

RJF TV

Ethernet connection system for harsh environment



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

RJFTV 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 (IP68)
- 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 - Shell size 19**
- **Robust metallic shells**
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min
- Compatible with cable diameter from 6 mm [0.236 in] to 13 mm [0.512 in], for smaller diameters please consult us

Environmental protection

- Sealing: IP68
- Salt spray: 48h with aluminium shell - Nickel, & black zinc cobalt plating
> 500h with aluminium shell - Olive drab cadmium plating
500 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 > 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
- Temperature range: -40°C / +85°C

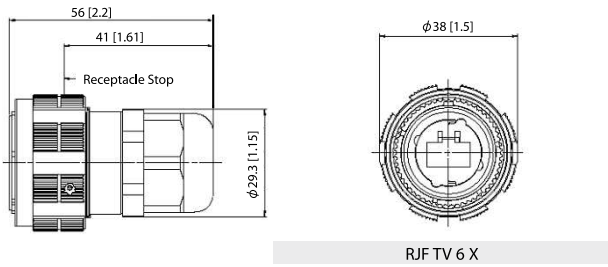
Part number code

RJF TV		2	2	G	03 100 BTX
Shell type					
6: plug with plastic gland					
6M: plug with metal gland					
2: square flange receptacle					
2PE: square flange receptacle, IP68 backshell, plastic gland					
2PEM: square flange receptacle, IP68 backshell, metal gland					
7: jam nut receptacle					
7PE: jam nut receptacle, IP68 backshell, plastic gland					
7PEM: jam nut receptacle, IP68 backshell, metal gland					
<i>Nota: also available a transversally sealed receptacle (unmated) ► See page 36</i>					
Back terminations (receptacles only)					
1: female RJ45					
1RA: right angle female RJ45					
2: RJ45 Cordset					
Shells material & Finish (inserts are metallized)					
N: aluminium shell - nickel plating - ROHS compliant			BZC: aluminium shell - black zinc cobalt plating		
G: aluminium shell - olive drab cadmium plating			ZC: aluminium shell - green zinc cobalt plating - ROHS compliant		
BZ: marine bronze shell - ROHS compliant			ZN: aluminium shell - black zinc nickel plating - ROHS compliant		
Cordset length (type 2 back termination only) - Other lengths are available on demand					
03 100 BTX: 0.3m [11.81 inches]		00: 8 tinned holes at the rear of the PCB to solder the cable			
05 100 BTX: 0.5m [19.68 inches]		xx OPEN: open cable - with no plug at the end (xx to be replaced by the cordset length 03, 05, 10, or 15 - see nearby)			
10 100 BTX: 1m [39.37 inches]					
15 100 BTX: 1.5m [59.05 inches]					
Remark: cabling configuration → 100 BTX = 568B (Ethernet specification)					

- 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

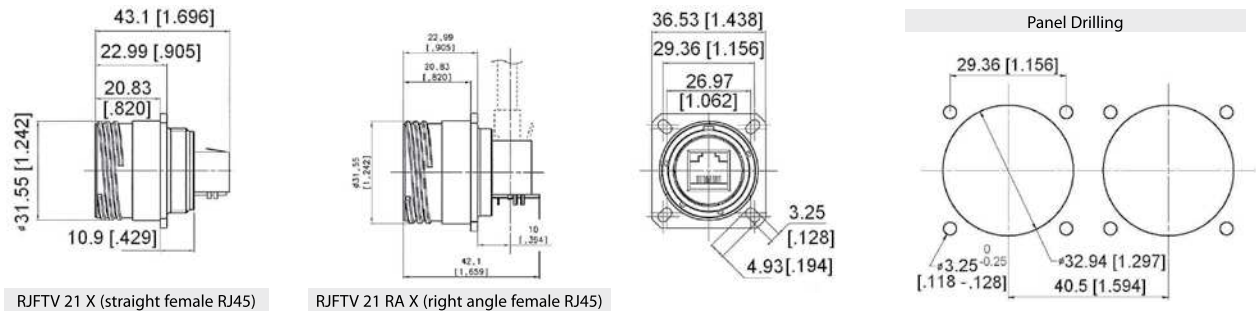
Plug

- Shell type 6 with plastic or metal gland

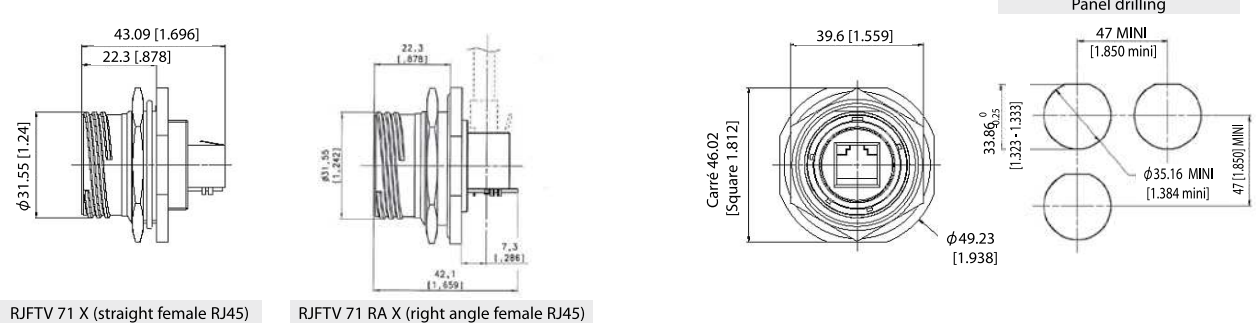


Receptacles

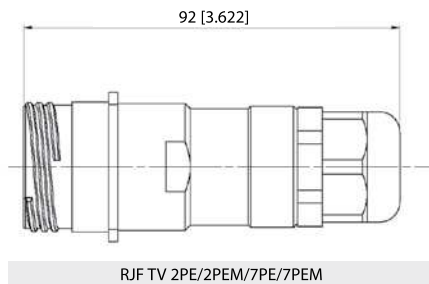
- Square flange receptacle - 4 mounting holes: shell type 2



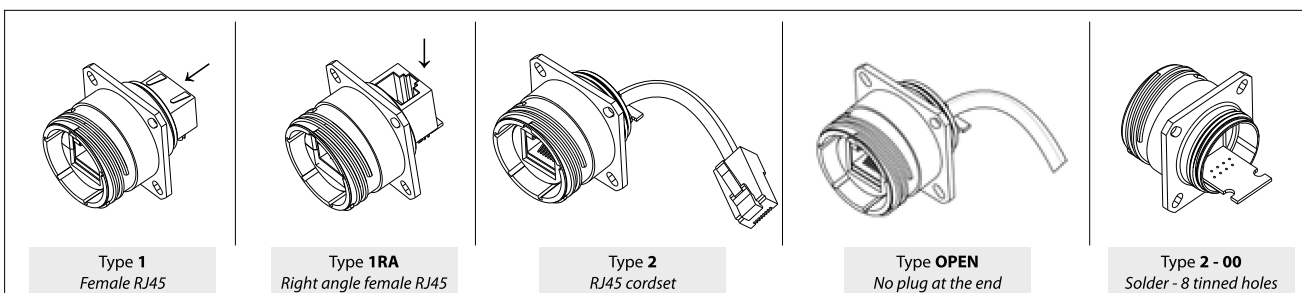
- Jam nut receptacle - Hexagonal nut mounting: shell type 7



- Receptacles with IP68 backshell: Shell type 2PE and 7PE with plastic or metal gland

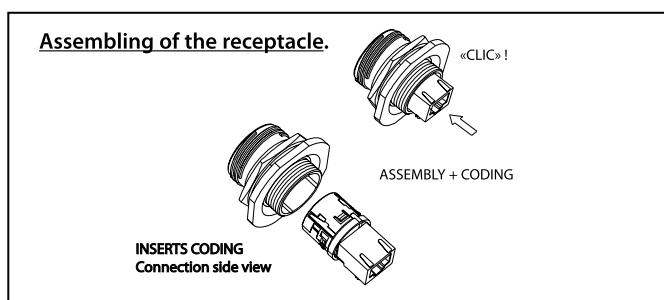
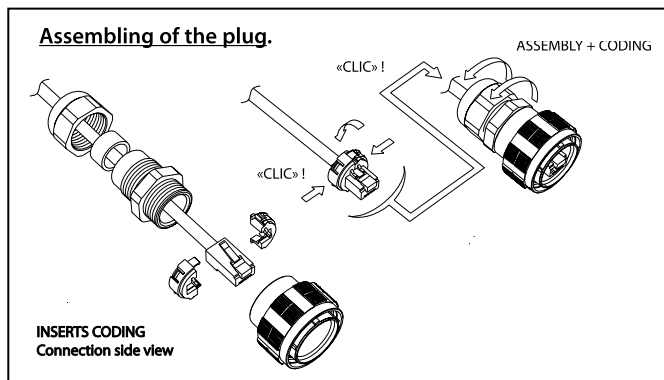


Back terminations



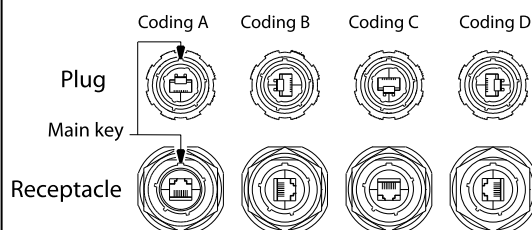
Assembly instructions

Insert codings



4 codings possibilities

(defined by the customer during the assembling).



IMPORTANT NOTE: to remove the insert, use the

■ Insert removal tool for receptacle and plug

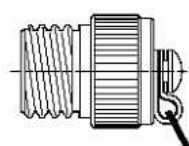
P/N: RJF ODE



Accessories

■ Metallic caps

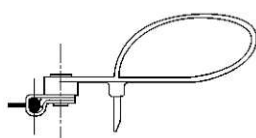
	RJFTVC	2	G
Connector type			
6: plug			
2: square flange receptacle			
7: jam nut receptacle			
Shell material & finish			
N: aluminium shell - nickel plating - ROHS compliant			
G: aluminium shell - olive drab cadmium plating			
BZ: marine bronze shell - ROHS compliant			
ZC: aluminium shell - green zinc cobalt plating - ROHS compliant			
ZN: aluminium shell - black zinc nickel plating - ROHS compliant			



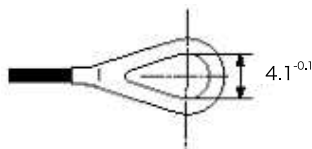
Plug Cap



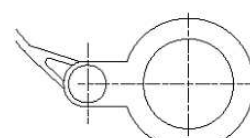
Receptacle Cap



Plug Cap end



Square flange receptacle cap end



Jam Nut receptacle cap end

■ Panel gasket for square flange receptacle

Thickness: 0,8 mm [.031]:

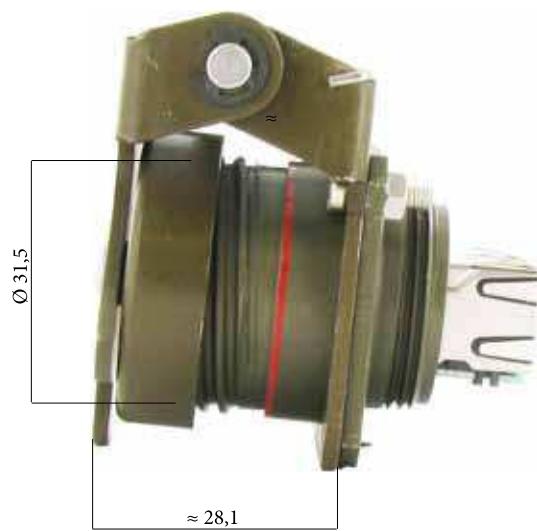
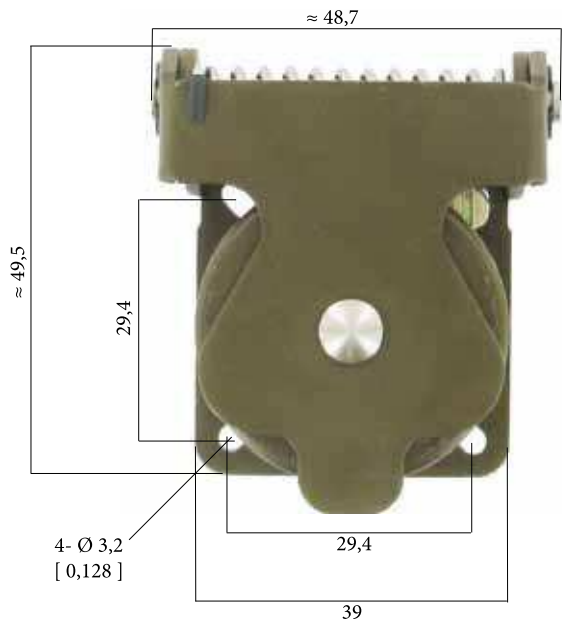
P/n: JE19



Metallic self closing cap (SCC)

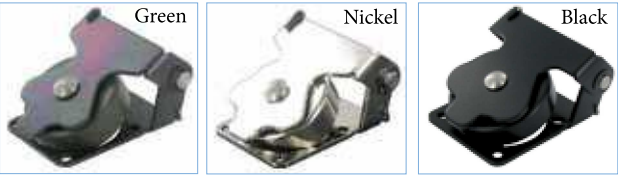
For RJFTV square flange receptacles.

This self closing cap automatically protects the RJF TV square flange receptacle (MIL-DTL-38999 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.



IMPORTANT NOTE

Metal self closing cap are sold separately (without receptacle).

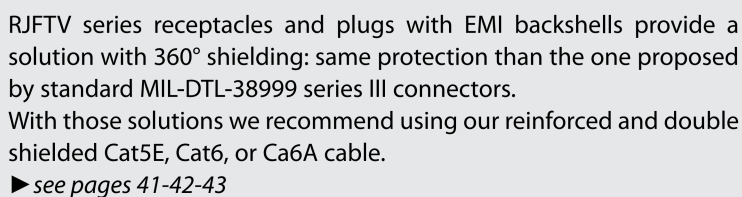


Sealing level IP67

Part number	Plating	Part number
	Black coating - ROHS compliant	RJF TV SCC B
	Nickel - ROHS compliant	RJF TV SCC N
	Olive drab cadmium	RJFTV SCC G

Remark: compatible with RJFTV square flange receptacle type RJFTV2xxx only (see page 26).

Receptacles & plugs with 360° EMI backshells



Technical drawing of the RJ45 connector assembly. The side view shows the cable with dimensions: 22,99 [,905] for the cable length, 33,2 [1,309] for the connector body length, and 36,53 [1,438] for the total length. The front view shows the RJ45 port with dimensions: 29,36 [1,156] for the port width and 29,36 [1,156] for the port height. The cable is labeled RJ45 SFTP Ø7 CABLE. The front view also shows the panel dimensions: Ø3,25 [,128] for the panel hole diameter and Ø32,94 [1,297] for the panel outer diameter.

Technical drawing of the 1000 Base-T Ethernet connector showing side and front views with dimensions.

Side View Dimensions:

- Coaxial cable diameter: 2.8
- Coaxial cable length: 23
- Connector body length: 39.5
- Overall height: 42.4

Front View Dimensions:

- Overall width: 38.53
- Mounting hole diameter: 7.6
- Mounting hole spacing: 36
- Overall height: 42.4

Figure 1 illustrates the components of the RJ45 connector assembly. The components shown are:

- Receptacle body
- Backshell body
- Band
- Heat shrink sleeve
- RJ45 receptacle
- 2 metallized inserts

P/n: JE19

[illegible]30

Kit38204 and Kit40771 include:



IMPORTANT NOTE

With these receptacles, you will have to solder your own cable on the PCB. So the wire positions have to be defined according to your network.

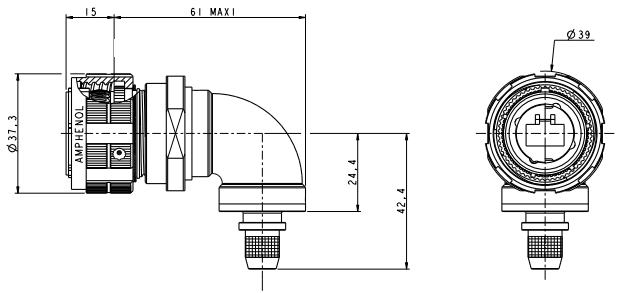
WIRE POSITION TO BE DEFINED BY CUSTOMER ACCORDING TO NETWORK

Plug - Straight backshell



Part number	Plating	P/N
	Nickel - ROHS compliant	Kit38081NI
	Olive drab cadmium	Kit38081
	Green zinc cobalt - ROHS compliant	Kit38081ZC
	Black zinc cobalt - ROHS compliant	Kit38081BZC

Plug - Right angle backshell



Part number	Plating	P/N
	Nickel - ROHS compliant	Kit40792NI
	Olive drab cadmium	Kit40792
	Green zinc cobalt - ROHS compliant	Kit40792ZC
	Black zinc cobalt - ROHS compliant	Kit40792BZC

Kit38081 and Kit40792 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.

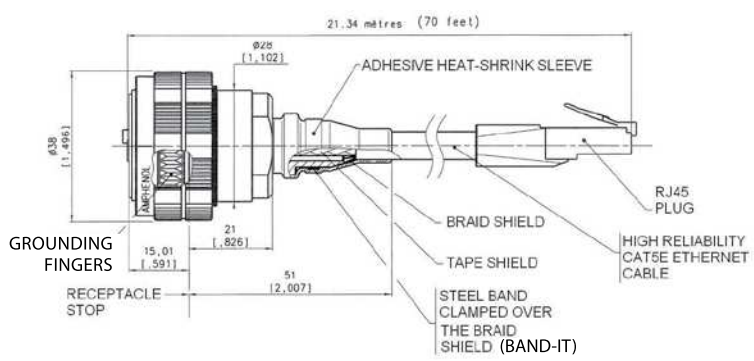
Remark: we advise using our double shielded, reinforced Cat5E, Cat6, or Cat6A cables (see pages 41-42-43) with these RJFTV series EMI connectors.

If customer wants to use his own cable, please check with us regarding compatibility with our backshells: 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...

Example of assembled cordset:

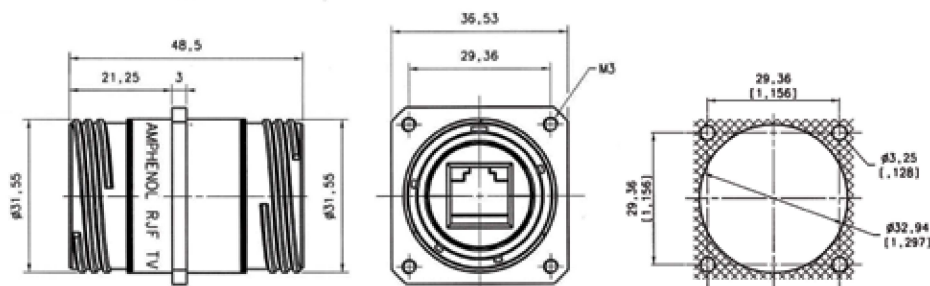


RJF TV

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 (IP68 when mated) inside and outside the equipment, and keeps the flexibility offered by panel mount and plug connectors. They can be connected with RJFTV series plugs.

Square flange receptacle



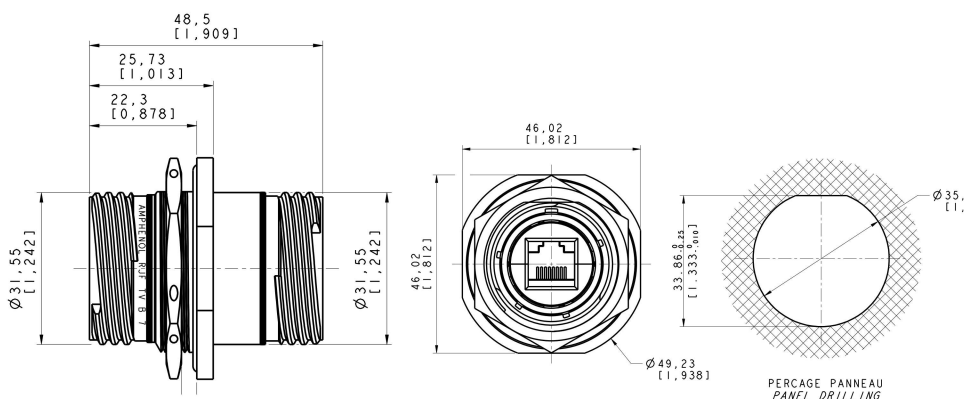
Part number	Plating	Metallized insert	For coding A
	Nickel - ROHS compliant	No	RJF TV B 2 N ISO BRUT *
	Nickel - ROHS compliant	Yes	RJF TV B 2 N ISO NI *
	Olive drab cadmium	No	RJF TV B 2 G ISO BRUT *
	Olive drab cadmium	Yes	RJF TV B 2 G ISO NI *

* ISO BRUT = non conductive insert
ISO NI = conductive insert

IMPORTANT NOTE

Possibility of other codings - Please consult us

Jam nut receptacle



Part number	Plating	Metallized insert	Part number
	Nickel - ROHS compliant	No	RJF TV B 7 N ISO BRUT *
	Nickel - ROHS compliant	Yes	RJF TV B 7 N ISO NI *
	Olive drab cadmium	No	RJF TV B 7 G ISO BRUT *
	Olive drab cadmium	Yes	RJF TV B 7 G ISO NI *

* ISO BRUT = non conductive insert
ISO NI = conductive insert

RJF TV

Stand off receptacles

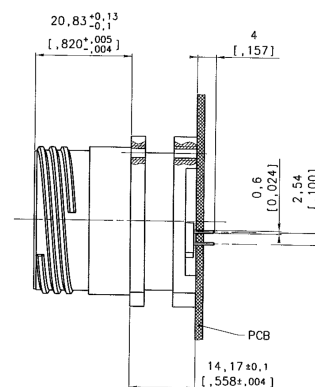
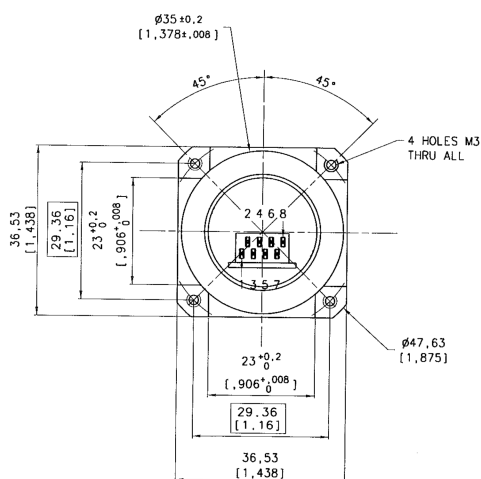
These receptacles can be sold directly to your PCB.

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.

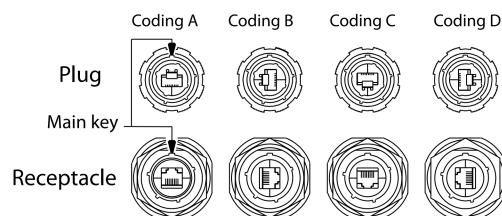
Square flange receptacle



Part number *	Plating available	Part number
	Nickel - ROHS compliant	RJF TV 2S X 5N F459
	Olive drab cadmium	RJF TV 2S X 5G F459

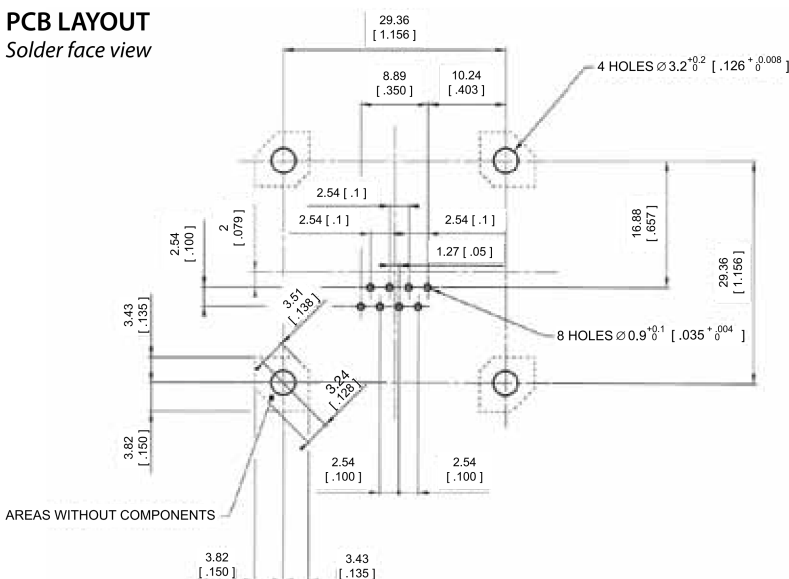
* new p/n - before it was RJFTV25GF459 or RJFTV25NF459

X to be replaced by the letter of the coding position you need (A, B, C, or D) ▶

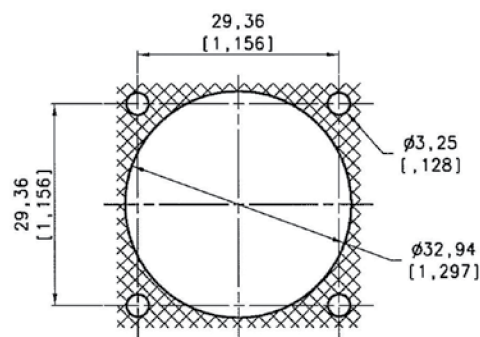


PCB LAYOUT

Solder face view

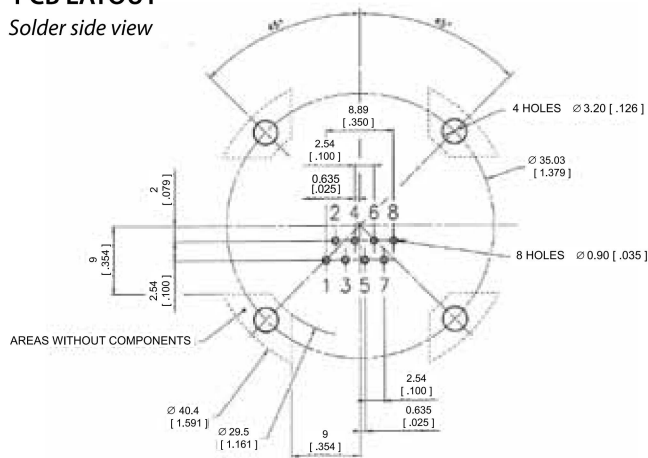


Panel drilling

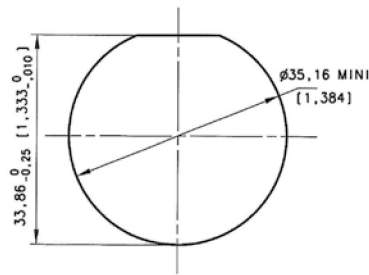


PCB LAYOUT

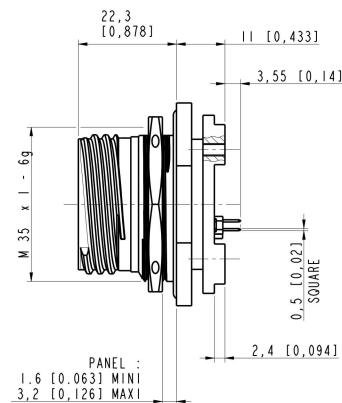
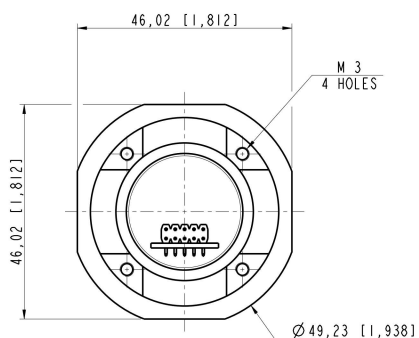
Solder side view



Panel Drilling



Now available with same distance between flange and PCB than the 38999 stand off one. So you can use a 38999 stand off and a RJ45 stand off in the same implementation.

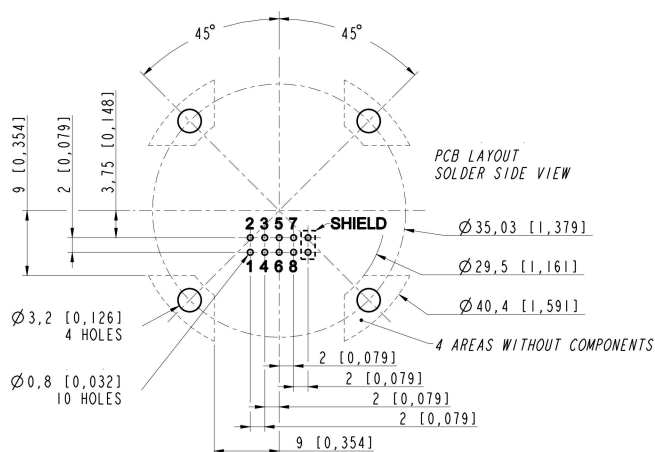


Part number: 36540

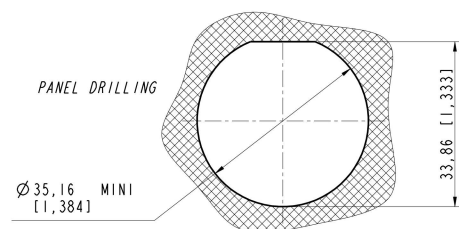
Jam nut receptacle, olive drab cadmium plating.

PCB LAYOUT

Solder side view



PANEL DRILLING



RJF TV

Transversally sealed receptacles



In some applications, a transversal sealing for the receptacle is a « must ». This will prevent fluids and dust from going through the receptacle when plug or cap are not mated to the receptacle. The sealed solution (version "S") has a compound at the rear of the receptacle as shown on the picture. The Sealed RJF TV has 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

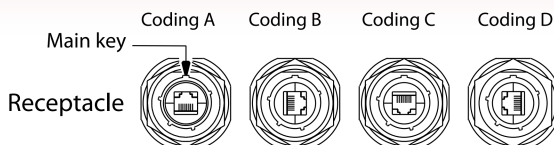
10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

Main characteristics

- Same as the RJF TV series.
- A complete IP68 sealing of the receptacle (even with no plug or no protective cap mated) is added.
- Outside dimensions are the same as the standard 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: **see below**.



Example :
RJFTV 2S A2 G 15 100BTX

Part number code

Series	RJF TV	7S	A	2	G	03 100BTX
RJFTV: MIL-DTL-38999 Series III						
Shell type						
2S: sealed square flange receptacle						
7S: sealed jam nut receptacle						
Coding						
A,B,C,D						
Back terminations (for receptacles only)						
1: female RJ45						
1RA: right angle female RJ45						
2: RJ45 Cordset						
Shell material & finish						
N: aluminium shell - nickel plating - ROHS compliant			BZC: aluminium shell - black zinc cobalt plating - ROHS compliant			
G: aluminium shell - olive drab cadmium plating			ZC: aluminium shell - green zinc cobalt plating - ROHS compliant			
BZ: marine bronze shell - ROHS compliant			ZN: aluminium shell - black zinc nickel plating - ROHS compliant			
Nota: receptacle inserts are metallized						
Cordset length (For Receptacles with "2" Back Termination only) - Other lengths are available on demand						
03 100 BTX: 0.3m [11.81 inches]						
05 100 BTX: 0.5m [19.68 inches]						
10 100 BTX: 1m [39.37 inches]						
15 100 BTX: 1.5m [59.05 inches]						
xx OPEN: open cable - with no plug at the end (xx to be replaced by the cordset length 03, 05, 10, or 15 - see above)						
Remark: cabling configuration: 100 BTX = 568B (Ethernet specification)						

Examples: - series III, sealed jam nut receptacle, A coding, with female RJ45 back termination, olive drab cadmium plating: **RJF TV 7SA 1 G**
- series III, sealed jam nut receptacle, A coding, 1.5m [59.05"] 100 BTX cordset, olive drab cadmium plating: **RJF TV 7SA 2 G15 100BTX**

RJF TV

Hermetic receptacles



In some applications, a transversal hermiticity for the receptacle is a « must ».

This will prevent gas from going through the receptacle when plug or cap are not mated to the receptacle.

The hermetic solution (version "H") has a compound at the rear of the receptacle as shown on the picture.

Helium leakage is less than 1.10^{-6} cm^3 per second [0.1 micron cubic ft per hour] at one bar [15 psi] pressure differential.

Applications

- Outdoor equipment
- Airplanes equipment
- Tactical radios
- Shelters
- Rugged computers
- Data acquisition and transmission in harsh environments

Data transmission

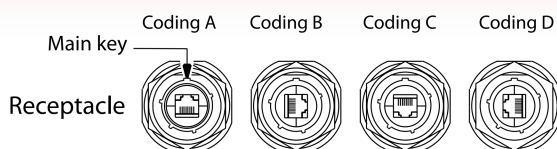
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Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

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- A complete IP68 sealing of the receptacle (even with no plug or no protective cap mated) is added.
- Outside dimensions are the same as the standard 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: **see below**.



Example :
RJFTV 2H A2 N 15 100BTX

Part number code

Series	RJF TV	7H	A	2	G	03 100BTX
RJFTV: MIL-DTL-38999 series III						
Shell type						
2H: transversally sealed and hermetic square flange receptacle						
7H: transversally sealed and hermetic jam nut receptacle						
Coding						
A,B,C,D						
Back terminations (for receptacles only)						
1: female RJ45						
1RA: right angle female RJ45						
2: RJ45 Cordset						
Shell material & finish						
N: aluminium shell - nickel plating - ROHS compliant			BZC: aluminium shell - black zinc cobalt plating - ROHS compliant			
G: aluminium shell - olive drab cadmium plating			ZC: aluminium shell - green zinc cobalt plating - ROHS compliant			
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Nota: receptacle inserts are metallized						
Cordset length (for receptacles with "2" back termination only) - Other lengths are available on demand						
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05 100 BTX: 0.5m [19.68 inches]						
10 100 BTX: 1m [39.37 inches]						
15 100 BTX: 1.5m [59.05 inches]						
xx OPEN: open cable - with no plug at the end (xx to be replaced by the cordset length 03, 05, 10, or 15 - see above)						
Remark: cabling configuration: 100 BTX = 568B (Ethernet specification)						

Examples:

- Series III, sealed jam nut receptacle, A coding, with female RJ45 Back termination, olive drab cadmium plating: **RJF TV 7HA 1 G**
- Series III, sealed jam nut receptacle, A coding, 1.5m [59.05"] 100 BTX cordset, olive drab cadmium plating : **RJF TV 7HA 2 G15 100BTX**



RJF TV

Special plug for big insulation wire up to 1.6 mm.



Special RJF TV plug dedicated to Ethernet cable with insulation wire from 1,1 to 1,6 mm.

Remark:

- compatible with any RJF TV receptacle
- for cables which are not compatible with standard RJ45 plug

Applications

- Robotics
- Industrial process control
- CNC machines
- Special machines
- Oil & Gas
- Motion control
- Data acquisition and transmission in harsh environment
- Tele-maintenance

Data transmission

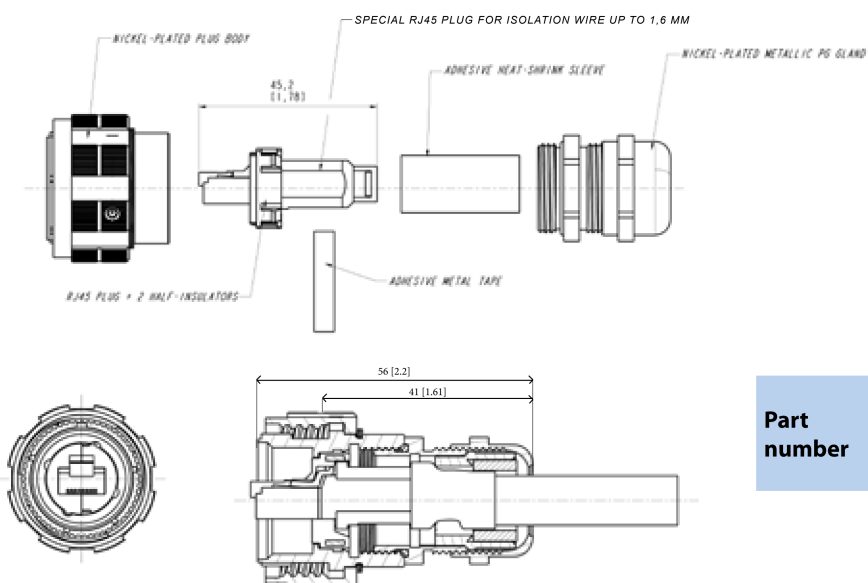
10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

Main characteristics

- Sealed against fluids and dusts (IP68)
- 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 - Shell size 19**
- **Robust metallic shells**
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min
- Compatible with cable diameter from 6 mm [0.236 in] to 13 mm [0.512 in], for smaller diameters please consult us

Environmental protection

- Sealing: IP68
- Salt spray: 48 h with nickel plating
> 96 h with black coating
> 500 h with olive drab cadmium
- Fire retardant/Low smoke: UL94 V0 and NF F 16 101 & 16 102
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 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
- Temperature range: - 40°C / +85°C



Part number

Plating	P/N
Nickel - ROHS compliant	35660
Olive drab cadmium	35660G