# USBF TV *(USB-A)*
## USB Connection System for Harsh Environment

With USB Field, you can insert a standard USB 2.0 cordset into a metallic plug which will protect it from shocks, dust and fluids.
**No hazardous on-field cabling and grounding!**

This metallic plug is connected into a receptacle, using a Tri Start Thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device for high vibrations.

### Applications
- Embedded Computers
- Data Acquisition and transmission in harsh environment
- Railways
- Battelfield Communication Systems
- Navy Systems

### Main characteristics
- Sealed against fluids and dusts (IP68)
- Shock, Vibration and Traction resistant
- No cabling operation in field and no tools required
- Improved EMI protection
- Tri Start Thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device
- 2 mechanical Coding / Polarization possibilities by the user (receptacle insert rotation)
- USBF TV plug retention in the receptacle: 100 N in the axis
- Mating cycles: 500 minimum

### Environmental Protection
- Sealing (when mated): IP68 (Temporary immersion)
- Salt Spray:      48 h with Nickel plating
  > 500 h with Olive Drab Cadmium
  1000 h with marine bronze shell
- Fire Retardant / Low Smoke: UL94 V0 and NF F 16 101 & 16 102
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 1micro s
- Shocks: IK06: weight of 250 g drop from 40 cm [15.75 in] onto connectors (mated pair)
- Humidity: 21 days, 43°C, 98% humidity
- Temperature Range: - 40°C / +85°C

### Data Transmission
USB Specification 2.0
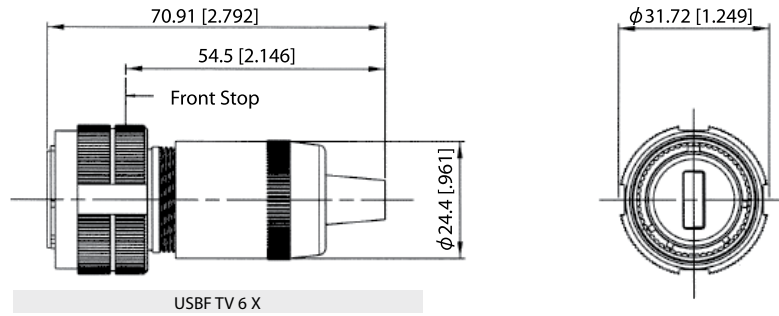Data Rate: Up to 480 Mbps for High Speed USB

### Part Number Code

| Series | | USBF TV | 2 | 1 | G |
|---|---|---|---|---|---|
| **USB Field TV** | | | | | |

| Shell Type | |
|---|---|
| **6:** | Plug |
| **2:** | Square flange receptacle |
| **2PE:** | Square flange receptacle with metal backshell *(type 1)* & with metal backshell + plastic gland *(type 2)* |
| **2PEM:** | Square flange receptacle with backshell + metal gland *(only for back termination type 2 = Solder)* |
| **7:** | Jam nut receptacle |
| **7PE:** | Jam nut receptacle with metal backshell *(type 1)* & with metal backshell + plastic gland *(type 2)* |
| **7PEM:** | Jam nut receptacle with backshell + metal gland *(only for back termination type 2 = Solder)* |

| Back Terminations *(Receptacles only)* | |
|---|---|
| **1:** | Female USB-A |
| **2:** | Solder (4 tinned holes) |

| Shells Material & Finish | |
|---|---|
| **N:** | Aluminium shell - Nickel plating - ROHS compliant |
| **G:** | Aluminium shell - Olive Drab Cadmium plating |
| **BZ:** | Marine bronze shell - ROHS compliant |

*Examples:*    - Olive Drab Cadmium Plug: USBF TV 6G
  - Olive Drab Cadmium Square Flange Receptacle, USB-A back terminat°: USBF TV 21G
  - Olive Drab Cadmium Jam Nut Receptacle, USB-A receptacle back terminat°: USBF TV 71G
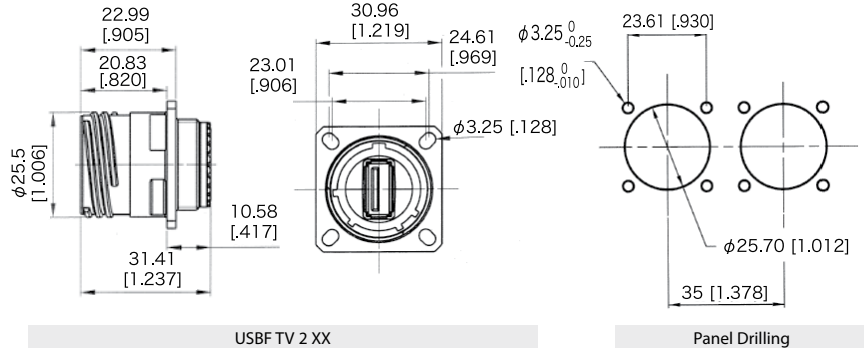  - Nickel Jam Nut Receptacle, solder back termination: USBF TV 72N
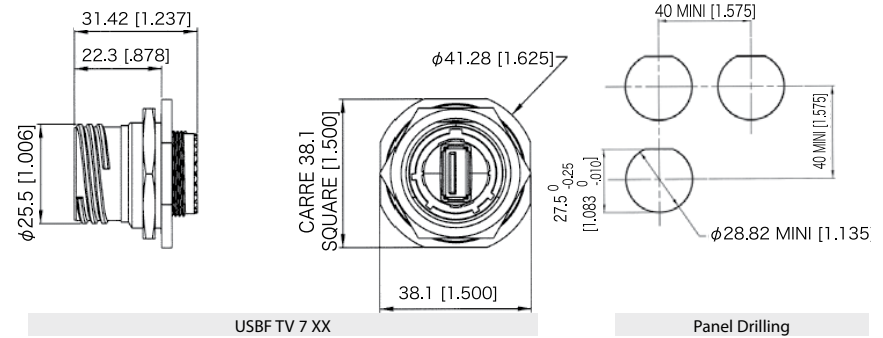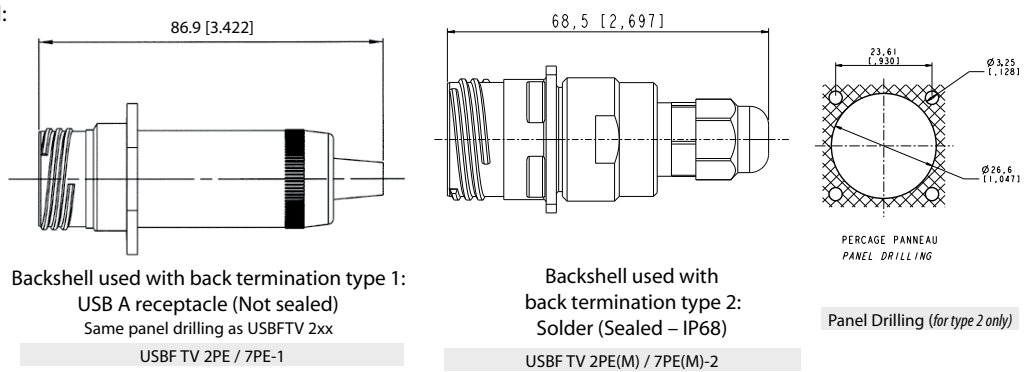
## Plug

■ Shell type 6



70.91 [2.792]

54.5 [2.146]

Front Stop

φ24.4 [.961]

φ31.72 [1.249]

USBF TV 6 X

## Receptacles

■ Square flange receptacle
4 mounting holes: Shell type 2



22.99 [.905]

20.83 [.820]

φ25.5 [1.006]

31.41 [1.237]

30.96 [1.219]

23.01 [.906]

24.61 [.969]

10.58 [.417]

φ3.25 [.128]

φ3.25 $^{0}_{-0.25}$

[.128 $^{0}_{-.010}$]

23.61 [.930]

φ25.70 [1.012]

35 [1.378]

USBF TV 2 XX

Panel Drilling

■ Jam nut receptacle
Hexagonal Nut mounting: Shell type 7



31.42 [1.237]

22.3 [.878]

φ25.5 [1.006]

φ41.28 [1.625]

CARRE 38.1 SQUARE [1.500]

38.1 [1.500]

40 MINI [1.575]

40 MINI [1.575]

27.5 $^{0}_{-0.25}$
[1.083 $^{0}_{-.010}$]

φ28.82 MINI [1.135]

USBF TV 7 XX

Panel Drilling

■ Receptacles with backshell:
Shell type 2PE and 7PE



86.9 [3.422]

68,5 [2,697]

23,61 [.930]

Ø3,25 [.128]

Ø26,6 [1,047]

PERCAGE PANNEAU
*PANEL DRILLING*

Backshell used with back termination type 1:
USB A receptacle (Not sealed)
Same panel drilling as USBFTV 2xx

USBF TV 2PE / 7PE-1

Backshell used with
back termination type 2:
Solder (Sealed – IP68)

USBF TV 2PE(M) / 7PE(M)-2
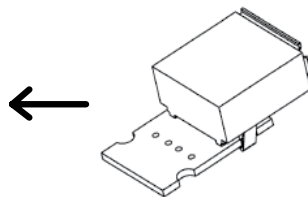
Panel Drilling (*for type 2 only*)
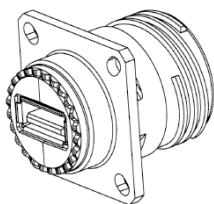
## Back terminations



Type 1: Female USB-A
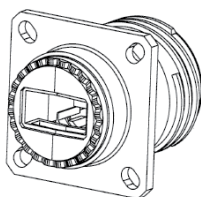


Type 2:
Solder 4 Tinned holes to solder your cable



View of the PCB of the Type 2 version with
4 tinned holes for solder termination

## Assembly Instructions

*Can be used with most the USB cordset brands : No tools required!*
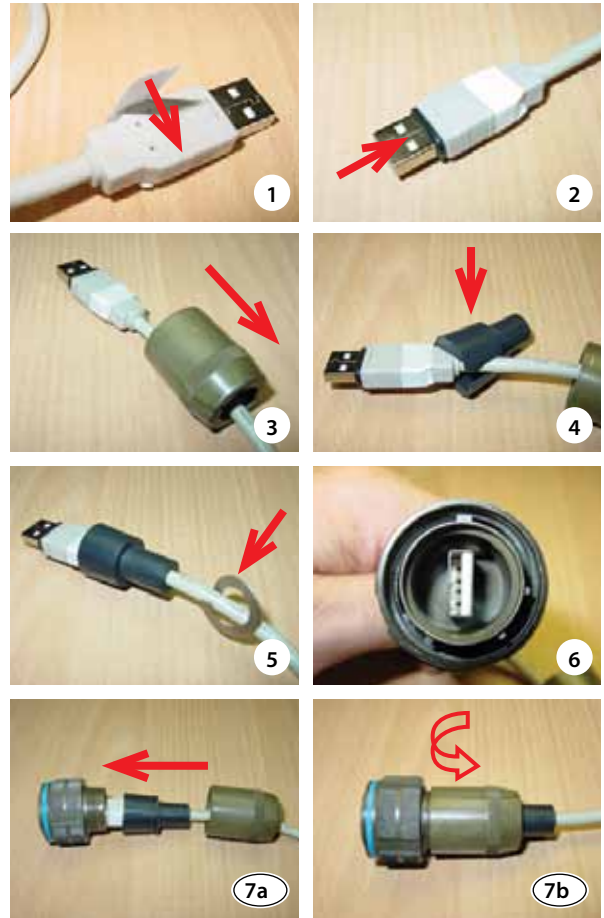
**Plug Assembly**

1. Only if you need a full sealing (IP68): Install the white sticker around the plug, covering the 4 little holes of the overmolding

2. Insert the black O Ring around the front face of the USB A plug. This O Ring will ensure connection sealing

3. Insert the USB cordset into the metallic backshell

4. Insert the retention spacer laterally to the cable (this spacer is soft, in order to adapt to different shapes of overmolding) and slide the overmolding of the USB-A plug into this retention spacer

5. Insert the friction ring laterally to the cable

6. Choose the right coding (2 positions) and insert the USB-A plug into the protective plug. Note at this step, the main key is used for polarization.

MAIN KEY

USB insulation on the left

CODE A

CONNECTION SIDE VIEW

USB insulation on the right

CODE B
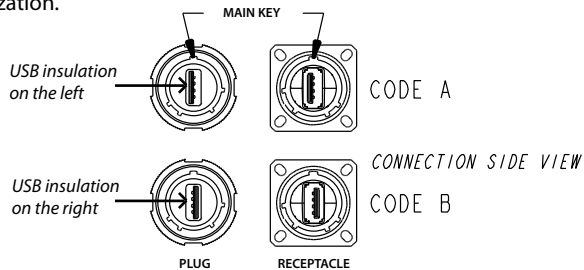
PLUG    RECEPTACLE

7. Screw the backshell on the plug body. A wrench can be necessary to fully tighten it, and the connection to the receptacle can help

### IMPORTANT NOTE
The connection sealing is not done by the black retention spacer (which is sloted), but by the front face ORing (fig.2)
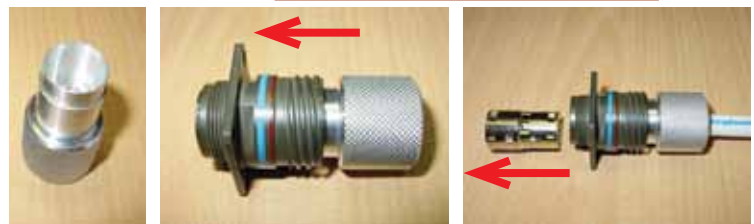
**Receptacle Assembly**

Insert the USB module from the rear. Reference is main key. Beware to have a coding compatible with the coding you used for the plug: on front view, the white shapes in the USBs must be on the same side.

*Example : coding B*

To remove the USB module, insert the removal tool **USBF ODE** from the Front, and push back the module.

### Accessories

■ **Metallic Caps**

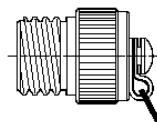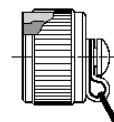| | USBF TVC | 2 | G |
|---|---|---|---|
| **Connector Type**<br>**6:** Plug<br>**2:** Square Flange Receptacle<br>**7:** Jam Nut Receptacle | | | |
| **Shells Material & Finish**<br>**N:** Aluminium shell - Nickel - ROHS compliant<br>**G:** Aluminium shell - Olive Drab Cadmium<br>**BZ:** Marine bronze shell - ROHS compliant | | | |

Plug Cap          Receptacle Cap

■ Panel Gasket for square flange receptacle (Thickness: 0,8 mm [.031]): JE15
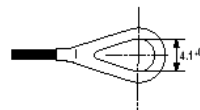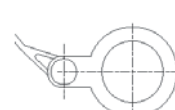
Plug Cap end          Square flange receptacle cap end          Jam Nut receptacle cap end

■ Receptacle Insert removal tool: USBF ODE