 µm fiber diameter: 02 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 1300 nm: Y | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 840 - 1300 nm: Z | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable diameter from 3,4 to 7 mm (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Ex: 5,5 mm → 55 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable supplier (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle protective cap | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |



■ CTOS “JAM NUT” RECEPTACLE – REAR MOUNT (77) - CTOS 77C90

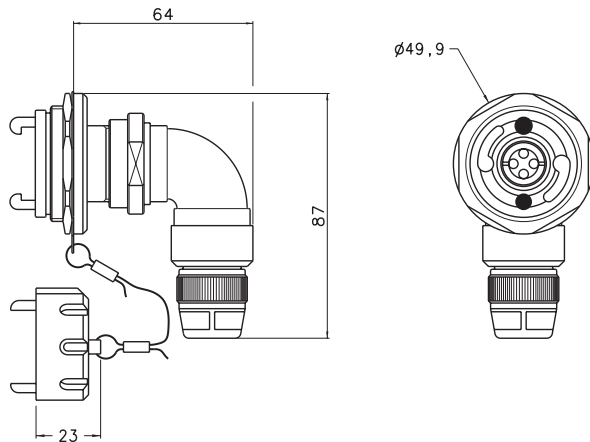
How to order receptacle patchcord



For other configurations consult us.

■ CTOS “JAM NUT” RECEPTACLE – REAR MOUNT (77)

CTOS 77M90: sealed 90° backshell receptacle for tactical cable



Backshell main use:

To be used inside and outside a vehicle to connect CTOS receptacle to the electro-optic transceivers, in a non protected or humid area, or when the rear space is too narrow. 90° backshell to be used with a 2 or 4 fibers tactical cable outside a vehicle.

Complete front and rear sealing.

Backshell with reduced overall dimensions.

Possibility to add a multi channel connector at the other cable end.

Cable/receptacle tensile strength: 50 daN (depending on cable performance).

How to order CTOS receptacle piece parts

| | Example: CTOS | 77 | M | 90 | 2 | 01 | Z | 55 | X | BPE |
|---|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Small Optical Field Connector | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Tactical cable sealed termination | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 90° backshell | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Number of channel: 1, 2, 4 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 50 / 125 μm fiber diameter: 01 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 62,5 / 125 μm fiber diameter: 02 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 1300 nm: Y | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 840 - 1300 nm: Z | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable diameter from 3,4 to 7 mm (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Ex: 5,5 mm → 55 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable supplier (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle protective cap | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

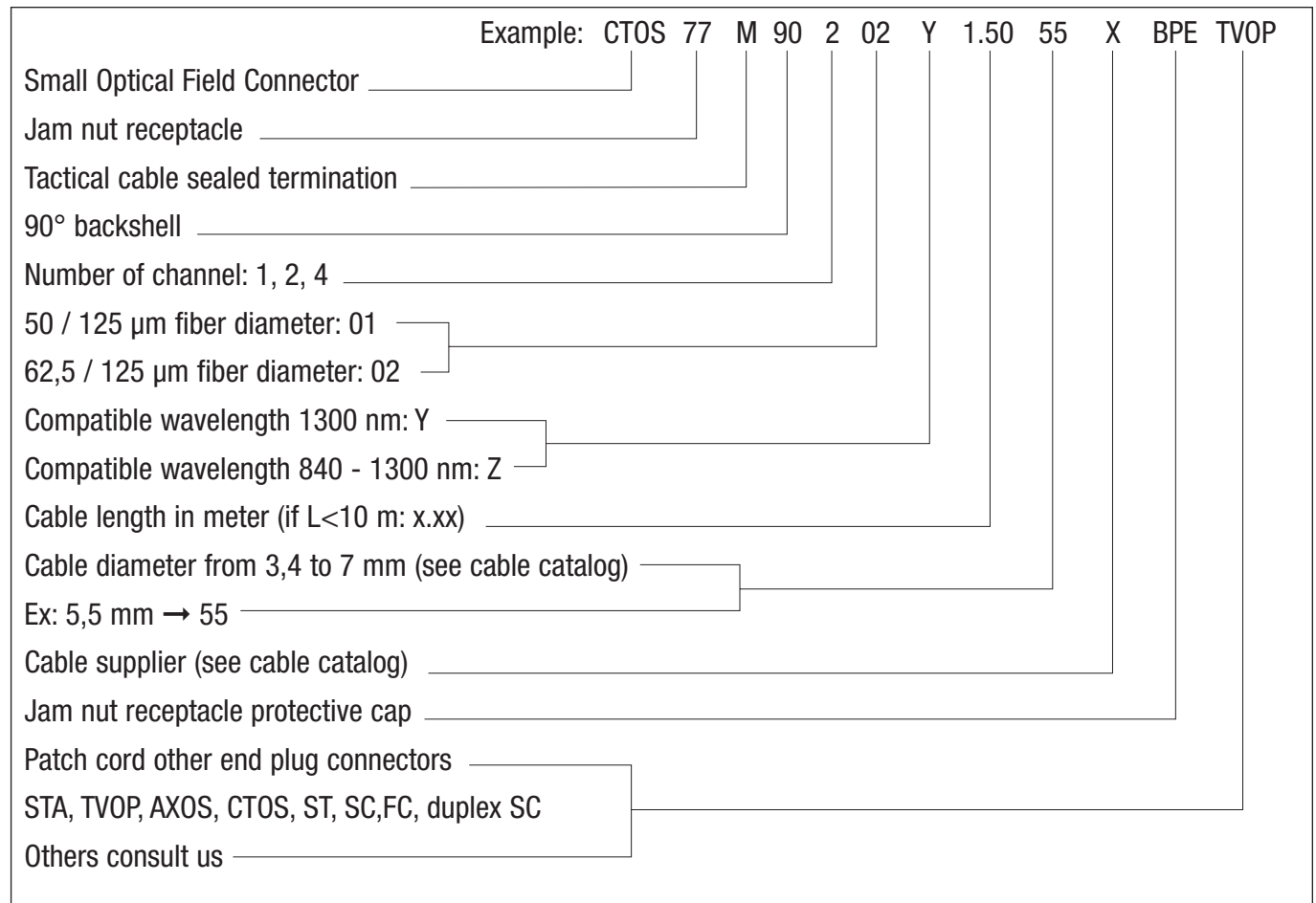


■ CTOS “JAM NUT” RECEPTACLE – REAR MOUNT (77) - CTOS 77M90

How to order receptacle patchcord

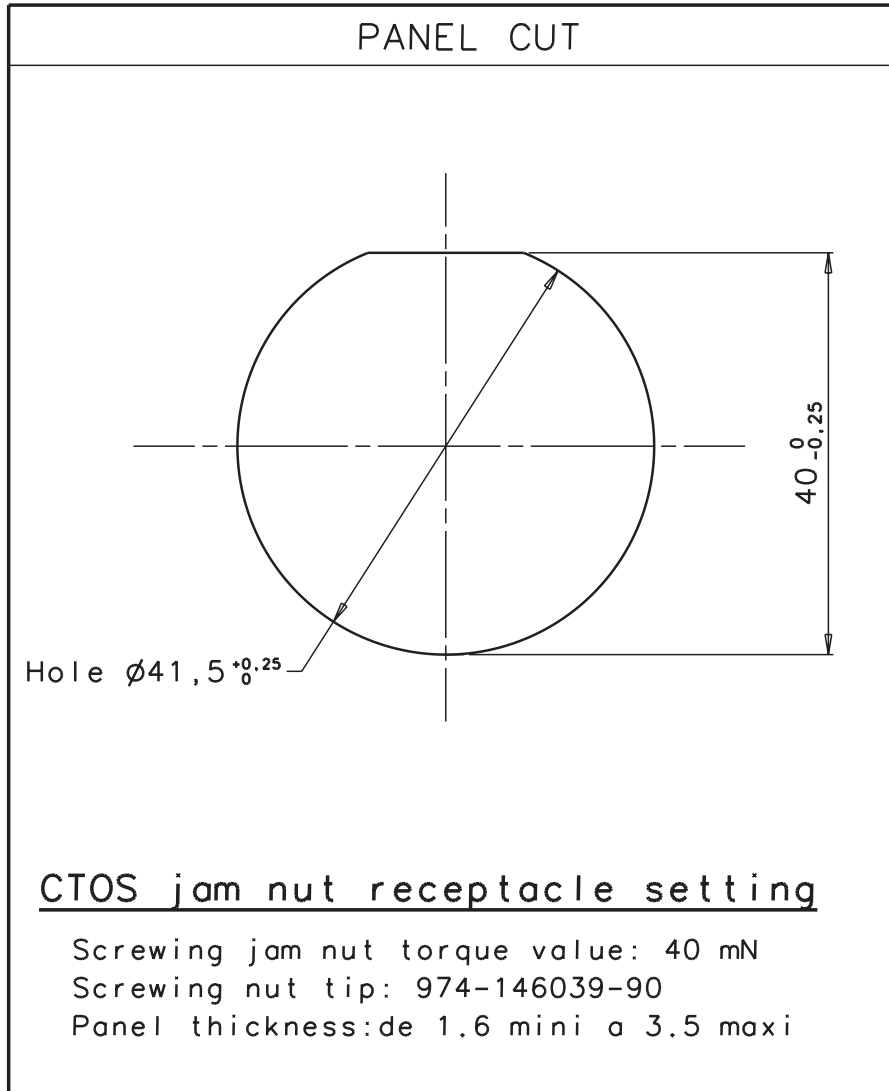
CTOS 77M90

TVOP



For other configurations consult us.

■ CTOS “JAM NUT” RECEPTACLE – REAR MOUNT (77)





■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00)

The square flange receptacle has to be mounted on to the vehicle panel. It provides the link between the inside electro-optic device and the outside optical link.

The square flange receptacle receives the first CTOS plug of the outer link patchcord.

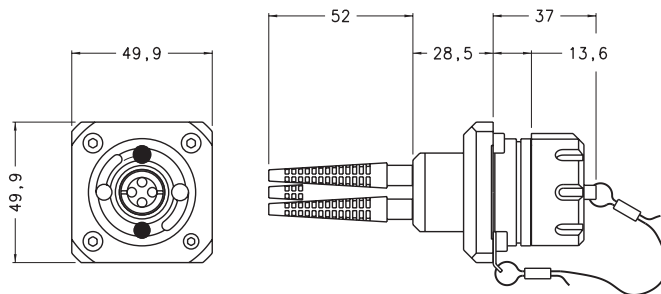
The square flange type makes it possible to have a high density of receptacles on a panel.

Easy panel cut off of 5 round holes.

Fixation by 4 screws. - Front sealing ensured by a flat gasket.

Electrical contact between panel receptacle and protective cap (EMI,CEM protection when cap is on). Protective cap attached to the panel or to the receptacle by a stainless steel rope.

■ CTOS 00P: STRAIGHT BACKSHELL RECEPTACLE FOR PIG TAIL



Backshell main use:

To be used inside a vehicle or on a box to connect CTOS receptacle to the electro-optic transceivers, in a protected area.

This rear part makes possible an easy cross connect output.

Straight rear part to be used with 1, 2, 4, pig-tails (2.8 mm single cable or duplex cable 2 x 3, 2x 1.6). Each pigtail can be terminated with ST,SC,FC, duplex SC and MTRJ connectors.

Pig tails tensile strength: 10 daN.

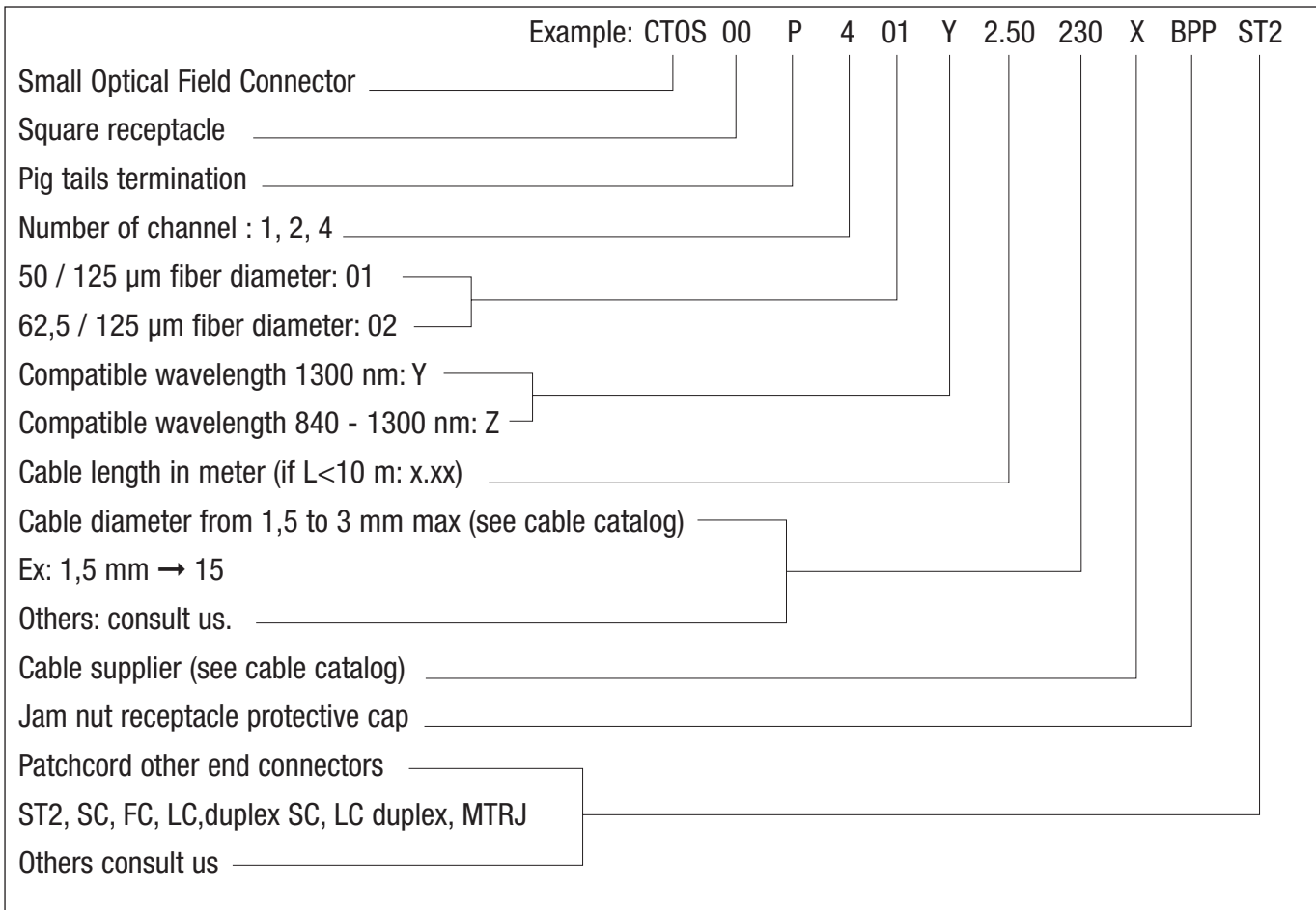
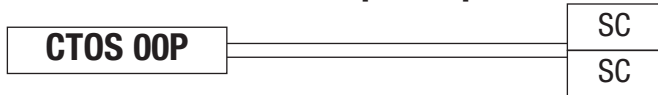
(depending on cable performance)

How to order CTOS receptacle piece parts

| | Example: CTOS | 00 | P | 2 | 01 | Z | 28 | X | BPP |
|---|---------------|----|---|---|----|---|----|---|-----|
| Small Optical Field Connector: _____ | | | | | | | | | |
| Square flange receptacle: _____ | | | | | | | | | |
| Pig tails termination: _____ | | | | | | | | | |
| Number of channel : 1, 2, 4 _____ | | | | | | | | | |
| 50 / 125 µm fiber diameter: 01 _____ | | | | | | | | | |
| 62,5 / 125 µm fiber diameter: 02 _____ | | | | | | | | | |
| Compatible wavelength 1300 nm: Y _____ | | | | | | | | | |
| Compatible wavelength 840 - 1300 nm: Z _____ | | | | | | | | | |
| Cable diameter from 1,5 to 3 mm (see cable catalog) _____ | | | | | | | | | |
| Ex : 2,8 mm → 28 | | | | | | | | | |
| Others: consult us. _____ | | | | | | | | | |
| Cable supplier (see cable catalog) _____ | | | | | | | | | |
| Jam nut receptacle protective cap _____ | | | | | | | | | |

■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00) - CTOS 00P

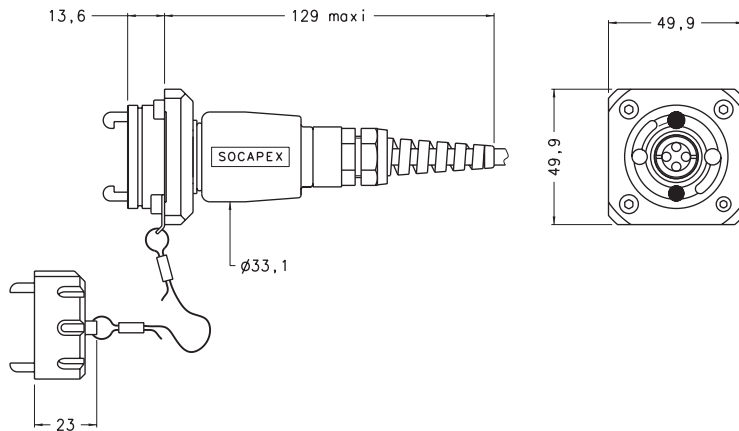
How to order CTOS receptacle patchcord





■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00)

CTOS 00C00: straight backshell receptacle for tactical cable



Backshell main use:

To be used inside a vehicle or on a box to connect CTOS receptacle to the electro-optic transceivers, in non protected area.

Unsealed straight backshell to be used with 1 or 2 tactical cables (1,2 or 4 number of channels) inside a vehicle.

The rear part is made of 2 half shells molded in aluminum alloy.

Possibility to add a multi channel connector at the other cable end.

Cable/receptacle tensile strength: 100 daN (depending on cable performances).

How to order CTOS receptacle piece parts

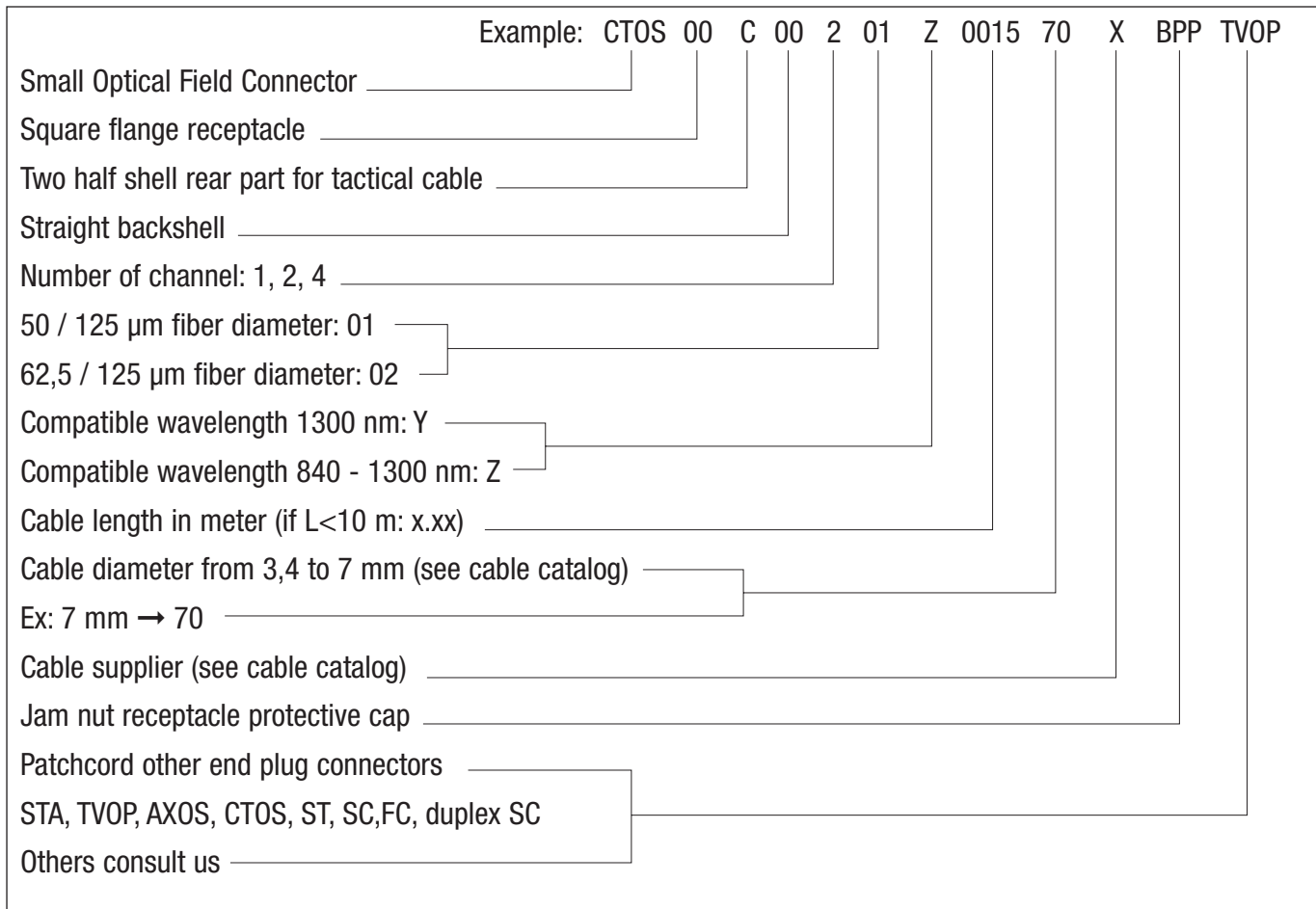
| | Example: CTOS | 00 | C | 00 | 2 | 01 | Z | 55 | X | BPP |
|---|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Small Optical Field connector | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Square flange receptacle | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Two half shell rear part for tactical cable | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Straight backshell | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Number of channel: 1, 2, 4 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 50 / 125 μm fiber diameter: 01 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 62,5 / 125 μm fiber diameter: 02 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 1300 nm: Y | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 840 - 1300 nm: Z | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable diameter from 3,4 to 7 mm (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Ex: 5,5 mm → 55 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable supplier (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle protective cap | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00) - CTOS 00C00

How to order CTOS receptacle patchcord

CTOS 00C00

TVOP

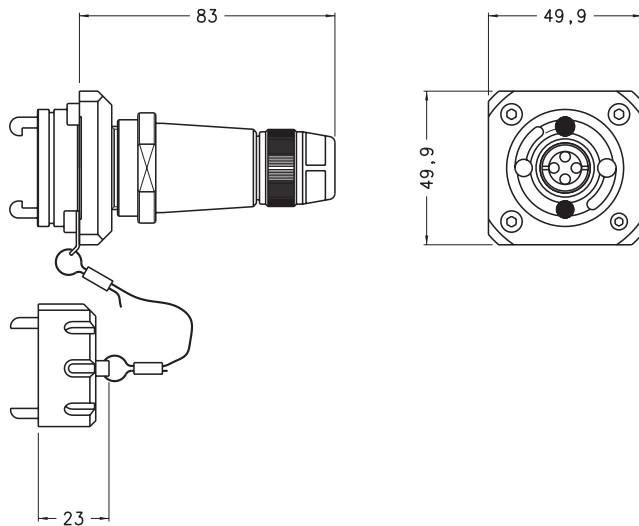


For other configurations consult us.



■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00)

CTOS 00M00: sealed straight backshell receptacle for tactical cable



Backshell main use:

To be used inside and outside of a vehicle to connect CTOS receptacle to the electro-optic transceivers, in a non protected or humid area. Straight backshell to be used with a 1,2, 4 fibers tactical cable inside or outside a vehicle.

The rear part is made of an aluminum alloy shell with bit of cable retention gland.

Complete front and rear sealing.

Possibility to add a multi channel connector at the other cable end.

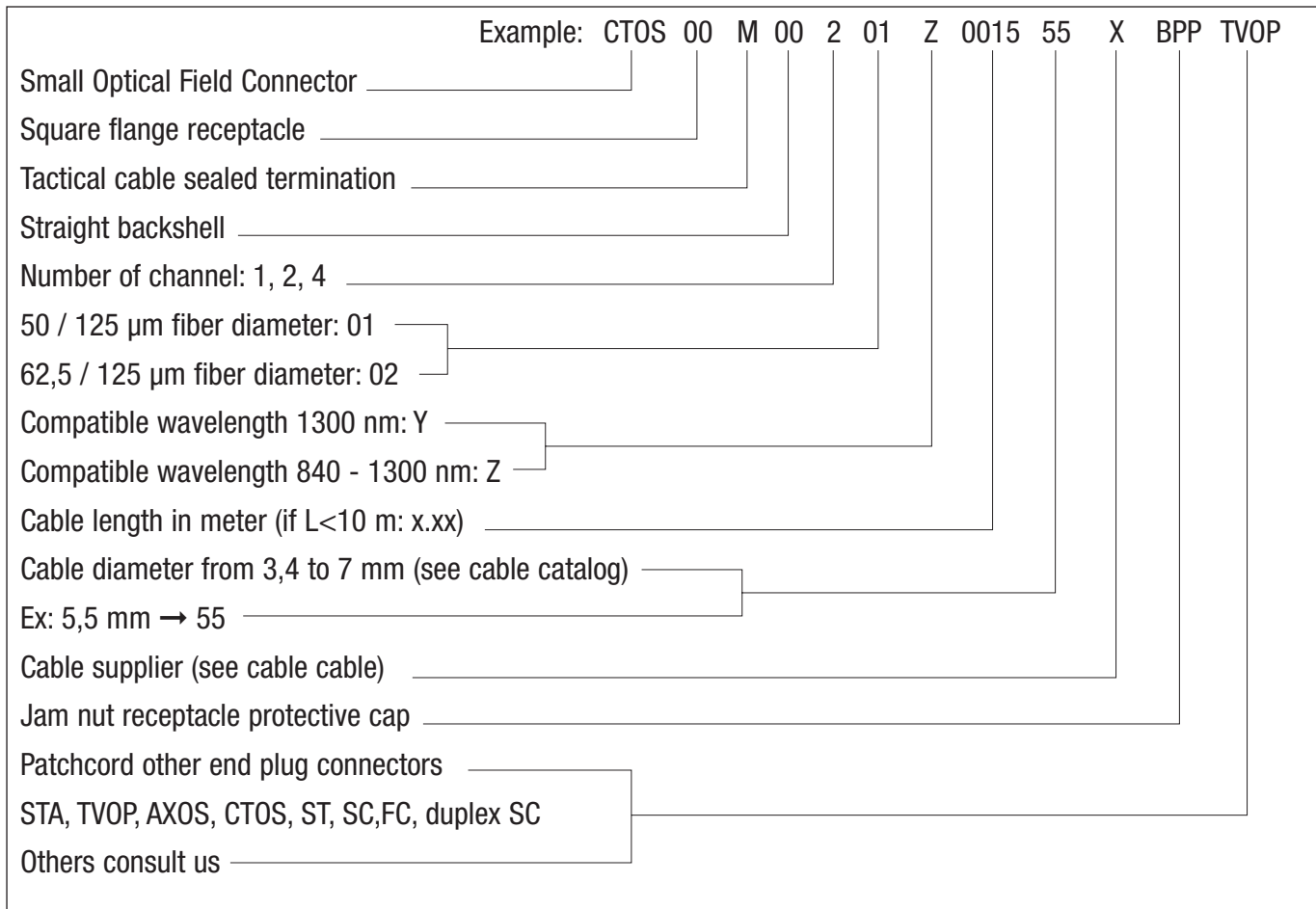
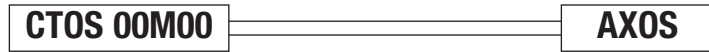
Cable/receptacle tensile strength: 100 daN (depending on cable performance).

How to order CTOS receptacle piece parts

| | Example: CTOS | 00 | M | 00 | 2 | 01 | Z | 55 | X | BPP |
|---|---------------|----|---|----|---|----|---|----|---|-----|
| Small Optical Field Connector | _____ | | | | | | | | | |
| Square flange receptacle | _____ | | | | | | | | | |
| Tactical cable sealed termination | _____ | | | | | | | | | |
| Straight backshell | _____ | | | | | | | | | |
| Number of channel: 1, 2, 4 | _____ | | | | | | | | | |
| 50 / 125 μm fiber diameter: 01 | _____ | | | | | | | | | |
| 62,5 / 125 μm fiber diameter: 02 | _____ | | | | | | | | | |
| Compatible wavelength 1300 nm: Y | _____ | | | | | | | | | |
| Compatible wavelength 840 - 1300 nm: Z | _____ | | | | | | | | | |
| Cable diameter from 3,4 to 7 mm (see cable catalog) | _____ | | | | | | | | | |
| Ex: 5,5 mm → 55 | _____ | | | | | | | | | |
| Cable supplier (see cable catalog) | _____ | | | | | | | | | |
| Jam nut receptacle protective cap | _____ | | | | | | | | | |

■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00) - CTOS 00M00

How to order receptacle patchcord

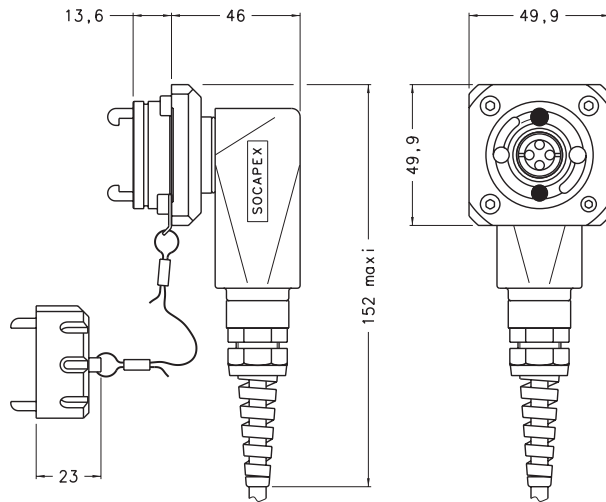


For other configurations consult us.



■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00)

CTOS 00C90: 90° backshell receptacle for tactical cable



Backshell main use:

To be used inside a vehicle or on a box to connect CTOL receptacle to the electro-optic transceivers, in a non protected area, or when the rear space is too narrow.

Unsealed 90° backshell to be used with a 1, 2, 4, fibers tactical cable inside a vehicle.

The rear part is made of 2 half shells molded in aluminum alloy.

Backshell with reduced overall dimensions.

Possibility to add a multi channel connector at the other cable end.

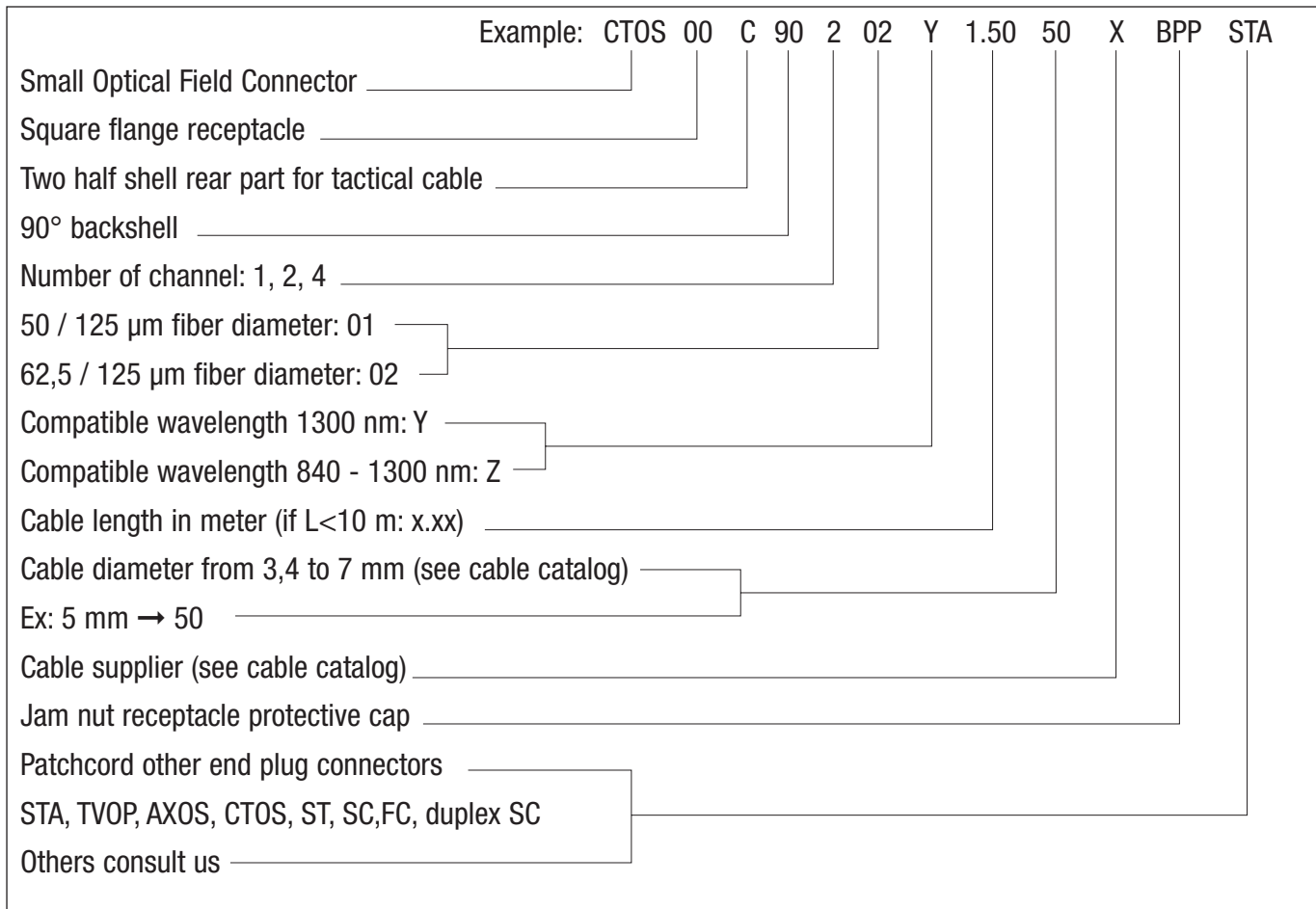
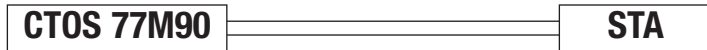
Cable/receptacle tensile strength: 50 daN (depending on cable performance).

How to order CTOS receptacle piece parts

| | Example: CTOS | 00 | C | 90 | 2 | 01 | Z | 55 | X | BPP |
|---|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Small Optical Field Connector | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Square flange receptacle | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Two half shell rear part for tactical cable | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 90° backshell | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Number of channel: 1, 2, 4 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 50 / 125 μm fiber diameter: 01 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 62,5 / 125 μm fiber diameter: 02 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 1300 nm: Y | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 840 - 1300 nm: Z | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable diameter from 3,4 to 7 mm (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Ex: 5,5 mm → 55 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable supplier (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle protective cap | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00) - CTOS 00C90

How to order receptacle patchcord

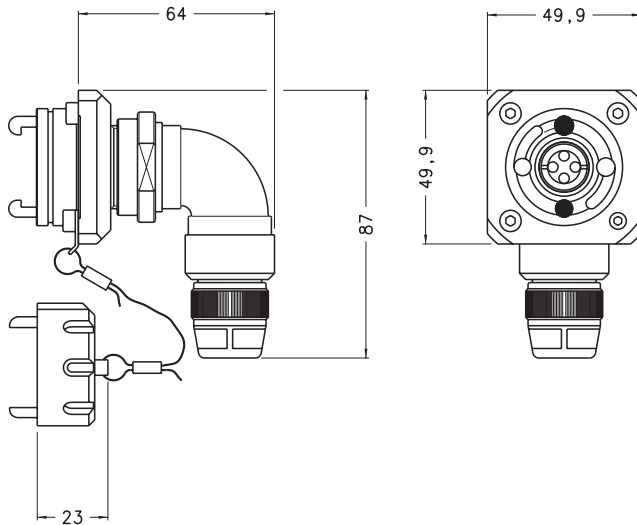


For other configurations consult us.



■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00)

CTOS 00M90: sealed 90° backshell receptacle for tactical cable



Backshell main use:

To be used inside and outside a vehicle to connect CTOS receptacle to the electro-optic transceivers, in a non protected or humid area, or when the rear space is too narrow.

90° backshell to be used with a 1, 2, 4 fibers tactical cable inside or outside a vehicle.

Complete front and rear sealing.

Backshell with reduced overall dimensions.

Possibility to add a multi channel connector at the other cable end.

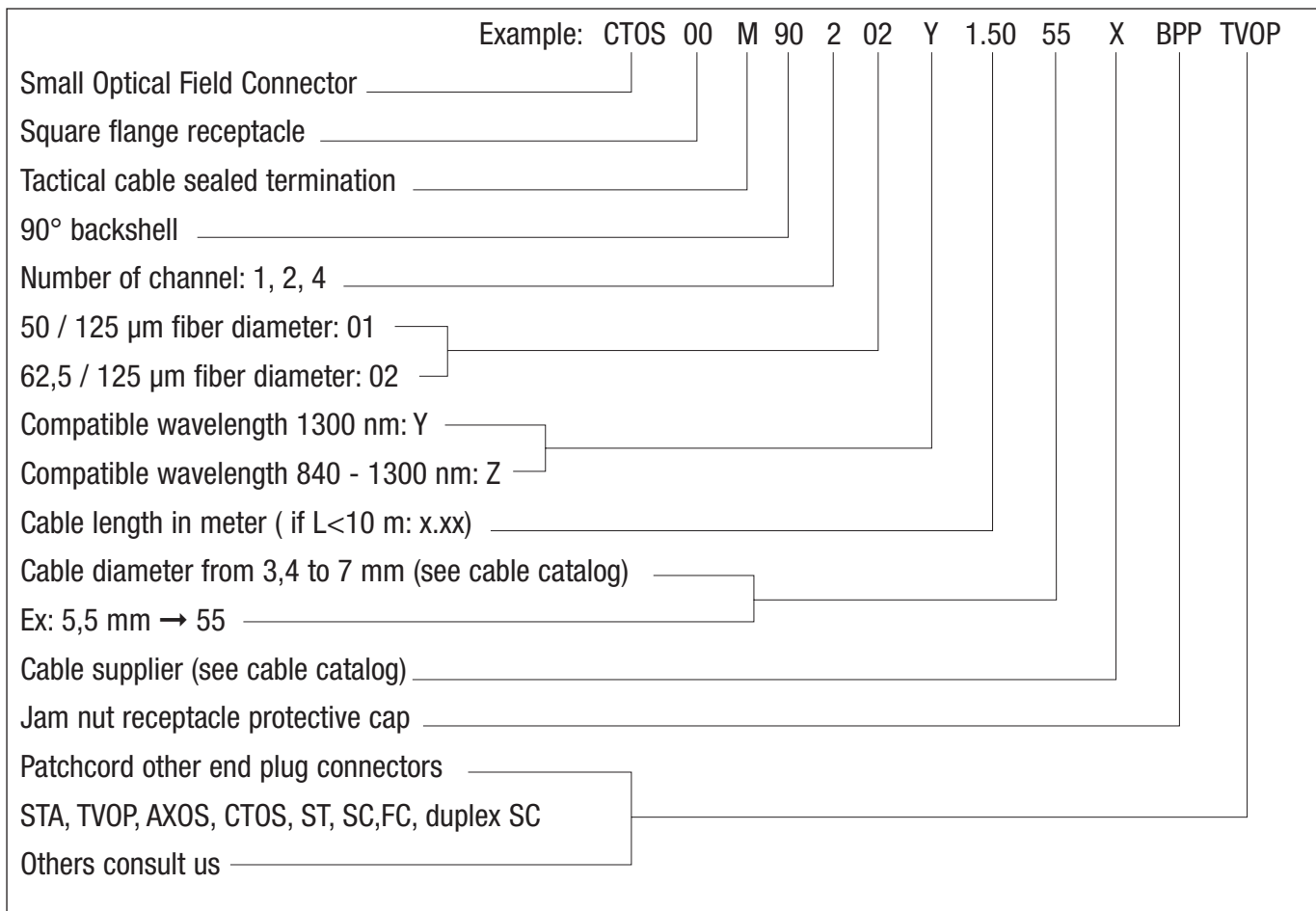
Cable/receptacle tensile strength: 50 daN (depending on cable performance).

How to order CTOS receptacle piece parts

| | Example: CTOS | 00 | M | 90 | 2 | 01 | Z | 55 | X | BPP |
|---|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Small Optical Field Connector | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Square flange receptacle | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Tactical cable sealed termination | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 90° backshell | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Number of channel: 1, 2, 4 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 50 / 125 μm fiber diameter: 01 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 62,5 / 125 μm fiber diameter: 02 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 1300 nm: Y | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Compatible wavelength 840 - 1300 nm: Z | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable diameter from 3,4 to 7 mm (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Ex: 5,5 mm → 55 | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Cable supplier (see cable catalog) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| Jam nut receptacle protective cap | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00) - CTOS 00M90

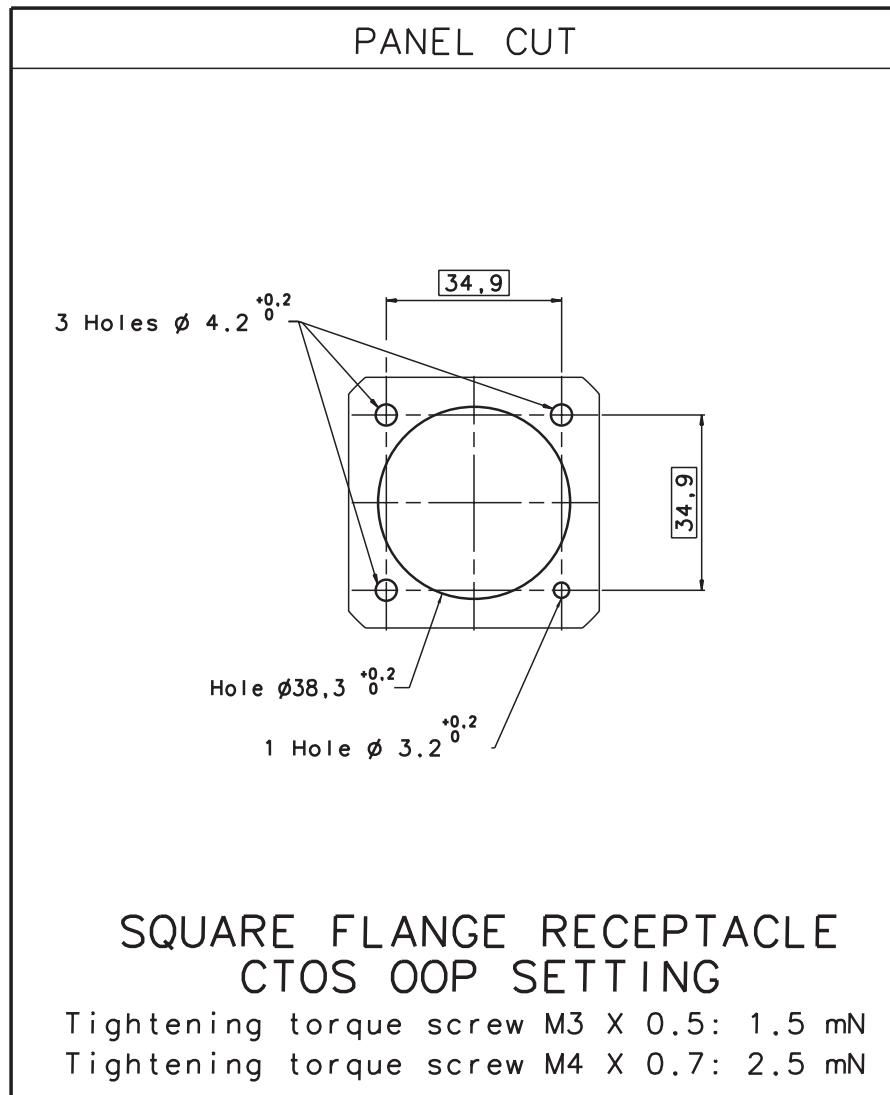
How to order receptacle patchcord



For other configurations consult us.



■ CTOS “SQUARE FLANGE” RECEPTACLE – REAR MOUNT (00)

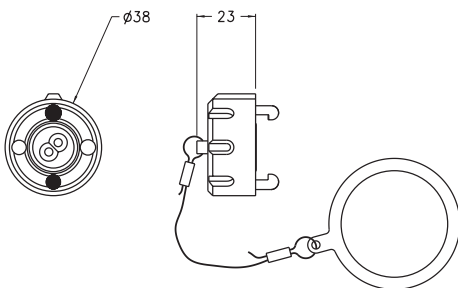


■ CTOS SHUNT CAPS

This device is designed to test the electronic emitter and receiver as well as the optical receptacle and the link before the optical link deployment in the field.

The loop back is done by channel pairs: channel 1 with channel 2, channel 3 with channel 4.

CTOS receptacle protective shunt cap (BPPSA/BPESA)



BPESA shunt cap

The receptacle protective shunt cap is used to test the emitter, the receiver and the CTOS receptacle on a vehicle before using the link. This shunt cap introduces a large insertion loss which is optical power budget dependent and has to be defined with the customer (generally 20 dB max).

The BPESA is dedicated to test the jam nut receptacle. It is delivered with a rope and a ring to be fixed under the hexagonal nut in order to replace the receptacle protective cap (see the drawing).

The BPPSA is dedicated to test square flange receptacle. It is delivered with a panel attachment cord and can replace the receptacle protective cap.

The BPBSA itself is equipped with a protective cap.

How to order CTOS receptacle protective shunt cap

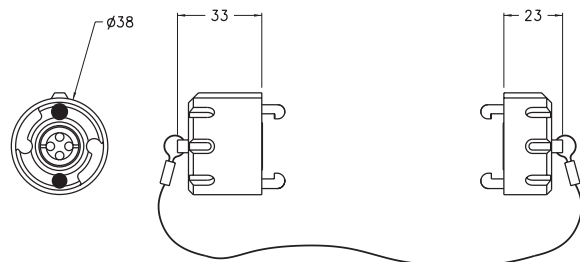
| | CTOS | BPPSA | 20 |
|---|-------|-------|-------|
| Small Optical Field Connector _____ | _____ | _____ | _____ |
| Protective shunt attenuating cap for jam nut receptacle: BPESA _____ | _____ | _____ | _____ |
| Protective shunt attenuating cap for square flange receptacle: BPPSA _____ | _____ | _____ | _____ |
| Protective shunt attenuating cap for receptacle equipped with a protective cap: BPBSA _____ | _____ | _____ | _____ |
| Insertion loss in dB: _____ | _____ | _____ | _____ |

■ CTOS BSA

The BSA is a plug shunt cap with a low insertion loss, to test the plug to plug CTOS patchcord on a reel before the optical link is deployed.

The maximum insertion loss is fixed at 4 dB.

The BSA is equipped with a protective cap.

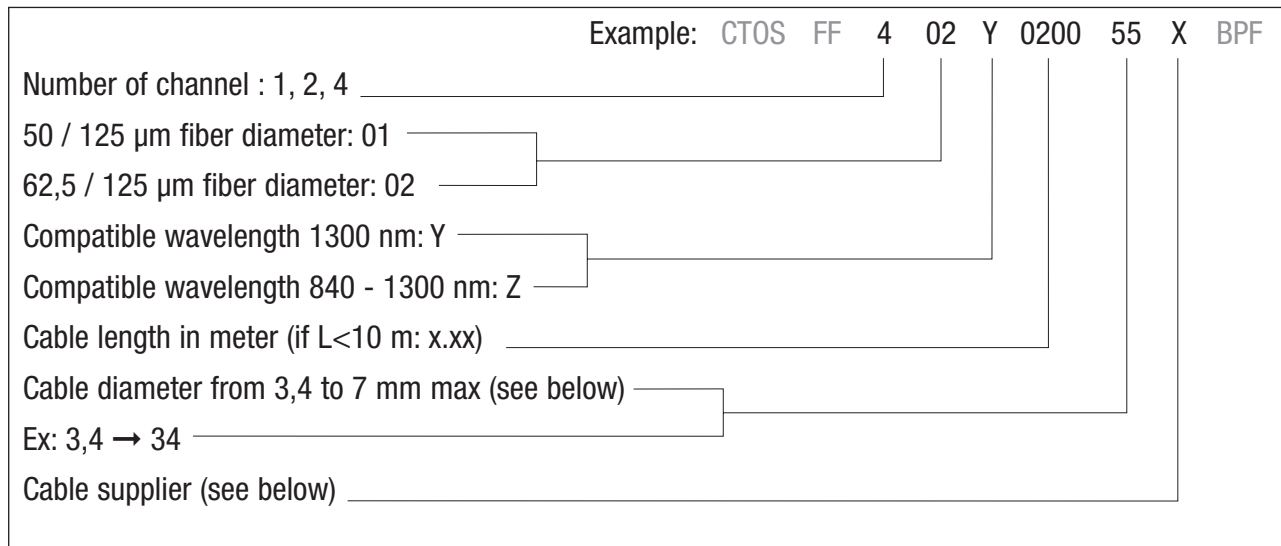


How to order CTOS receptacle protective shunt cap

| | CTOS | BSA | 4 |
|--|-------|-------|-------|
| Small Optical Field Connector _____ | _____ | _____ | _____ |
| Attenuating shunt cap for plug equipped with a protective cap: _____ | _____ | _____ | _____ |
| Insertion loss maximum in dB: _____ | _____ | _____ | _____ |

Fiber optic cable catalogue

Every “How to order” related to plug, patchcord and receptacles requires fiber optic cables informations as below:



Cable diameter & supplier:

Cable diameter and supplier have to be indicated in the « How to order » document. They are describe as below under « Specifications to write down ».

| Cable diameter (mm) | 1.5 | 1.6 | 2.8 mono | 3 duplex | 3 scindex | 3.8 | 5.5 | 6 | 6.6 | 7 | 7.5 |
|--|-----|-----|----------|----------|-----------|-----|-----|----|-----|----|-----|
| Specifications to write down on the how to order | 15 | 16 | 28 | 230 | 231 | 38 | 55 | 60 | 65 | 70 | 75 |

| Cable suppliers | Specifications to write down on the how to order |
|--------------------------|--|
| NEXANS | A |
| SPECTRA | S |
| PIRELLI | P |
| NOKIA | N |
| BOSH | B |
| DRAKA | D |
| BRUGG | G |
| No customer requirements | X |

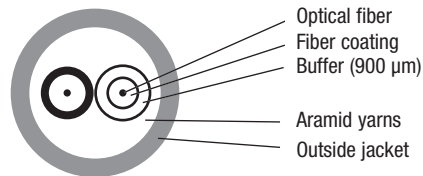
Tactical cables technical information



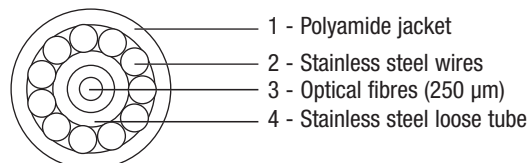
| Company | | OCC | | | | NEXANS | | | | SPECTRA STRIP | | BRUGG | | |
|---------------------------------|-----------------------------|-----------------------------------|---------------|---------------|---------------|-----------------------------------|---------------|---------------|---------------|--|----|-----------------------------------|---------------|---------------|
| Number of fibers | | 2 | 4 | 6 | 8 | 1 | 2-4 | 6 | 8 | 1 - 2 - 4 - 6 - 8 | | 1 | 2 | 4 |
| Cable diameter mm (in) | | 5 (0,2) | 5,5 (0,22) | 6,0 (0,24) | 6,5 (0,26) | 6 (0,24) | 5,4 (0,21) | 6,1 (0,24) | 6,3 (0,25) | 5,5 (0,22) | | 3,4 (0,13) | 3,8 (0,15) | 3,8 (0,15) |
| Cable weight kg/km (lb/1,000ft) | | 23 (15) | 28 (19) | 28 (19) | 38 (26) | 26 (18) | 25 (17) | 32 (22) | 35 (24) | (2-4 core typically) (17) | 25 | 18 (12) | 25 (17) | 26 (17) |
| Reinforcing protection | | aramid yarns | | | | aramid yarns | | | | aramid yarns | | stainless-steel wires | | |
| Outside jacket | | polyurethan | | | | polyurethan | | | | spectraloy | | polyamid | | |
| Fiber minimum bandwidth | Multimode 850nm (MHz/km) | 200 (62,5/125) | | | | 500 (50/125) 200 (62,5/125) | | | | 200 (50/125) 400 (62,5/125) | | 500 | | |
| | Multimode 1300nm (MHz/km) | 500 (62,5/125) | | | | 800 (50/125) 500 (62,5/125) | | | | 400 (50/125) 600 (62,5/125) | | 800 | | |
| | Single mode 1310nm (GHz/km) | - | | | | - | | | | 3,5 | | 3,5 | | |
| | Single mode 1550nm (GHz/km) | - | | | | - | | | | 18 | | 18 | | |
| Fiber maximal attenuation | Multimode 850nm (dB/km) | 3 (62,5/125) | | | | 3,5 | | | | 3,5 | | 2,7 | | |
| | Multimode 1300nm (dB/km) | 1 (62,5/125) | | | | 1,5 | | | | 1,5 | | 0,8 | | |
| | Single mode 1310nm (dB/km) | - | | | | 0,42 | | | | 0,45 | | 0,36 | | |
| | Single mode 1550nm (dB/km) | - | | | | 0,28 | | | | 0,3 | | 0,25 | | |
| Temperature range | Storage | -70°C / +85°C (-94°F / +185°F) | | | | -40°C / +70°C (-40°F / +158°F) | | | | -60°C / +85°C (-76°F / +185°F) | | -60°C / +85°C (-76°F / +185°F) | | |
| | Operating | -55°C / +85°C (-67°F / +185°F) | | | | -40°C / +70°C (-40°F / +158°F) | | | | -55°C / +85°C (-67°F / +185°F) | | -55°C / +85°C (-67°F / +185°F) | | |
| Minimum bending radius mm (in) | | 8 X OD cable | | | | 60 (2,36) | 50 (1,97) | | | 10 X OD cable | | 30 (1,18) | 35 (1,38) | 35 (1,38) |
| Maximum tensile strength | Short term N (lbs.f) | 1800 (405) | 1800 (405) | 1800 (405) | 1800 (405) | (IEC 794 1E1) 2200 (495) | | | | (2-4 core typically) (60- 1 part.3 cl.15.1) 2000 (450) | | 1000 (225) | 2500 (562) | 1600 (360) |
| | Operating N (lbs.f) | 600 (135) | 600 (135) | 600 (135) | 600 (135) | 1300 (292) | | | | (2-4 core typically) 2600 | | 750 (169) | 1800 (405) | 1100 (247) |
| Crush resistance N/cm (lbs/in) | | (EIA 455 41) 440 (251) | | | | (IEC 794 1E3) 300 (171) | | | | (2-4 core typically) (IEC 60794-1-1 &2) 1200 (685) | | 2500 (1428) | 1200 (685) | 1000 (571) |
| Impact resistance (1J impact) | | (EIA 455 25) 200 | | | | (IEC 794 1E4) 100 | | | | 100 min | | 100 min | | |
| Torsion/torque | | (TIA/EIA-455-104) 2000 cycles | | | | (IEC 794 1E8) 30000 cycles | | | | (2-4 core typically) (IEC 60794-1-1) 1000 cycles | | 10000 min | 7000 min | 7000 min |

Technical information given by the supplier

Tactical cables with aramid yarn reinforcing protection



Tactical cable with stainless steel wires reinforcing protection



NORTH AMERICA

AMPHENOL PCD, Inc.

2 technology Drive
Peabody, MA 01960
Telephone: 1-978-532-8800
Fax: 1-978-532-6800

AMPHENOL AEROSPACE OPERATIONS AMPHENOL INDUSTRIAL OPERATIONS

40-60 Delaware Street
Sidney, New York 13838-1395 - USA
Telephone: 1-607-563-5011
Fax: 1-607-563-5157

AMPHENOL BACKPLANE SYSTEMS

18 Celina Avenue
Nashua, New Hampshire 03063 - USA
Telephone: 1-603-883-5100
Fax: 1-603-883-0171

AMPHENOL CANADA CORPORATION

20 Melford Drive - Scarborough, Ontario M1B 2X6
Canada
Telephone: 1-416-291-4401
Fax: 1-416-292-0647
1870 boul. des Sources, Suite 204
Pointe Claire, Quebec H9R 5N4 - Canada
Telephone: 1-514-630-7242 ext. 225
Fax: 1-514-630-7697

AMPHENOL FIBER OPTIC PRODUCTS- RICHARDSON OPERATION

1778 North Plano Road, Suite 212
Richardson, Texas 75081
Telephone: 1-972-744-9801
Fax: 1-972-744-9022

EUROPE

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MIL-AERO & INDUSTRIAL Business Unit
948 Promenade de l'Arve - B. P. 29
74311 Thyez Cedex - France
Telephone: 33-4-5089-2800
Fax: 33-4-5096-1941

AMPHENOL LIMITED WHITSTABLE

Thanet Way, Whitstable - Kent, CT5 3JF
United Kingdom
Telephone: 44-1227-773-200
Fax: 44-1227-276-571

AMPHENOL LIMITED NOTTINGHAM

Unit D1 Crossgate Drive, Queens Drive Industrial
Estate - NG2 1LW - Nottingham - United Kingdom
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