RJF TV

Ethernet Connection System for Harsh Environment

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!
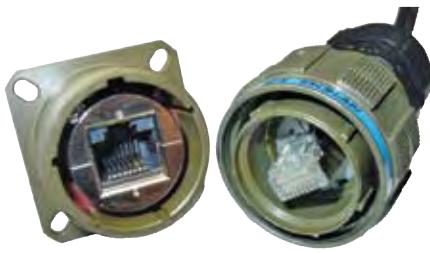
Applications

- 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

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**
- **Robust metallic shells**
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min
- Compatible with cable diameter from 5,5 mm [0.216 in] to 13 mm [0.512 in]

Environmental Protection

- Sealing: IP68
- Salt Spray: 48 h with Aluminium shell - Nickel plating
  > 500 h with Aluminium shell - Olive Dran 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

Part Number Code

Series RJ Field TV	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
2SA, 7SA:	Transversally sealed receptacle (unmated) see page 22

Back Terminations (Receptacles only)
1:	Female RJ45
1RA:	Right Angle Female RJ45
2:	RJ45 Cordset

Shells material & Finish
N:	Aluminium shell - nickel plating (receptacle inserts are metallized) - ROHS compliant
G:	Aluminium shell - olive drab cadmium plating (receptacle inserts are metallized)
BZ:	Marine bronze shell (receptacle inserts are metallized) - ROHS compliant

Cordset Length (type 2 back termination only)
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]
00:	8 tinned holes at the rear of the PCB to solder the cable

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

Amphenol — RJF TV

Plug:

■ Shell type 6 with Plastic or Metal Gland

56 [2.2]
41 [1.61]
Receptacle Stop
φ29.3 [1.15]
φ38 [1.5]

RJF TV 6 X
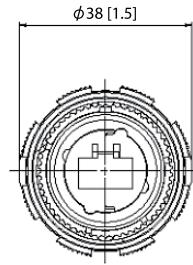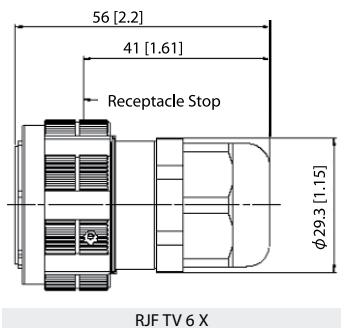
Receptacles:

■ Square flange receptacle • 4 mounting holes: Shell type 2

43.1 [1.696]
22.99 [.905]
20.83 [.820]
φ31.55 [1.242]
10.9 [.429]

22.99 [.905]
20.83 [.820]
φ31.55 [1.242]
10 [.394]
42.1 [1.659]

36.53 [1.438]
29.36 [1.156]
26.97 [1.062]
3.25 [.128]
4.93 [.194]

29.36 [1.156]
φ3.25 -0.25 0 [.118 -.128]
φ32.94 [1.297]
40.5 [1.594]
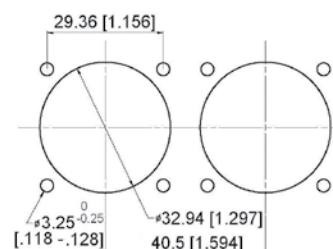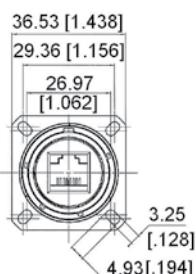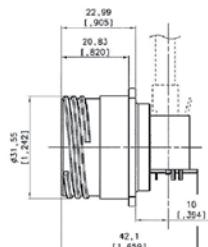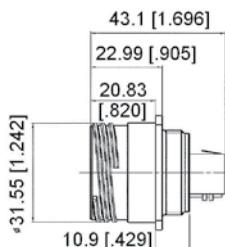
RJFTV 21 X (Straight Female RJ45)   RJFTV 21 RA X (Right Angle Female RJ45)   Panel Drilling

■ Jam nut receptacle • Hexagonal Nut mounting: Shell type 7

43.09 [1.696]
22.3 [.878]
φ31.55 [1.24]

22.3 [.878]
φ31.55 [1.242]
7,3 [.286]
42.1 [1.659]

[1.696]

39.6 [1.559]
Carré 46.02 [Square 1.812]
φ49.23 [1.938]

47 MINI [1.850 mini]
33.86 0 -0.25 [1.323 - 1.333]
φ35.16 MINI [1.384 mini]
47 [1.850] MINI
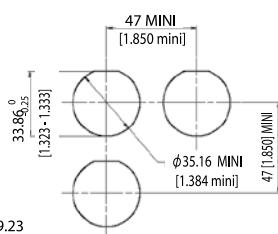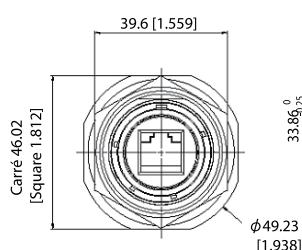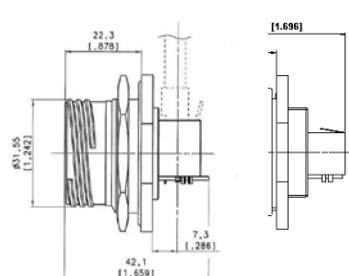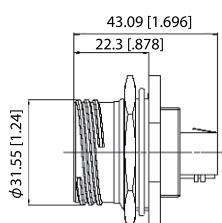
RJFTV 71 X (Straight Female RJ45)   RJFTV 71 RA X (Right Angle Female RJ45)   Panel Drilling

■ Receptacles with IP68 backshell: • Shell type 2PE and 7PE with Plastic or Metal Gland

92 [3.622]
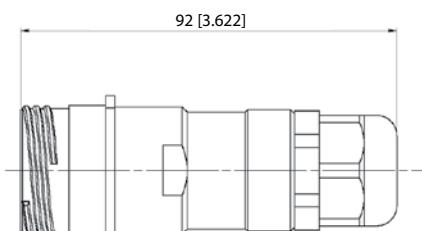
RJF TV 2PE/2PEM/7PE/7PEM

Back Terminations
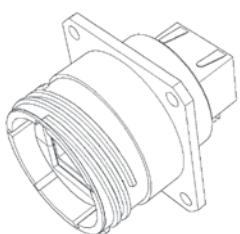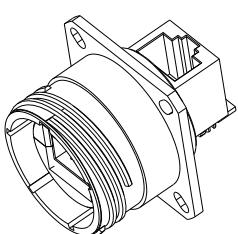
Type 1: Female RJ45   Type 1RA: Right Angle Female RJ45   Type 2: RJ45 Cordset   Type 2 - 00: Solder - 8 tinned holes
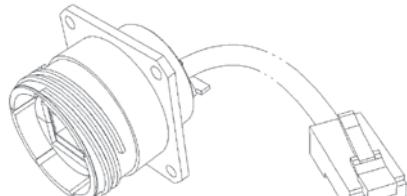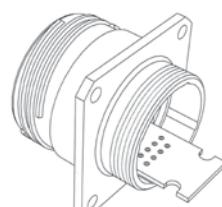
Notes   Type 2 without RJ45 plug at the end of the cable is also available: consult factory

Insert Codings

CONNECTION SIDE VIEW

"CLIC"!

"CLIC"!

"CLIC"!

ASSEMBLY + CODING

ASSEMBLY + CODING

INSERTS CODING
CONNECTION SIDE VIEW

CODE A	CODE B	CODE C	CODE D

PLUG

MAIN KEY
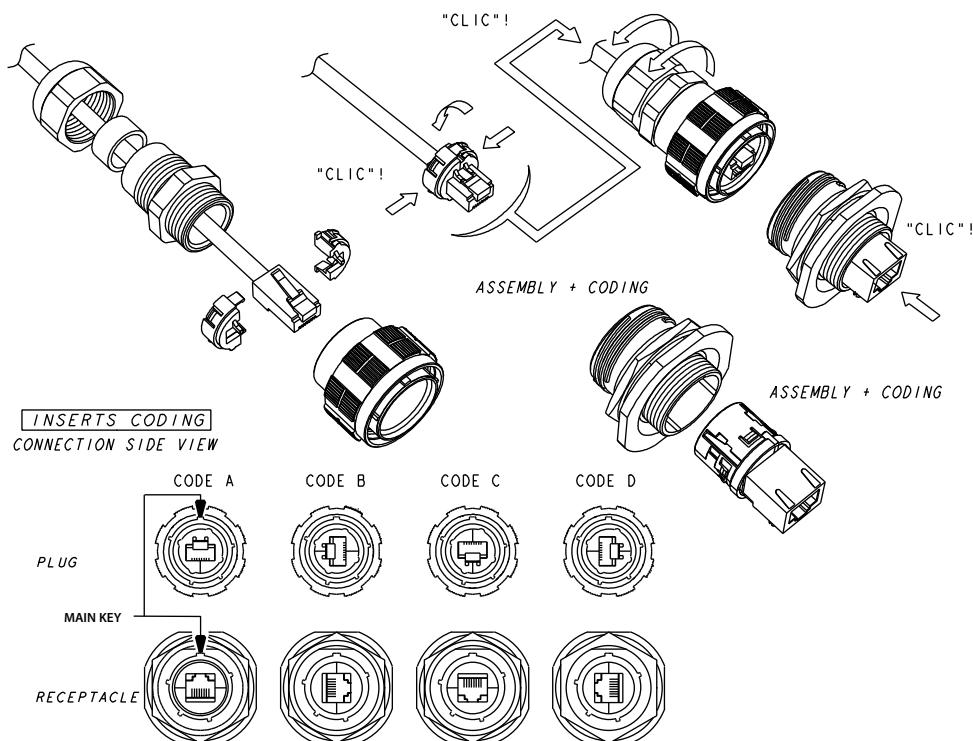
RECEPTACLE

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			
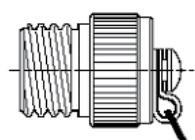
Plug Cap
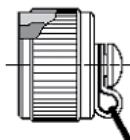
Receptacle Cap
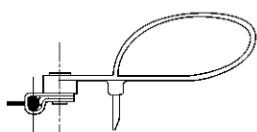
Plug Cap end
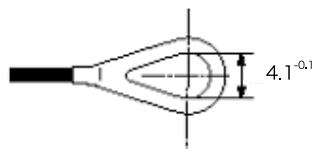
Square flange receptacle cap end

$4.1^{-0.1}$
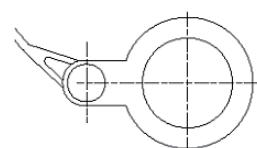
Jam Nut receptacle cap end

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

■ **Insert removal tool: RJF ODE**

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RJF TV

RJF TV
Self Closing Cap (SCC Series)

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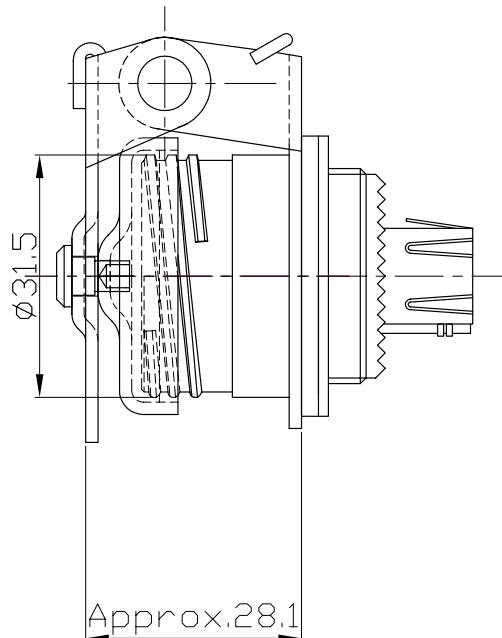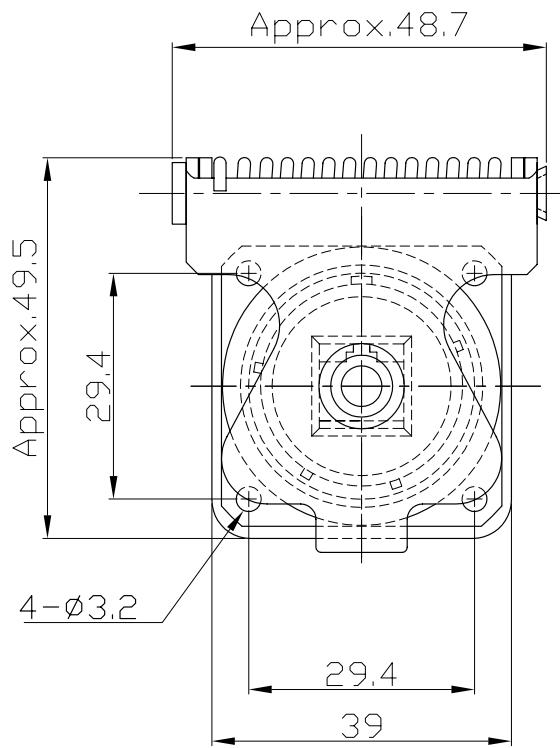
■ **Panel Gasket for square flange receptacle**
(Thickness: 0,8 mm [.031]):

PART NUMBER: JE19

PART NUMBER:

Self closing cap only: **RJFTVSCC**

Remark: Compatible only with RJFTV square flange receptacle type: RJFTV**2**XXX (see page 14)

Amphenol

RJFTV

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

Square Flange Receptacle *Straight Backshell*

22,99 [.905]
51,2 [2,017]
33,2 [1,309]
36,53 [1,438]
RJF SFTP ø7 CABLE
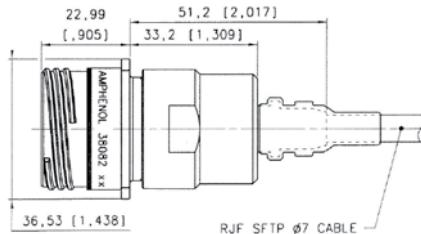
PART NUMBERS:
Olive Drab Cadmium Plating: **Kit38082**
Nickel Plating: **Kit38082NI**

Square Flange Receptacle *Right Angle Backshell*

2,8
36,53
29,36 [1,156]
29,36 [1,156]
ø3,25 [.128]
ø32,94 [1,297]
42,4
23
39,5
53
29,36
26,97
42,4
60,67

Panel Drilling
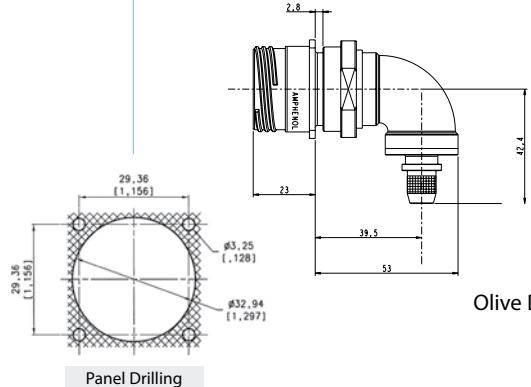
PART NUMBERS:
Olive Drab Cadmium Plating: **Kit40791**
Nickel Plating: **Kit40791NI**

Kit38082, Kit38082NI, Kit 40791 & Kit 40791NI include:

RECEPTACLE BODY — 2 METALLIZED INSERTS — BACKSHELL BODY — HEAT-SHRINK SLEEVE
RJ45 RECEPTACLE
BAND
GASKET
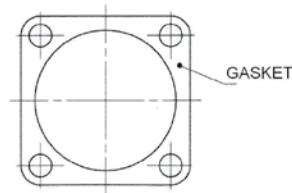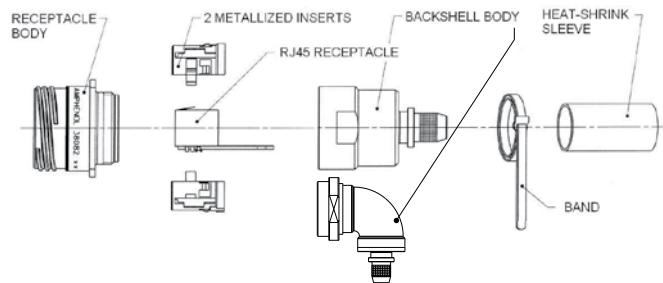
Jam Nut Receptacle *Straight Backshell*

22,3 [.878]
51,9 [2,044]
33,9 [1,336]
46,02 [1,812]
RJF SFTP ø7 CABLE
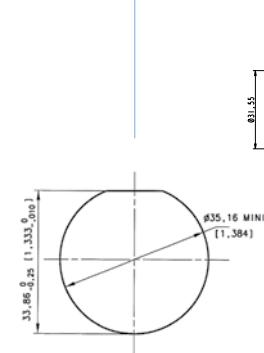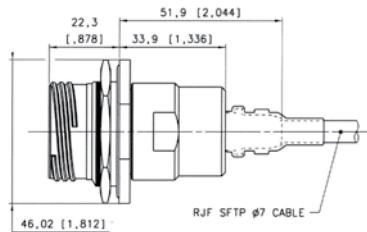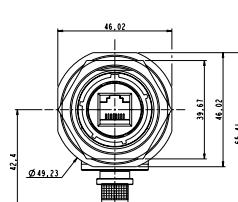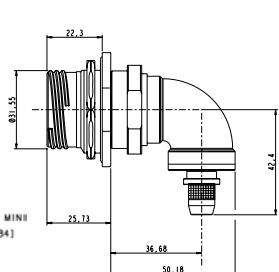
**PART NUMBERS:**
Olive Drab Cadmium Plating: **Kit38204**
Nickel Plating: **Kit38204NI**

Jam Nut Receptacle *Right Angle Backshell*

22,3
ø31,55
46,02
ø35,16 MINI [1,384]
33,86 -0,25 [1,333 -.010]
42,4
25,73
36,68
50,18
39,67
46,02
65,41
42,4
ø49,23

Panel Drilling

PART NUMBERS:
Olive Drab Cadmium Plating: **Kit40771**
Nickel Plating: **Kit40771NI**

Kit38204, Kit38204NI, Kit 40771 & Kit 40771NI include:

PANEL O-RING — RECEPTACLE BODY — 2 METALLIZED INSERTS — BACKSHELL BODY — HEAT-SHRINK SLEEVE
RJ45 RECEPTACLE
PANEL NUT
BAND

RJFTV - 360° shielded

Amphenol
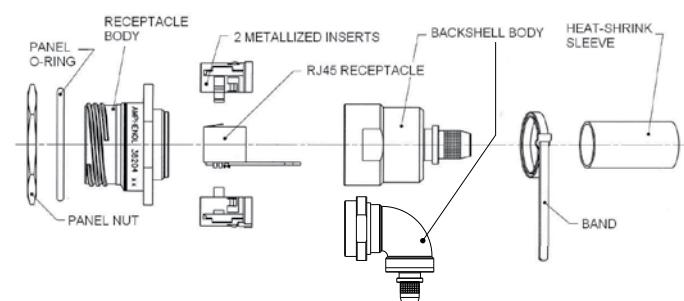
IMPORTANT NOTE

With these receptacles, customer will have to solder his own cable on the PCB. So the wire positions have to be defined by the customer according to his network.
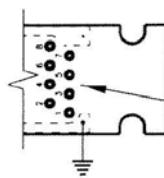
WIRE POSITION
TO BE DEFINED
BY CUSTOMER
ACCORDING TO NETWORK

Plug *Straight Backshell*

Grounding Ring

RJF SFTP ⌀7 CABLE

⌀28 [1,102]
⌀38 [1,496]
15,01 [,591]
39 [1,535]
RECEPTACLE STOP
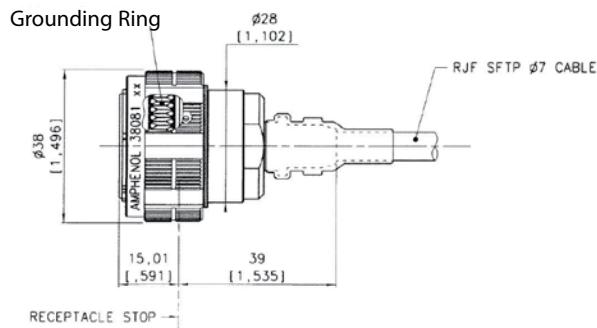
PART NUMBERS:
Olive Drab Cadmium Plating: **Kit38081**
Nickel Plating: **Kit38081NI**

### Plug *Right Angle Backshell*

15   61 MAXI
⌀37,3
⌀39
24,4
42,4
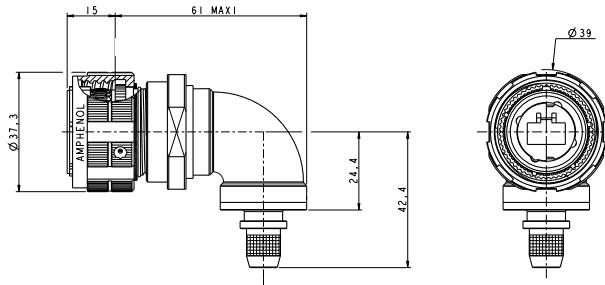
PART NUMBERS:
Olive Drab Cadmium Plating: **Kit40792**
Nickel Plating: **Kit40792NI**

Kit38081, Kit38081NI, Kit40792 & Kit40792NI include:

PLUG BODY   2 INSERTS   BACKSHELL BODY   HEAT-SHRINK SLEEVE

BAND-IT
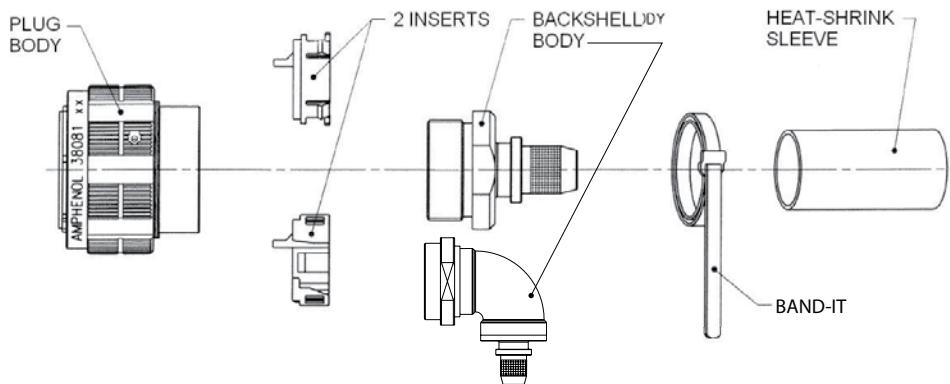
IMPORTANT NOTE

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 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…

21.34 mètres (70 feet)
⌀28 [1,102]
ADHESIVE HEAT-SHRINK SLEEVE
⌀38 [1,496]
GROUNDING FINGERS
21 [,826]
15,01 [,591]
51 [2,007]
RECEPTACLE STOP
BRAID SHIELD
TAPE SHIELD
STEEL BAND CLAMPED OVER THE BRAID SHIELD (BAND-IT)
RJ45 PLUG
HIGH RELIABILITY CAT5E ETHERNET CABLE

RJFTV - 360° shielded

Amphenol
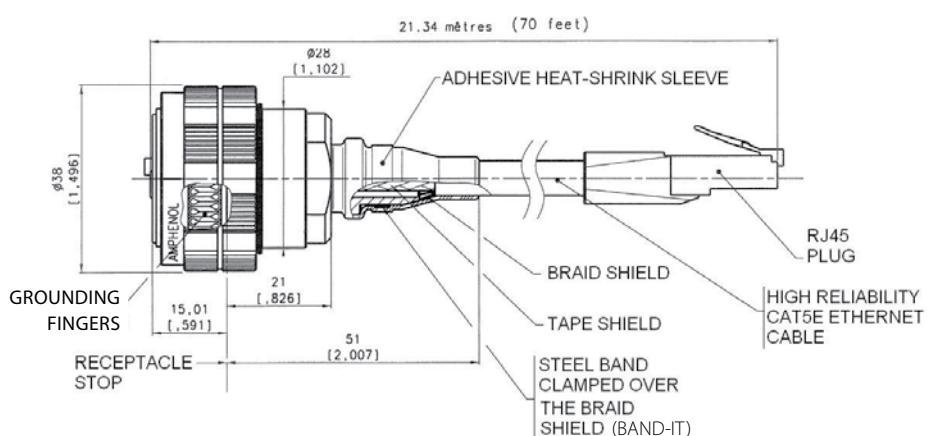
RJFTV

Through Bulkhead – Stand-off receptacles

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) inside and outside the equipement, and keeps the flexibility offered by panel mount and plug connectors.
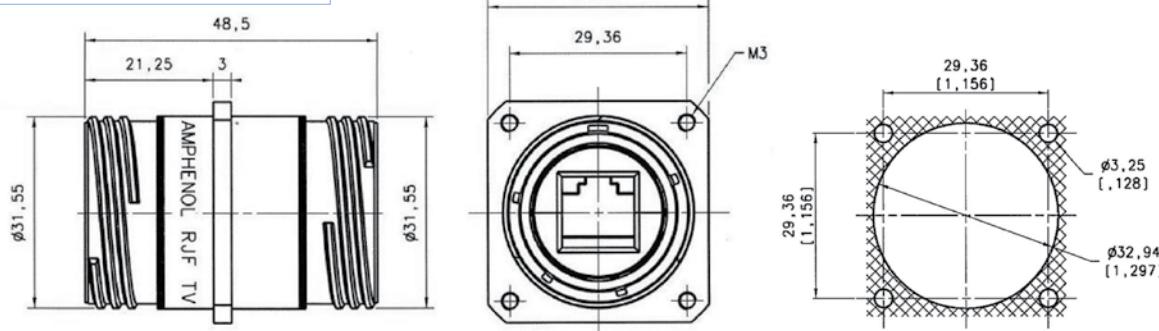
PART NUMBERS:

Nickel plating – Non metallized inserts: **RJFTVB2N ISO BRUT**   Olive Drab Cadmium plating – Non metallized inserts: **RJFTVB2G ISO BRUT**
Nickel plating – Metallized inserts: **RJFTVB2N ISO NI**   Olive Drab Cadmium plating – Metallized inserts: **RJFTVB2G ISO NI**

Stand-off receptacles

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

Square Flange Receptacle
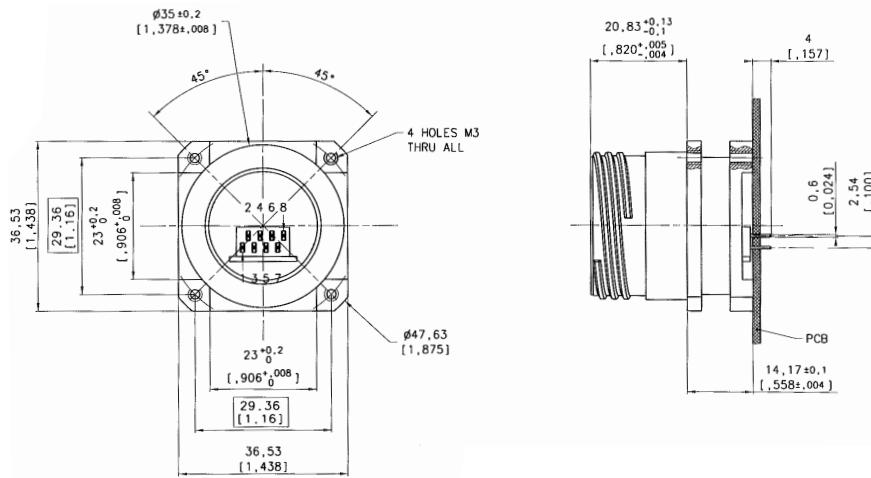
PART NUMBERS:
Olive Drab Cadmium Plating: **RJFTV25GF459**
Nickel Plating: **RJFTV25NF459**

PCB LAYOUT
Solder face view

29,36 [1.156]

8,89 [.350]   10,24 [.403]

4 HOLES Ø3.2$^{+0.2}_{0}$ [.126$^{+.008}_{0}$]

2.54 [.1]
2.54 [.1]   2.54 [.1]
1.27 [.05]

16,88 [.657]

29,36 [1.156]

2.54 [.100]
2 [.079]

3.43 [.135]
3.51 [.138]

3.24 [.128]

8 HOLES Ø0.9$^{+0.1}_{0}$ [.035$^{+.004}_{0}$]

3.82 [.150]

2.54 [.100]   2.54 [.100]

AREAS WITHOUT COMPONENTS

3.82 [.150]   3.43 [.135]

Panel Drilling

29,36 [1,156]

29,36 [1,156]

Ø3,25 [,128]

Ø32,94 [1,297]

Panel Drilling

Jam Nut Receptacle

Ø40,4 ± 0,15 [1.591 ± 0.006]
Ø35,03 [1.379]
Ø29,5 ± 0,15 [1.161 ± 0.006]

45°   45°

4 HOLES M3 THRU ALL

46,02 ON FLATS [1.812]

18 $^{+0.2}_{0}$ [.709 $^{+.008}_{0}$]

2 4 6 8
3 5 7

18 $^{+0.2}_{0}$ [.709 $^{+.008}_{0}$]

Ø49,23 [1.938]

46,02 [1.812]

22,3 $^{+0,13}_{-0,1}$ [.878 $^{+.005}_{-.004}$]

4 [.157]

M 35 x 1-6g

0,6 [0,024]
2,54 [.100]

PCB

PANEL : 1,6 MINI   3,6 MAXI [.063]   [.126]

12,7 ±0,1 [.500±.004]

PART NUMBERS:
Olive Drab Cadmium Plating: **RJFTV75GF459** - Nickel Plating: **RJFTV75NF459**

PCB LAYOUT
Solder face view

45°   45°

8,89 [.350]

4 HOLES Ø 3.20 [.126]

2.54 [.100]
0.635 [.025]

Ø 35.03 [1.379]

2 [.079]

2 4 6 8
1 3 5 7

8 HOLES Ø 0.90 [.035]

9 [.354]
2.54 [.100]

AREAS WITHOUT COMPONENTS

Ø 40,4 [1.591]
Ø 29,5 [1.161]

2.54 [.100]
0.635 [.025]

9 [.354]

Panel Drilling

33,86 $^{0}_{-0,25}$ [1.333 $^{0}_{-.010}$]

Ø35,16 MINI [1,384]

Panel Drilling

RJF/RJF TV

Environmentaly Sealed Receptacles, Transversally sealed receptacles

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 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

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.

MAIN CHARACTERISTICS
- Same as the RJF and 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 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.

CODE A   CODE B   CODE C   CODE D

PLUG

MAIN KEY

RECEPTACLE

RJFTV 7S A 2G 15 100BTX

Part Number Code

Series		RJF TV	7S	A	2	G	03 100BTX
RJF:	MIL-DTL-26482 H bayonet						
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							
B:	Aluminium shell - black coating *(Only available for RJF Series)* - ROHS compliant						
N:	Aluminium shell - nickel plating - ROHS compliant *(note: receptacle inserts are metallized)*						
G:	Aluminium shell - olive drab cadmium plating *(note: receptacle inserts are metallized)*						
BZ:	Marine bronze shell *(only available for RJFTV) (receptacle inserts are metallized)* - ROHS compliant						
Cordset Length *(For Receptacles with "2" Back Termination only)*							
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]						

Remark: Cabling configuration: 100 BTX = 568B (Ethernet specification)

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

Amphenol

RJF/RJF TV

RJF/RJF TV
Hermetic receptacles

HERMETIC RECEPTACLE 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 examples below. This feature is available both in RJF and RJF TV shells (please consult the relevant data sheet for product details and accessories). 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
10 BaseT, 100 BaseTX and 1000 BaseT networks Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

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.

MAIN CHARACTERISTICS
- Same as the RJF and 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 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.

CODE A   CODE B   CODE C   CODE D

PLUG

MAIN KEY

RECEPTACLE

RJFTV 7 H 2G 15 100BTX

Part Number Code

Series		RJF TV	7H	A	2	G	03 100BTX
RJF:	MIL-DTL-26482 H bayonet						
RJFTV:	MIL-C-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							
B:	Aluminium shell - black coating *(Only available for RJF Series)* - ROHS compliant						
N:	Aluminium shell - nickel plating - ROHS compliant *(note: receptacle inserts are metallized)*						
G:	Aluminium shell - olive drab cadmium plating *(note: receptacle inserts are metallized)*						
BZ:	Marine bronze shell *(only available for RJFTV)* *(receptacle inserts are metallized)* - ROHS compliant						
Cordset Length *(For Receptacles with "2" Back Termination only)*							
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]						

Remark: Cabling configuration: 100 BTX = 568B (Ethernet specification)

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

RJF/RJF TV

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