

# USBF TV

Transversally sealed receptacles



In some applications, a transversal sealing for the receptacle is a « must ». This will prevent fluids and dust from going through the receptacle when plug or cap are not mated to the receptacle. The sealed solution (version "S") has a compound at the rear of the receptacle below. In addition, the Sealed USBF TV has been successfully tested in very high vibration corresponding to airplane applications.

### Applications

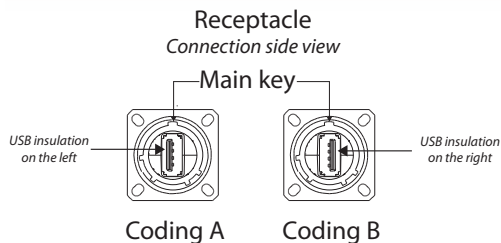
- Embedded computers
- Data acquisition and transmission in harsh environment
- Railways
- Battelfield communication systems
- Navy systems

### Data transmission

USB specification 2.0  
Data rate: up to 480 Mb/s for high speed USB

### IMPORTANT NOTE

Due to the compound, the coding of the connector must be done in the factory: use the codes A or B in the part number. **Example:** USBFTV 2S A 2 N 03 A



### 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 - Shell size 15
- 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 > 1 micro 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

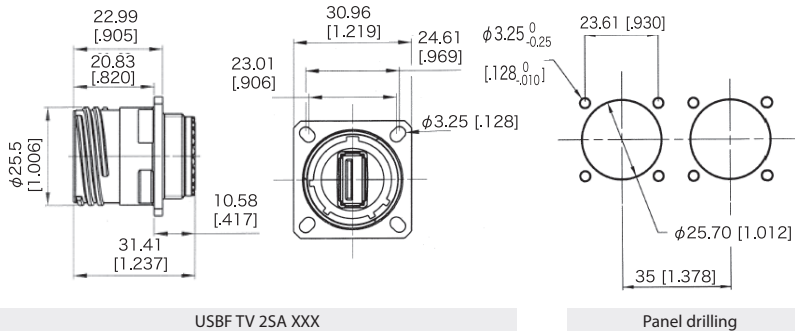
### Part number code

Series	USBF TV	2PES	A	2	N	03	A
USB Field TV							
Shell Type							
2S : square flange receptacle							
2PES: square flange receptacle + backshell + plastic gland							
2PEMS: square flange receptacle + backshell + metal gland							
7S: jam nut receptacle							
7PES: jam nut receptacle + backshell + plastic gland							
7PEMS: jam nut receptacle + backshell + metal gland							
Coding							
"A" (Standard) or "B"							
Back terminations							
2: rugged USB cable (see corresponding datasheet page 109)							
Shells plating							
N: nickel							
G: olive drab cadmium							
ZN: aluminium shell - black zinc nickel plating - ROHS compliant							
USB cable length							
03: 30 cm [11.81 inches]							
05: 50 cm [19.68 inches]							
10: 1 meter [39.37 inches]							
USB cable end							
A: standard USB-A plug							
OPEN: open cable (no connector)							

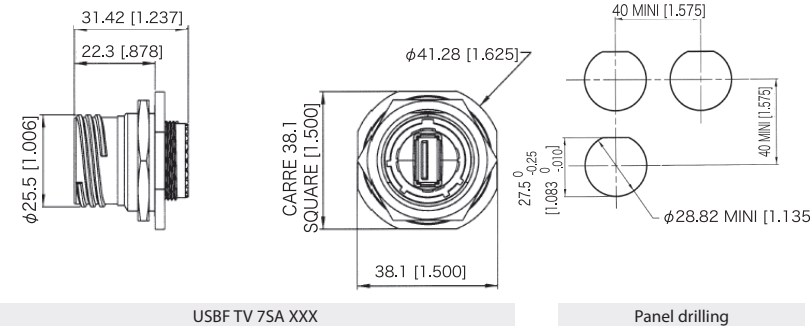
Examples: - Olive drab cadmium square flange receptacle with 30 cm of USB cable and standard USB-A plug: USBF TV 2S G 03 A  
- Nickel jam nut receptacle + backshell + plastic gland, with 1 meter of USB cable, and a standard USB-A plug: USBF TV 7PES N10 A

## Receptacles

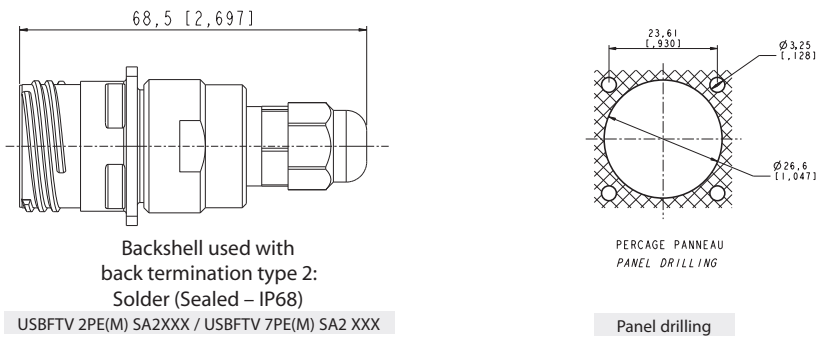
- Square flange receptacle 4 mounting holes: shell type 2



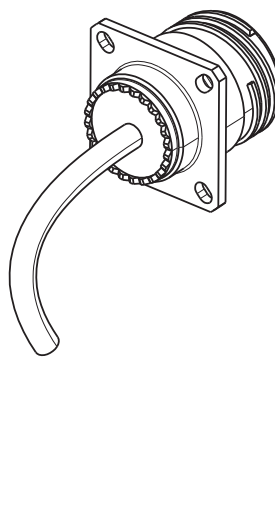
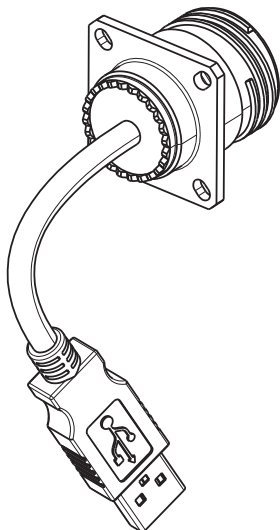
- Jam nut receptacle hexagonal nut mounting: shell type 7



- Jam nut receptacle hexagonal nut mounting: shell type 7



## Cordset end





# USBF TV

## Hermetic receptacles



In some applications, a transversal hermiticity for the receptacle is a « must ». This will prevent gas from going through the receptacle when plug or cap are not mated to the receptacle. The hermetic solution (version "H") has a compound at the rear of the receptacle. Helium leakage is less than  $1.10^{-6}$  cm<sup>3</sup> per second [0.1 micron cubit ft per hour] at one bar [15 psi] pressure differential.

### Applications

- Embedded computers
- Data acquisition and transmission in harsh environment
- Railways
- Battelfield communication systems
- Navy systems

### Data transmission

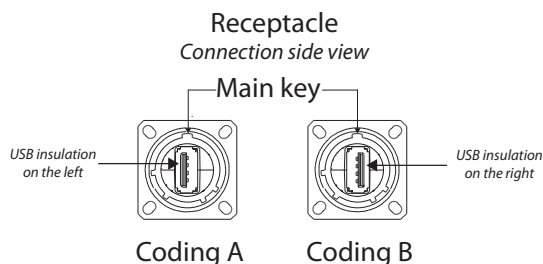
USB specification 2.0  
Data rate: up to 480 Mb/s for high speed USB

### Main characteristics

- Same as the USBF TV (see page 76)... a complete IP68 sealing of the receptacle is added (even with no plug or no protective cap mated).
- Outside dimensions are the same as the standard USBF TV (USB-A).
- Vibrations : the compounded version of the USBF TV has been tested in vibration following the NAS 1599 aeronautic specification (ambient temperature):  
5 - 3000 Hz, 20g, 2.5 mm [1 inch] double amplitude, 3 axes, 12 hours  
Note: this specification exceeds MIL-C-26500 requirements.

### IMPORTANT NOTE

Due to the compound, the coding of the connector must be done in the factory: use the codes A or B in the part number. **Example:** USBFTV 2H A 2 N 03 A



### Part number code

Series	USBF TV	2H	A	2	N	03	A
USB Field TV							
Shell type							
2H :	hermetic square flange receptacle						
2PEH:	hermetic square flange receptacle + backshell + plastic gland						
2PEMH:	hermetic square flange receptacle + backshell + metal gland						
7H:	hermetic jam nut receptacle						
7PEH:	hermetic jam nut receptacle + backshell + plastic gland						
7PEMH:	hermetic jam nut receptacle + backshell + metal gland						
Coding							
"A" (standard) or "B"							
Back terminations							
2:	rugged USB cable (see corresponding datasheet page 109)						
Shells plating							
N:	nickel						
G:	olive drab cadmium						
ZN:	aluminium shell - black zinc nickel plating - ROHS compliant						
USB cable length							
03:	30 cm [11.81 inches]						
05:	50 cm [19.68 inches]						
10:	1 meter [39.37 inches]						
USB cable end							
A:	standard USB-A plug						
OPEN:	open cable (no connector)						

Examples: - Olive drab cadmium hermetic square flange receptacle with 30 cm of USB cable and standard USB-A plug: USBF TV 2H G 03 A  
- Nickel hermetic jam nut receptacle + backshell + plastic gland, with 1 meter of USB cable, and a standard USB-A plug: USBF TV 7PEH N10 A



# USB TV

## Receptacles with 360° EMI backshells

USBFTV receptacles series with EMI backshells provide 360° shielding; same protection than the one proposed per standard MIL-DTL-38999 serie III connectors. We offer these EMI backshells with square flange and jam nut receptacles.

The available platings are nickel or olive drab cadmium.

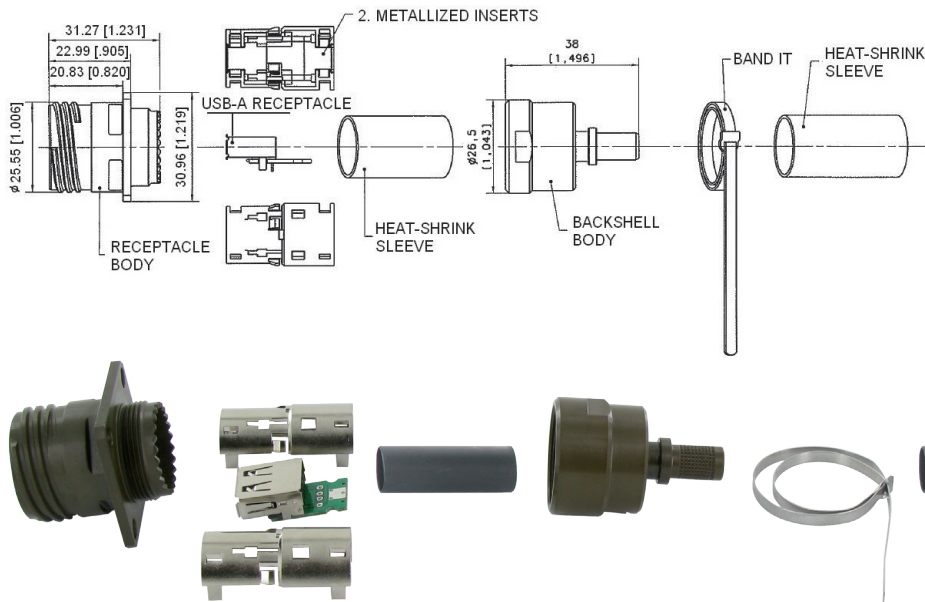
With those solutions we suggest using our reinforced USB cable (shielded – zero halogen jacket) ► see page 109

We can provide those receptacles:

- with cordset already soldered
- without cordset

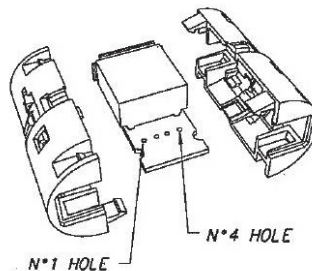
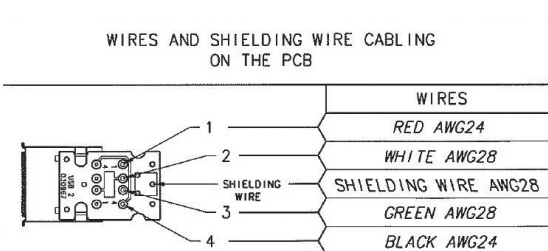


### Example with a square flange receptacle (provided without cable)



Part number	Plating	Square flange receptacle	Jam nut receptacle
	Nickel - ROHS compliant	KIT40263	KIT40245
	Olive drab cadmium	KIT40263G	KIT40245G
	Black zinc nickel plating - ROHS compliant	KIT40263ZN	KIT40245ZN

**IMPORTANT NOTE**  
 With receptacles provided without cable, customer will have to solder his cable on the PCB ; please find below the cabling specification.  
 If customer prefers to use his cable, please check with us compatibility with our EMI backshells: [www.usbfield.com](http://www.usbfield.com)



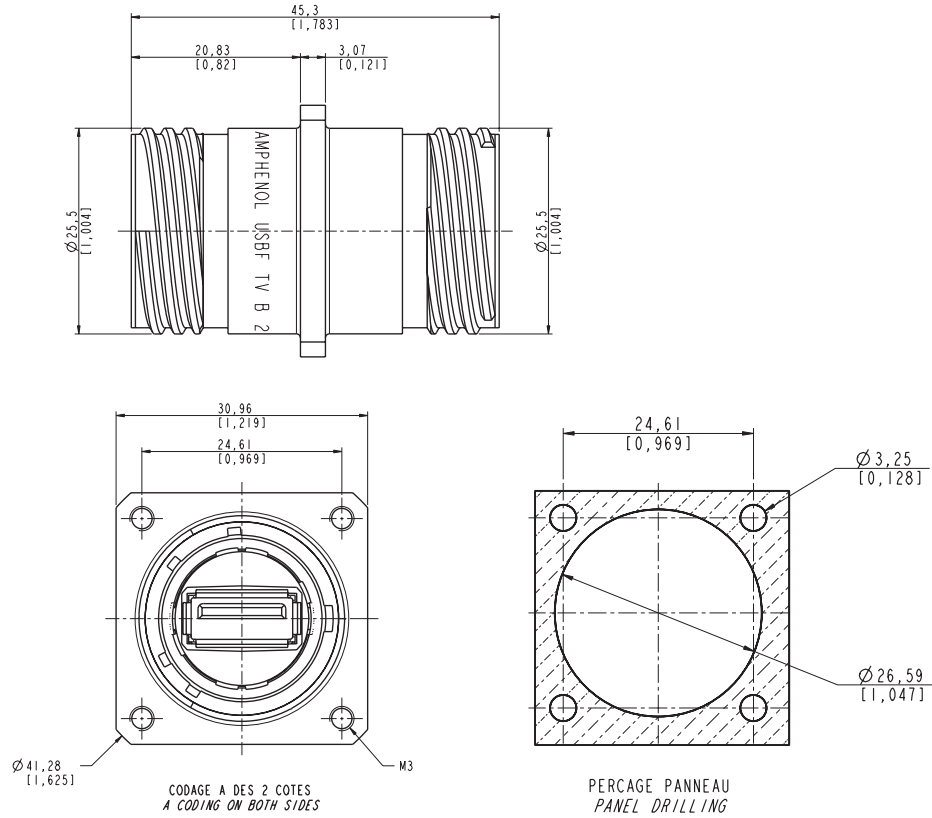




# USBF TV

Through bulkhead

## Receptacle



Part number	Plating	P/N
	Nickel - ROHS compliant	USBF TV B 2 N
	Olive drab cadmium	USBF TV B 2 G
	Black zinc nickel - ROHS compliant	USBF TV B 2 ZN

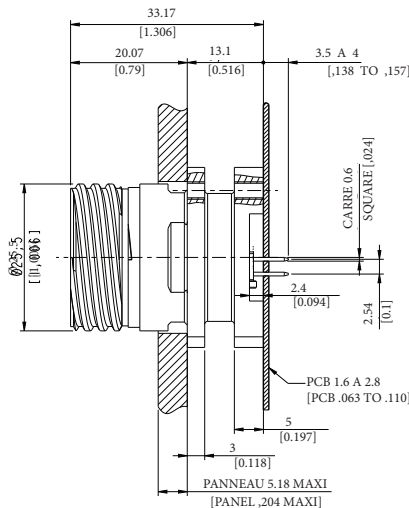
Nota : could be used with plug USBFTV, nickel and olive drab cadmium. See page 97.

# USBF TV

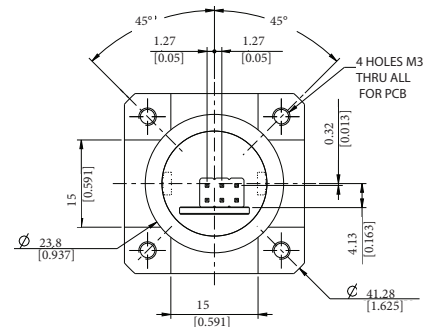
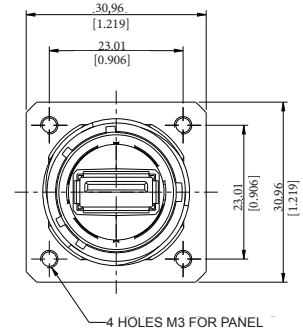
## Stand off receptacles

These receptacles can be soldered directly to your PCB. A compound insures a transversal sealing and good performance in high-vibration environments. The shell of those receptacles are in the "Stand Off" style. They can be connected with rugged USBF TV series plugs.

### Square flange receptacle



**Datas for coding A**  
Coding B is also available, please consult us.



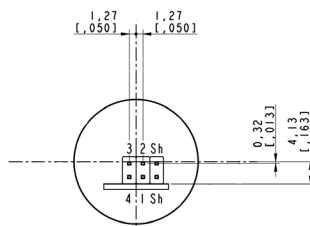
Part number	Plating	P/N for coding A	P/N for coding B
	Nickel - ROHS compliant	USBF TV 25 N F459	USBF TV 2S B 5 N F459
Olive drab cadmium	USBF TV 25 G F459	USBF TV 2S B 5 G F459	
Black zinc nickel - ROHS compliant	USBF TV 25 ZN F459	USBF TV 2S B 5 ZN F459	

### Connection side view

#### Main key

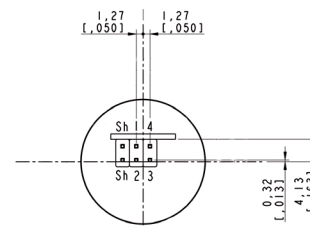


#### Plug Receptacle



#### Coding A - Pins position :

1 & 4 = Power - Red & black wires USB2.0 cable  
2 & 3 = Signal - White & green wires USB2.0 cable  
Sh = Shield

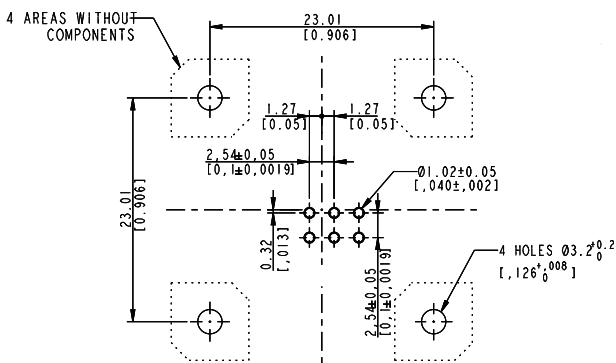


#### Coding B - Pins position :

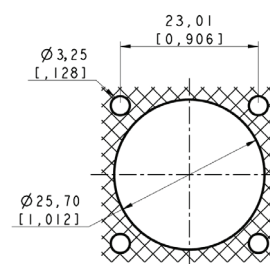
1 & 4 = Power - Red & black wires USB2.0 cable  
2 & 3 = Signal - White & green wires USB2.0 cable  
Sh = Shield

### Recommended PCB hole LAYOUT (Coding A) - Solder side view

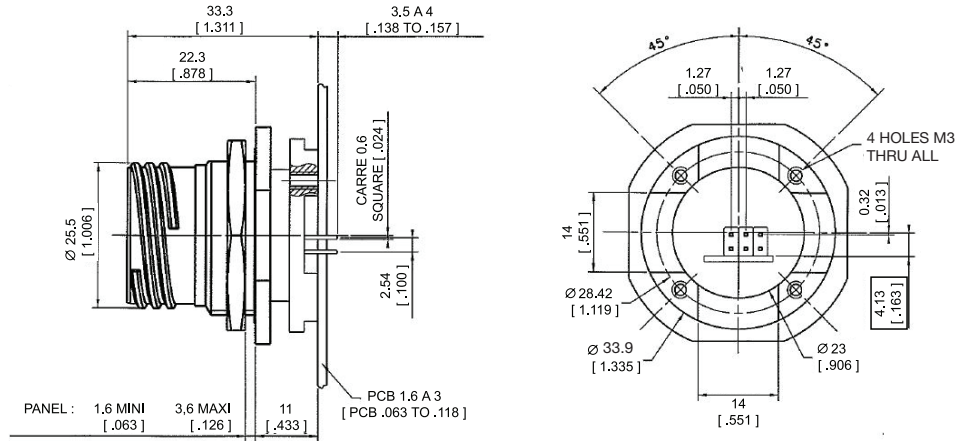
Nota : for coding B, please consult us.



### Panel drilling



## Jam nut receptacle



Part number	Plating available	P/N	P/N
		for coding A	for coding B
	Nickel - ROHS compliant	USBF TV 75 N F459	USBF TV 75 B 5 N F459
	Olive drab cadmium	USBF TV 75 G F459	USBF TV 75 B 5 G F459
	Black zinc nickel - ROHS compliant	USBF TV 75 ZN F459	USBF TV 75 B 5 ZN F459

### Connection side view

#### Main key

USB insulation on the left



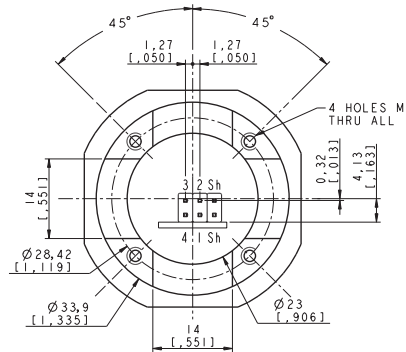
CODE A

USB insulation on the right

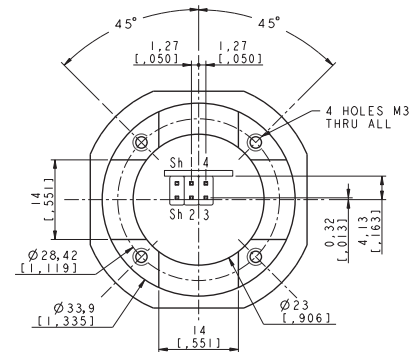


CODE B

Plug Receptacle



Coding A - Pins position:  
 1 & 4 = Power - Red & black wires USB2.0 cable  
 2 & 3 = Signal - White & green wires USB2.0 cable  
 Sh = Shield

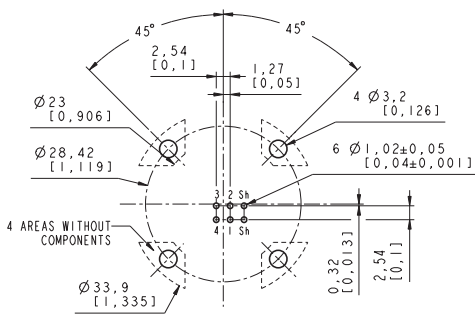


Coding B - Pins position:  
 1 & 4 = Power - Red & black wires USB2.0 cable  
 2 & 3 = Signal - White & green wires USB2.0 cable  
 Sh = Shield

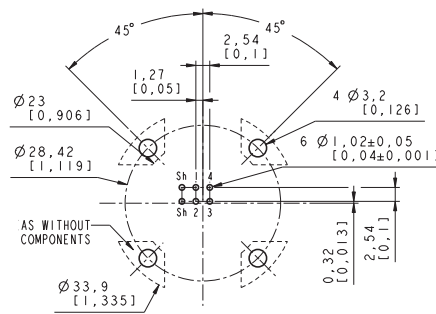
## Recommended PCB hole LAYOUT

Solder side view

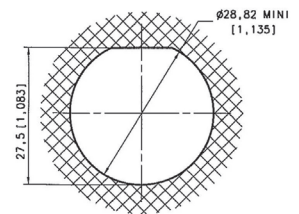
### Coding A



### Coding B



### Panel drilling



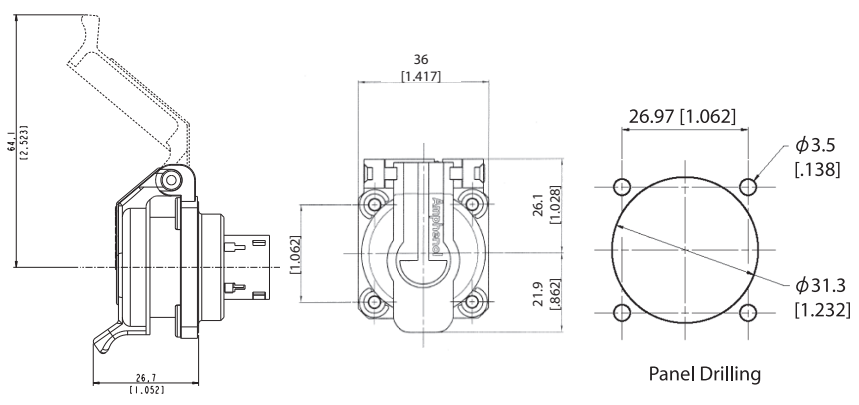
# USB 2.0 Receptacle with Self Closing Cap

Sealing level IP54  
(Splash and dust Proof)



This Self Closing Cap automatically protects the USB Field square flange receptacles (MIL-C-26482 type), protecting your system from dust and water projections. A spring automatically closes the upper part of the cap when either the USB cordset, or USB key are removed from the receptacle.

## USBF 21 X SCC




Version: USB-A (front and back termination)

Part number *	Plating		Metallized inserts (EMI)	
	Part number *	Plating	Metallized inserts (EMI)	
USBF 21B SCC	Black coated	No (blank insert)		
USBF 21N SCC	Nickel plated	Yes		
USBF 21G SCC	Olive drab cadmium plated	Yes		
USBF 21ZN SCC	Black zinc nickel - ROHS compliant	No		


\* The part number includes the receptacle + the self closing cap

■ **Note:** Panel gasket with any of these receptacles: **JE18**


## RJF 21 X SCC, USBF 21 X SCC, & IEEE1394




**RJ45 version**  
*(see page 25)*



**USB3.0-A version**  
*(see page 94)*



**USB-B version**  
*(see page 118)*



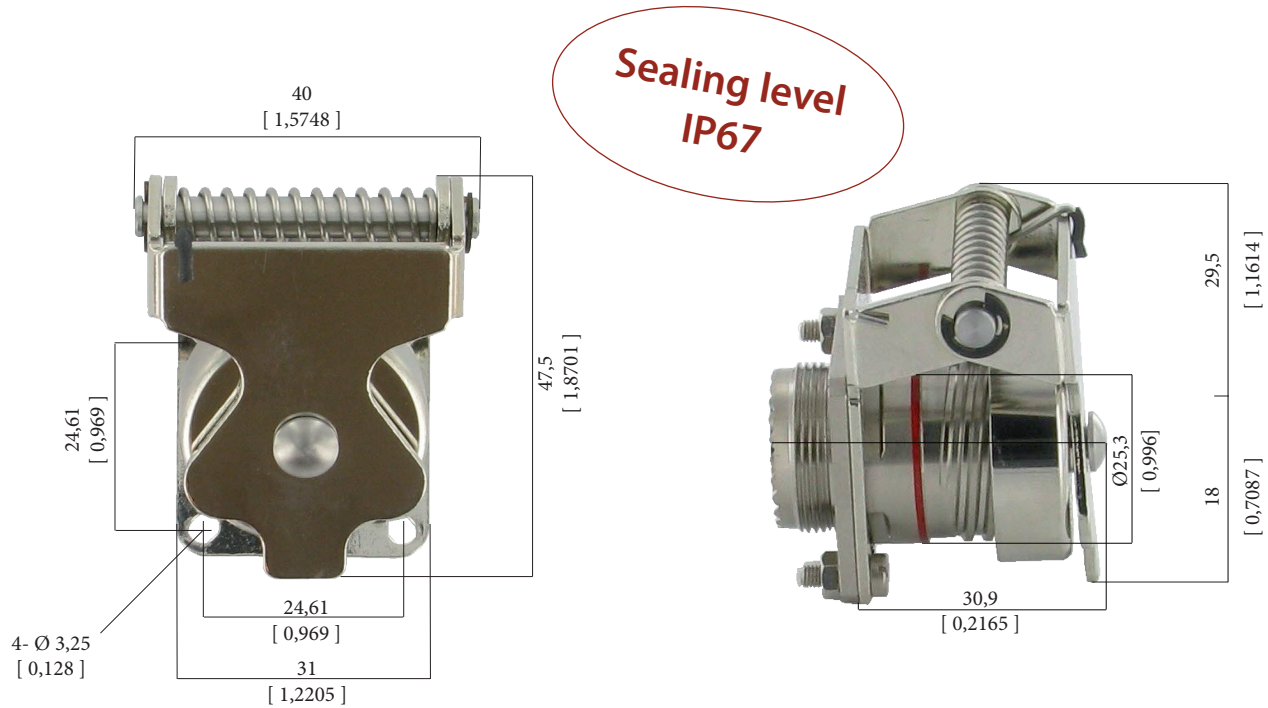
**IEEE1394 version**  
*(see page 143)*

# Metallic Self Closing Cap (SCC)

For USBF TV 2.0 square flange receptacles.

This Self Closing cap automatically protects the USBF TV (2.0 - type A) square flange receptacles (MIL-DTL-38999 type), protecting your system from dust and water projection.

A spring automatically closes the upper part of the cap when the USB plug is removed from the receptacle.



## IMPORTANT NOTE

Metal Self Closing cap are sold separately (without receptacle).

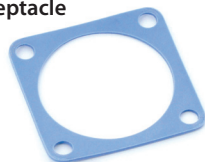


Part number	Plating	P/N
	Black - ROHS compliant	<b>USBFTVSCCB</b>
	Nickel - ROHS compliant	<b>USBFTVSCCN</b>
	Olive drab cadmium	<b>USBFTVSCCG</b>
	Black zinc nickel - ROHS compliant	<b>USBFTVSCCZN</b>

**Remark:** also compatible with USB3FTV (type A) & USBBFTV (type B) square flange receptacles:  
 USB3FTVXX (see page 95)  
 USBBFTV2XX (see page 119)

■ Panel gasket for square flange receptacle (thickness: 0,8 mm [.031]):

Part number: **JE15**



Sealing level IP67

# High Reliability USB 2.0 Cordsets



General construction: this is a USB-2.0 cable containing one 28 AWG 90Ω characteristic impedance data pair, two 24 AWG power conductors, overall SFTP shields (SFTP = double shielding, braid and foil), jacketed in black UV resistant Polyurethane HFFR\*. Designed for fixed or portable applications in industrial and harsh environments. \*HFFR: Halogen Free Flame Retardant.

### Jacket compound specification:

Halogen Free Flame Retardant Polyether-based Polyurethane. Glossy finish. Excellent hydrolysis resistance. High microbial resistance. UV resistant. High flexibility.

### Applications

- Robotics
- Motion control
- Railways
- CNC machines
- Battelfield communication
- Industrial process

**Datas  
for cable alone only  
(without USB plug)**

### PHYSICAL CHARACTERISTICS

<b>DATA CONDUCTORS</b>	bare copper, 7/0.12 mm nom (28 AWG)
<b>DATA INSULATION</b>	0.9 mm nom
<b>COLOR DATA PAIR</b>	Green & white
<b>POWER CONDUCTORS</b>	Tinned copper, 7/0.2 mm (24 AWG)
<b>POWER INSULATION</b>	1.1 mm nom
<b>COLOR POWER WIRE</b>	Red & Black
<b>SHIELDS</b>	Foil: providing 100% coverage, in contact with tinned copper drain wire and an overall braid providing 65% nom. coverage made of 16x5/0.1 mm tinned copper strands
<b>JACKET</b>	PU compound
<b>COLOR JACKET</b>	Black
<b>WEIGHT</b>	26 lbs/mft (38 kg/km)
<b>OUTSIDE DIAM.</b>	0.20 inch (5.1 mm nom. +/- 0.15)
<b>MIN BEND RADIUS</b> <i>(During installation)</i>	45.9 mm (9x O. D.)
<b>MIN BEND RADIUS</b> <i>(During operation)</i>	25.5mm (5 x O.D.)
<b>TEMPERATURE installation</b>	Plus 60°C, minus 5°C
<b>TEMPERATURE operational</b>	Plus 85°C, minus 40°C

### CORDSETS WITH A USB A PLUG OVERMOLDED ON EACH END (OUT OF USB SPECIFICATION > 5 M)

Length (m/ft)	Part number
6 m / 19.68 ft	USB2 AA 600 PU HFFR
7 m / 22.96 ft	USB2 AA 700 PU HFFR
8 m / 26.24 ft	USB2 AA 800 PU HFFR
9 m / 29.52 ft	USB2 AA 900 PU HFFR
10 m / 32.80 ft	USB2 AA 1000 PU HFFR

### REEL OF DRUM (WITHOUT USB PLUG ON ENDS)

Length	PN
300 m / ~ 984 ft	190-040567-00

### ELECTRICAL CHARACTERISTICS

<b>DC RESISTANCE</b>	94 Ohms/Km @ 20°C
<b>IMPEDANCE</b>	90 +/- 13 Ohms 1-400 MHz
<b>ATTENUATION</b>	
<b>1 KHZ</b>	8 db/100m max.
<b>4 MHZ</b>	15,6 db/100m max.
<b>24 MHZ</b>	38 db/100m max.
<b>96 MHZ</b>	76 db/100m max.
<b>200 MHZ</b>	128 db/100m max.
<b>400 MHZ</b>	232 db/100m max.
<b>CAPACITANCE 2X28 AWG</b>	
<b>CAPACITANCE</b>	54pF/m nom. @ 1KHz
<b>CAPACITANCE UNBALANCE</b>	2.0 pF/m max. @ 1KHz (wire to ground)
<b>DIELECTRIC STRENGTH</b>	VAC/1 min - 500 V/Min
<b>RESISTANCE UNBALANCE</b>	2% max. @ 20°C
<b>VELOCITY OF PROPAGATION</b>	65% min. 68% max.

### CORDSETS WITH A USB A PLUG OVERMOLDED ON EACH END (UNDER USB SPECIFICATION ≤ 5M)

Length (m/ft)	Part number
0.5 m / 1,64 ft	USB2 AA 050 PU HFFR
1 m / 3.28 ft	USB2 AA 100 PU HFFR
1.50 m / 4.92 ft	USB2 AA 150 PU HFFR
2 m / 6.56 ft	USB2 AA 200 PU HFFR
2.50 m / 8.2 ft	USB2 AA 250 PU HFFR
3 m / 9.84 ft	USB2 AA 300 PU HFFR
3.50 m / 11.48 ft	USB2 AA 350 PU HFFR
4 m / 13.12 ft	USB2 AA 400 PU HFFR
4.5 m / 14.76 ft	USB2 AA 450 PU HFFR
5 m / 16.40 ft	USB2 AA 500 PU HFFR



# USBF SC

Quick release series



This product offers a new coupling solution, particularly for applications requiring quick disconnect. The system consists of a circular spring within the receptacle keeping the plug mated, and creating an internal coupling mechanism.

### Applications

- Embedded computers
- Data acquisition and transmission in harsh environment
- Railways
- Battelfield communication systems
- Navy systems

### Data transmission

USB specification 2.0  
Data rate: up to 480 Mb/s for high speed USB

### Main characteristics

- Sealed against fluids and dusts (IP67)
- Shock, vibration and traction resistant
- No cabling operation in field and no tools required
- Improved EMI protection
- Mating cycles: 500
- Mating force after 500 cycles: 40 N
- Unmating force after 500 cycles: 55 N

### Environmental protection

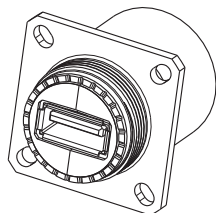
- Sealing (when mated): IP67 (temporary immersion)
- Salt spray: 48 h with nickel plating  
> 500 h with olive drab cadmium
- Fire retardant / Low smoke: UL94 V0 and NF F 16 101 & 16 102
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 1 micro s
- Shocks: IK06 ► weight of 250 g drop from 40 cm [15.75 in] onto connectors (mated pair)
- Humidity: 21 days, 43°C, 98% humidity
- Temperature range: - 40°C / +85°C

### Part number code

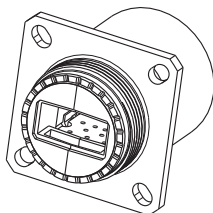
Series	USBF SC	2	1	G
USBF spring loaded				
Shell Type				
6: plug				
1: inline receptacle				
2: square flange receptacle				
7: jam nut receptacle				
Back terminations (receptacles only)				
1: female USB-A				
2: solder (4 tinned holes) - Not available for shell type "1" (inline receptacle)				
Shells material & finish				
N: aluminium shell - nickel plating - ROHS compliant				
G: aluminium shell - olive drab cadmium plating				
BZ: marine bronze shell - ROHS compliant				
ZN: aluminium shell - black zinc nickel plating - ROHS compliant				

### Back terminations

USBFSC Back terminations receptacles



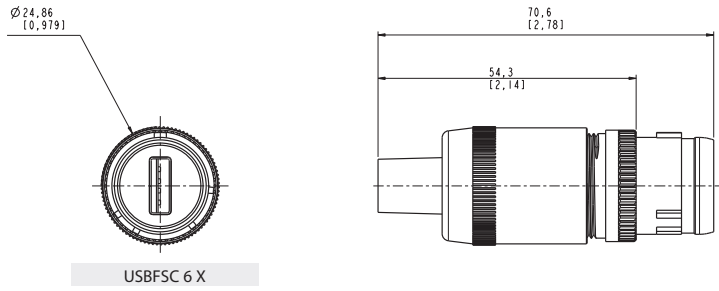
Type 1: female USB-A



Type 2: solder (4 tinned holes)

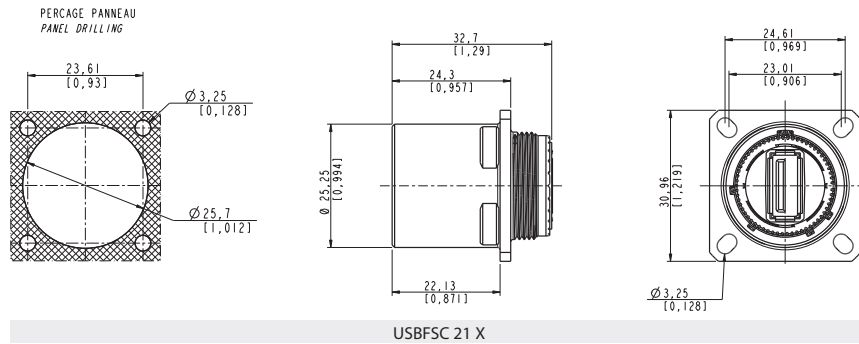
## Plug

### ■ Shell type 6

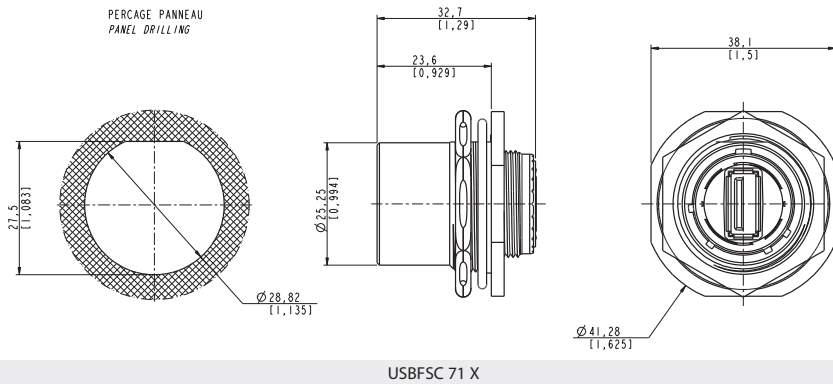


## Receptacles

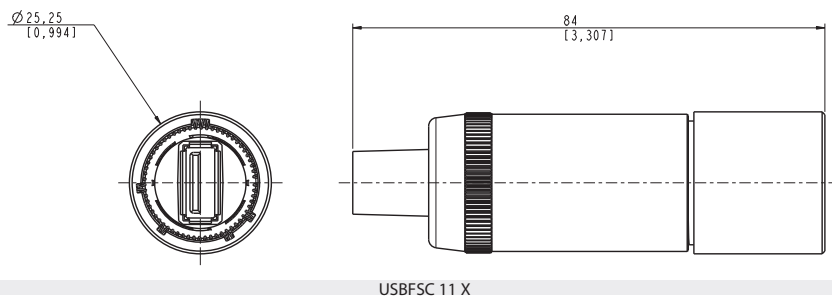
### ■ Square flange receptacle 4 mounting holes: shell type 2



### ■ Jam nut receptacle hexagonal nut mounting: shell type 7



### ■ Inline receptacle: shell type 1



# USBBF TV (USB-B)

USB connection system for harsh environment



USB Field allows you to use a standard USB 2.0 connection in harsh environment:

- 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
- plug retention in the receptacle: 100N in the axis
- mating cycles: 500 minimum
- temperature range: -40°C/+85°C

## Applications

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

## Data transmission

USB specification 2.0  
Data rate: up to 480 Mb/s for high speed USB

## 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 - Shell size 15
- Plug retention in the receptacle: 100N in the axis
- Mating cycles: 500 minimum

## Environmental protection

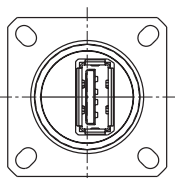
- Sealed against fluids and dusts (IP68)
- Temperature range: - 40°C / +85°C

## Part number code

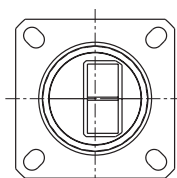
Series	USBBF TV	2	1	G
USB Field TV				
Shell type				
6: plug				
2: square flange receptacle				
2PE: square flange receptacle with metal backshell (type 1) & with metal backshell + plastic gland (type 2)				
2PEM: square flange receptacle metal gland (only for soldering back termination type 2)				
7: jam nut receptacle				
7PE: jam nut receptacle with metal backshell (type 1) & with metal backshell + plastic gland (type 2)				
7PEM: jam nut receptacle metal gland (only for soldering back termination type 2)				
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				
ZN: aluminium shell - black zinc nickel plating - ROHS compliant				

Examples: - Plug-cadmium plating: USBBF TV 6G  
- Square flange receptacle-USB-A back termination - cadmium plating: USBBF TV 21G  
- Jam nut receptacle, solder termination -nickel plating: USBBF TV 72N

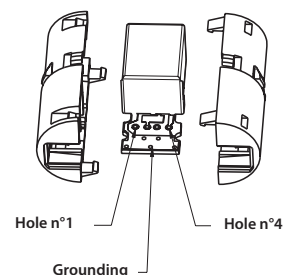
## Back terminations



Type 1: female USB-A

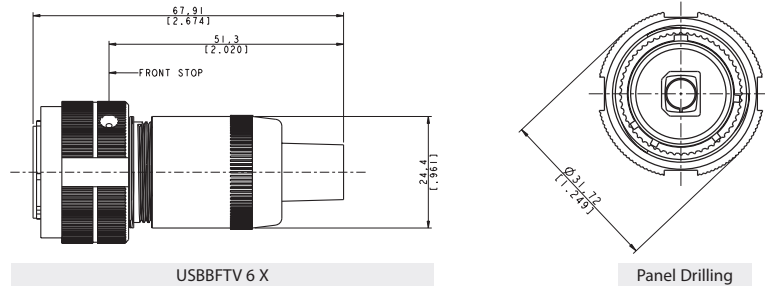


Type 2: solder (4 tinned holes)



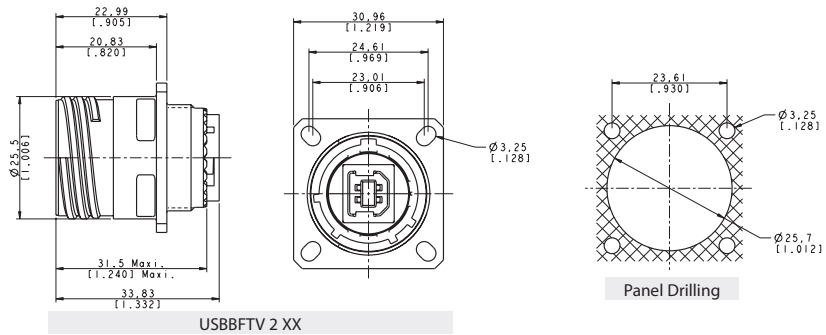
## Plug

### ■ Shell type 6

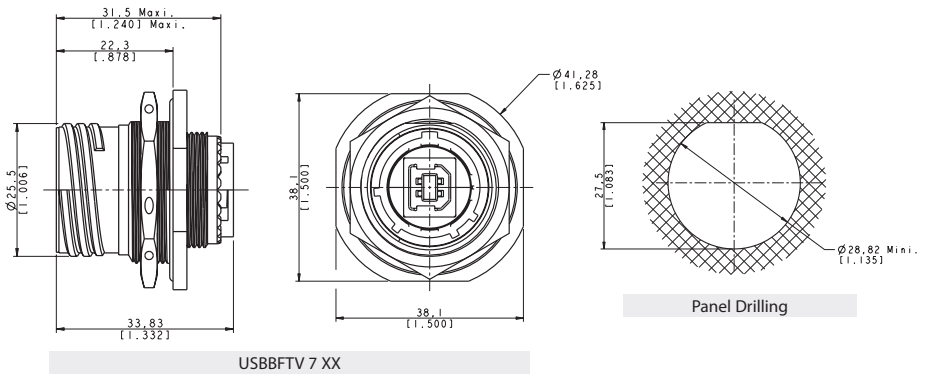


## Receptacles

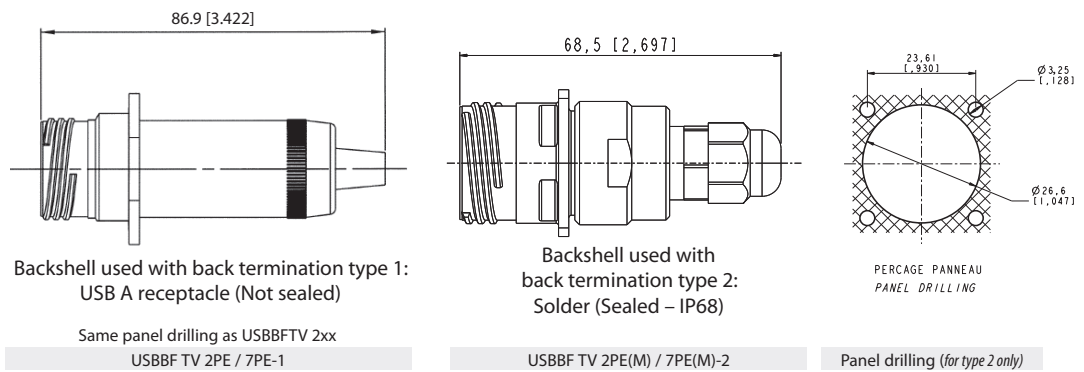
### ■ Shell type 2 - Square flange receptacle



### ■ Shell type 7 - Jam nut receptacle



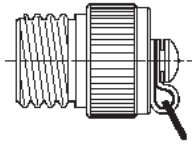
### ■ «2PEM» and «7PEM» shells with backshell to protect back termination from dust, shocks and vibration.



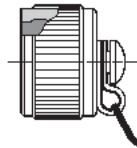
## Accessories

- **Metallic caps** (same as USB-A version - see page 99)

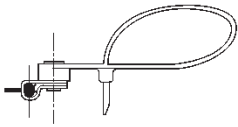
	USBF TVC	2	G
<b>Connector type</b>			
6: plug			
2: square flange receptacle			
7: jam nut receptacle			
<b>Shells material &amp; finish</b>			
N: nickel plating - ROHS compliant			
G: olive drab cadmium plating			
ZN: aluminium shell - black zinc nickel plating - ROHS compliant			



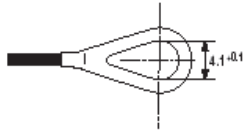
Plug Cap



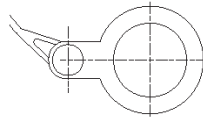
Receptacle Cap



Plug Cap end

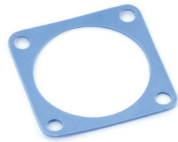


Square flange  
receptacle cap end



Jam Nut receptacle  
cap end

- **Panel gasket for square flange receptacle**  
(thickness: 0,8 mm [.031]); p/n **JE15**



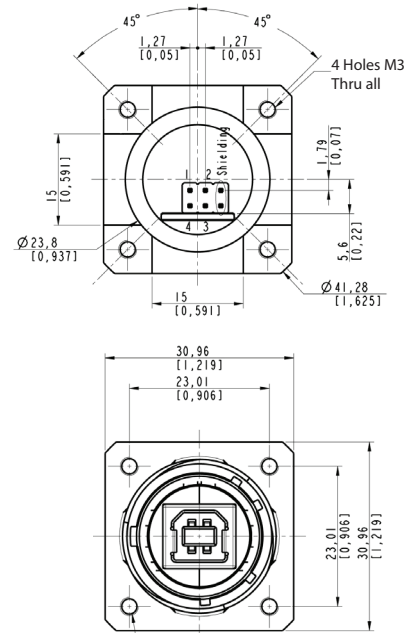
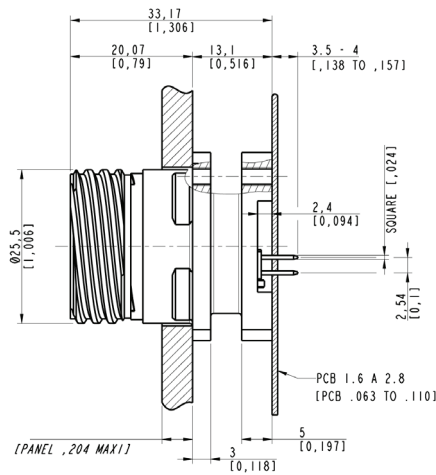


# USBBF TV

## Stand off receptacles

These receptacles can be soldered directly to your PCB. A compound insures a transversal sealing and good performance in high-vibration environments. The shell of those receptacles are in the "Stand Off" style. They can be connected with USBBF TV series plugs.

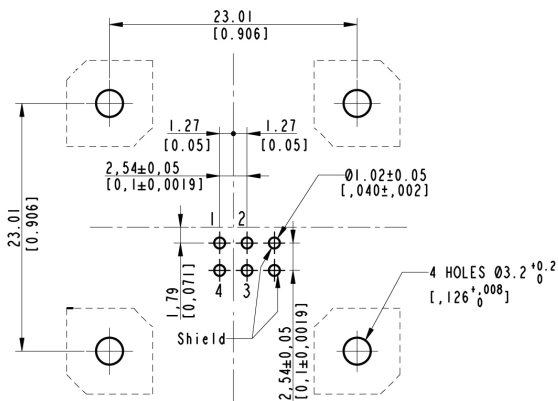
### Square flange receptacle



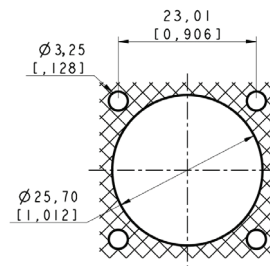
Part number	Plating	Part number
	Nickel - ROHS compliant	USBBF TV 2 5 N F459
	Olive drab cadmium	USBBF TV 2 5 G F459
	Black Zinc Nickel - ROHS compliant	USBBF TV 2 5 ZN F459

### Recommended PCB hole LAYOUT

Solder side view



### Panel drilling







# USBBF TV

Transversally sealed receptacles



## Applications

- Embedded computers
- Data acquisition and transmission in harsh environment
- Railways
- Battelfield communication systems
- Navy systems

## Data transmission

USB specification 2.0  
Data rate: up to 480 Mb/s for high speed USB

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.

## 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 - Shell size 15
- 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 > 1 micro 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

## Part number code

Series	USBBF TV	7S	2	G	10	OPEN
USBB Field TV						
Shell type						
2S: sealed square flange receptacle						
2PES: sealed square flange receptacle + backshell + plastic gland						
2PEMS: sealed square flange receptacle + backshell + metal gland						
7S: sealed jam nut receptacle						
7PES: sealed jam nut receptacle with backshell						
7PEMS: sealed jam nut receptacle + backshell + metal gland						
Back terminations						
2: rugged USB cable						
Shells plating						
N: nickel						
G: olive drab cadmium						
ZN: aluminium shell - black zinc nickel plating - ROHS compliant						
USB cable length						
03: 30 cm [11.81 inches]						
05: 50 cm [19.68 inches]						
10: 1 meter [39.37 inches]						
USB cable end						
A: standard USB-A plug						
OPEN: open USB cable (no connector)						

Examples: - Olive drab cadmium jam nut receptacle: USBBF TV 7 XX  
- Nickel square flange receptacle: USBBF TV 2 XX



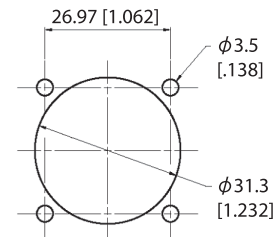
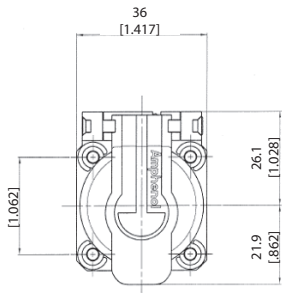
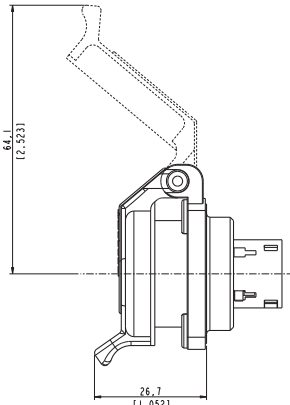
# USB B receptacle with Self Closing Cap

Sealing level IP54  
(Splash and dust Proof)



This Self Closing Cap automatically protects the RJ Field square flange receptacles (MIL-C-26482 type), protecting your system from dust and water projections. A spring automatically closes the upper part of the cap when the USB B plug is removed from the receptacle.

## USBBF 21 X SCC



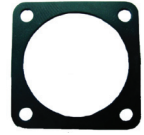
Panel Drilling

Version: USB-B (front in USB-B and back termination in USB-A)

Part number*	Plating	Metallized inserts (EMI)	Part number
	Black coated	No (blank insert)	<b>USBBF 21B SCC</b>
	Nickel plated	Yes	<b>USBBF 21N SCC</b>
	Olive drab cadmium plated	Yes	<b>USBBF 21G SCC</b>
	Black Zinc Nickel - ROHS plating	No	<b>USBBF 21ZN SCC</b>

\* The part number includes the receptacle + the self closing cap

■ Note: panel gasket with any of these receptacles, p/n JE18



## RJF 21 X SCC, USBF 21 X SCC, & IEEE1394



RJ45 version  
(see page 25)



USB2.0 & 3.0 - A version  
(see pages 94 & 107)



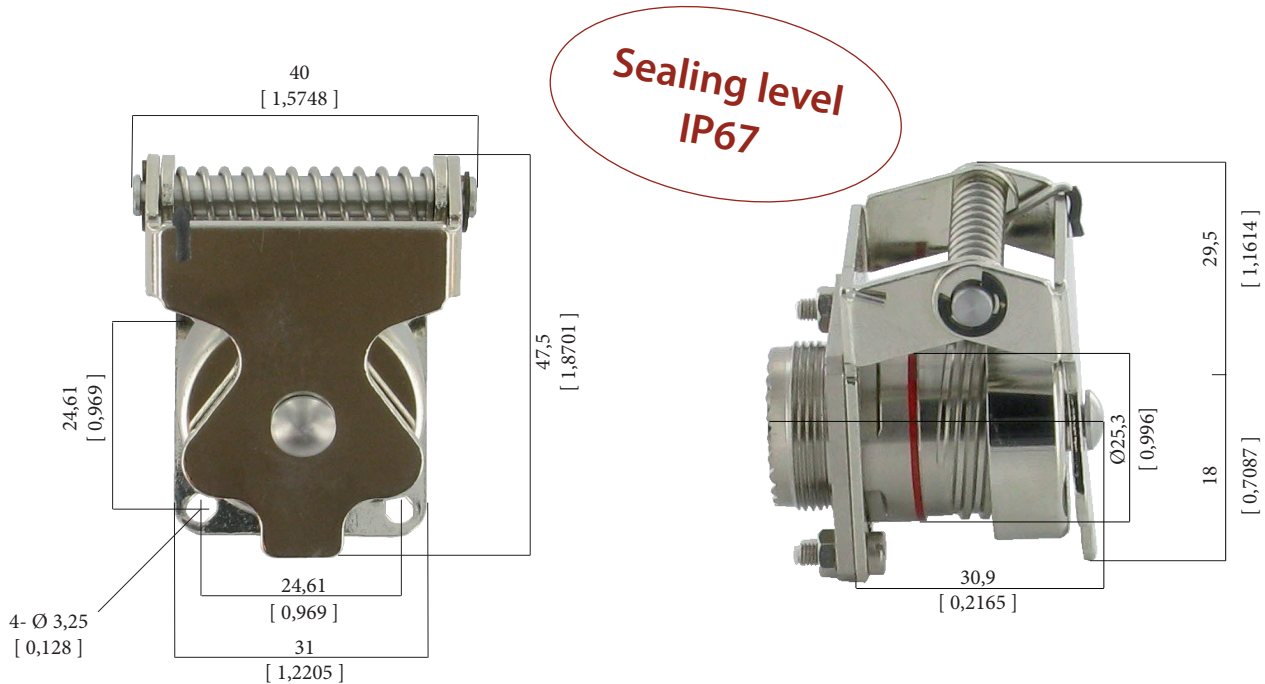
IEEE1394 version  
(see page 143)

# Metallic Self Closing Cap (SCC)

For USBB square flange receptacles.

This Self Closing cap automatically protects the USBB (2.0 - type A) square flange receptacles (MIL-DTL-38999 type), protecting your system from dust and water projection.

A spring automatically closes the upper part of the cap when the USB plug is removed from the receptacle.



## IMPORTANT NOTE

Metal Self Closing cap are sold separately (without receptacle).



Part number	Plating	P/N
	Black - ROHS compliant	<b>USBFTVSCCB</b>
	Nickel - ROHS compliant	<b>USBFTVSCCN</b>
	Olive drab cadmium	<b>USBFTVSCCG</b>
	Black Zinc Nickel - ROHS plating	<b>USBFTVSCCZN</b>

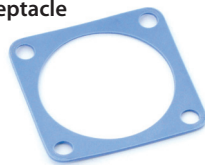
**Remark:** also compatible with USB3FTV (type A) & USBBFTV (type B) square flange receptacles:

USB3FTV2XX (see page 95)

USBFTV2XX (see page 108)

■ Panel gasket for square flange receptacle (thickness: 0,8 mm [.031]):

Part number: **JE15**



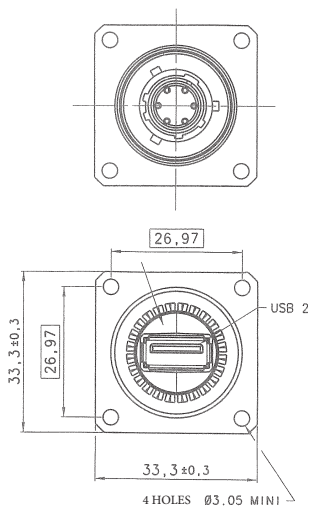
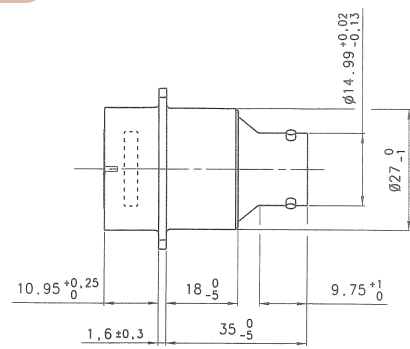


# Special USB adaptor

For Military & Commercial Aeronautics

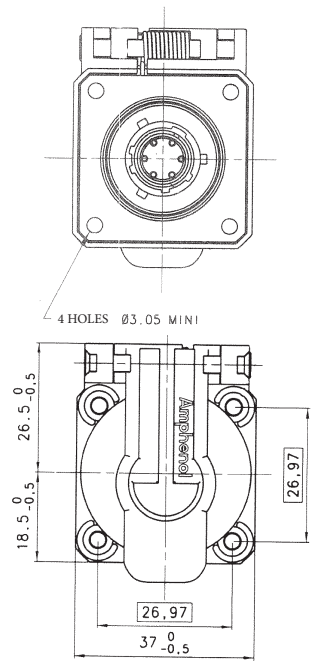
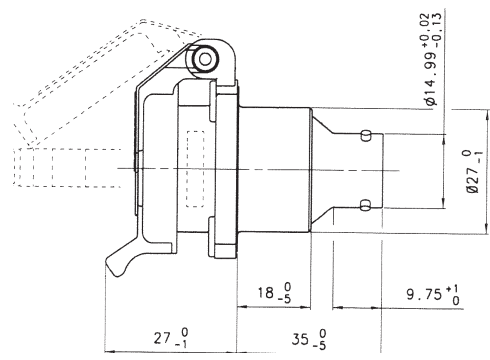
At the rear of the adaptor, the connection is for connectors type EN3646.

## Adaptor USB only



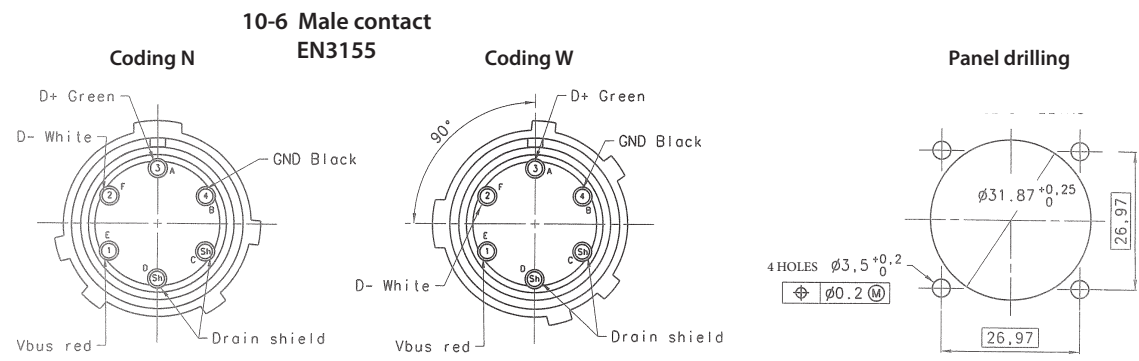
Part number	Plating	Coding	P/n
	Black anodized	N	<b>35608</b>
	Black anodized	W	<b>35615</b>

## Adaptor USB + Self Closing Cap (SCC)



Part number	Plating	Coding	P/n
	Black anodized	N	<b>35616</b>
	Black anodized	W	<b>35617</b>

For all options:






# Rugged USB Solutions



## Cable assemblies

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USB-B Field : Plastic shell - Overmolded cordset plug .....	121





# USB-A Field

Rugged USB-A plastic & neoprene solutions with Self Closing Cap



Amphenol USB-A Field - Plastic & Neoprene versions are rugged USB interconnect solutions fitted to be used in any industrial harsh environment. The Self Closing Cap enclosure enables to protect the USB-A Field receptacle from dust and fluids when the plug or the USB Memory key are unmated.

### Applications

- Access point
- Telecom equipments
- Video control
- Robotics
- Industrial process control
- CNC machines
- Special machines

### Main characteristics

- Sealing level:
  - Mated condition with plug or rugged USB Memory Key: IP67
  - Receptacle with Self Closing Cap alone : IP54
- Mating cycles: 500
- Push-pull mating
- Neoprene shells for plug & USB Keys
- Data transmission: USB specification 2.0
- Data rate: up to 480 Mb/s for high speed USB
- Temperature range: -40°C / +85°C
- RoHS compliant

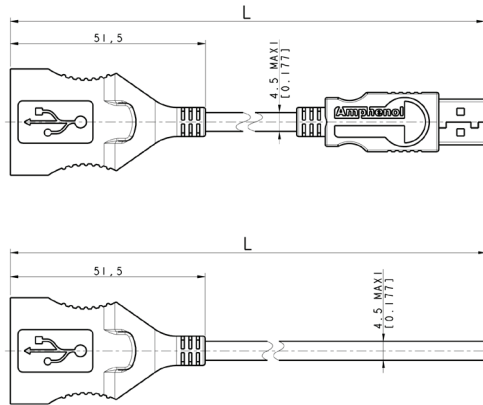
### Plug with soft neoprene shell



**Part number:**  
USBAP 6 xxxA  
with USB-A plug

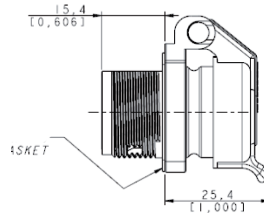
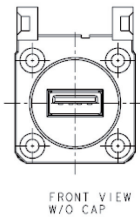
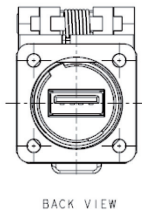
IP67 when mated  
on receptacle

**Part number:**  
USBAP 6 xxx  
Open

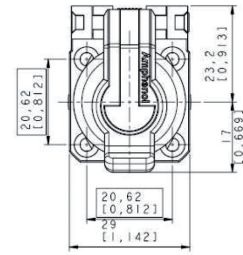


Part number	Extremity type Open or USB-A	$L$ $^{+5cm}$ $_0$	$L$ $^{+0.164ft}$ $_0$
		Meters	Feet
USBAP6 05 OPEN	Open	0.5	1.64
USBAP6 05A	USB-A	0.5	1.64
USBAP6 10 OPEN	Open	1.0	3.28
USBAP6 10A	USB-A	1.0	3.28
USBAP6 15 OPEN	OPEN	1.5	4.92
USBAP6 15A	USB-A	1.5	4.92
USBAP6 20 OPEN	OPEN	2.0	6.56
USBAP6 20A	USB-A	2.0	6.56

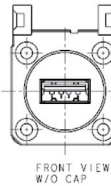
## Square flange receptacle



IP54  
when alone



Part number:  
USBAPSCC 21



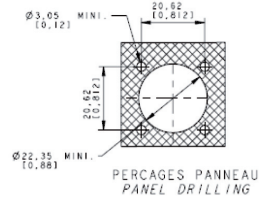
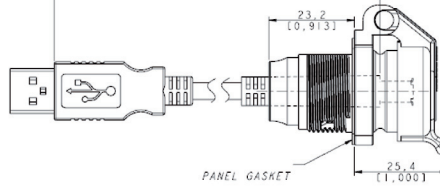
Standard lengths L:

0,2M

0,3M

0,5M

1,0M

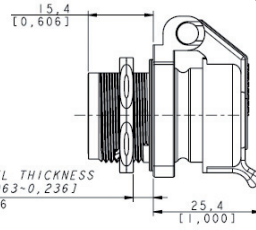
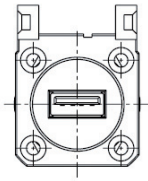
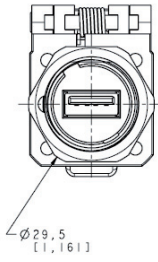


Part number	Cordset length	
	Meters	Feet
USBAPSCC 22 02A	0.2	0.66
USBAPSCC 22 03A	0.3	0.98
USBAPSCC 22 05A	0.5	1.65
USBAPSCC 22 10A	1.0	3.28

## Jam nut receptacle

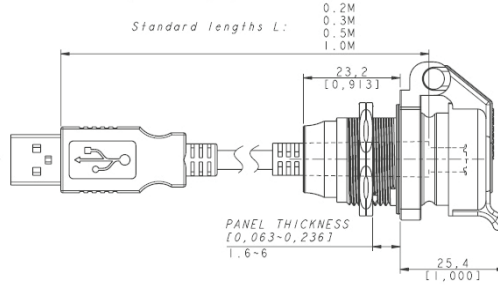
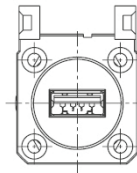
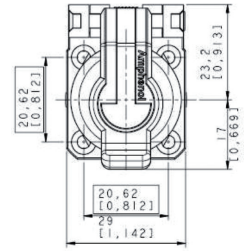


**Part number:**  
USBAPSCC 71



PANEL THICKNESS  
[0,063-0,236]  
1.6-6

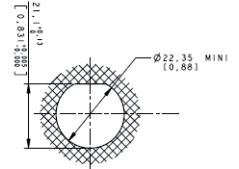
**IP54  
when alone**



Standard lengths L:

- 0.2M
- 0.3M
- 0.5M
- 1.0M

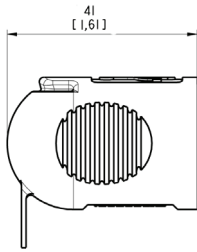
PANEL THICKNESS  
[0,063-0,236]  
1.6-6



PANEL DRILLING

Part number	Cordset length	Cordset length
	Meters	Feet
USBAPSCC 72 02A	0.2	0.66
USBAPSCC 72 03A	0.3	0.98
USBAPSCC 72 05A	0.5	1.65
USBAPSCC 72 10A	1.0	3.28

## USB plastic - IP67 cap (for square flange receptacle only)



**Part number:**  
USBAP IP67 CAP



Cap lanyard fixed by a screw  
(for square flange receptacle only)

**How to unplug:**



**Locking Shape:**

Push-up the self-closing cap before removing the USBKey,  
Plug or IP67 protective cap from the receptacle



# USB-B Field

Plastic shell - Overmolded cordset plug



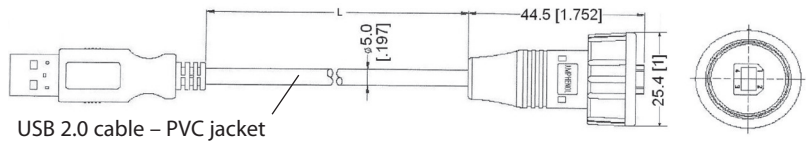
## IP68 SEALED USB-B CONNECTION SYSTEM

- Plastic shells
- Thread coupling
- Overmolded plug cordset: male sealed USB-B plug to standard USB-A plug
- Available cordset lengths: 1m and 2m - For other lengths please contact us
- Rear mount jam nut receptacle with 50mm flying lead + 5-way connector back termination. Panel gasket included.
- Temperature range: -20°C +80°C

### Applications

- Embedded computers
- Data transfer
- Numerical control machine

## Overmolded plug cordset : male sealed USB-B plug, standard USB-A plug.

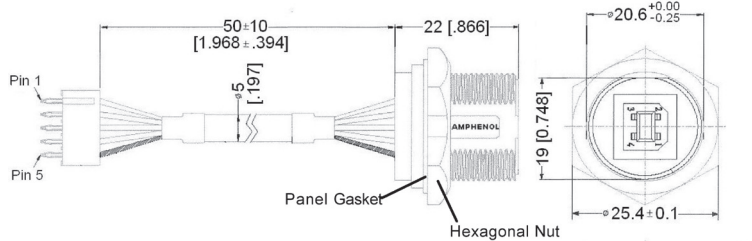


Part number	Length
USBBF6100	1000±50mm [39.37±1.97]
USBBF6200	2000±50mm [78.74±1.97]

## Receptacle - Female USB-B

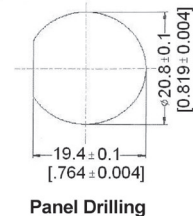


Part number :  
USBBF7



### JWT CONNECTOR - PITCH 2.5MM

- JWT 1 = USB1 = RED (AWG 24)
- JWT 2 = USB2 = WHITE (AWG 28)
- JWT 3 = USB3 = GREEN (AWG 28)
- JWT 4 = USB4 = BLACK (AWG 24)
- JWT 5 = USB Shield



## Receptacle cap



Part number:  
USBBFC7




# Rugged USB Solutions



## Rugged electronics

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# Reinforced USB3FTV Memory Keys

Derived from MIL-DTL-38999 series III specification • Capacities 16, 32 & 64 GB



We provide reinforced USB memory keys available in different capacities. They can be used ONLY with our Amphenol Socapex USBFTV or USB3FTV series receptacles. When mated on the receptacle, the system is IP68 and allows data transmission in harsh environments.

### Environmental protection

- Sealing: IP68 (when mated)
- Salt spray: 48 h with nickel plating (ROHS)  
> 500 h with olive drab cadmium
- Vibrations: MIL-STD-810G method 514.5 fig 514.5.C cat 14
- Temperature range: - 40°C / +85°C (MIL-STD-810F)
- Data transmission during vibration & temperature tests

### Other features

- Type: USB3.0 (capacities 16, 32,64 & 128 GB)
- Voltage: 5V DC - 500 mA max

### IMPORTANT NOTE

USBFTV memory key to be used with USBFTV receptacles (3.0 and 2.0)  
▶ see page 86 for 3.0 & page 97 for 2.0

NEW

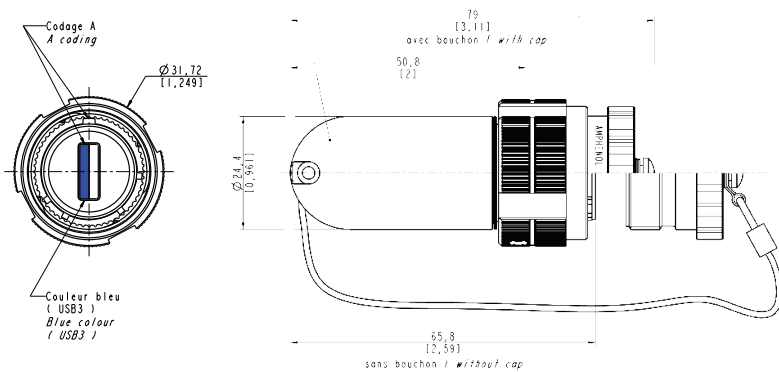
### Specific features

- Engineering control (Product Change Notice & End of life Policy)
- Memory type: MLC (3000 read/write cycles)
- Wear Leveling function\*
- MTBF: 1,000,000 hours

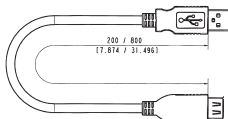
Interface	Super-speed USB3.0 compliant; backward compatible with USB2.0 and USB1.1			
Speed performance**	Read (MB/s)	16GB 200	32GB 205	64GB 200
	Write (MB/s)	47	85	80

Power consumption\*\*: Active: 265 mA / Idle: 70mA

\*\* Results may vary from flash configurations or host system settings.



Memory size for 16, 32 & 64 GB capacities



A male/Femelle USB cordset is included with each memory key

**\*Wear-Leveling:** Flash memory can be erased a limited number of times. In a typical application, and especially if a file system is used, specific pages are constantly updated (e.g., the page that contains the FAT, registry, etc.). Without any special handling, these pages would wear out more rapidly than other pages, reducing the lifetime of the entire flash. To overcome this inherent deficiency, USB-Disk Module (UDM) uses wear-leveling algorithm. This wear-leveling algorithm ensures that consecutive writes of a specific sector are not written physically to the same page in the flash. This distributes flash media usage evenly across all pages, thereby maximizing flash lifetime. The wear-leveling mechanism provides write/erase cycles for reliable data storage over an extended period.

### Definition of part number

USB3FTV KEY 6	A	64	N	CAP	APA
For USB3.0 version	Coding position: <b>A:</b> coding A <b>B:</b> coding B	Capacity for <u>USB3FTV KEY:</u> 16 / 32 / 64 / 128	Plating <b>N:</b> nickel <b>G:</b> olive drab cadmium <b>ZN:</b> Black Zinc Nickel	<b>CAP:</b> with cap <b>Blank:</b> without cap	
<b>Nota:</b> USB3.0 is compatible with USB2.0	<b>⚠ Coding position must be the same than the receptacle</b>	<b>Nota:</b> other capacity, please consult us at <a href="mailto:contact@usbfield.com">contact@usbfield.com</a>	<b>Nota:</b> please check the plating of your USBFTV receptacle.		

**Example:** - USB3.0 version, coding B, capacity of 64GB, olive drab cadmium plating, with cap: p/n is **USB3FTVKEY6 B 64 G CAP APA**



