

# Amphenol



RJ Field



RJF TV



Self Closing Cap  
(RJ 45/USB/IEEE 1394)



RJF RB (RJ Fast)



RJF 544



RJF EZ



USB-A Field



Rugged USB memory  
key



FW Field (IEEE 1394)



RJ11 Field



MTRJ Field - LC Field



RJ Switch

## FIELD Series - catalog

Reinforced Infocom Connectors for Harsh Environment  
RJ45 Field - RJ11 Field - RJ Switch - USB Field - FireWire Field - LC Field - MTRJ field



Electronica 2004  
**Amphenol**  
RJF Series  
Awarded

"Component  
product of the  
year"

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## APPLICATIONS

Commercial  
Avionics and Rail  
Mass Transit



Factory  
Automation



Video  
and CCTV



Wireless  
Systems



C4ISR  
Military  
Communications

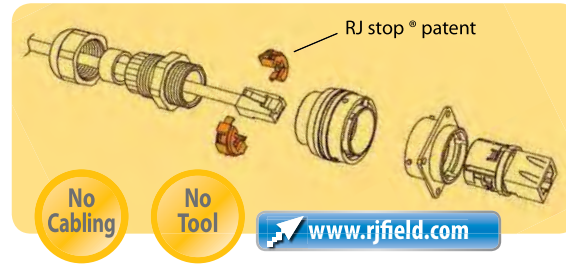


## RJFIELD CONCEPT

The Amphenol Field Series allows you to transform a standard infocom cordset into a rugged waterproof connector for harsh environments.

RJ field allows you to use Ethernet Class D / Cat. 5e connections for 10 Base T, v 100 Base TX or 1000 Base T networks in extreme environments.

### EXAMPLE FOR RJ 45 CORDSET






- A full range of versions depending upon the application
- No cabling operation nor measurement required after installation
- Sealing: IP67 (1 meter immersion for up to 30 minutes)
- Shock, vibration and traction resistant
- Inline extension
- Mechanical coding/polarization
- EMI protection



## RJFIELD SELECTION GUIDE

CONNECTORS	Series	Industrial Ethernet Specification	Coupling Mechanism	Shape	Material	Specification	Prime Market	Page
	RJF RB		Reverse Bayonet	Circular	Plastic	N/A	Industrial & Telecom	3
	RJF544	IEC 60603-7 variant 12	Push Pull	Circular	Plastic	N/A	Industrial & Telecom	6
	RJF EZ	IEC 60603-7 variant 13	Lever	Rectangular	Plastic	N/A	Industrial & Telecom	8
	RJF	IEC 60603-7 variant 11	Bayonet	Circular	Metal	MIL-C-26482	MIL/Aero & Industrial	10
	RJF TV		Thread	Circular	Metal	MIL-DTL-38999 (Series III)	MIL/Aero & Rail Mass Transit	15
	USBFTV		Thread	Circular	Metal	MIL-DTL-38999 (Series III)	Mil/Aero & Rail Mass Transit	26
	Rugged USB Key			Circular	Metal	N/A	MIL/Aero & Industrial	31
	USBBF		Thread	Circular	Plastic	N/A	Industrial & Telecom	33
	FWFTV		Thread	Circular	Metal	MIL-DTL-38999 (Series III)	Mil/Aero & Video	34
	Self Closing Cap		Bayonet (for RJ45) N/A (for USB-A and IEEE1394)	Circular	Metal	N/A	Industrial & Telecom	37
	RJ11F		Bayonet	Circular	Metal	MIL-C-26482	MIL/Aero & Industrial	38
	MTRJFTV		Thread	Circular	Metal	MIL-DTL-38999 (Series III)	Mil/Aero & Rail Mass Transit	40
	LC/LX5F		Thread	Circular	Metal	MIL-DTL-38999 (Series III)	Mil/Aero & Rail Mass Transit	42

## RJFIELD SELECTION GUIDE

ETHERNET SWITCHES	Series	Sealing	Material	Number of ports	Unmanaged	Ring	Managed	Prime Market	Page
	RJS	IP30	Metal & Plastic	5 or 9	x	x	x	Factory Automation / Video	44
	RJSPC	IP67	Plastic	5	x	x		Factory Automation	47
 <b>NEW</b>	RJSML	IP67	Metal	9	x	x	x	MIL/Aero	51

## RJFIELD SELECTION GUIDE

CABLE & CORDSET	Reels	Cordsets	Prime Market	Page
	<i>(without RJ45)</i> 100 m (around 238 ft) 300 m (around 984 ft)	<i>(with RJ45 overmolded at each end)</i> Available lengths see page 25	Mil/Aero & Rail Mass Transit	25
	Available in Cordset	Available Length see page 32	Mil/Aero / Rail Mass Transit & Industrial	32

# RJF RB

## Ethernet Connection System for Harsh Environment – Industrial Ethernet



RJF RB allows you to use an Ethernet Class D / Cat. 5e and Class E/Cat 6 connection for 10 BaseT, 100 BaseTX or 1000 BaseT networks in harsh environments.

With the patented RJStop® system you can use a standard RJ45 cordset in a protective composite plug which will protect it from shocks, dust and fluids.

**No hazardous on-field cabling and grounding!**

### MAIN CHARACTERISTICS

- Sealed against fluids and dust (IP67)
- Shock, Vibration and Traction resistant
- No cabling operation in field, no tools required
- **Reverse bayonet coupling**
- RJ45 cordset retention in the plug: 70 N in the axis
- Mating cycles: 500 min



IDC Receptacle

**NEW  
CAT6**



PCB Receptacle

**NEW  
PCB**

**ROHS COMPLIANT**

RJF RB

### Applications

- Telecom Equipments
- Video Control
- Robotics
- Industrial Process Control
- CNC Machines
- Special Machines
- Motion Control

### Environmental Protection

- Sealing: IP67
- Salt Spray > 1000 h
- Fire Retardant / Low Smoke: UL94 V0 and NFF 16102, DIN 5510-2
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Operating Temperature: - 40°C / +85°C

### Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks  
 Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801  
 Cat6 per TIA/EIA 568B and ClassE per ISO/IEC 11801

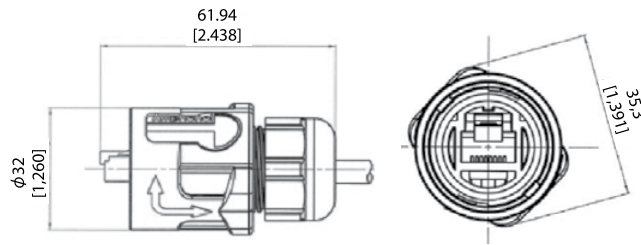
### Part Number Code

<b>Series</b> RJF RB	RJF RB	7	1RA
<b>Shell Type</b> 6: 7:	Composite reverse bayonet Plug, Plastic Gland Composite jam nut Receptacle		
<b>Back Terminations (For Receptacles only)</b>			
1:	Female RJ45		
1RA:	Right angle female RJ45		
2:	RJ45 Cordset		
3U:	IDC cat6 - unshielded		
3F:	IDC cat6 - partial shielding		
3S:	IDC cat6 - 100% shielded		
<b>Cordset Length (For Receptacles with "2" back termination only)</b>			
03:	0.3m [11.81 inches]		
05:	0.5m [19.68 inches]		
10:	1m [39.37 inches]		
15:	1.5m [59.05 inches]		
<b>Cabling Configuration (For "7" Receptacles and with type "2" back termination only)</b>			
100BTX:	(-568B)		
568A			

- Examples:
- Plug: RJF RB 6
  - Receptacle, female RJ45 Back termination: RJF RB 71
  - Receptacle, right angle female RJ45 Back termination: RJF RB 71RA
  - Receptacle, 1,5m [59.05"] RJ45 cordset termination: RJF RB 72 15 100BTX

## Plug

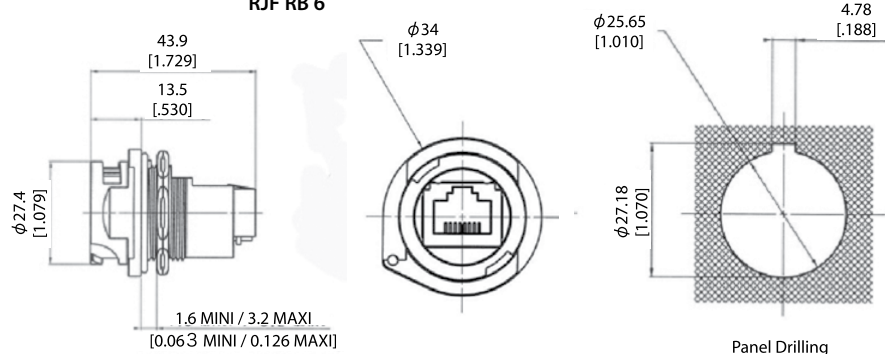
- Type 6 Shell with Plastic Gland



**RJF RB 6**

## Receptacle

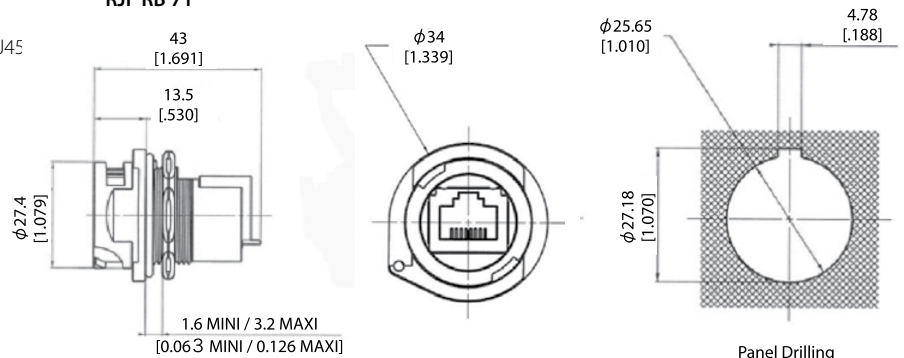
- Type 1: Female RJ45 (front mounting)



**RJF RB 71**

Panel Drilling

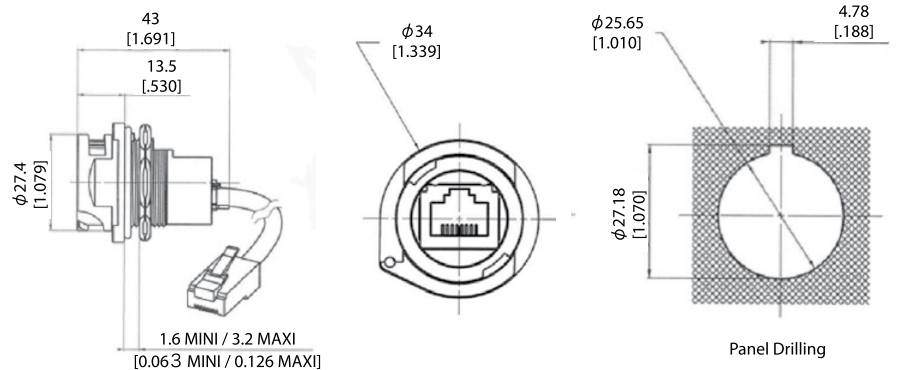
- Type 1RA: Right Angle Female RJ45 (front mounting)



**RJFRB71RA**

Panel Drilling

- Type 2: RJ45 Cordset (front mounting)



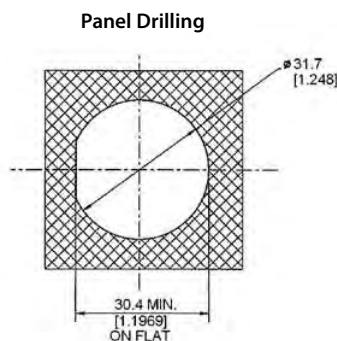
**RJFRB72XX 100BTX (XX=03, 05, 10 or 15 - see part number code page 3)**

Panel Drilling

- Type 3: IDC Cat6 termination (rear mounting)

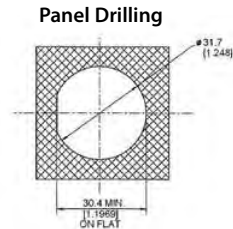
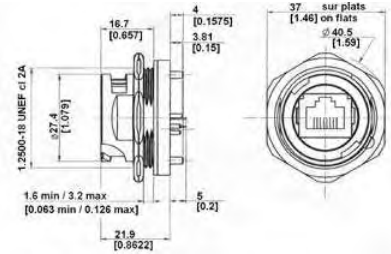


Unshielded: **RJFRB73U**  
Partial shielding **RJFRB73F**



Shielded: **RJFRB73S**

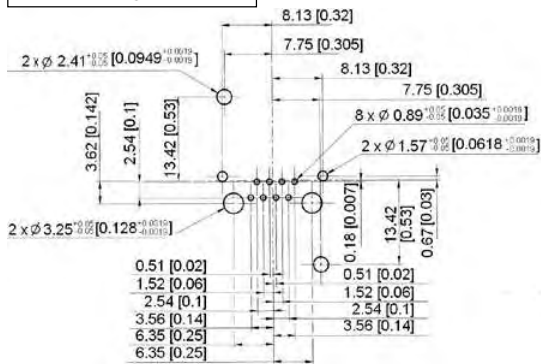
- Straight PCB termination receptacle:  
(rear mounting)



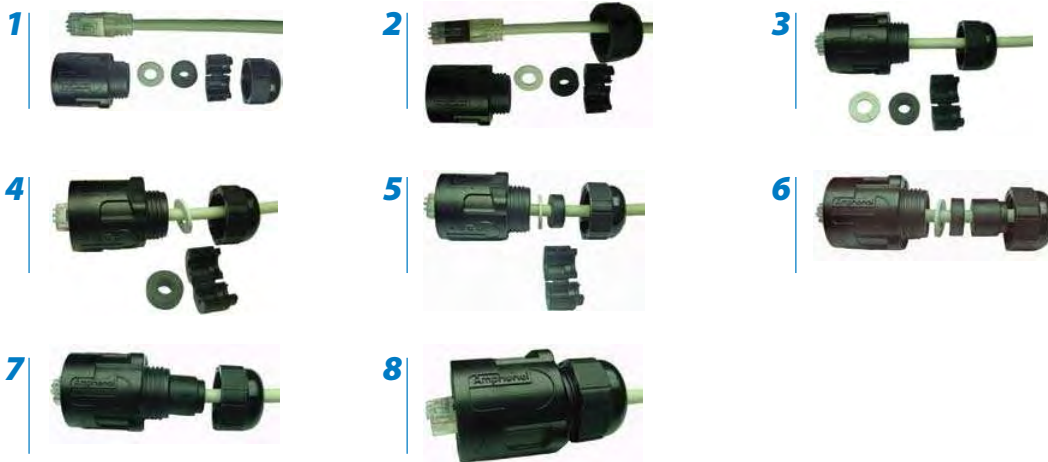
Part number: RJFRB 75

**IMPORTANT NOTE**  
The customer's PCB design will determine the receptacle category.

### PCB Drilling RJFRB

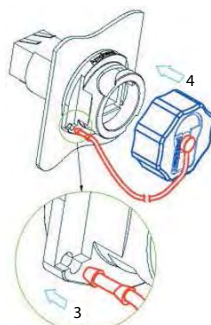


### Assembly Instructions



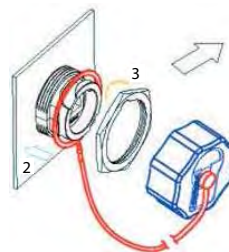
### Accessories

- IP67 Dust Caps



RJFRB C7

Cap for receptacles RJFRB71 / 71RA / 72xxx



RJFRB C75

Cap for receptacles RJFRB75 and RJFRB73x

# RJF 544

## Ethernet Connection System for Harsh Environment – Industrial Ethernet



RJF544 allows you to use an Ethernet Class D / Cat. 5e connection for 10 BaseT, 100 BaseTX or 1000 BaseT networks in harsh environments: With the patented RJStop® system you can use a standard RJ45 cordset in a protective composite plug which will protect it from shocks, dust and fluids. **No hazardous on-field cabling and grounding!**

**ROHS COMPLIANT**

RJF 544

### MAIN CHARACTERISTICS

- Compliant with IEC 60603-7 variant 12
- Shock, Vibration and Traction resistant
- No cabling operation in field and no tools required
- Sealed against fluids and dust (IP67)
- **Quick Push Pull coupling**
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min
- Improved EMI Protection

### Applications

- Telecom Equipment
- Video Control
- Robotics
- Industrial Process Control
- CNC Machines
- Special Machines
- Motion Control
- Tele-maintenance

### Environmental Protection

- Sealing: IP67
- Salt Spray > 1000 h
- Fire Retardant / Low Smoke: UL94 V0 and NFF 16102, DIN 5510-2
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 10 nano s.
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Operating Temperature: - 40°C / +85°C

### Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks  
 Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

### Part Number Code

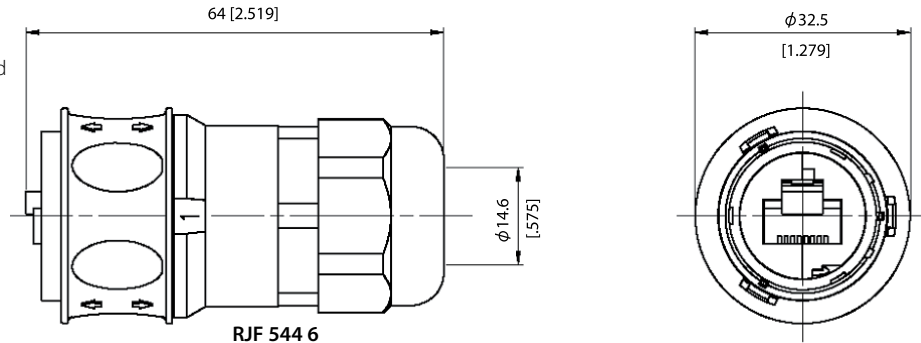
<b>Series</b> RJField 544 - Push Pull	<b>RJF 544</b>	<b>2</b>	<b>2</b>	<b>03</b>	<b>100 BTX</b>
<b>Shell Type</b>					
<b>6:</b>	Composite Push Pull Plug, Plastic Gland				
<b>2:</b>	Composite Square Flange Receptacle				
<b>2M:</b>	Metallized (Ni) Composite Square Flange Receptacle				
<b>Back Terminations (For Receptacles only)</b>					
<b>1:</b>	Female RJ45				
<b>2:</b>	RJ45 Cordset				
<b>Cordset Length (For Receptacles with "2" Back Termination only)</b>					
<b>03:</b>	0.3 meters [11.81 inches]				
<b>05:</b>	0.5 meters [19.68 inches]				
<b>10:</b>	1 meter [39.37 inches]				
<b>15:</b>	1.5 meters [59.05 inches]				
<b>00:</b>	8 tinned holes at the rear of the PCB to solder the cable				
<b>Cabling Configuration (For "2" Receptacles only)</b>					
<b>100BTX:</b>	(-568B)				
<b>568A</b>					

- Examples:
- Plug: RJF 544 6
  - Square flange receptacle, Female RJ45 Back termination: RJF 544 21
  - Metallized Square flange receptacle, Female RJ45 Back termination: RJF 544 2M 1
  - Square flange receptacle, 1,5m [59.05"] 100 BTX cordset termination: RJF 544 22 15 100BTX
  - Square flange receptacle, solder termination: RJF 544 22 00



## Plug

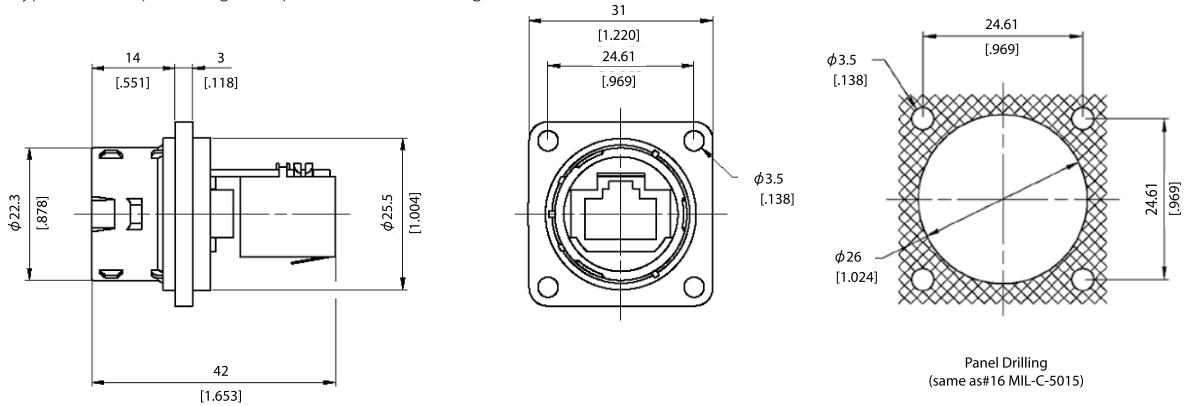
- Type 6 Shell with Plastic Gland



RJF 544 6

## Receptacle

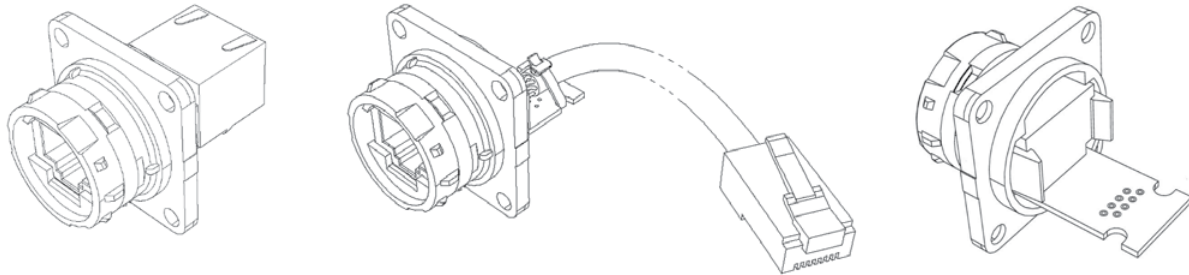
- Type 2 Shell: Square flange receptacle with 4 mounting holes



RJF 544 2

Panel Drilling  
(same as #16 MIL-C-5015)

## Back Terminations



Type 1: Female RJ45

Type 2: RJ45 Cordset

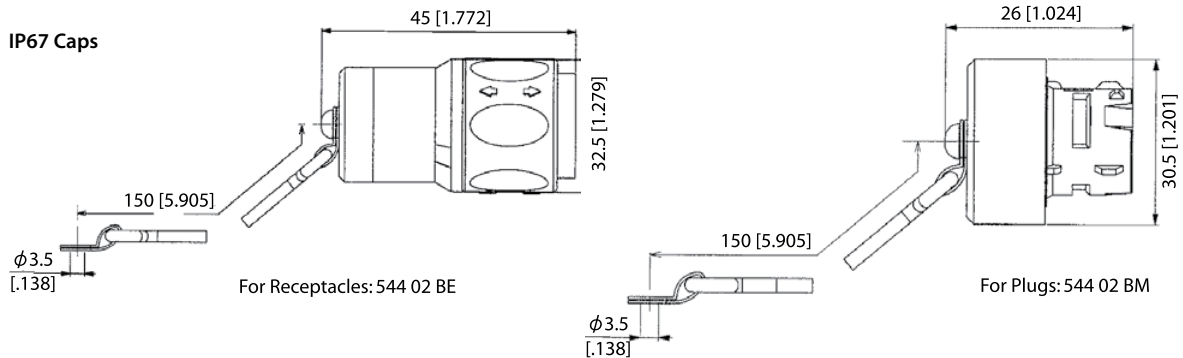
Type 2-00: Solder - 8 tinned holes

Notes: - Type 2 without RJ45 plug at the end of the cable are also available: consult factory

- Type 1 also available with 90° female RJ45

## Accessories

- IP67 Caps



For Receptacles: 544 02 BE

For Plugs: 544 02 BM

- Panel Gasket (Thickness: 1 mm [0.039]): Part No. 544 02 JE
- Plug Insert removal tool: Part No. 5440 OT 02



RJFEZ allows you to use an Ethernet Class D / Cat. 5e connection for 10 BaseT, 100 BaseTX or 1000 BaseT networks in harsh environments. With the patented RJStop® system you can use a standard RJ45 cordset in a protective composite plug which will protect it from shocks, dust and fluids. **No hazardous on-field cabling and grounding!**

### MAIN CHARACTERISTICS

- **Compliant with IEC 60603-7 variant 13**
- Sealed against fluids and dust (IP67)
- Shock, Vibration and Traction resistant
- No cabling operation in field and no tools required
- **Quick lever coupling**
- RJ45 cordset retention in the plug: 70 N in the axis
- Mating cycles: 500 min

### Applications

- Telecom Equipment
- CNC Machines
- Video Control
- Special Machines
- Robotics
- Motion Control
- Industrial Process Control
- Tele-maintenance

### Environmental Protection

- Sealing: IP67
- Salt Spray > 1000 h
- Fire Retardant / Low Smoke: UL94 V0 and NFF 16102, DIN 5510-2
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Operating Temperature: - 40°C / +85°C

### Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks  
 Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

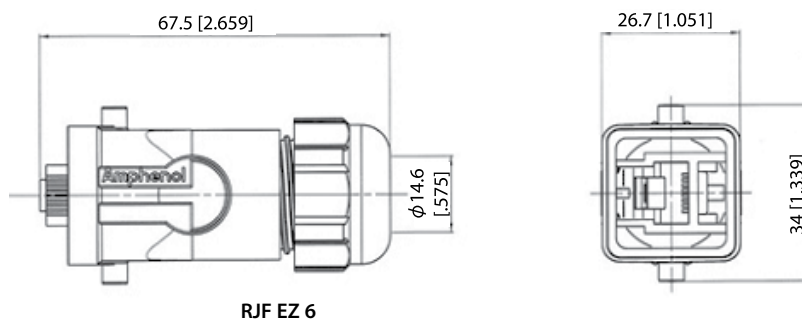


### Part Number Code

<b>Series</b> RJField EZ - Lever	RJF EZ	2	2	03	100 BTX
<b>Shell Type</b>					
6:	Composite Lever Plug, Plastic Gland				
2:	Composite Square Flange Receptacle				
<b>Back Terminations (For Receptacles only)</b>					
1:	Female RJ45				
2:	RJ45 Cordset				
<b>Cordset Length (For Receptacles with "2" Back Termination only)</b>					
03:	0.3m [11.81 inches]				
05:	0.5m [19.68 inches]				
10:	1m [39.37 inches]				
15:	1.5m [59.05 inches]				
<b>Cabling Configuration (For "2" Receptacles only)</b>					
100BTX:	(=568B)				
568A					

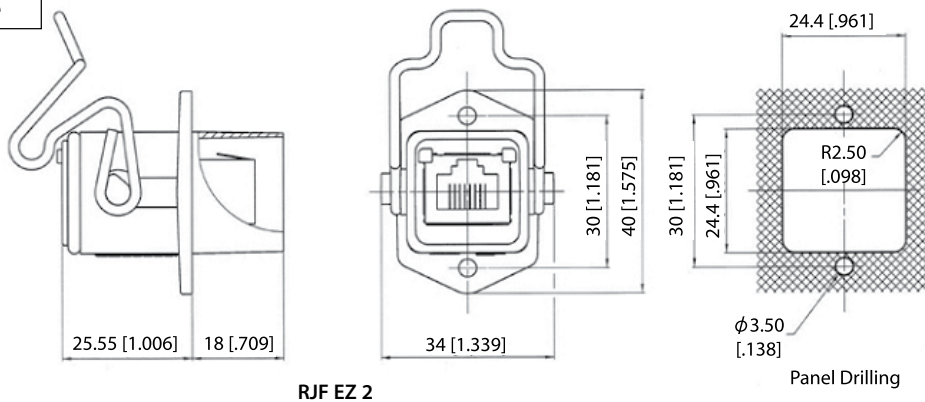
- Examples:
- Plug: RJF EZ 6
  - Receptacle, Female RJ45 Back termination: RJF EZ 21
  - Receptacle, 1,5m [59.05"] 100 BTX cordset termination: RJF EZ 22 15 100BTX

**Plug**



RJF EZ 6

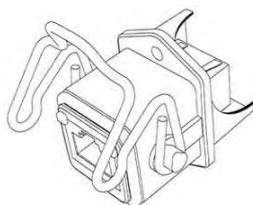
**Receptacle**



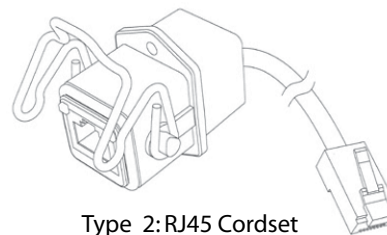
RJF EZ 2

Panel Drilling

**Back Terminations**



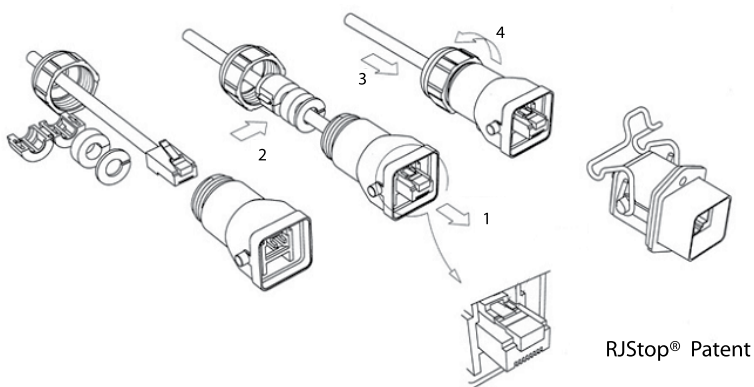
Type 1: Female RJ45



Type 2: RJ45 Cordset

Notes: Type 2 without RJ45 plug at the end of the cable are also available: consult factory

**Assembly Instructions**



RJStop® Patent

**Accessories**

- IP67 Dust Caps  
For Plugs: **Not available**  
For Receptacles: **RJF EZ BE**



- Panel Gasket  
Thickness: 1 mm [0.039]  
Part No. RJF EZ JE





RJF allows you to use an Ethernet Class D / Cat. 5e connection for 10 BaseT, 100 BaseTX or 1000 BaseT networks in harsh environments:  
 With the patented RJStop® system you can use a standard RJ45 cordset in a metallic plug which will protect it from shocks, dust and fluids.  
**No hazardous on-field cabling and grounding!**

### ROHS COMPLIANT

"N": nickel plating  
 "B": black coating

### MAIN CHARACTERISTICS

- Compliant with IEC 60603-7 variant 11
- Bayonet coupling ("Audible & Visual" coupling signal)
- Robust metallic shells based on MIL-C-26482
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min
- Sealed against fluids and dust (IP67)
- Shock, Vibration and Traction resistant
- No cabling operation in field and no tools required
- Mechanical Coding / Polarization (4 positions)

### Applications

- Robotics
- Industrial Process Control
- CNC Machines
- Special Machines
- Oil & Gas
- Motion Control
- Data Acquisition and Transmission in Harsh Environment
- Tele-maintenance

### Environmental Protection

- Sealing: IP67
- Salt Spray: 48 h with Nickel plating  
> 96 h with black coating  
> 500 h with Oliv 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 > 10 nano 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
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Temperature Range: - 40°C / +85°C

### Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks  
 Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

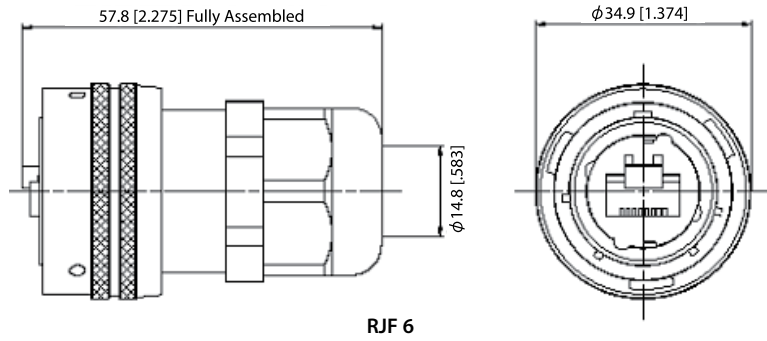
### Part Number Code

Series RJField	RJF	2	2	B	03	100 BTX
<b>Shell Type</b>						
6:	Plug, Plastic Gland					
6M:	Plug, Metal Gland					
2:	Square Flange Receptacle					
2PE:	IP67 In line square flange Receptacle					
2PEM:	IP67 In line square flange Receptacle, Metal Gland					
7:	Jam Nut Receptacle					
7PE:	IP67 In line Jam Nut Receptacle					
7PEM:	IP67 In line Jam Nut Receptacle, Metal Gland					
<b>Back Terminations (For Receptacles only)</b>						
1:	Female RJ45					
2:	RJ45 Cordset					
<b>Shell Finishes</b>						
B:	Black Coating - ROHS compliant					
N:	Nickel (Note: with this version, the inserts are metallized) - ROHS compliant					
G:	Olive Drab Cadmium (Note: with this version, the inserts are metallized)					
<b>Cordset Length (For Receptacles with "2" Back Termination only)</b>						
03:	0.3m [11.81 inches]					
05:	0.5m [19.68 inches]					
10:	1m [39.37 inches]					
15:	1.5m [59.05 inches]					
00:	8 tinned holes at the rear of the PCB to solder the cable					
<b>Cabling Configuration (For "2" Receptacles only)</b>						
100BTX:	(=568B)					
568A						

- Examples:
- Nickel plug: RJF 6 N
  - Black square flange receptacle, female RJ45 back termination: RJF 2 1 B
  - Olive drab cadmium jam nut receptacle, 1.5m [59.05"] 100 BTX cordset termination: RJF 7 2 G 15 100BTX
  - Black in line square flange receptacle, 30cm [11.81"] 100BTX cordset termination: RJF 2PE 2 B 03 100BTX
  - Nickel jam nut receptacle, solder termination: RJF 72 N 00

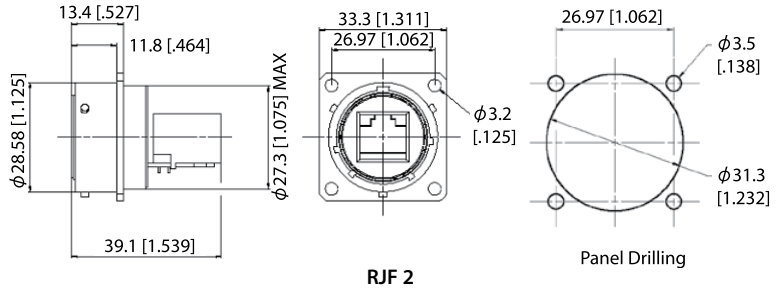
**Plug:**

- Shell type 6 With Plastic or Metal Gland

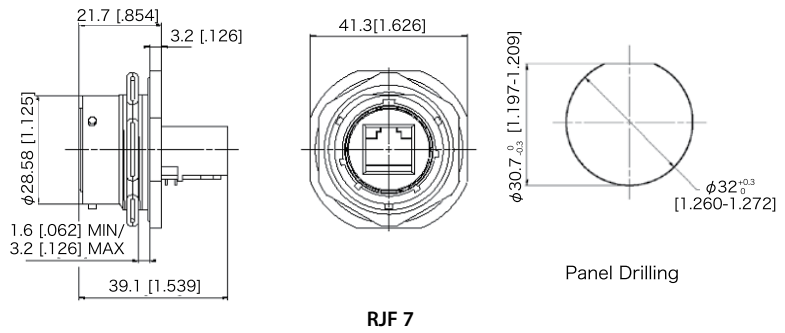


**Receptacles:**

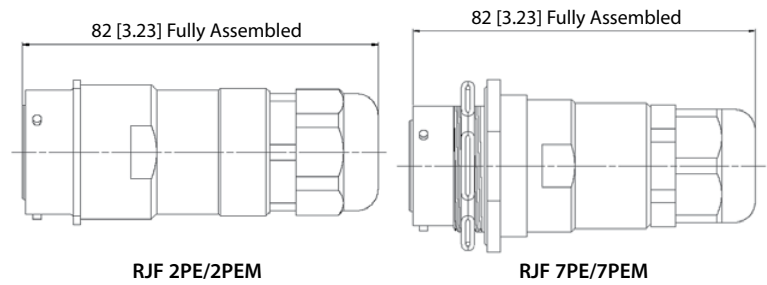
- Square flange receptacle  
4 mounting holes: Shell type 2



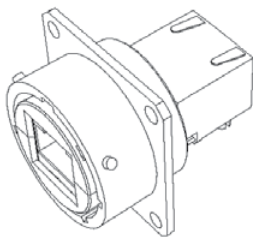
- Jam nut receptacle  
Hexagonal Nut mounting;  
Shell type 7



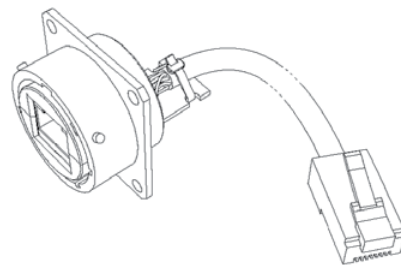
- IP67 In line receptacles:  
Shell type 2PE and 7PE with Plastic or Metal Gland



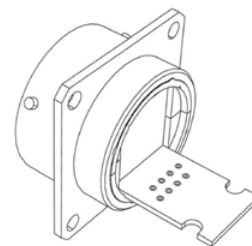
**Back Terminations:**



Type 1: Female RJ45



Type 2: RJ45 Cordset



Type 2 - 00: Solder - 8 tinned holes

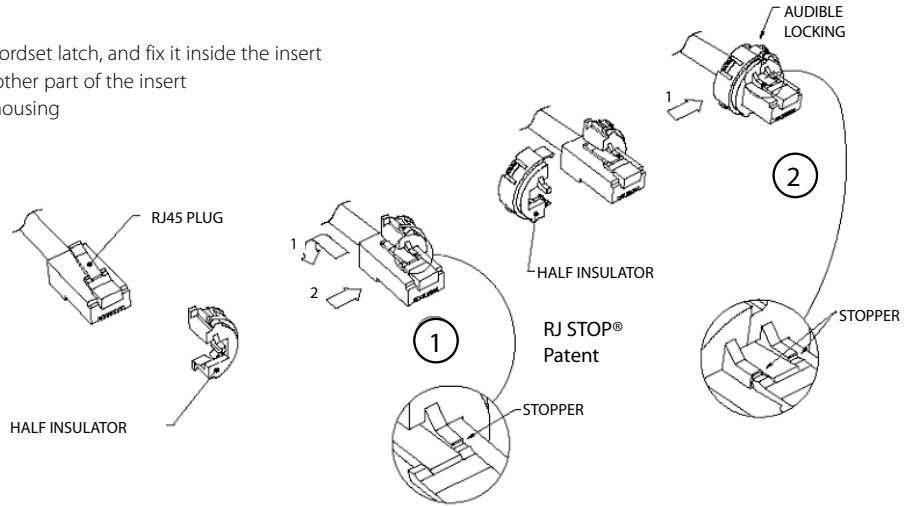
**Notes:** • Type 2 without RJ45 plug at the end of the cable are also available: consult factory

• Type 1 also available with 90° female RJ45

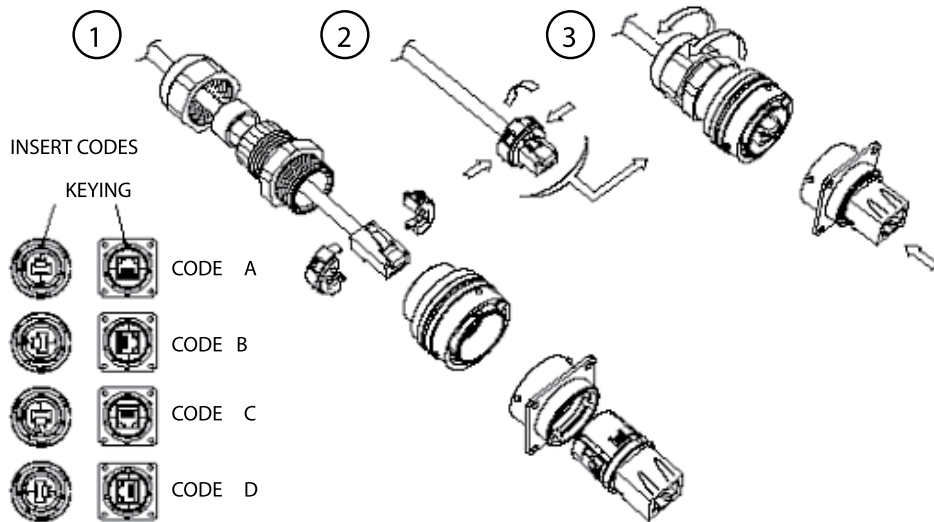
Universal: Can be used with all standard \* RJ45 Cat.5e cordset brands

**Assembly instructions**

1. Push down the RJ45 cordset latch, and fix it inside the insert
2. Press in and click the other part of the insert
3. Insert in the metallic housing



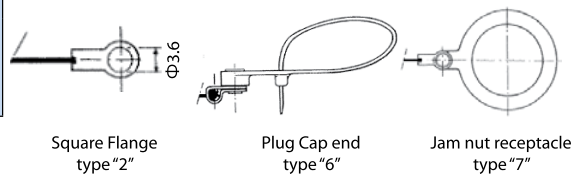
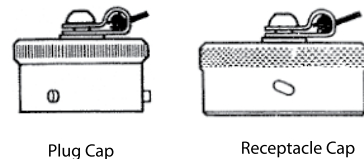
Easy and Safe: No field cabling tools required



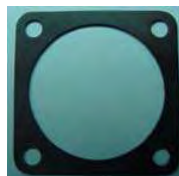
**Accessories:**

■ **Metallic cap**

	RJFC	2	B
<b>Connector Type</b>			
6:	Plug		
2:	Square Flange Receptacle		
7:	Jam Nut Receptacle		
<b>Finishes</b>			
B:	Black Coating - ROHS compliant		
N:	Nickel - ROHS compliant		
G:	Olive Drab Cadmium		



■ **Panel gasket for square flange « 2 » thickness: 0,6 mm – P/N: JE 18**



■ **Insert removal tool for receptacle and plug P/N = RJF ODE**



# RJF

## Special receptacles: Right angle, cable mount inline & PC tails

### Right Angle Receptacles

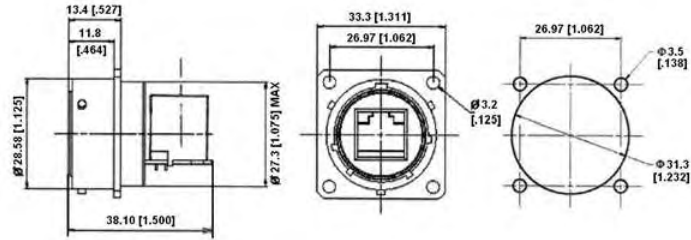


**ROHS COMPLIANT**

"N": nickel plating  
"B": black coating

Some applications have minimal space inside the system. The right angle receptacles meet this need while keeping the advantage of connecting a standard RJ45 cordset at the back.

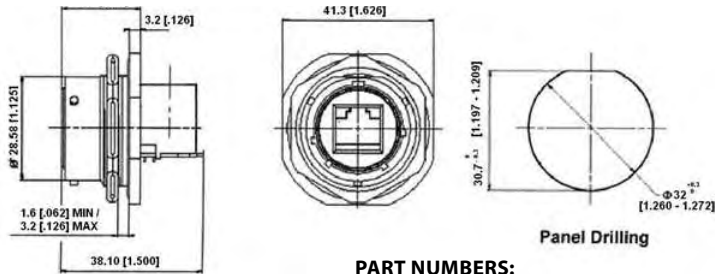
#### Square Flange Receptacle - 4 mounting holes - Right Angle - 4 clocking positions:



#### PART NUMBERS:

Black coating: **RJF21RAB**  
 Nickel plating: **RJF21RAN**  
 Olive Drab Cadmium plating: **RJF21RAG**

#### Jam Nut Receptacle - Hexagonal nut mounting - Right Angle - 4 clocking positions:



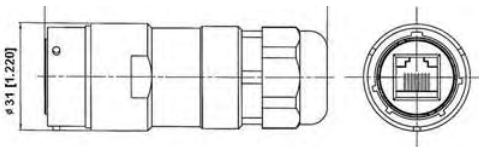
#### PART NUMBERS:

Black coating: **RJF71RAB**  
 Nickel plating: **RJF71RAN**  
 Olive Drab Cadmium plating: **RJF71RAG**

### Inline Cable Mount Receptacles



Inline receptacles allow you to make cable extensions in the field by using them with rugged RJFied series plugs.



#### PART NUMBERS:

##### Plastic Gland

Black coating: **RJF2PEWF1B**  
 Nickel plating: **RJF2PEWF1N**  
 Olive Drab Cadmium plating: **RJF2PEWF1G**

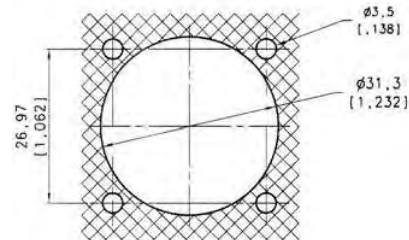
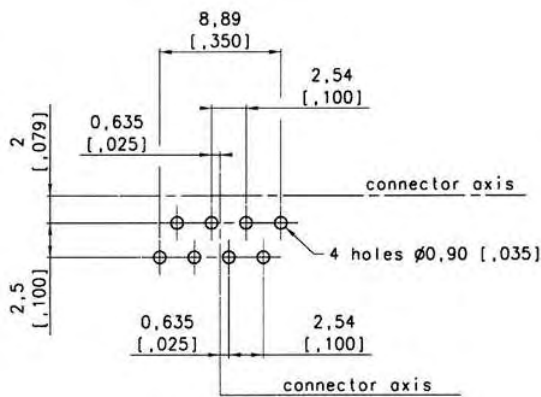
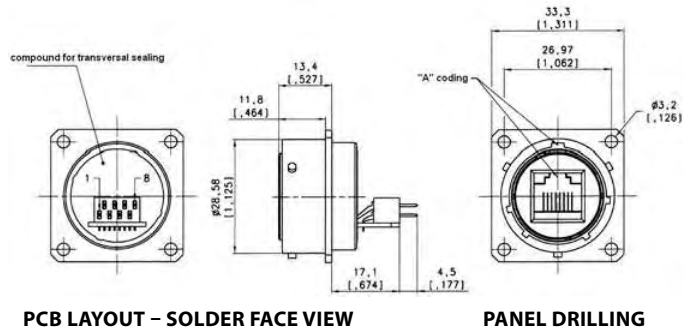
##### Metallic Gland

Black coating: **RJF2PEWFM1B**  
 Nickel plating: **RJF2PEWFM1N**  
 Olive Drab Cadmium plating: **RJF2PEWFM1G**

## PCB Tails Receptacles



These receptacles can be soldered directly on your PCB. A compound insures a transversal sealing and good performance in high vibration environments. They can be connected with rugged RJField series plugs.



### PART NUMBERS:

Note:

1. Platings available:

"B": black coating

"N": nickel plating

"B": olive drab cadmium plating

2. As these receptacles are compounded, coding position has to be chosen before ordering

### Examples:

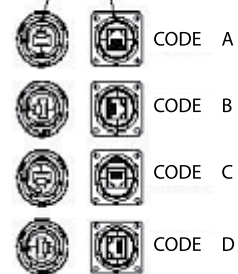
Square flange receptacle – black coating – coding A: **RJF2SA5B**

Square flange receptacle – nickel plating – coding C: **RJF2SC5N**

Square flange receptacle – olive drab cadmium plating – coding D: **RJF2SD5G**

### Insert Codes

#### Keying



## Environmentally 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 as shown on the picture. For more information, please consult datasheet RJF-RJFTV Environmentally Sealed Receptacles, page 23.

**ROHS COMPLIANT**

"N": nickel plating

"B": black coating





### ROHS COMPLIANT

"N": nickel plating  
"BZ": marine bronze

#### Applications

- Data Acquisition and Transmission in harsh environment
- Railways
- Radars
- Shelters
- Battlefield Communication
- Systems
- Navy

#### Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks  
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

#### Part Number Code

<b>Series</b> RJ Field TV	<b>RJF TV</b>	<b>2</b>	<b>2</b>	<b>G</b>	<b>03</b>	<b>100 BTX</b>
<b>Shell Type</b>						
<b>6:</b>	Plug with Plastic gland					
<b>6M:</b>	Plug with Metal gland					
<b>2:</b>	Square Flange Receptacle					
<b>2PE:</b>	Square Flange Rec. with IP67 backshell					
<b>2PEM:</b>	Square Flange Rec, IP67 back, metal gland					
<b>7:</b>	Jam Nut Receptacle					
<b>7PE:</b>	Jam Nut Rec. With IP67 backshell					
<b>7PEM:</b>	Jam Nut Rec., IP67 back, metal gland					
<b>2SA, 7SA:</b>	Compounded versions: see page 23					
<b>Back Terminations (Receptacles only)</b>						
<b>1:</b>	Female RJ45					
<b>2:</b>	RJ45 Cordset					
<b>Shells material &amp; Finish</b>						
<b>N:</b>	Aluminium shell - nickel plating (receptacle inserts are metallized) - ROHS compliant					
<b>G:</b>	Aluminium shell - olive drab cadmium plating (receptacle inserts are metallized)					
<b>BZ:</b>	Marine bronze shell (receptacle inserts are metallized) - ROHS compliant					
<b>Cordset Length (type 2 back termination only)</b>						
<b>03:</b>	0.3m [11.81 inches]					
<b>05:</b>	0.5m 19.68 inches]					
<b>10:</b>	1m [39.37 inches]					
<b>15:</b>	1.5m [59.05 inches]					
<b>00:</b>	8 tinned holes at the rear of the PCB to solder the cable					
<b>Cabling Configuration (for Type "2" receptacles only)</b>						
<b>100BTX:</b>	(=568B)					
<b>568A</b>						

- Examples:
- Olive Drab Cadmium plug with plastic gland: RJF TV 6G
  - Olive Drab Cadmium Jam Nut Receptacle, female RJ45 back termination: RJF TV 71G
  - Nickel Jam Nut Receptacle, 1,5 m 100 BTX cordset back termination: RJF TV 72N 15 100BTX
  - Olive Drab Cadmium in line Square Flange Recept., 0,3 m 100 BTX cordset back termination: RJF TV 2PE 2 G 03 100BTX
  - Nickel Jam Nut Receptacle Solder termination 8 tinned holes: RJF TV 22 N 00

RJF TV allows you to use an Ethernet Class D / Cat. 5e connection for 10 BaseT, 100 BaseTx or 1000 BaseT networks in harsh environments. With the patented RJStop system you can use a standard RJ45 cordset in a metallic plug which will protect it from shocks, dust and fluids.  
**No hazardous on-field cabling and grounding!**

#### MAIN CHARACTERISTICS

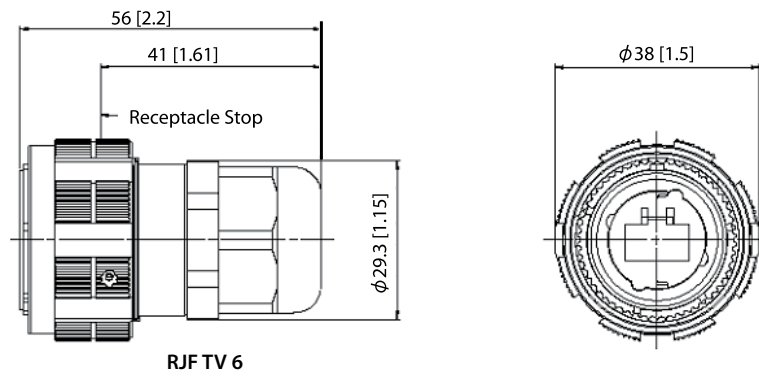
- Sealed against fluids and dusts (IP67)
- Shock, Vibration and Traction resistant
- No cabling operation in field and no tools required
- Mechanical Coding / Polarization (4 positions)
- Improved EMI protection
- **Tri Start Thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device**
- **Robust metallic shells**
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min

#### Environmental Protection

- Sealing: IP67
- Salt Spray: 48 h with Aluminium shell - Nickel plating  
> 500 h with Aluminium shell - Olive Drab Cadmium plating  
1000h 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 > 10 nano s.
- Compounded versions tested per NAS 1599 (5-3000 Hz, 20g, 12h)
- Shocks: IK06: weight of 250 g drop from 40 cm [15.75 in] onto connectors (mated pair)
- Humidity: 21 days, 43°C, 98% humidity
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Temperature Range: - 40°C / +85°C

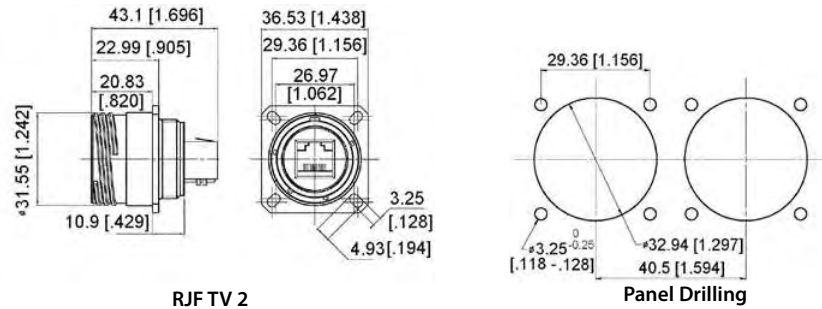
## Plug

- « 6 » Shell With plastic or metal gland

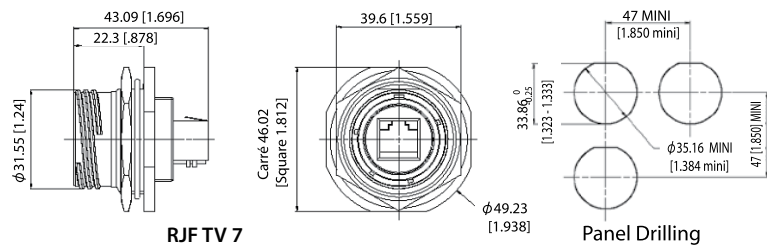


## Receptacles

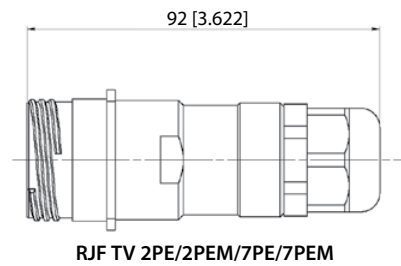
- « 2 » Shell Square Flange



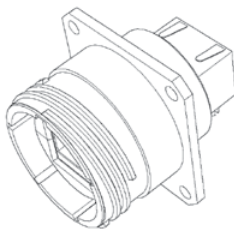
- « 7 » Shell Jam Nut



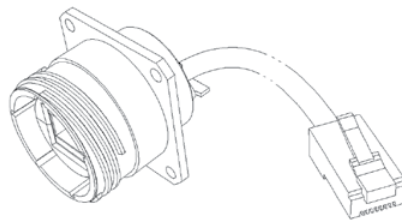
- « 2PE » and « 7PE » Shells  
IP67 In-line receptacle  
With plastic or Metal gland



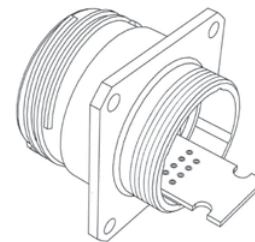
## Back Terminations



Type 1: Female RJ45



Type 2: RJ45 Cordset



Type 2 - 00: Solder - 8 tinned holes

Notes Type 2 without RJ45 plug at the end of the cable are also available: consult factory

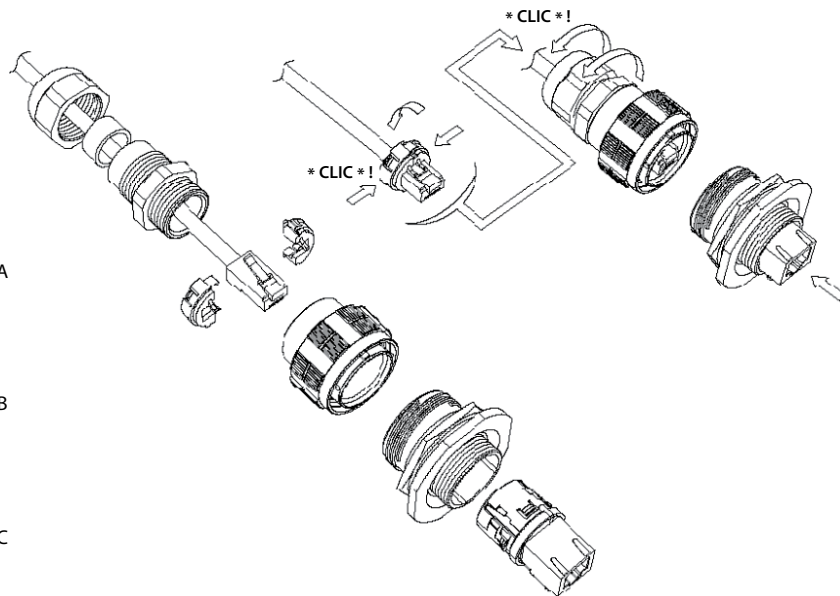
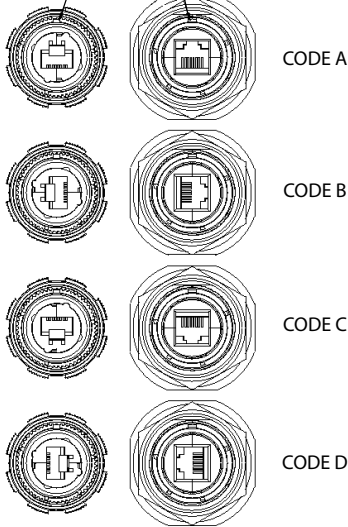
## Assembly instructions

### Insert Codings

CONNECTION SIDE VIEW

Plug      Receptacle

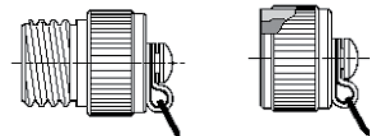
Main Key



### Accessories

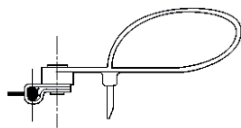
#### ■ Metallic Caps

	RJFTVC	2	G
<b>Connector Type</b>			
6: Plug			
2: Square Flange Receptacle			
7: Jam Nut Receptacle			
<b>Shell Material &amp; finish</b>			
N: Aluminium shell - nickel plating - ROHS compliant			
G: Aluminium shell - olive drab cadmium plating			
BZ: Marine bronze shell - ROHS compliant			

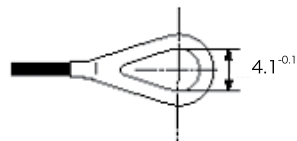


Plug Cap

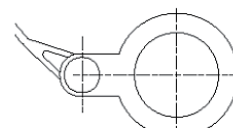
Receptacle Cap



Plug Cap end



Square flange receptacle cap end



Jam Nut receptacle cap end

- Panel Gasket for square flange receptacle  
(Thickness: 0,8 mm [.031]): JE19



- Insert removal tool: RJF ODE



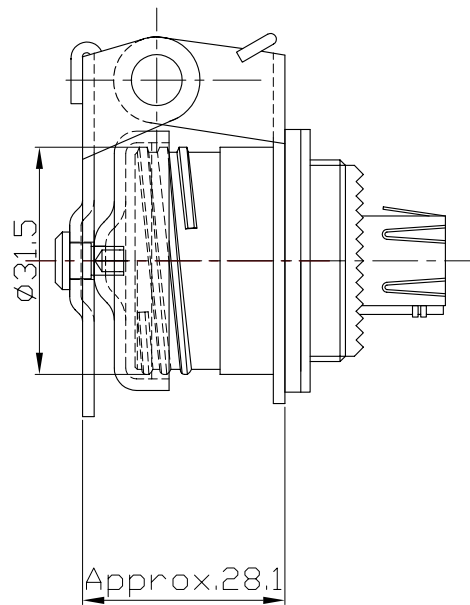
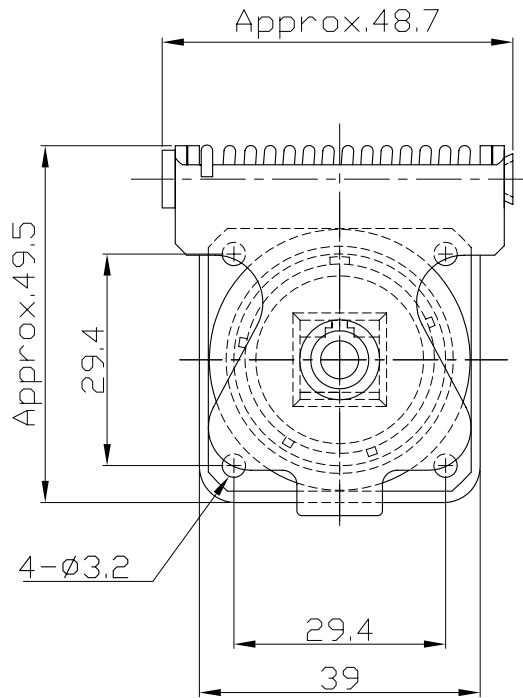
# RJF TV

## SELF CLOSING CAP (SCC SERIES)

RJFTV SCC Series

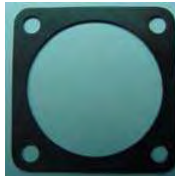


This Self Closing cap automatically protects the RJF TV square flange receptacle (MIL-DTL-3899 type), protecting your system from dust and water projection. A spring automatically closes the upper part of the cap when the RJF TV plug is removed from the receptacle.



- Panel Gasket for square flange receptacle (Thickness: 0,8 mm [.031]):

PART NUMBER: JE19



### PART NUMBER:

Self closing cap only: **RJFTVSCC**

**Remark:** Compatible only with RJFTV square flange receptacle type: RJFTV2XXX (see page 15)

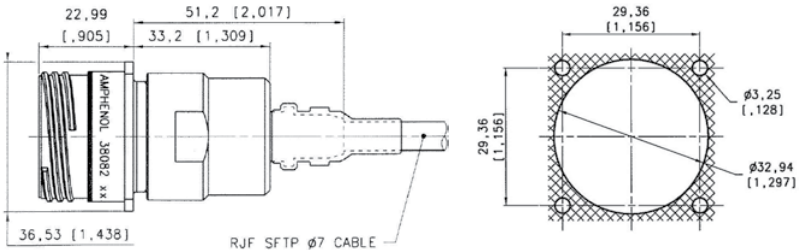
# RJFTV

## Receptacles - Plugs with 360° EMI backshells



RJFTV series receptacles and plugs with EMI backshells provide a solution with 360° shielding: same protection than the one proposed per standard MIL-DTL-38999 serie III connectors. With those solutions we recommend using our reinforced and double shielded cat5E cable, see page 24.

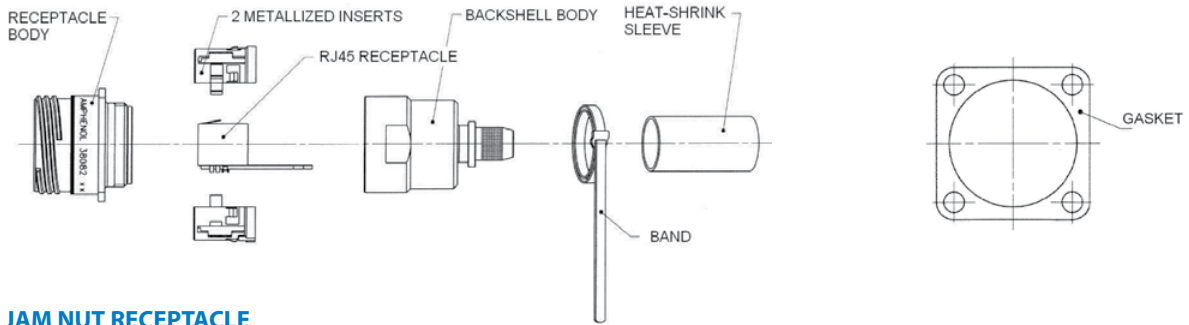
### SQUARE FLANGE RECEPTACLE



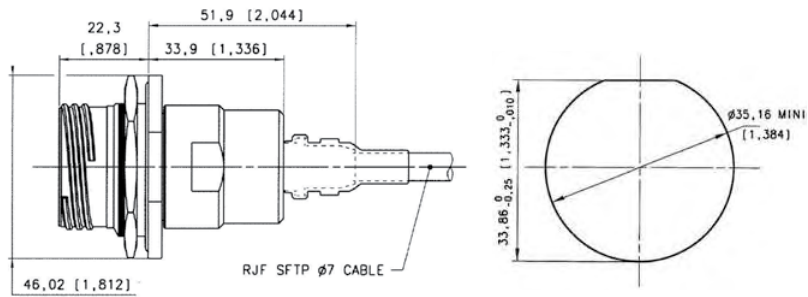
#### PART NUMBERS:

Olive Drab Cadmium Plating: **Kit38082**  
 Nickel Plating: **Kit38082NI**

Kit38082 and Kit38082NI include:



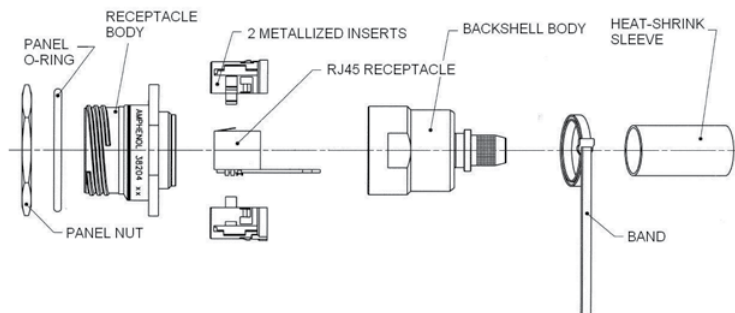
### JAM NUT RECEPTACLE



#### PART NUMBERS:

Olive Drab Cadmium Plating: **Kit38204**  
 Nickel Plating: **Kit38204NI**

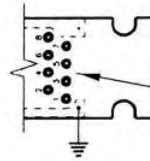
Kit38204 and Kit38204NI include:



RJFTV - 360° shielded

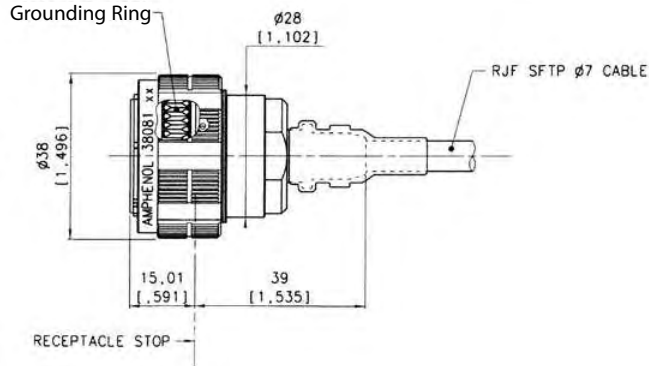
### IMPORTANT NOTE

With these receptacles, customer will have to solder his cable on the PCB. So the wire positions have to be defined per the customer according to his network.



WIRE POSITION  
TO BE DEFINED  
BY CUSTOMER  
ACCORDING TO NETWORK

### PLUGS

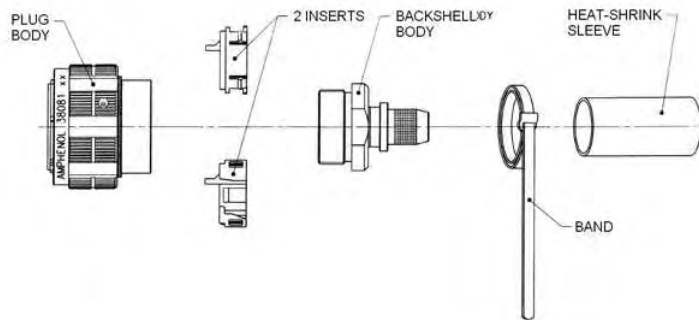


### PART NUMBERS:

Olive Drab Cadmium Plating: **Kit38081**

Nickel Plating: **Kit38081NI**

Kit38081 and Kit38081NI include:

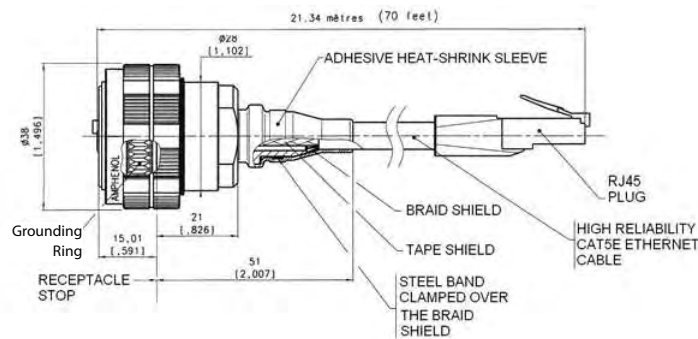


### IMPORTANT NOTE

With these plugs, the standard RJ45 plug is not provided. Customer will have to crimp a standard RJ45 on the cable by himself.

We advise using our double Shielded, reinforced Cat5E cable (see page 24) with these RJ45 series EMI connectors. If customer wants to use his own cable, please check with us regarding compatibility with our backshells: [contact@rjfield.com](mailto:contact@rjfield.com).

We also provide assembled cordsets, (see examples below). For this type of solution please provide the configuration needed: length, description of second end...



### Right Angle Receptacles

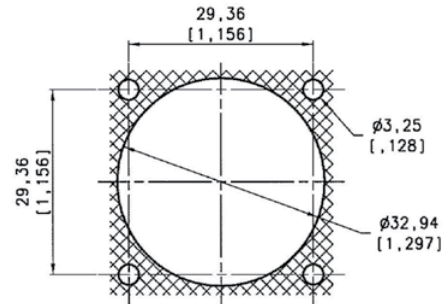
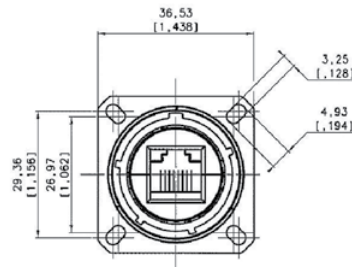
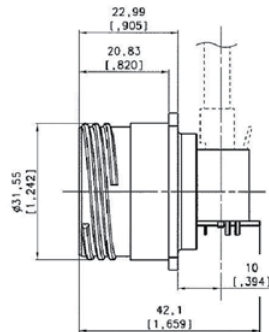


Some applications have minimal space inside the system. The right angle receptacles meet this need while keeping the advantage of connecting a standard RJ45 cordset at the back.

**ROHS COMPLIANT**

"N": nickel plating

### SQUARE FLANGE RECEPTACLE



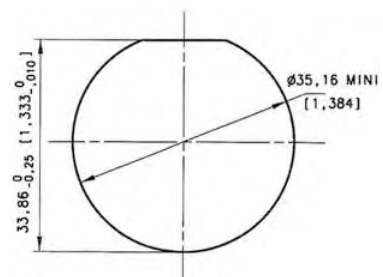
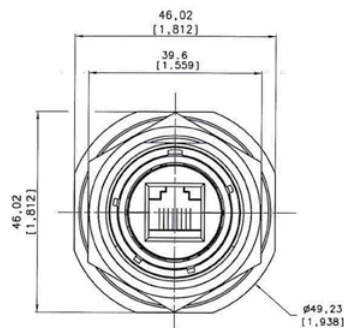
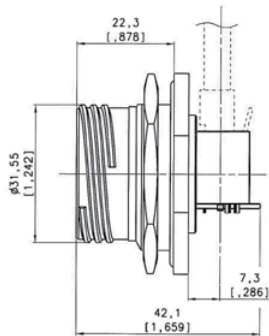
PANEL DRILLING

#### PART NUMBERS:

Nickel plating: **RJFTV21RAN**

Olive Drab Cadmium plating: **RJFTV21RAG**

### JAM NUT RECEPTACLE



PANEL DRILLING

#### PART NUMBERS:

Nickel plating: **RJFTV71RAN**

Olive Drab Cadmium plating: **RJFTV71RAG**

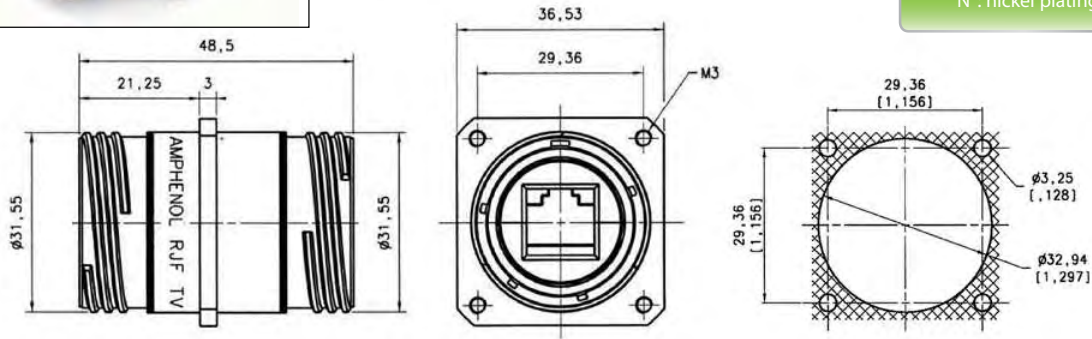
## Through Bulkhead Receptacles



Our RJFTV through bulkhead receptacles can be connected on each side with rugged RJFTV plugs. This system allows mechanical protection and a sealing (IP67) inside and outside the equipment, and keeps the flexibility offered by panel mount and plug connectors.

**ROHS COMPLIANT**

"N": nickel plating



### PART NUMBERS:

Nickel plating – Non metallized inserts: **RJFTVB2N ISO BRUT**

Nickel plating – Metallized inserts: **RJFTVB2N ISO NI**

Olive Drab Cadmium plating – Non metallized inserts: **RJFTVB2G ISO BRUT**

Olive Drab Cadmium plating – Metallized inserts: **RJFTVB2G ISO NI**

## Environmentally Sealed Receptacles



RJF TV 75A2 G 05 100BTX

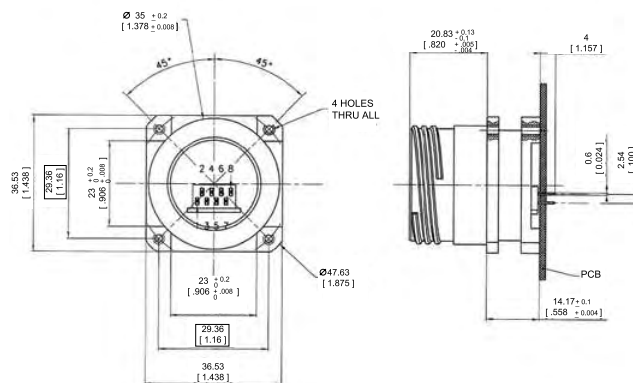
In some applications, a transversal sealing for the receptacle is a « must ». This will prevent fluids and dust from going through the receptacle when plug or cap are not mated to the receptacle. The sealed solution (version "S") has a compound at the rear of the receptacle as shown on the example. In addition, the Sealed RJF TV have been successfully tested in very high vibration corresponding to airplanes applications. For more information, please consult datasheet RJF-RJFTV Environmentally Sealed Receptacles (*see page 23*).

## PCB Tails 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 RJFTV series plugs.

### SQUARE FLANGE RECEPTACLE



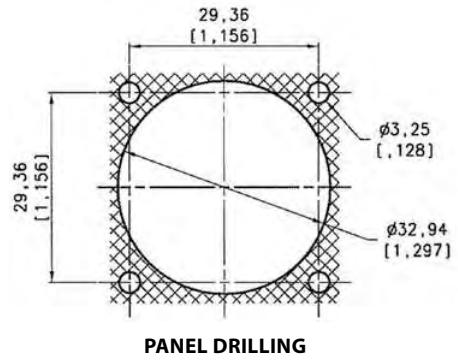
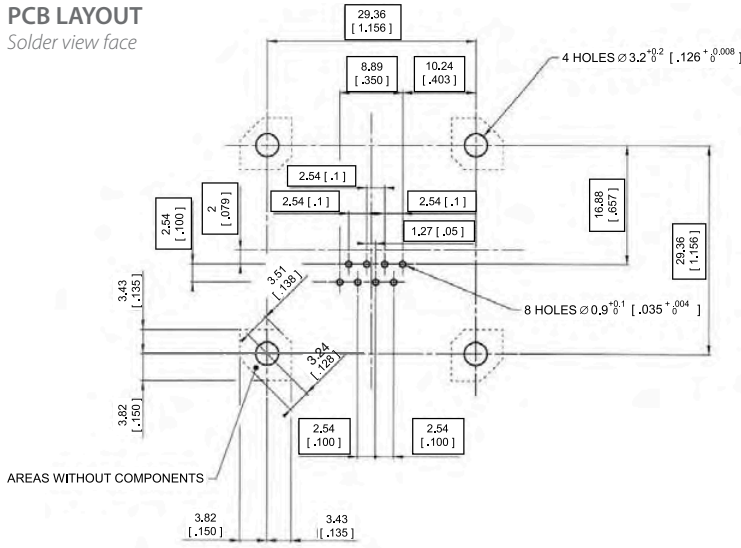
### PART NUMBERS:

Olive Drab Cadmium Plating: **RJFTV25GF459**

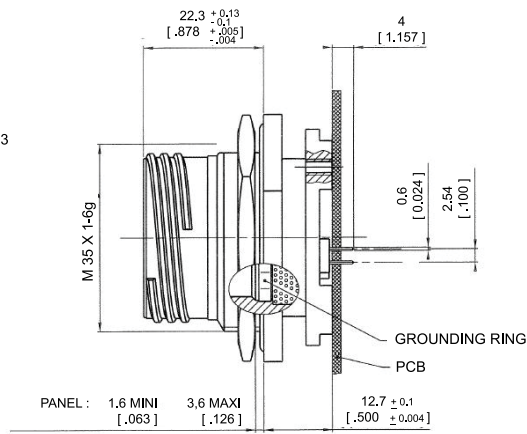
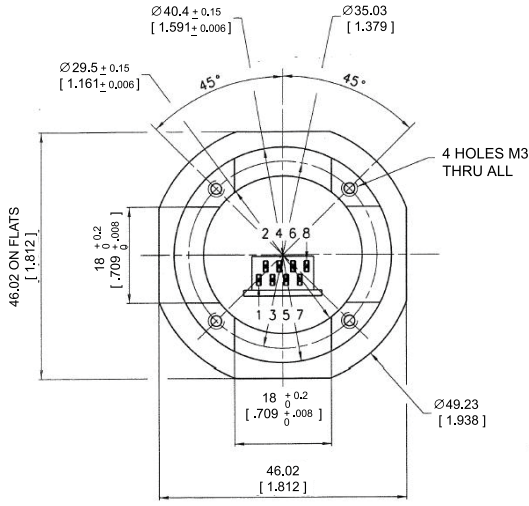
Nickel Plating: **RJFTV25NF459**



**PCB LAYOUT**  
Solder view face

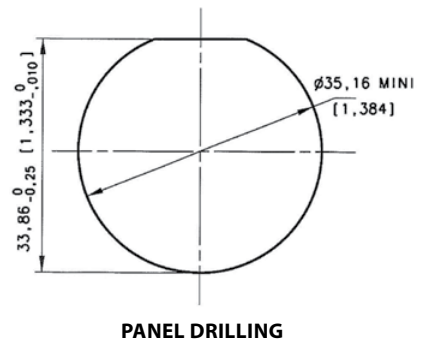
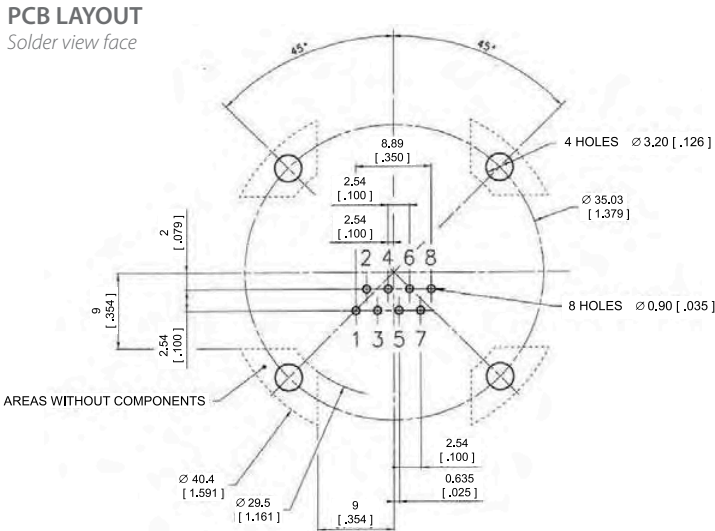


**JAM NUT RECEPTACLE**



**PART NUMBERS:**  
Olive Drab Cadmium Plating: **RJFTV75RGF459**  
Nickel Plating: **RJFTV75RNF459**

**PCB LAYOUT**  
Solder view face



# RJF/RJF TV

## Environmentally Sealed Receptacles

RJF/RJF TV



**SEALED RECEPTACLE** 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 as shown on the examples below. This feature is available both in RJF and RJF TV shells (please consult the relevant data sheet for product details and accessories). In addition, the Sealed RJF TV have been successfully tested in very high vibration corresponding to airplane applications.

### Applications

- Outdoor Equipment
- Airplanes Equipment
- Tactical Radios
- Shelters
- Rugged computers
- Data Acquisition and Transmission in Harsh Environments

### Data Transmission

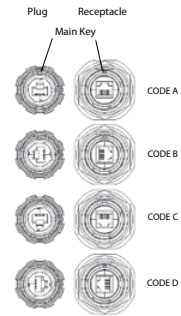
10 BaseT, 100 BaseTX and 1000 BaseT networks  
Cat 5e per TIA/EIA 568B and ClassD  
per ISO/IEC 11801

### ROHS COMPLIANT

- “N”: nickel plating
- “B”: black coating
- “BZ”: marine bronze (only for RJFTV)

### MAIN CHARACTERISTICS

- Same as the RJF and RJF TV series ... a complete IP67 sealing of the receptacle (even with no plug or no protective cap mated) is added. IP 67 means immersion during 30 minutes under 1 meter of water (watertight).
- Outside dimensions are the same as the standard RJF and RJF TV series.
- Vibrations: The compounded versions of the RJF TV have 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, B, C or D in the Part Number.



RJFTV 7S A 2G 15 100BTX

### Part Number Code

<b>Series</b>	<b>RJF TV</b>	<b>7S</b>	<b>A</b>	<b>2</b>	<b>G</b>	<b>03</b>	<b>100 BTX</b>
<b>RJF:</b>	MIL-C-26482 bayonet						
<b>RJFTV:</b>	MIL-C-38999 series III						
<b>Shell Type</b>							
<b>2S:</b>	Sealed Square Flange Receptacle						
<b>7S:</b>	Sealed Jam Nut Receptacle						
<b>Coding</b>							
<b>A,B,C,D</b>							
<b>Back Terminations (For Receptacles only)</b>							
<b>1:</b>	Female RJ45						
<b>2:</b>	RJ45 Cordset						
<b>Shell material &amp; Finish</b>							
<b>B:</b>	Aluminium shell - black coating - ROHS compliant (available for RJF Series Only)						
<b>N:</b>	Aluminium shell - nickel plating - ROHS compliant (note: receptacle inserts are metallized)						
<b>G:</b>	Aluminium shell - olive drab cadmium plating (note: receptacle inserts are metallized)						
<b>BZ:</b>	Marine bronze shell (receptacle inserts are metallized) - ROHS compliant (only available for RJFTV)						
<b>Cordset Length (For Receptacles with "2" Back Termination only)</b>							
<b>03:</b>	0.3m [11.81 inches]						
<b>05:</b>	0.5m [19.68 inches]						
<b>10:</b>	1m [39.37 inches]						
<b>15:</b>	1.5m [59.05 inches]						
<b>Cabling Configuration (For "2" Receptacles only)</b>							
<b>100BTX:</b>	(=568B)						
<b>568A</b>							

- Examples:
- Bayonet, A coding, Olive Drab Cadmium Jam Nut sealed receptacle with female RJ45 Back termination: RJF 7SA 1 G
  - Bayonet, A coding, Black square flange sealed receptacle, Female RJ45 Back termination: RJF 2SA 1 B
  - Series III, A coding, Olive Drab Cadmium Jam Nut sealed receptacle, 1.5m [59.05"] 100 BTX cordset: RJF TV 7SA 2 G15 100BTX

# CABLE CAT 5E

## High Reliability Cat 5e Ethernet Cable & Cordsets



General Construction: A 4 pair, 24 AWG, 100 Ohm SFTP round patch cable, designed to the ISO / IEC 11801 Category 5e requirements (cat 5e on 76m). The cable contains 4 twisted pairs, cabled, double shielded with kevlar reinforcement strands, jacketed in black UV resistant Polyurethane HFFR. Designed for fixed or portable applications in 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.

**ROHS COMPLIANT**

### Applications

- Robotics
- Motion Control
- Railways
- CNC Machines
- Battelfield communication
- Industrial Process Control

### PHYSICAL CHARACTERISTICS

<b>CONDUCTORS</b>	24 AWG (0,25 mm <sup>2</sup> ) tinned copper, 7x0,20 mm
<b>INSULATION</b>	Color coded 568-B, Linear Low Density Polyethylene, Nom. Dia. 0,039" (1 mm)
<b>ASSEMBLY</b>	Pairs cabled with Kevlar strength members and separation tape wrapped
<b>SHIELDS</b>	Inner: Aluminium mylar 100% coverage Outer: Tinned copper braid 80% coverage
<b>JACKET</b>	Black, special PUR compound
<b>WEIGHT</b>	40 Lbs / mft (59 KG/Km)
<b>OUTSIDE DIAM.</b>	0,28" (7.1 mm) nom.
<b>MIN BEND RADIUS (During installation)</b>	67,5mm (9x O. D.)
<b>MIN BEND RADIUS (During operation)</b>	37,5mm (5 x O.D.)
<b>MIN FLEXES TO FAILURE</b>	Passes IEC 61156-6 requirements
<b>TEMPERATURE</b>	Plus 70°C, minus 25°C

### Cordsets with a RJ45 plug overmolded on each end

Length (m/ft)	Part Number
0,76 m / 2,5 ft	RJF SFTP 5E 0076
1,52 m / 5 ft	RJF SFTP 5E 0152
3,05 m / 10 ft	RJF SFTP 5E 0305
4,57 m / 15 ft	RJF SFTP 5E 0457
6,24 m / 20,46 ft	RJF SFTP 5E 0624
7,62 m / 25 ft	RJF SFTP 5E 0762
9,37 m / 30,72 ft	RJF SFTP 5E 0937
10,00 m / 32,78 ft	RJF SFTP 5E 1000
15,25 m / 50 ft	RJF SFTP 5E 1525
22,87 m / 75 ft	RJF SFTP 5E 2287
30,5 m / 100 ft	RJF SFTP 5E 3050
45,75 m / 150 ft	RJF SFTP 5E 4575

### ELECTRICAL CHARACTERISTICS

<b>DC Resistance</b>	96 Ohms/Km @ 20° C
<b>Impedance</b>	100 +/- 15 Ohms 1-100 MHz

### Attenuation

772 KHz	2.70 db/100m nom.
1 MHz	3.15 db/100m nom.
4 MHz	6.45 db/100m nom.
10 MHz	9.90 db/100m nom.
16 MHz	12.3 db/100m nom.
20 MHz	13.8 db/100m nom.
31.25 MHz	17.7 db/100m nom.
62.5 MHz	25.6 db/100m nom.
100 MHz	33 db/100m nom.

### N.E.X.T. (Near-End Crosstalk Loss)

772 KHz	64 db min.
1 MHz	62 db min.
4 MHz	53 db min.
10 MHz	47 db min.
16 MHz	44 db min.
20 MHz	42 db min.
31.25 MHz	40 db min.
62.5 MHz	35 db min.
100 MHz	32 db min.

<b>Capacitance</b>	46pF / m nom. @ 1KHz
<b>LCL</b>	43 dB min. @ 64 KHz
<b>Capacitance Unbalance</b>	3.4 pF / m max. @ 1KHz (wire to ground)
<b>Insulation Resistance</b>	150 M Ohm min.
<b>Voltage Rating</b>	230 VMS
<b>Dielectric Strength</b>	VAC/1 min - 700 V/Min
<b>Propagation Delay (100 MHz)</b>	5.2 ns/m max. @ 100 MHz
<b>Delay Skew</b>	20 ns/100m max. @ 1-100 MHz
<b>Resistance Unbalance</b>	3% max. @ 20° C
<b>Structural Return Loss (100 MHz)</b>	23db/100m min. @ 1-20 MHz
<b>Spark test (tested during production)</b>	3 KV
<b>Velocity of propagation</b>	67% nom.

### Reel of cable (without RJ45 plug on ends)

Length (m / ft)	Part Number
100 m / ~328 ft	190-038045-00
300 m / ~984 ft	190-038045-01

Reinforced CAT 5E Cable

# USBF TV

## USB Connection System for Harsh Environment

USBF TV



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

**ROHS COMPLIANT**

"N": nickel plating  
 "BZ": marine bronze

### 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
- Mechanical Coding / Polarization (2 positions)
- 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 to 1500

### Environmental Protection

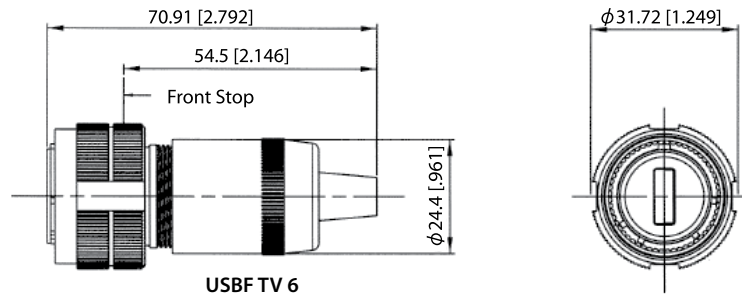
- Sealing (when mated): IP67 (Temporary immersion)
- Salt Spray: 48 h with Nickel plating  
 > 500 h with Olive Drab Cadmium  
 1000 h with marine bronze shell
- Fire Retardant / Low Smoke: UL94 V0 and NF F 16 101 & 16 102
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 1micro s
- Shocks: 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: - 55°C / +85°C

**Part Number Code**

<b>Series</b> USB Field TV	<b>USBF TV</b>	<b>2</b>	<b>1</b>	<b>G</b>
<b>Shell Type</b>				
<b>6:</b>	Plug			
<b>2:</b>	Square Flange Receptacle			
<b>2PE:</b>	Square Flange Receptacle with backshell			
<b>7:</b>	Jam Nut Receptacle			
<b>7PE:</b>	Jam Nut Receptacle with backshell			
<b>Back Terminations (Receptacles only)</b>				
<b>1:</b>	USB-A receptacle			
<b>2:</b>	Solder (4 tinned holes)			
<b>Shells Material &amp; Finish</b>				
<b>N:</b>	Aluminium shell - Nickel plating - ROHS compliant			
<b>G:</b>	Aluminium shell - Olive Drab Cadmium plating			
<b>BZ:</b>	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 termination: USBF TV 72N

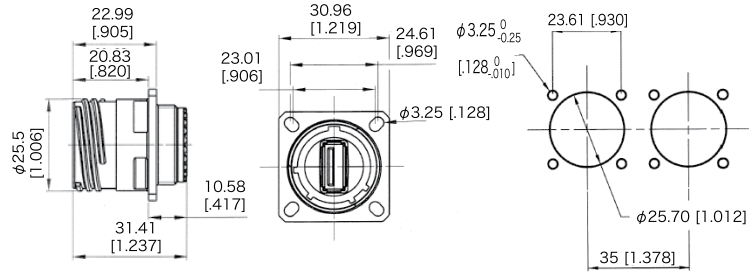
## Plug



USB TV 6

## Receptacles

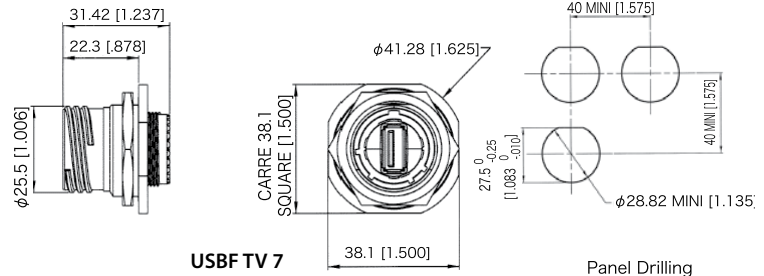
- « 2 » Shell Square Flange



USB TV 2

Panel Drilling

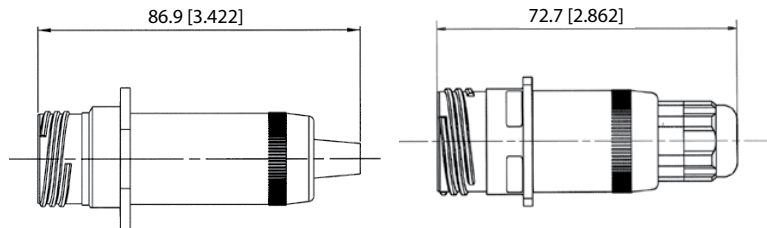
- « 7 » Shell Jam Nut



USB TV 7

Panel Drilling

- « 2PE » and « 7PE » Shells



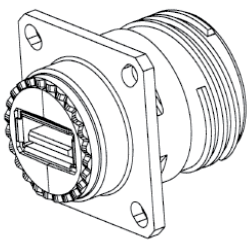
Backshell used with back termination type 1:  
USB A receptacle (Not sealed)

USB TV 2PE/7PE-1

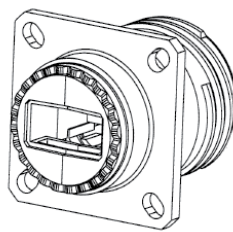
Backshell used with back termination type 2:  
Solder (Sealed - IP67)

USB TV 2PE/7PE-2

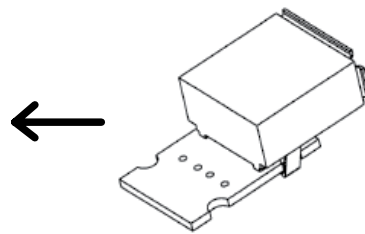
## Back Terminations



Type 1: USB-A Receptacle



Type 2: Solder  
4 Tinned holes to solder your cable



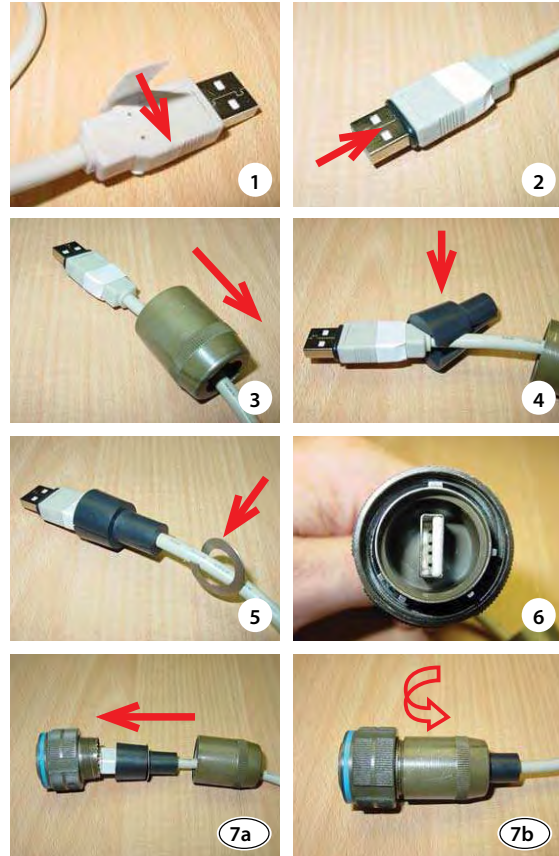
View of the PCB of the  
Type 2 version with 4 tinned  
holes for solder termination

## Assembly Instructions

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

### Plug Assembly

1. Only if you need a full sealing (IP67): 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.
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

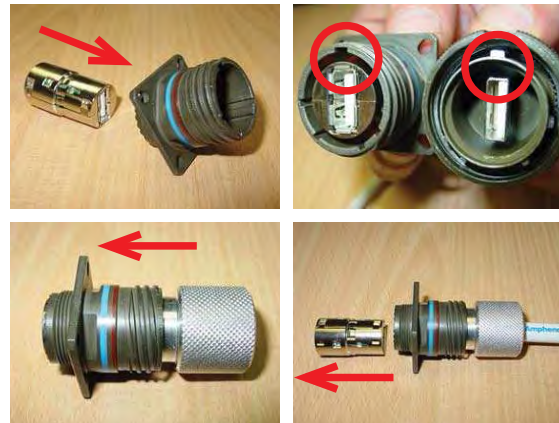


### IMPORTANT NOTE

The connection sealing is not done by the black retention spacer (which is slotted), but by the front face ORING (see 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.



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

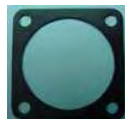


### Accessories

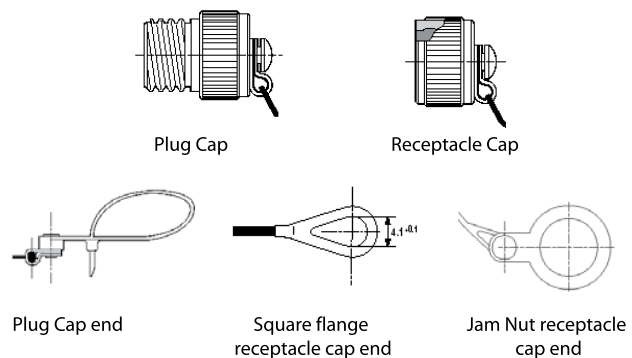
#### ■ Metallic Caps

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

- Panel Gasket for square flange receptacle (Thickness: 0,8 mm [.031]): JE15



- Receptacle Insert removal tool: USBF ODE



# USBFTV

Receptacles with 360° EMI backshells & PC Tails receptacles



## RECEPTACLES WITH 360° EMI BACKSHELLS

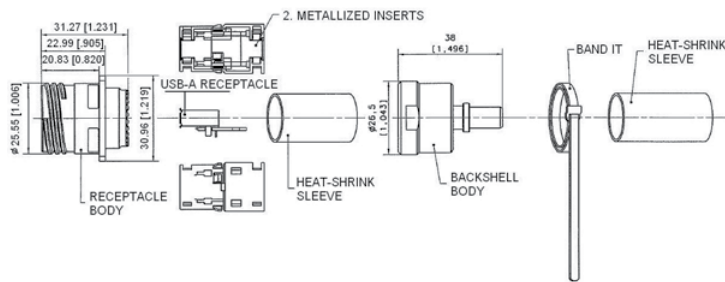
USBFTV Receptacles series with EMI backshells provide 360° shielding: same protection than the one proposed per Standard MIL-DTL-38999 serie III Connectors. We offer these EMI backshells with square flange and jam nut receptacles. The available platings are nickel or olive drab cadmium. With those solutions we suggest using our reinforced USB cable (shielded – zero halogen jacket). See page 31

We can provide those receptacles:   
 • with cordset already soldered   
 • without cordset

For 360° shielded USBFTV series receptacles, please consult us:

[www.usbfield.com](http://www.usbfield.com)

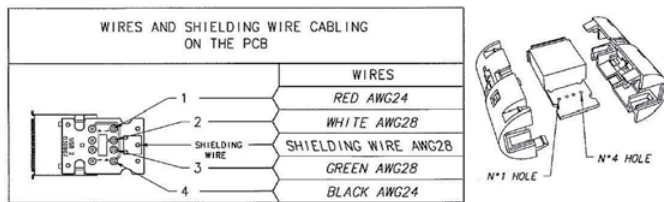
### EXAMPLE WITH A SQUARE FLANGE RECEPTACLE (PROVIDED WITHOUT CABLE)



### 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:

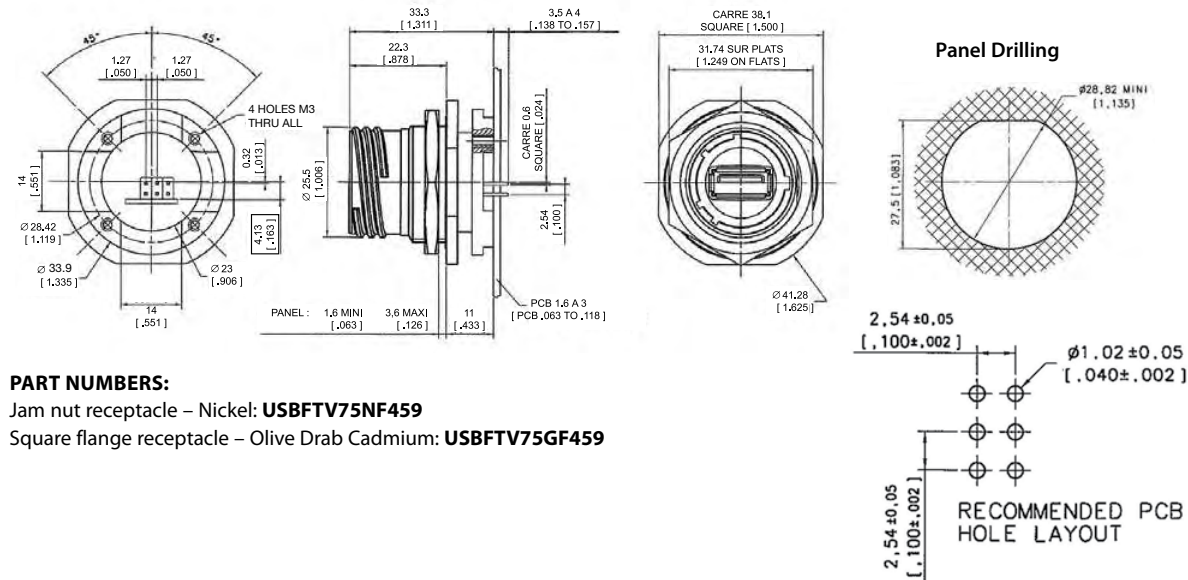
[www.usbfield.com](http://www.usbfield.com)



**ROHS COMPLIANT**  
 "N": nickel plating

### PC TAILS RECEPTACLE WITH « STAND OFF » SHELL

Those receptacles can be soldered directly on your PCB. A compound insures a transversal sealing and good performance in high-vibration environments. The shell of these receptacles are in the « Stand Off » style. They can be connected with rugged USBFTV series plugs.



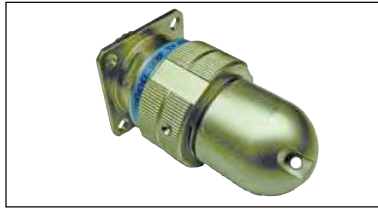
### PART NUMBERS:

Jam nut receptacle – Nickel: **USBFTV75NF459**

Square flange receptacle – Olive Drab Cadmium: **USBFTV75GF459**

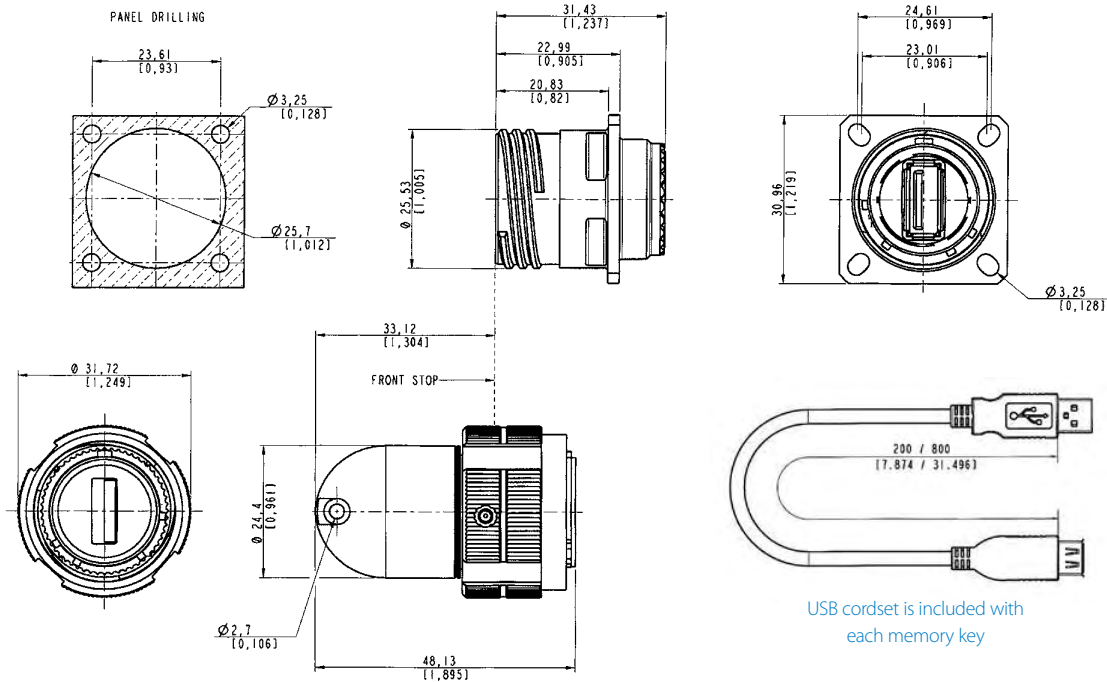
# REINFORCED USBFTV MEMORY KEYS

USBFTV - memory keys



We provide reinforced USB memory keys available in different capacities. They can be used ONLY with our USBFTV series receptacles. When mated on the receptacle, the system is IP67.

Dimensions of rugged USBFTV Key shown with receptacle USBFTV21x



USB cordset is included with each memory key

**ROHS COMPLIANT**  
 "N": nickel plating  
 "B": black coating

## DEFINITION OF PART NUMBER

**USBFTV KEY 6 A 0256 N CAP**

Beginning of every USBFTV Key part number. Remains unchanged.

**Coding position:**  
**A:** coding A  
**B:** coding B  
**NB:** please check the coding of your USBFTV receptacle\*

**Capacity of your USBFTV Key:**  
 0256  
 0512  
 1024  
 Other capacity, please consult us at [contact@rjfield.com](mailto:contact@rjfield.com)

**Plating:**  
 "N": nickel plating  
 "G": olive drab cadmium  
**NB:** please check the plating of your USBFTV receptacle

**Cap:** With cap  
**Blank:** Without cap

\*The coding can be changed on the receptacle using our tool USBFODE

EXAMPLE: **USBFTVKEY6A0256N:** USBFTV KEY – CODING A – CAPACITY OF 256MO – NICKEL PLATING

EXAMPLE: **USBFTVKEY6A1024GCAP:** USBFTV KEY – CODING A – CAPACITY OF 1024MO – OLIVE DRAB CADMIUM PLATING - PROTECTIVE CAP



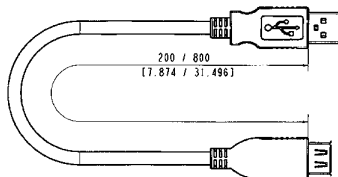
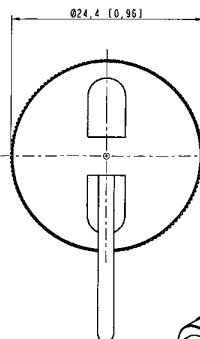
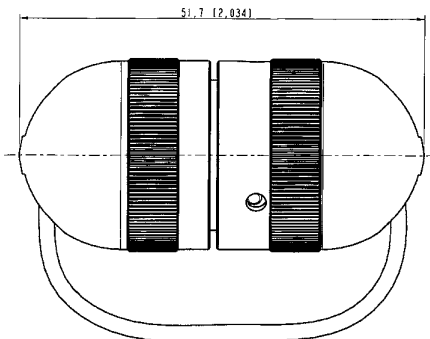
# REINFORCED USB MEMORY KEYS



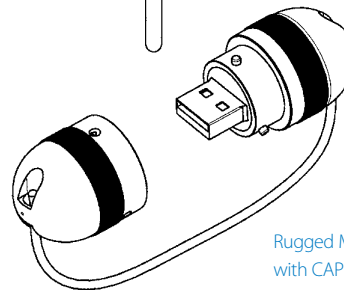
We provide reinforced USB memory keys available in different capacities. When mated, the system is IP67. Shells are metallic with 1/4 turn bayonet coupling.

Dimensions of rugged USBF Key:

**ROHS COMPLIANT**



USB cordset is included with each memory key



Rugged Metallic USB KEY with CAP SEALING : IP 67

USB Memory keys

## DEFINITION OF PART NUMBER

**USBF KEY**

**0256**

**N**

Beginning of every USB Key part number. Remains unchanged.

### Capacity of your USBF Key:

- 0256
- 0512
- 1024

Other capacity, please consult us at [contact@rjfield.com](mailto:contact@rjfield.com)

### Shell finish:

- N:** Natural
- G:** Green
- B:** Black

EXAMPLE: **USBFKEY0256N**: USB MEMORY KEY - CAPACITY OF 256MO - SHELL FINISH : NATURAL

EXAMPLE: **USBFKEY1024G**: USB MEMORY KEY - CAPACITY OF 1024MO - SHELL FINISH : GREEN

# High Reliability USB 2.0 Cordsets



## Applications

- Robotics
- Motion Control
- Railways
- CNC Machines
- Battelfield communication
- Industrial Process

**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 foild), 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.

**ROHS COMPLIANT**

## 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>	38 KG/Km
<b>OUTSIDE DIAM.</b>	0.20 inch (5.1 mm nom. +/- 0.15)
<b>MIN BEND RADIUS</b> (During installation)	45.9 mm ( 9x O. D.)
<b>MIN BEND RADIUS</b> (During operation)	25.5mm ( 5 x O.D.)
<b>TEMPERATURE installation</b>	Plus 60°C, minus 5°C
<b>TEMPERATURE operational</b>	Plus 70°C, minus 30°C

## 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>	54pF / m nom. @ 1KHz
<b>CAPACITANCE</b>	2.0 pF / m max. @ 1KHz
<b>UNBALANCE</b>	(wire to ground)
<b>DIELECTRIC STRENGTH</b>	VAC/1 min - 500V/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 (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

### 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

# USB B Field

ROHS COMPLIANT



## SEALED (IP67) USB-B CONNECTION SYSTEM

- USB-B male plug overmolded on USB2.0 cable
- USB-A plug can be used with USBFTV
- USB-B female receptacle with 50 mm wires & 5 way connectors
- Plastic shells
- Thread coupling
- Rear mount Jam Nut receptacle with panel gasket included

### Applications

- Embedded Computers
- Data Transfer
- Numerical Control Machine

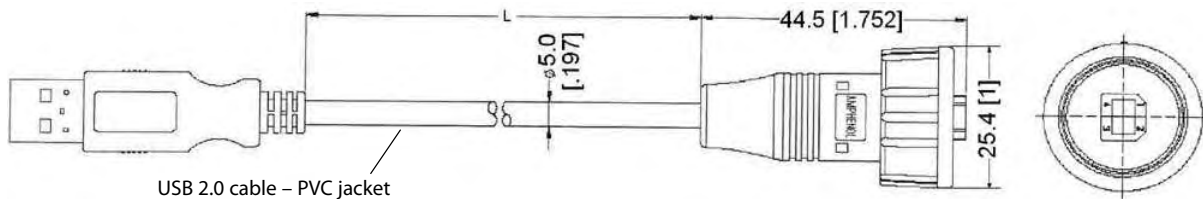
## MALE SEALED PLUG USB-B / USB-A CORDSET



## FEMALE RECEPTACLE AND CAP



## PLUG CORDSET - MALE SEALED USB-B / MALE USB-A (\*)



USB 2.0 cable - PVC jacket

### PART NUMBERS:

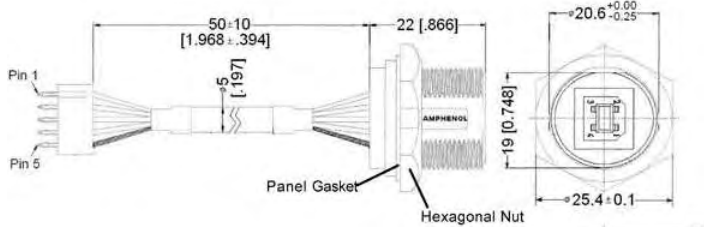
- L = 1000±50mm [39.37±1.97] - P/N: **USBBF6100**
- L = 2000±50mm [78.74±1.97] - P/N: **USBBF6200**

### PIN ASSIGNMENTS (FRONT VIEW)

- 1 = RED (AWG 24)
- 2 = WHITE (AWG 28)
- 3 = GREEN (AWG 28)
- 4 = BLACK (AWG 24)
- Shield = Drain

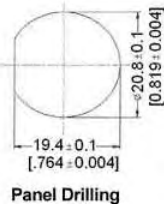
(\*) To get a sealed USB-A plug, you can use our USB FTV series.

## RECEPTACLE - FEMALE USB-B



### 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 = YELLOW (AWG 24)



## RECEPTACLE CAP



RECEPTACLE PN:  
USBBF7

CAP PN: USBBFC7

# FWF TV

## IEEE 1394 Connection System for Harsh Environments



**ROHS COMPLIANT**

"N": nickel plating

### Applications

- Embedded Computers
- Video
- Railways
- Battelfield Communication Systems
- Naval & Shipboard Systems
- Robotics & Automation
- Process Control
- Rugged Communications

### Data Transmission

IEEE 1394a-2000  
400 Mbits/second over 4.5 meters

With FW Field, you can insert a standard IEEE1394 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

- No assembly tools required
- Sealed against fluids and dusts (IP67)
- No time-consuming in-field cabling operation necessary
- **Tri-start thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device**
- FW plug retention in the receptacle: 100 N in the axis
- Mating cycles: 500 to 1500 times
- Improved EMI protection

### Environmental Protection

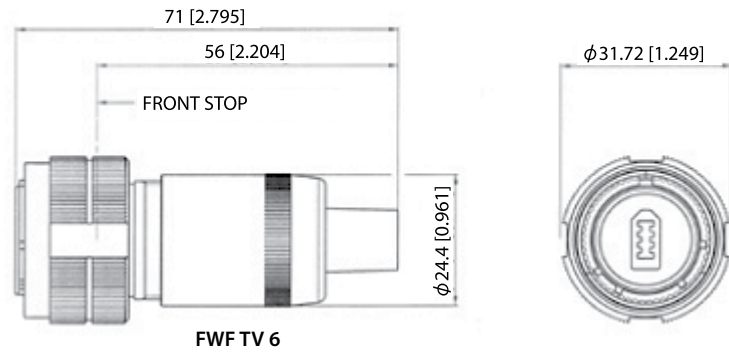
- Sealing (mated): IP67 (Temporary immersion - 1 meter up to 30 minutes)
- Salt Spray: 48 hr with Nickel plating  
500 hr with Olive Drab Cadmium
- Fire Retardant / Low Smoke: UL94 V0 and NF F 16 101 & 16 102
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 1 micro s
- Shocks: IK06: weight of 250 g drop from 40 cm [15.75 in] onto connectors (mated pair)
- Humidity: 21 days, 43°C, 98% humidity
- Temperature Range: - 55°C / +85°C

### Part Number Code

Series	FW F TV	2	1	G
<b>IEEE1394 Field TV</b>				
<b>Shell Type</b>				
<b>6:</b>	Plug			
<b>2:</b>	Square Flange Receptacle			
<b>2PE:</b>	Square Flange Receptacle with backshell			
<b>7:</b>	Jam Nut Receptacle			
<b>7PE:</b>	Jam Nut Receptacle with backshell			
<b>Back Terminations (Receptacles only)</b>				
<b>1:</b>	IEEE 1394 receptacle			
<b>2:</b>	Solder Board (6 tinned holes)			
<b>Shell Plating</b>				
<b>N:</b>	Nickel - ROHS Compliant			
<b>G:</b>	Olive Drab Cadmium			

- Examples:
- Olive Drab Cadmium Plug: FWF TV 6G
  - Olive Drab Cadmium Square Flange Receptacle, IEEE 1394 front & back: FWF TV 21G
  - Olive Drab Cadmium Jam Nut Receptacle, IEEE 1394 front and back: FWF TV 71G
  - Nickel Jam Nut Receptacle, solder board termination: FWF TV 72N

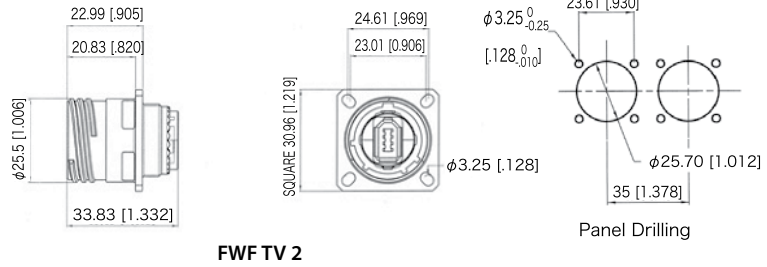
## Plug



FWF TV 6

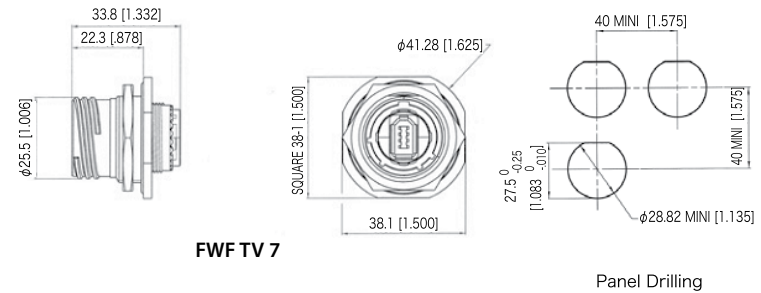
## Receptacles

- « 2 » Shell Square Flange



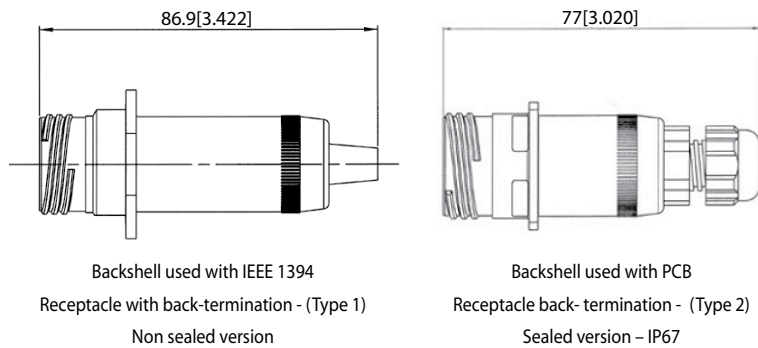
FWF TV 2

- « 7 » Shell Jam Nut



FWF TV 7

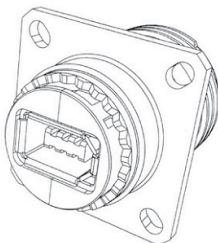
- « 2PE » and « 7PE » Shells



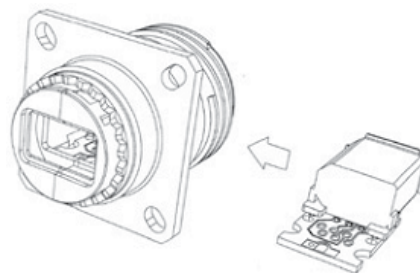
Backshell used with IEEE 1394  
Receptacle with back-termination - (Type 1)  
Non sealed version

Backshell used with PCB  
Receptacle back-termination - (Type 2)  
Sealed version - IP67

## Back Terminations



Type 1 : IEEE 1394 Receptacle



Type 2 : Solder 6 Tined holes for soldering

View of the PCB Type 2 version - with 6 tinned holes for solder termination

## Assembly Instructions

Can be used with most IEEE 1394 cordset brands: No tools required!

### Plug Assembly

1. If a fully sealed (IP67) assembly is required: Install the white tape around the plug to cover the 4 holes of the overmolding. If there are no holes omit this step.
2. Insert the black O Ring around the front face of the IEEE 1394 plug. This O Ring will ensure the seal.
3. Insert the IEEE 1394 cordset into the metallic backshell.
4. Insert the retention spacer laterally onto the cable (this spacer is soft so as to adapt to various overmolding styles) and slide the IEEE 1394 plug into this retention spacer.
5. Insert the friction ring laterally onto the cable cordset.
6. Insert the IEEE 1394 plug into the metallic circular shell. Note at this step that the main key is used for polarization.
7. Screw the backshell on the plug body. A spanner may be required to fully close the backshell to the circular shell.

**Important Note:** The sealing of the connector is not done by the black retention spacers which are slotted, but rather by the front face O-Ring (Fig 2).

### Receptacle Assembly

To Solder your cable onto the PCB:

1. Attach the 2 metallized plastic inserts around the PCB (Fig 1a & 1b).
2. Insert the IEEE 1394 module from the rear of the connector.

### Removing Modules

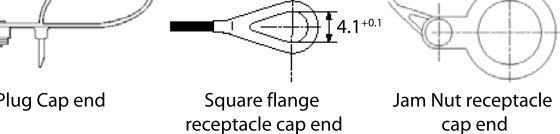
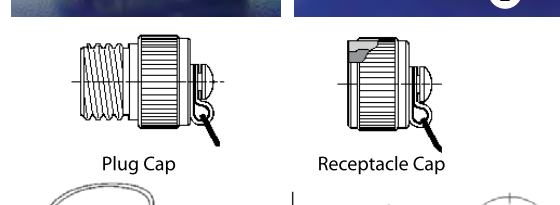
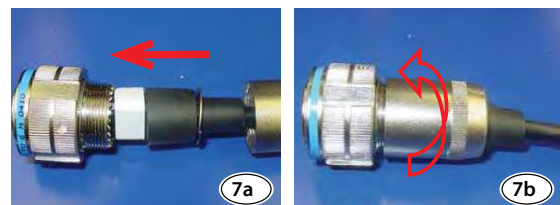
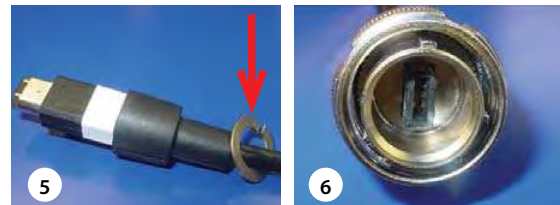
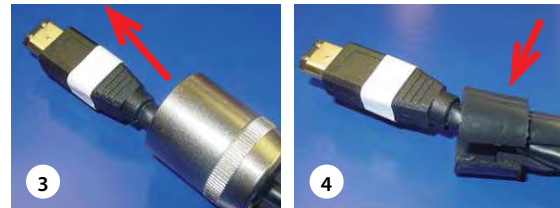
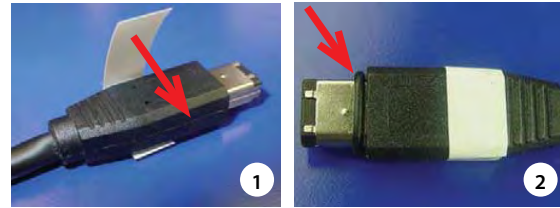
1. Insert the removal tool FWF ODE from the front
2. Push the module back with thumb.

### Accessories

#### Metallic Caps

	FWFTVC	2	G
<b>Connector Type</b>			
6:	Plug		
2:	Square Flange Receptacle		
7:	Jam Nut Receptacle		
<b>Shell plating</b>			
N:	Nickel - ROHS Compliant		
G:	Olive Drab Cadmium		

- Panel Gasket for square flange receptacle (Thickness: 0,8 mm [.031]): JE15
- Receptacle Insert removal tool: FWF ODE



# SELF CLOSING CAP

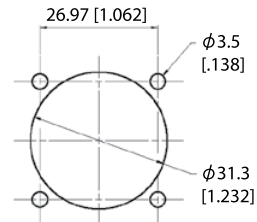
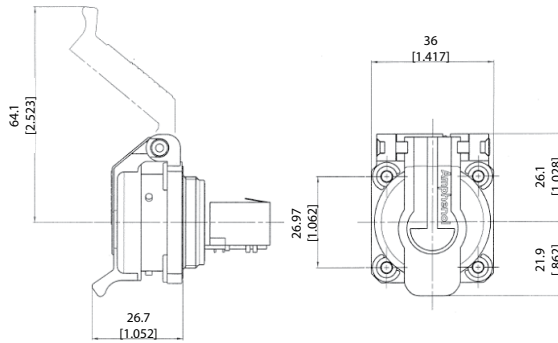
For RJ Field, USB and IEEE1394 receptacles



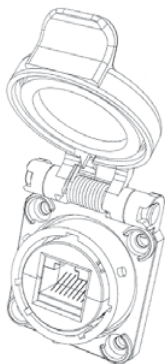
This Self Closing Cap automatically protects the RJ Field square flange receptacles (MIL-C-26482 type), protecting your system from dust and water projections. The same cap can be used to protect USB and IEEE1394 receptacles. A spring automatically closes the upper part of the cap when either the RJ Field plug, RJ45 cordset, USB or IEEE1394 cordset, or USB key are removed from the receptacle.

## ROHS COMPLIANT

"N": nickel plating  
"B": black coating

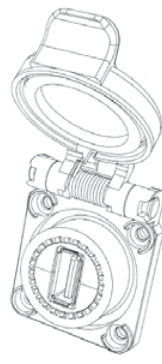


Panel Drilling



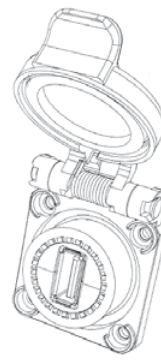
**Version: RJ45**  
**RJF 21N SCC**  
Nickel and metallized inserts (EMI)

**RJF 21B SCC**  
Black and blank insert



**Version: USB**  
**USBF 21N SCC**  
Nickel and metallized inserts (EMI)

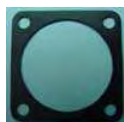
**USBF 21B SCC**  
Black and blank insert



**Version: IEEE1394**  
**FWF 21N SCC**  
Nickel and metallized inserts (EMI)

**FWF 21B SCC**  
Black and blank insert

■ Note: Panel gasket for square flange receptacles: JE18



# RJ11F

Rugged RJ11/RJ12 Connection System for Harsh Environment

RJ11F



RJ11Field allows you to use a standard phone RJ11 / RJ12 connection in harsh environments. With the patented RJStop® system you can use a standard RJ11 / RJ12 cordset in a metallic plug which will protect it from shocks, dust and fluids. **No hazardous on-field cabling!**

## MAIN CHARACTERISTICS

- Bayonet coupling ("Audible & Visual" coupling signal)
- Robust metallic shells based on MIL-C-26482
- 4 mechanical user-defined coding / Polarization settings (insert rotation)
- RJ11 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min

## Environmental Protection

- Sealing: IP67
- Salt Spray:
  - 48 h with Nickel plating
  - > 96 h with black coating
  - > 500 h with Oliv 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 > 10 nano 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
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Temperature Range: - 40°C / +85°C

## Applications

- Industrial applications
- Battlefield communication

## ROHS COMPLIANT

"N": nickel plating  
"B": black coating

## Part Number Code

Series	RJ11F	2	2	B
RJ11Field				
Shell Type				
6:	Plug, Plastic Gland			
2:	Square Flange Receptacle			
7:	Jam Nut Receptacle			
Back Terminations (For Receptacles only)				
1:	Female RJ11			
2:	Solder (6 tinned holes)			
Shell Finishes				
B:	Black Coating - ROHS Compliant			
N:	Nickel - ROHS Compliant			
G:	Olive Drab Cadmium			

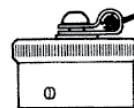
Examples: - Black Plug: RJ11F 6 B  
- Black square flange receptacle, Female RJ11 Back termination: RJ11F 2 1 B  
- Nickel Jam Nut Receptacle, solder termination: RJ11F 72 N

## Accessories

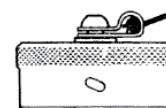
- Metallic cap

	RJ11FC	2	B
Connector Type			
6:	Plug		
2:	Square Flange Receptacle		
7:	Jam Nut Receptacle		
Finishes			
B:	Black Coating - ROHS Compliant		
N:	Nickel - ROHS Compliant		
G:	Olive Drab Cadmium		

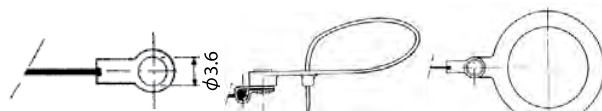
- Panel gasket for square flange « 2 » thickness: 0,6 mm P/N: JE 14



Plug cap



Receptacle cap



Square Flange type « 2 »

Plug Cap end type « 6 »

Jam nut receptacle type « 7 »

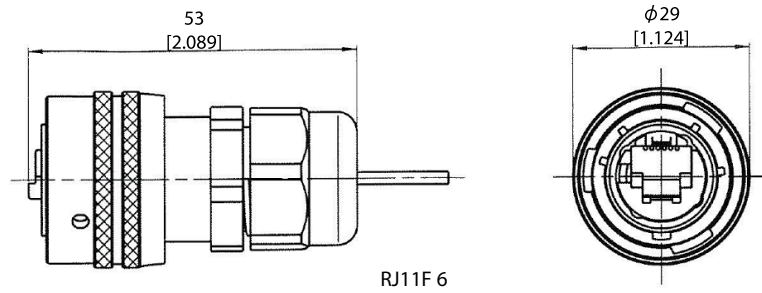
- Insert removal tool for receptacle and plug P/N = RJ11F ODE





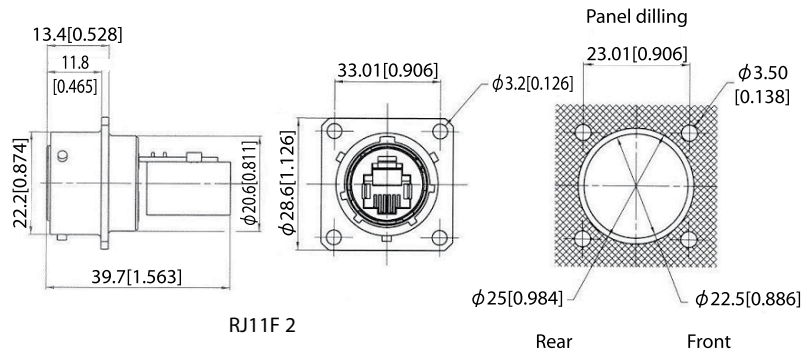
## Plug

- Shell type 6 with Plastic Gland

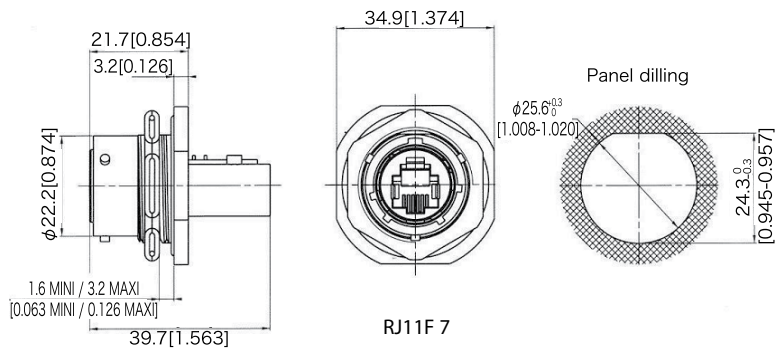


## Receptacles

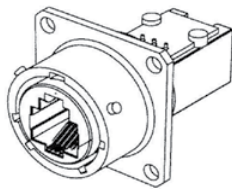
- Square flange receptacle  
4 mounting holes Shell type 2



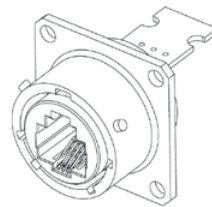
- Jam nut receptacle Hexagonal Nut mounting-  
Shell type 7



## Back Terminations



Type 1: Female RJ11 / RJ12

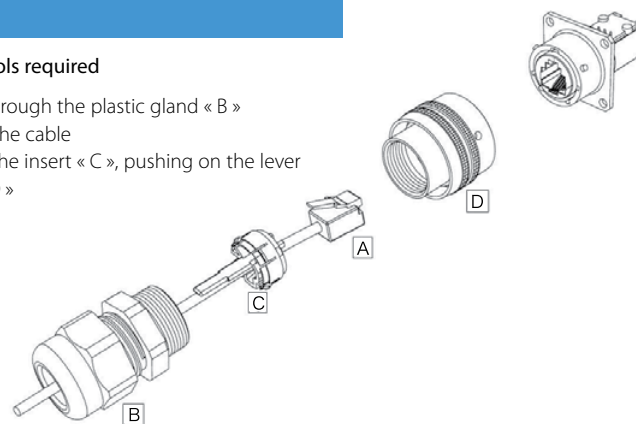


Type 2: Solder  
6 tined through holes to solder your cable

## Assembly instructions

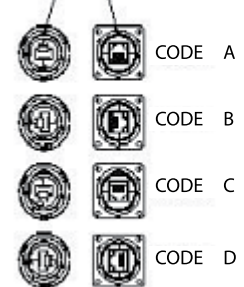
Easy and Safe: No field cabling tools required

1. Pass the RJ11 / RJ12 plug « A » through the plastic gland « B »
2. Laterally slide the insert « C » on the cable
3. Fix the RJ11 / RJ12 plug « A » in the insert « C », pushing on the lever
4. Insert in the metallic housing « D »
5. Tighten the plastic gland « B »



### Insert Codes

#### Keying



4 coding positions

# MTRJF TV

Transform your MTRJ patchcord into an Environmental Connector



With MTRJF TV you can use a standard MTRJ patchcord in a metallic plug which will protect it from shocks, dust and fluids.

### No hazardous on-field cabling!

The MTRJ Field offers an easy system to upgrade from a standard to an environmental MTRJ.

- Sealed against fluids and dust (IP67)
- Shock, Vibration proof,
- No cabling operation in field and no tools required for installation

### MECHANICAL CHARACTERISTICS

- Number of Channels: 1/2/4
- Typical Insertion Loss: 0,5db in MM
- Durability: 500 mating/unmating cycles (changes for <0,2 db)

**ROHS COMPLIANT**

"N": nickel plating

### Applications

- Railways
- Base Station
- Military communication
- Navy

### Part Number Code

Serie	MTRJF TV	6M	C	G	N
MTRJ Field TV					
Shell Type					
6:	Plug with metal backshell, plastic PG clamp				
6M:	Plug with metal backshell and metal PG clamp				
2:	Square flange receptacle				
2PE:	Square flange, metal backshell and plastic PG clamp				
2PEM:	Square flange, metal backshell and metal PG clamp				
7:	Jam nut receptacle				
7PE:	Jam nut, metal backshell and plastic PG clamp				
7PEM:	Jam nut, metal backshell and metal PG clamp				
Cable Type					
C:	Mini round cable 2,8 mm				
D:	Flat duplex cable 1,6 mm				
S:	Duplex zipcord 1,6 mm				
0:	Receptacle without backshell				
T:	Flat duplex cable + Duplex zipcord for 1,6 mm - 2mm - 2,8mm				
Shell Finish					
N:	Nickel plated				
G:	Olive drab cadmium plated				
B:	Bronze				
D:	Black zinc cobalt				
Z:	Olive drab zinc cobalt				
Polarization					
N:	Normal				
A / B / C / D / E					

Cap Series	B	EC	N	TV	W	13
Protective cap type						
EC:	For square flange receptacle					
ER:	For jam nut receptacle					
F:	For plug					
Wire type						
N:	Nylon cord					
Blank:	Metallic chain					
TV:	Series					
Shell finish						
B:	Bronze					
F:	Electroless nickel plated, aluminium version					
W:	Olive drab cadmium plated, aluminium version					
D:	Black zinc cobalt					
Z:	Olive drab zinc cobalt					

### Requested information to order MTRJ Field Patchcord

Plug MTRJ: Male /Female  
 Type of fiber: 50/125, 62,5/125, 9/125  
 Patchcord length: ex 10.5m  
 Drawing: description of the product

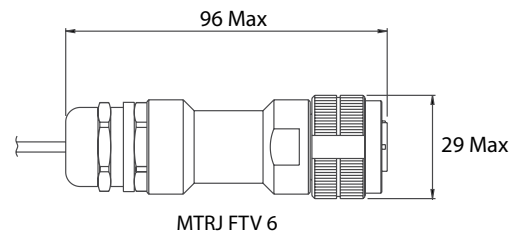
Contact us for other configuration

### Dismounting Tool Ordering Information

MTRJF TV DM TOOL

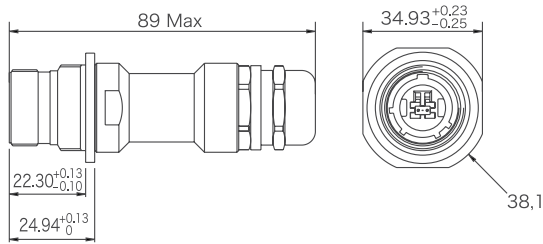
**Line drawings** (Dimensions in mm)

- Plug (MIL DTL 38 999 series III Size 13)

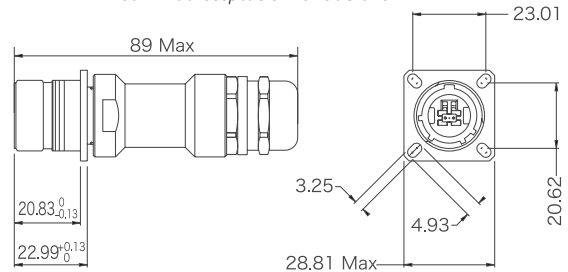


- Receptacle (MIL DTL 38 999 series III Size 13) with backshell

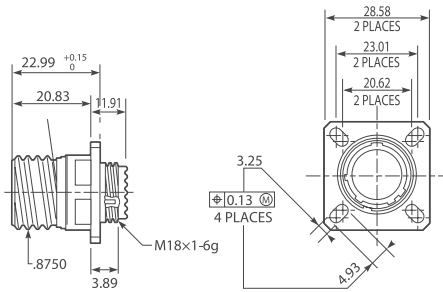
Square flange receptacle with backshell



Jam Nut receptacle with backshell

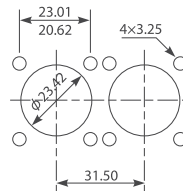


- Square Flange Receptacle (MIL DTL 38 999 series III Size 13)

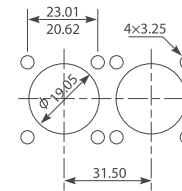


**PANEL DRILLING**

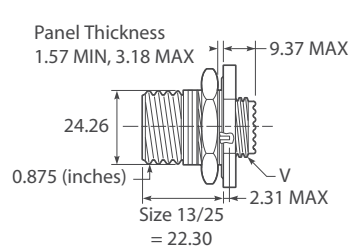
Square flange receptacle rear panel mounting



Square flange receptacle front panel mounting

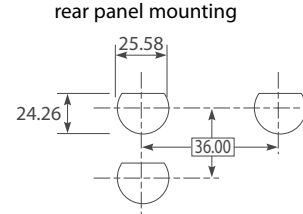


- Jam Nut Receptacle (MIL DTL 38 999 series III Size 13)



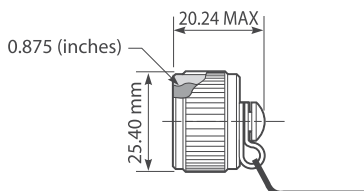
**PANEL DRILLING**

Jam nut receptacle rear panel mounting

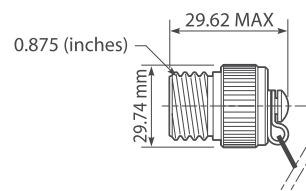


**Protective caps**

Protective cap for plug (nylon cord)



Protective cap for receptacles (nylon cord)



# LC/LX5F

Transform your LC/LX5 patchcord into an Environmental Connector



The LC Field and LX5 Field offers an easy system to upgrade from a standard to an environmental LC or LX5.

- Sealed against fluids and dust (IP67)
- Shock, Vibration proof
- No cabling operation in field and no tools required for installation (except 1,6mm and 2mm zipcord cable)

With the patented RJStop<sup>®</sup> system you can use a standard LC or LX5 patchcord in a metallic plug which will protect it from shocks, dust and fluids. **No hazardous on-field cabling!**

LC/LX5F

### MECHANICAL CHARACTERISTICS

- Number of Channels: 2
- Typical Insertion Loss: 0,5db in MM and SM
- Durability 500 mating/unmating cycles (changes for <0,2 db)

### Applications

- Railways
- Base Station
- Military communication
- Navy

**ROHS COMPLIANT**

"N": nickel plating

### Part Number Code

Serie	XXXX TV	XX	X	X	X
Optical connector type					
LCF: LC Field TV					
LX5F: LX5 Field TV					
Shell Type					
6M:	Plug with metal backshell and metal PG clamp				
2:	Square flange receptacle without backshell				
7:	Jam nut receptacle without backshell				
Cable Type					
D:	Flat duplex cable 1,6 mm				
E:	Duplex zipcord 1,6 mm				
F:	Flat duplex cable 2 mm				
G:	Duplex zipcord 2 mm				
H:	Flat duplex cable 2,8 mm				
I:	Duplex zipcord 2,8 mm				
O:	Receptacle without backshell				
T:	Flat duplex cable + Duplex zipcord for 1,6 mm - 2mm - 2,8mm				
Shell Finish					
N:	Nickel plated				
G:	Olive drab cadmium plated				
B:	Bronze				
D:	Black zinc cobalt				
Z:	Olive drab zinc cobalt				
Polarization					
N:	Normal				
A / B / C / D / E					

Cap Series	B	EC	N	TV	W	19
Protective cap type						
EC:	For square flange receptacle					
ER:	For jam nut receptacle					
F:	For plug					
Wire type						
N:	Nylon cord					
Blank:	Metallic chain					
TV:	Series					
Shell finish						
B:	Bronze					
F:	Electroless nickel plated, aluminium version					
W:	Olive drab cadmium plated, aluminium version					
D:	Black zinc cobalt					
Z:	Olive drab zinc cobalt					
Corresponding connector shell size: 19						

### Requested information to order LC/LX5 Field Patchcord

- Type of connector: Male /Female
- Type of fiber: 50/125, 62,5/125, 9/125
- Patchcord length: ex 10,5m
- Drawing: description of the product

Contact us for other configuration

### Tools informations:

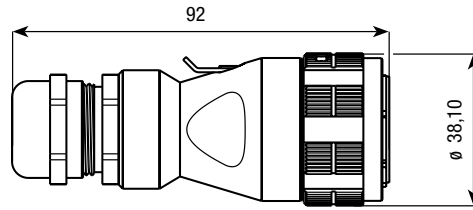
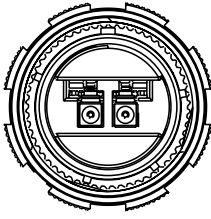
- Mounting Tools:**
- LCFTV MO TOOL: LC FIELD Mounting tools
- LX5TV MO TOOL: LC FIELD Mounting tools

### Dismounting Tools \*:

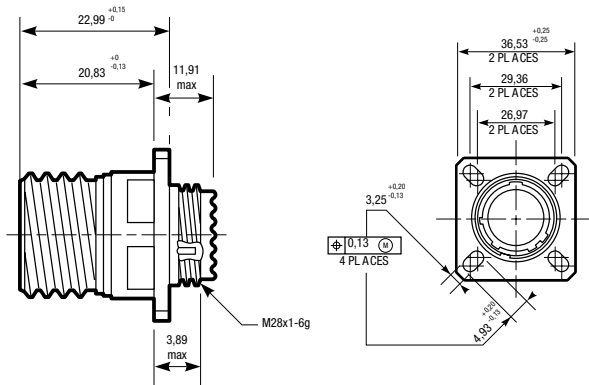
- LCFTV DM TOOL: LC FIELD Dismounting tools
- LX5TV DM TOOL: LC FIELD Dismounting tools
- (To dismount the LC or LX5 you need to use both of dismounting and mounting tools)

Line drawings (Dimensions in mm)

- Plug (MIL DTL 38 999 series III Size 19)

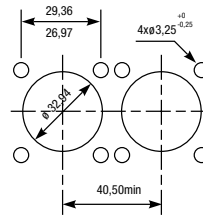


- Square Flange Receptacle (MIL DTL 38 999 series III Size 19)

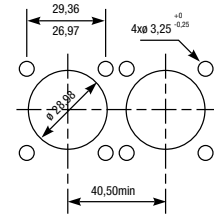


PANEL DRILLING

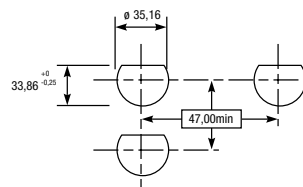
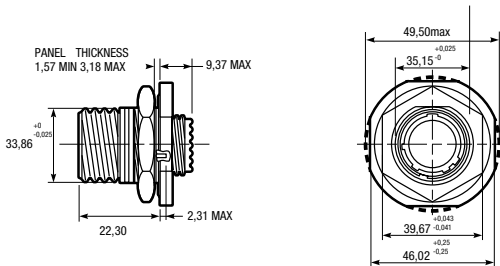
Square flange receptacle rear panel mounting



Square flange receptacle front panel mounting

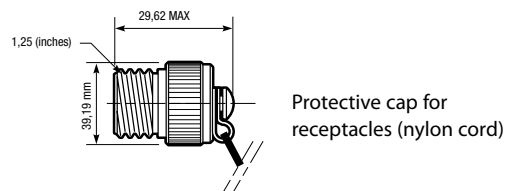
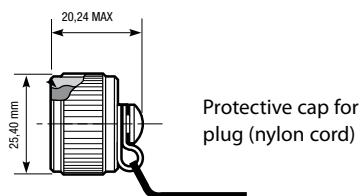


- Jam Nut Receptacle (MIL DTL 38 999 series III Size 19)



PANEL DRILLING  
Jam nut receptacle rear panel mounting

Protective caps

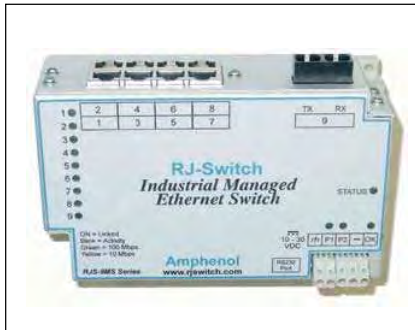


# RJ Switch

ROHS COMPLIANT

Industrial Ethernet Switch  
IP30

RJ Switch



## Applications

- Factory Automation
- Robotics
- Process Control
- Transportation Systems
- Data Acquisition & Transmission

## KEY FEATURES

- Redundant power inputs with surge/spike protection
- Ultra reliable 1,000,000 hours MTBF
- Hazardous location: operation in Zone 2
- Wide operating temperature range of -40°C to 70/85°C
- Rugged metal packaging with DIN rail or direct panel mounting
- Auto-detecting, auto-crossover and auto-polarity
- Full-Duplex operation with flow control (no collisions!)
- Ring Switch Networking Features
  - Real-Time Ring for ultra-fast fault-tolerant loops
  - Recovery time of 30 ms + 5 ms per hop!
  - Ideal for deterministic systems and PLCs
  - Real-time traffic prioritization
  - Port mirroring for traffic diagnostic
- Managed Switch Networking Features
  - Rapid Spanning Tree (RSTP) for fast redundant rings
  - Priority queuing for real-time performance (QoS and CoS)
  - SNMP v1 and v2 for network management
  - SNMPv3 for authentication and encryption
  - IGMP for multicast filtering
  - VLAN for traffic segregation
  - User friendly configuration (web, Telnet, RS232)
  - Encryption using HTTPS, SSL, SSH, SNMPv3
  - Message filtering to stop broadcast storms
  - RMON and port mirroring for diagnostics
  - The Power of Linux Inside

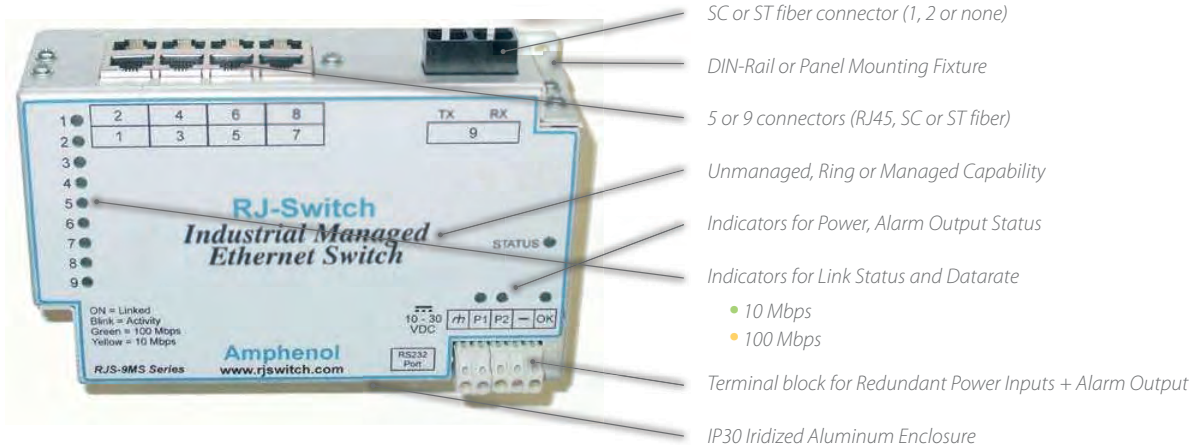
## INDUSTRIAL RUGGED ETHERNET SWITCH

Amphenol offers a full range of Rugged Ethernet switches for industrial use. These switches are specifically designed for industrial applications where Real-Time is a key requirement. The wide range, from unmanaged Plug & Play switches to those managed with fiber optics ports, will fulfill all your needs. This family of switches, IP30 rated, is suitable for both Din-Rail or flat panel mounting. This is an easy way to make the Ethernet networks of your manufacturing site, automation or control units deterministic.

This wide range of Ethernet switches is available with following features:

- Unmanaged, Real-Time Ring and Managed models
- RJ45 ports and up to two fiber optics ports (multimode or singlemode)
- 5 or 9 port models

## DESCRIPTION



## MANAGED, RING & UNMANAGED SWITCH FEATURES

### IEEE Ethernet Standards

IEEE 802.3 /u	10 Mbps Ethernet and 100 Mbps Fast Ethernet
IEEE 802.3x	Full-Duplex with Flow Control
IEEE 802.1p	Priority Queuing – QoS, CoS, ToS/DS ( <i>Ring and managed models</i> )
IEEE 802.1D/w	Rapid Spanning Tree for redundant rings and Spanning Tree for interoperability ( <i>managed models</i> )
IEEE 802.1Q	VLAN for traffic segregation ( <i>managed models</i> )

### Regulatory Approvals

EMI emissions	EN55022, FCC part 15, ICES-003
EMC immunity	IEC61326-1, IEEE C37.90
Shocks	IEC60068-2-27
Vibrations	IEC60068-2-6
Free Fall	IEC60068-2-32
Hazardous Location	UL1604, CSA C22.2/213 ( <i>Class 1, Div. 2</i> ), EN50021/Zone 2

### Ethernet features

RJ45 ports	5 or 9 Shielded RJ45 ports 10/100BaseTX
Fiber optic ports	SC or ST connectors Datarate 100BaseFX ( <i>100Mbps</i> ) Wavelength 1300 nm center Fiber multimode (mm) optimal: 62.5/125 um Fiber singlemode (sm) optimal: 9/125 um Fiber max distance ( <i>Full duplex</i> ): 2km ( <i>mm</i> ), 15 or 40 km ( <i>sm</i> )
Ethernet switch type	Intelligent store & forward
Full / Half Duplex	Configurable
RJ45 speed	10 or 100 Mbps auto-negotiation
RJ45 MDI/MDIX	Auto-crossover connection
RJ45 TD and RD polarity	Auto-polarity
Typical latency	16 us + frame time @ 10 Mbps ( <i>varies on load and settings</i> ) 5 us + frame time @ 100 Mbps
MAC addresses supported	2048
Memory bandwidth	3.2 Gbps

### Environmental

Operating Temperature	- 40°C to +85°C
(- 40°C to +70°C for RJS-9MS models)	
Storage Temperature	- 40°C to +85°C
Humidity (non-condensing)	5 to 95 % RH

### Status *RS and MS models only*

"OK" contact output	10 – 30 VDC
(or 10 - 50 VDC depends on models)	
Maximum current	0.5 A

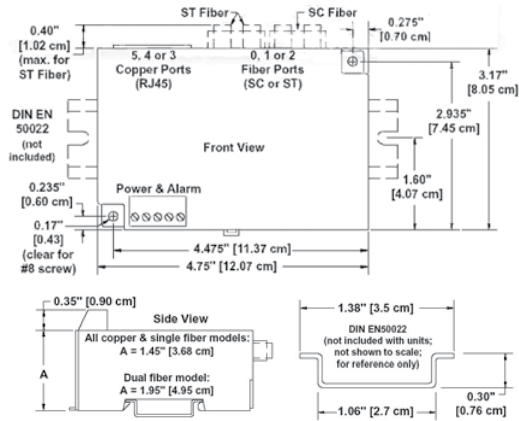
### Power Supply

Input Power ( <i>depends on models</i> )	4 W - typical,
<i>ALL PORTS ACTIVE AT 100 MBPS</i>	
Redundant Inputs	10 - 50 VDC ( <i>models RJS-5RS; RJS-9RS</i> ) 10 - 30 VDC ( <i>all other models</i> )

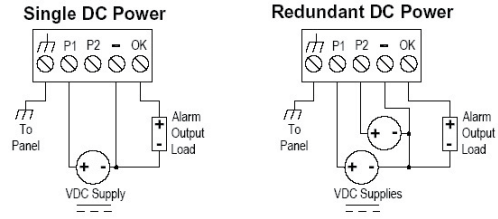
#### EXCEEDS MIL-STD-1275

Power protection rating	Industrial	MIL-STD-1275 Available on: RJS-5RS / RJS-9RS RJS-9MS -4 & -5
Surge protection		100 V for 1s
Transient protection	15 KW peaks	15 KW peaks
Spike protection	5 KW (10 times for 10 μs)	5 KW (10 times for 10 μs) 250 V (50 times for 100 μs)

## DIMENSIONS (EXAMPLE FOR 5 PORT RING MODELS)



## POWER AND ALARM WIRING



### Part Number Code

<b>Series</b>	RJS	5ES	1	-	-
<b>RJ-Switch</b>					
<b>Type of Electronics</b>					
5ES: 5 ports total, Ethernet unmanaged switch					
9ES: 9 ports total, Ethernet unmanaged switch					
5RS: 5 ports total, Ethernet Ring switch					
9RS: 9 ports total, Ethernet Ring switch					
5MS: 5 ports total, Ethernet Managed switch					
9MS: 9 ports total, Ethernet Managed switch					
<b>RJ45 or fiber ports</b>					
1: RJ45 ports only, no fiber					
2: 1 multimode fiber ports					
3: 1 singlemode fiber ports					
4: 2 multimode fiber ports (except for 9ES- models)					
5: 2 singlemode fiber ports (except for 9ES- models)					
<b>Style of Fiber connectors</b>					
Blank: No fiber					
SC: SC style fiber connector(s)					
ST: ST style fiber connector(s)					
SCL: SC style fiber connector(s), long haul fiber (40km), on singlemode models					
STL: ST style fiber connector(s), long haul fiber (40km), on singlemode models					
<b>Pre-set for Ring models only</b>					
E0: Pre-set for 0 rings (special order)					
E1: Pre-set for 1 ring (standard order), configured on last 2 ports					
E2: Pre-set for 2 rings (special order), Ring 1 = last 2 ports, Ring 2 = ports 1 & 2.					

Example: RJ-Switch, 5 ports Ethernet Ring switch, with 1 multimode ST fiber port, pre-set for 1 ring: **RJS-SRS-2-ST-E1**

## A COMPLETE RANGE OF IP67 SEALED INDUSTRIAL ETHERNET SWITCHES

Amphenol offers the widest range of IP67 sealed Industrial Ethernet switches for very harsh environments. The Ethernet interfaces are waterproof & rugged RJ45 connectors from the RJ FIELD series ([www.rjfield.com](http://www.rjfield.com)). For any other product such as RJ45/fiber optics converter, please do not hesitate to consult us.



### RJS-PC5 SERIES

- 5 ports IP67 RJ45 connectors
- Polyester enclosure
- Ring or unmanaged models



### RJS-AL SERIES

- 8 ports IP67 RJ45 connectors
- Aluminum enclosure
- Managed or unmanaged models



### RJS-PC SERIES

- 8 ports IP67 RJ45 connectors
- Polyester enclosure
- Managed or unmanaged models

CONSULT OUR DEDICATED WEBSITE FOR MORE INFORMATION:

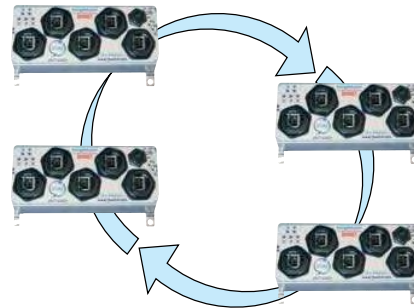
[www.rjswitch.com](http://www.rjswitch.com)



# RJ Switch

ROHS COMPLIANT

Harsh Environment Industrial Ethernet Switch  
Plastic Enclosure - IP67



## Rugged & Waterproof Switch

Amphenol offers a small size 5 port waterproof Ethernet Switch that can withstand a variety of extreme conditions - low & high temperatures, shocks & vibrations, dust particles or even liquid immersion. This is an easy way to make the Ethernet networks of your manufacturing site, automation or control units deterministic.

### Amphenol IP67 Industrial Ring Switch

Amphenol IP67 Ring Ethernet switch is a combination of very fast, fault-tolerant network redundancy Sixnet technology and IP67 sealed & rugged packaging, specifically designed for the harshest environments.

Rings self-configure and just run, without any complex configuration.

The switch board is sealed within a waterproof IP67 polyester enclosure suitable for highly corrosive environments. The polyester material is glass fiber reinforced. This makes it very rugged against shocks and vibration.

The I/O interfaces are waterproof & rugged RJ45 connectors from the RJ FIELD plastic circular series.

### Key Features

- Waterproof IP67 Rating (NEMA 6)
- Reduced Installation Costs with the patented RJStop® system
- Use any standard RJ45 cordset
- Rugged Enclosure in Polyester reinforced with 30% glass fiber
- Redundant power inputs with surge/spike protection
- Ultra reliable 1,000,000 hours Mean Time Between Failure (MTBF)
- Zone 2 hazardous location
- Ring Switch Networking Features (managed features available !)
  - Real-Time Ring for ultra-fast fault-tolerant loops
    - Recovery time of 30 ms + 5 ms per hop!
  - Modbus monitoring over Ethernet
    - Ideal for deterministic systems and PLCs
  - Real-time traffic prioritization (QoS and CoS)
    - Assure delivery of real-time data
    - Improve network utilization
    - User settable priority assignments
  - Advanced switch features
    - User configurable port settings
    - Port mirroring for traffic diagnostics
    - Pre-configurable for Plug-And-Play simplicity

### Industrial Applications

- Factory Automation
- Robotics
- Process Control
- Transportation Systems
- Data Acquisition & Transmission

## IP67 Unmanaged and Ring Switch Features

### IEEE Ethernet Standards

IEEE 802.3	10Mbps Ethernet
IEEE 802.3u	100Mbps Fast Ethernet
IEEE 802.3x	Full-Duplex with Flow Control
IEEE 802.1p standard	QoS/CoS - Quality/Class of Service for Ring model only

### Regulatory Approvals

EMI emissions	EN55022, FCC part 15, ICES-003
EMC immunity:	IEC61326-1, IEEE C37.90
Shocks:	IEC60068-2-27
Vibrations:	IEC60068-2-6
Free Fall:	IEC60068-2-32
Hazardous Location:	UL1604, CSA C22.2/213 (Class 1, Div. 2), EN50021/Zone 2

### Ethernet features

Ports	5 Shielded RJ45 ports 10/100BaseTX
Ethernet switch type	Intelligent store & forward
Full / Half Duplex	Configurable
RJ45 speed	10 or 100 Mbps auto-negotiation
RJ45 MDI/MDIX	Auto-crossover connection
RJ45 TD and RD polarity	Auto-polarity
Typical latency	16 us + frame time @ 10 Mbps (varies on load and settings) 5 us + frame time @ 100 Mbps
MAC addresses supported	2048
Memory bandwidth	3.2 Gbps
Ethernet isolation	1500 Vrms 1 minute
Ring features (for Ring model only)	Link loss recovery time: 30 ms plus 5 ms per hop Maximum switches in ring: 50+ Dual Ring support

### Power Supply

Input power (typical)	ES: 2,4 W ; RS: 2,7 W
-----------------------	-----------------------

### Status Reporting (for Ring model only)

"OK" contact output	Output current: 0.5 A max
"OK" contact State	OFF when a fail occurs ON when power and switching is OK

### Environmental

Operating Temperature	- 40°C to +75°C
Storage Temperature	- 40°C to +85°C

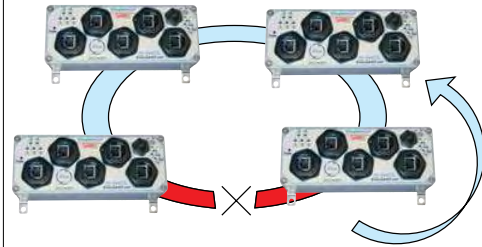
### Weight

0.54 kg

## Real-Time Ring Switches

Amphenol Real-Time Ring switches combines the Plug&Play simplicity of an unmanaged switch with high performances of Sixnet Ring managed switches.

- **Real-Time fault-tolerant Ring**  
Recovery time of 30 ms + 5 ms per hop!
- **Real-Time traffic prioritization (QoS & CoS)**  
Assure delivery of real-time data
- **Available Managed features**  
User configurable port settings  
Port mirroring for traffic diagnostics  
Pre-configurable for Plug & Play simplicity



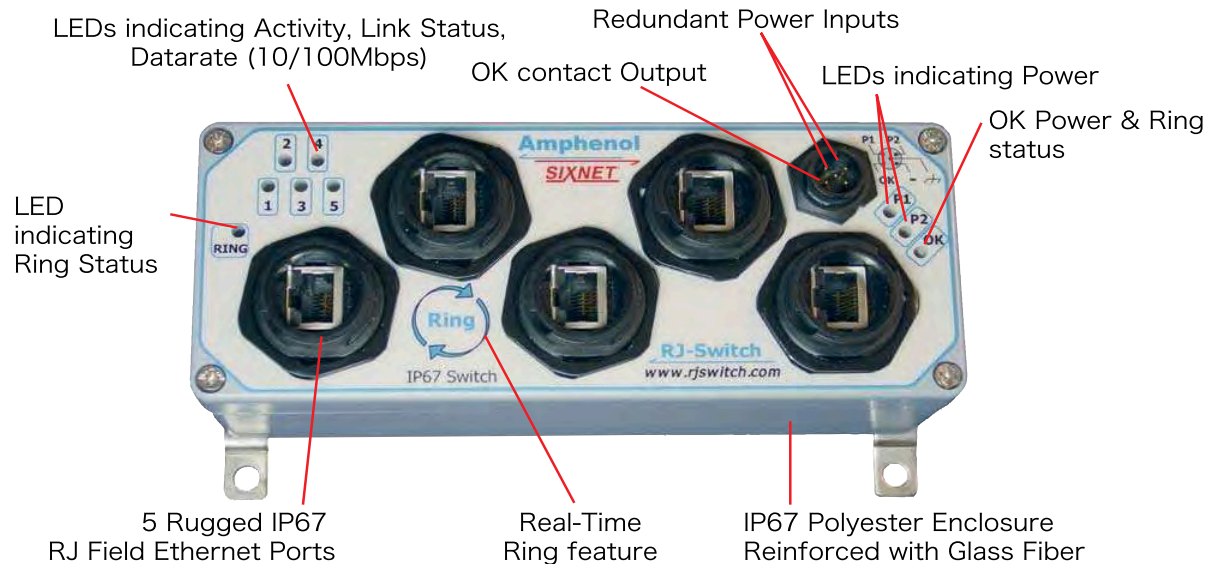
The use of such switches provides a fast network and avoids faults. When a break occurs, the switch instantly transfers data to new path. The link loss recovery is 30 ms plus 5 ms times the number of Ring switches in the ring. For example, 10 ring switches will recover in less than 80 ms. Rings can be pre-configured to "just run". They don't need an assigned IP address. But if you like, you can fine tune the performance of the ring by using a simple Windows wizard (which is free).

Ring networks can be divided into multiple "sub-rings" which enhance reliability and recovery speed through small ring paths.

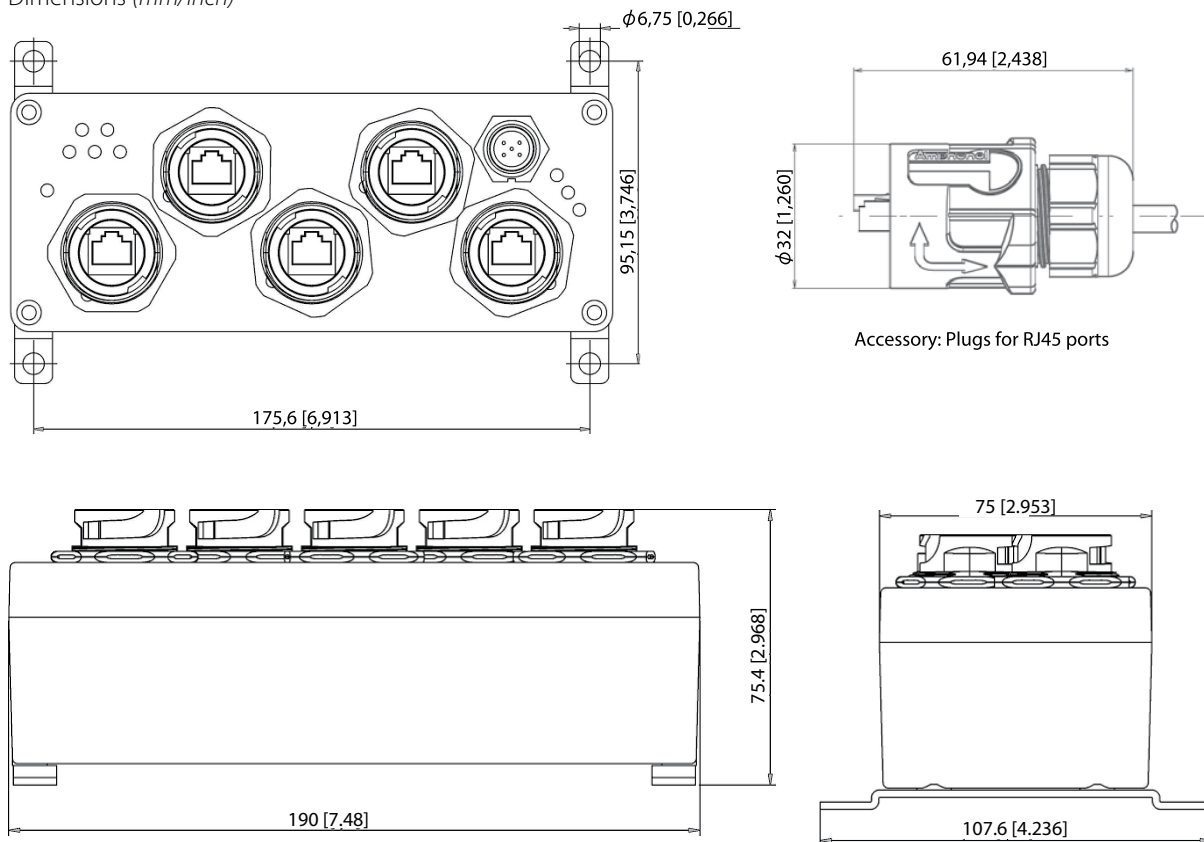
The prioritization of messages assures delivery of real-time data. Some applications need to force no-real-time data (such as video information) to lower priority and force critical real-time data at higher priority. Network utilization is improved.

This combination of Ethernet technology associated with rugged and sealed protective enclosure is the ideal solution to deliver deterministic performance to your industrial systems even in the harshest environment!

### Description *(example for Ring model)*



Dimensions (mm/inch)



Accessory: Plugs for RJ45 ports

Part Numbers

Series	RJS-PC	5ES	1
IP67 RJ-Switch, with polyester body			
Type of Electronics			
5RS:	5 ports 10/100 Mbps, Ring switch (standard order)		
5ES:	5 ports 10/100 Mbps, Unmanaged switch (special order)		
Connectors			
1:	RJ45 ports, 10/100BaseT(X)		
1CAPS:	Caps are attached on both power and data receptacles		
Military Rated Protection			
Blank:	Industrial protection (standard order)		
EP:	Extended power protection exceeds MIL-STD-1275 (special order)		

Example IP67 Ethernet Ring switch, 5 ports 10/ 100 Mbps, with caps attached on the receptacles: RJS-PC-5RS-1CAPS

Note The Ring model is pre-set for 1 ring enabled on the ports 4 and 5. You may change the configuration by using the free windows configuration tool. Simply choose the desired pair of ports for your new enabled ring.

Accessories



- P/N: RJF PC5 PWR  
Plug for power port  
Sealing protection: IP67



- P/N: RJF RB 6  
Plugs for RJ45 ports  
Sealing protection: IP67

**FREE WINDOWS**  
Configuration tool  
Download it at  
[www.rjswitch.com](http://www.rjswitch.com)

# RJ Switch

Harsh Environment Military Ethernet Switch  
Metallic enclosure – IP67 – Gigabit



## Sealed, Rugged & Waterproof Switch

Amphenol offers 9 ports managed, RING and unmanaged Ethernet Switches that can withstand a variety of extreme conditions. Whatever the situation - high temperatures, extreme shocks & vibrations, dust particles or even liquid immersion there is a solution available.

This is an easy way to make the Ethernet networks of your systems deterministic. Up to 3 gigabit ports are offered! The switch electronics are sealed within a waterproof IP67 metallic enclosure. The conductive cadmium plating is suitable for most demanding EMI-RFI environments. The I/O interface includes redundant power inputs as well as waterproof rugged RJ45 connectors from the RJF TV FIELD threaded product series based on MIL-DTL-38999 (Series III) metallic shell size 19. This series enables the transformation without tooling any standard RJ45 cordset into a robust and waterproof connection system.

## Key Features

### Rugged environmental features

- Rugged metal packaging with cadmium olive drab protection
- MIL-DTL-38999 III connectors for both power and Ethernet ports
- IP65/IP67 rated
- MIL-STD-1275 Surge and Spike protection
- MIL-STD-810F shocks
- Zone 2 hazardous location
- Wide operating temperature range of  $-40^{\circ}\text{C}$  to  $70^{\circ}\text{C}$
- Altitude 3000m height; transportation 10000m height

### Ethernet features

- 3 ports 10/100/1000-BaseT(X) + 6 ports 10/100-BaseT(X)
- Unmanaged, RING unmanaged and Managed models
- Full-Duplex operation with flow control (no collisions!)
- Auto-detecting, auto-crossover and auto-polarity

## Applications

### Military Applications

- Data Acquisition & Transmission
- Battlefield Communication C4ISR
- Rugged Networks
- Mobile Communications
- Test Equipment
- Avionic & Shipboard Systems

### RING switch

- Ring for fast fault-tolerant loops
- Recovery time of 30 ms + 5 ms per hop!
- QoS and CoS priority queuing

### MANAGED switch

- RSTP for redundant rings
- QoS and CoS priority queuing
- SNMPv3 authentication and encryption
- IGMP for multicast filtering
- VLAN for traffic segregation
- And much more !

## Managed & Unmanaged Switch Features

### IEEE Ethernet Standards

Models	Features	802.3/u	802.3x	802.3z	802.1p	802.1D	802.1w	802.1Q
RJS ML 9ES	Unmanaged	✓	✓					
RJS ML 9RS	RING	✓	✓		✓			
RJS ML 9RG	RING - Gigabit	✓	✓	✓	✓			
RJS ML 9MS	Managed	✓	✓		✓	✓	✓	✓
RJS ML 9MG	Managed - Gigabit	✓	✓	✓	✓	✓	✓	✓

IEEE 802.3 /u	10 Mbps Ethernet and 100 Mbps Fast Ethernet
IEEE 802.3x	Full-Duplex with Flow Control
IEEE 802.3z	Gigabit 1000 Mbps Ethernet
IEEE 802.1p	Priority queuing – QoS, CoS, ToS/DS
IEEE 802.1D/w	Rapid Spanning Tree for redundant rings and Spanning Tree (interoperability)
IEEE 802.1Q	VLAN for traffic segregation

### Regulatory Approvals

EMI emissions	EN55022 class A, FCC part 15, ICES-003
EMC immunity	IEC61326-1, IEEE C37.90
Shocks:	MIL-STD-810F : 40g, 11ms, 18 saw tooth shocks
Hazardous Location:	UL1604, CSA C22.2/213, EN50021 Class1, Div. 2 / Zone 2

### Power Supply

Redundant 24 VDC Input	10 – 50 VDC for Ring -9RS models 10 - 30 VDC for all other models
Input power	4 to 9 W typical (all ports active), depends on models
Connectors for power	TV 07 RW 0935 P: MIL-DTL-38999 III Jam nut receptacle olive drab cadmium plated 6 contacts size 22D

### Ethernet features

RJ45 ports	9 shielded RJ45 ports 10/100 Base T(X) or 1000 Base T(X)
Connectors for RJ45 ports	RJFTV 7 G: Jam nut receptacle based on MIL-DTL-38999 III Olive drab cadmium plated
Full / Half Duplex	Automatic or configurable
MDI / MDIX	Auto-crossover connection
RJ45 speed	10, 100 or 1000 Mbps auto-negotiation
Typical latency	16 us + frame time @ 10 Mbps (varies on load and settings) 5 us + frame time @ 100 Mbps
MAC addresses supported	2048 8192 (gigabit models)
Memory bandwidth	3.2 Gbps 32 Gbps (gigabit)

### Temperature

Operating Temperature	- 40°C to +70°C
Storage Temperature	- 40°C to +85°C

### Status (Ring models)

“OK” contact output	Sourcing power
Maximum current 0.5 A	

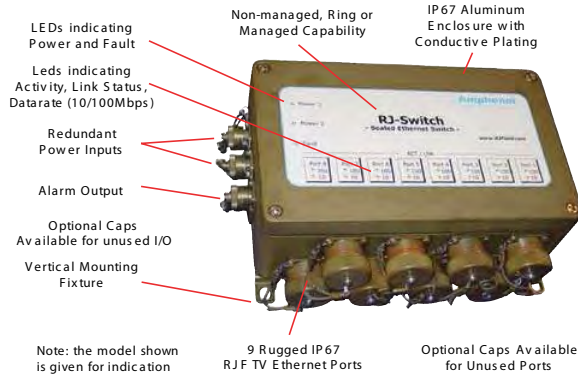
### Weight

approx 2.2Kg

#### EXCEEDS MIL-STD-1275

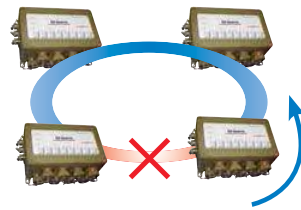
Power ratings	Industrial specifications 9ES1; 9MS1; 9RG1; 9MG1	MIL-STD-1275 Specifications RJS-ML-9RS1
Surge protection		100 V for 1s
Transient protection	15 KW peaks	15 KW peaks 5 KW
Spike protection	5 KW (10x for 10 µs)	(10x for 10 µs) 250 V (50x for 100 µs)

## RJ-Switch enclosure description



## Real-Time Ring Switches

Amphenol Real-Time Ring switches combines the Plug&Play **simplicity** of an unmanaged switch with **high performances** of managed switches.



### Real-Time fault-tolerant Ring

Recovery time of 30 ms + 5 ms per hop!

### Real-Time traffic prioritization (QoS & CoS)

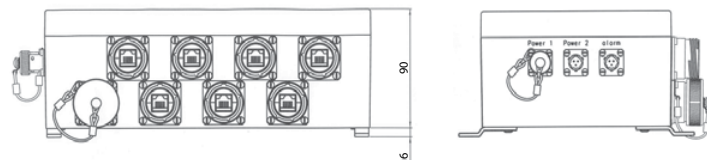
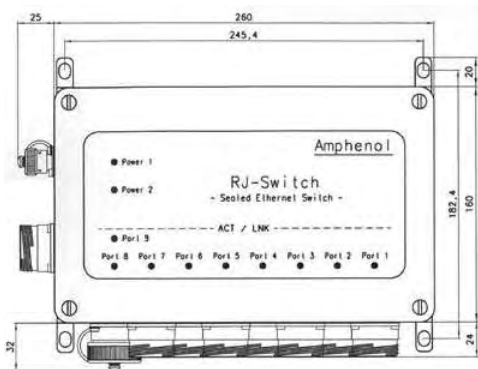
Assure delivery of real-time data

### Available Managed features

User configurable port settings  
Port mirroring for traffic diagnostics  
Pre-configurable for Plug & Play simplicity

The use of such switches provides a fast network and avoids faults. When a break occurs, the switch instantly transfers data to new path. The link loss recovery is 30 ms plus 5 ms times the number of Ring switches in the ring. For example, 10 ring switches will recover in less than 80 ms. Rings can be pre-configured to "just run". They don't need an assigned IP address. But if you like, you can fine tune the performance of the ring by using a simple Windows wizard (which is free). Ring networks can be divided into multiple "sub-rings" which enhance reliability and recovery speed through the small ring paths.

## Dimensions (mm) *Military Aluminum ML Enclosure*



### NOTE:

The model shown is given for indication.  
The LEDs for Power status and ports activity depend on models.

## Part Numbers

Series	RJS	ML	9ES1
RJ-Switch			
Type of Enclosure	<b>ML:</b> Aluminum, OD Green Cadmium Plating & MIL-DTL-38999 (Series III) Receptacles		
Type of Electronics	<b>9ES1:</b> Unmanaged 9 ports 10/100 Base T(X) <b>9RS1:</b> Unmanaged RING 9 ports 10/100 Base T(X) <b>9RG1:</b> Unmanaged RING 6 ports 10/100 Base T(X) + 3 ports 10/100/1000 Base T(X) <b>9MS1:</b> Managed 9 ports 10/100 Base T(X) <b>9MG1:</b> Managed 6 ports 10/100 Base T(X) + 3 ports 10/100/1000 Base T(X)		
Accessories:	Caps for receptacles fixed with string directly to the receptacle		
<b>Blank:</b>	No caps included		
<b>Caps:</b>	Attached caps for both power and data included		

**Example:** Unmanaged RING switch in an aluminum enclosure with olive drab green conductive cadmium plating, 9 ports 10/100 Base T(X) & RJF TV threaded coupling receptacles & caps added to the switch: **RJS ML 9RS1 CAPS**

*The informations given in this section are as a guideline only. We reserve the right to modify our products in any way we deem necessary.*

## Accessories



- Plugs for Ethernet ports  
Based on MIL-DTL-38999  
No tool required!  
RJF TV 6 M G



- Plugs for Power 1 and Power 2  
MIL-DTL-38999  
Olive drab cadmium plated  
Crimp contacts  
6 contacts size 22D  
TV 06 RW 0935 S

## RJF RB (RJ FAST) CONCEPT



RJFast is the only system on the market capable of converting a standard RJ-45 cable into a category 6 Ethernet connector compatible with industrial environments (including IP67) in a few seconds, without tedious, long and costly crimping.

- No Tool
- No Cabling



## NOTES

Area for notes, consisting of horizontal dotted lines.





## RJ FIELD GLOSSARY

### **10BASE-T**

10 Mbps Ethernet on twisted-pair (Category 3) cable.

### **100BASE-T**

The twisted pair version of 100 Mbps Ethernet. Requires Category 5 cabling.

### **1000BASE-T**

A recent LAN standard for implementing 1000 Mbps Ethernet on Category 5 cable. Also called Gigabit Ethernet.

### **Auto-MDIX**

A protocol which allows two Ethernet devices to negotiate their use of the Ethernet Transmit (Tx) and Receive (Rx) cable pairs. This allows two Ethernet devices with MDI or MDI-X connectors to connect without using a cross-over cable.

### **Baud**

A unit of measurement that denotes the number of bits that can be transmitted per second. For example, if a modem is rated at 9600 baud it is capable of transmitting data at a rate of 9600 bits per second.

### **Bandwidth**

The maximum capacity of a network channel. Usually expressed in bits per second (bps). Ethernet channels have bandwidths of 10, 100, and 1000 Mbps (Gigabit).

### **bps**

Bits Per Second is the unit used for measuring line speed, the number of information units transmitted per second.

### **Broadcast**

A transmission initiated by one station and sent to all stations on the network.

### **Byte**

The amount of memory needed to store one character such as a letter or a number. Equal to 8 bits of digital information. The standard measurement unit of a file size.

### **Category 5**

A performance classification for twisted pair cables, connectors and systems. Specified to 100 MHz. Suitable for voice and data applications up to 155 Mbps.

### **Category 5 e**

Also called Enhanced Category 5. A performance classification for twisted pair cables, connectors and systems. Specified to 100 MHz. Suitable for voice and data applications up to 1000 Mbps.

### **Category 6**

A performance classification for twisted pair cables, connectors and systems. Specified up to 250 MHz.

### **CSMA/CD**

Carrier Sense Multiple Access/Collision Detect. The Medium Access Control (MAC) protocol used in Ethernet.

### **Data rate**

The speed of the data transmission, measured in bps (bits per second) or Mbps.

### **Duplex (Full, Half)**

Full duplex is a communications method that allows for the simultaneous transmission and reception of data. In Half Duplex communication, transmissions and receptions can occur in either direction but not at the same time.

### **Ethernet**

The most common network protocol in use. A protocol is a set of rules enabling data communications. Ethernet can operate over several different media including fiber optic, coaxial cable and twisted-pair cable.

### **IEEE 802.3**

IEEE Working Group for CSMA/CD, the protocol used in Ethernet transmissions.

### **IGMP snooping**

The ability of a switch to observe Internet Group Multicast Protocol (IGMP) traffic in order to learn IP Multicast group membership. The purpose is to restrict multicast transmissions to only those ports which have requested them.

### **LAN**

Local Area Network. A network of directly-connected machines (located in close proximity), providing high speed communication over physical media such as fiber optics, coaxial cable, or twisted pair wiring.

**MAC Address**

A unique address assigned to a station interface, identifying that station on the network. With Ethernet, this is the unique 48-bit station address. Same as the physical address.

**Megabit (Mb)**

Megabit. One million bits of information, usually used to express a data transfer rate; 1 Megabit/second = 1Mbps.

**Megabyte (MB)**

MegaByte. A unit of data storage size which represents one million characters of information.

**Multicast**

A transmission initiated by one station to many stations of the network.

**Port Mirroring**

Port mirroring allows a switch port to monitor packets from any or all of its ports so that traffic can be analysed.

**Quality of Service (QoS)**

Some switches support QoS (per 802.1p and 802.1Q standards) whereby messages can be assigned levels of priority. QoS is important where time-critical applications can be impaired by data delays.

**RJ45**

8-position modular jacks used on twisted pair links for Ethernet cabling.

**RJ-Field**

A wide range of connectors which allow to reinforce and seal standard RJ45 cable. See [www.rjfield.com](http://www.rjfield.com)

**SNMP**

Simple Network Management Protocol. This is THE standard used for switch management programs.

**Spanning Tree Protocol (STP)**

A link management protocol providing path redundancy and preventing network loops by defining a tree to span all switches in a network. It forces redundant data paths into a standby (blocked) state. If a path malfunction occurs, the topology is reconfigured and the link reestablished by activating the standby path.

**TCP/IP**

Transmission Control Protocol/Internet Protocol. A set of protocols, resulting from ARPA efforts, used by the Internet to support services such as remote login (TELNET), file transfer (FTP) and mail (SMTP).

**TELNET**

The Internet standard protocol for remote login (terminal connection) service. TELNET allows a user at one site to interact with a remote timesharing system at another site as if the user's terminal were connected directly to the remote computer.

**VLAN**

Virtual Local Area Network. A LAN that maps stations on a basis other than location such as by department, user type or application. Managing traffic, workstations, and bandwidth can be easier with a VLAN and improve network efficiency.

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