# RJFTVX, USBFTVX, RJ11FTVX

## RJ45,USB, RJ11/12 explosion proof solutions for Zone 2

Amphenol Atex Field Bus range is designed for device group II category 3G. According to EN60079-15 it may be operated within zone 2 and class I, Division 2, as low power non sparking connectors.

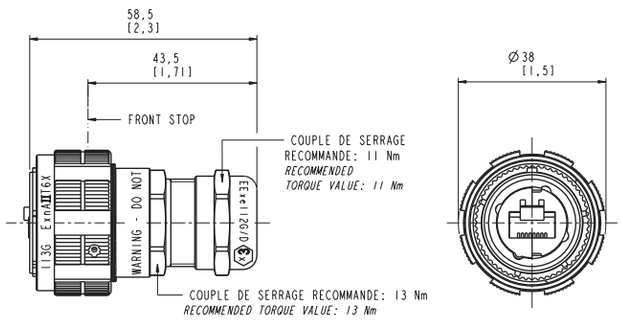
## RJFTVX • Rugged and sealed RJ45 connector

RJFTVX allows you to use an Ethernet Class D / Cat. 5e connection for 10 BaseT, 100 BaseTx or 1000 BaseT networks in ATEX zone 2 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. RJFTVX features the same main characteristics than RJFTV series (see page 14)

### CHARACTERISTICS

| | |
|---|---|
| Ex marking | II3G ExnAIIT6 X |
| Operating temperature range | -40°C / +60°C |
| Voltage | 60 Veff max |
| Power | 20 W max |
| Outside cable diameter | 6mm to 12mm |
| Sealing | IP68 |
| Data transmission | 10 BaseT, 100 BaseTX & 1000 BaseT networks. Cat. 5e per TIA/EIA 568B & Class D per ISO/IEC 11801 |

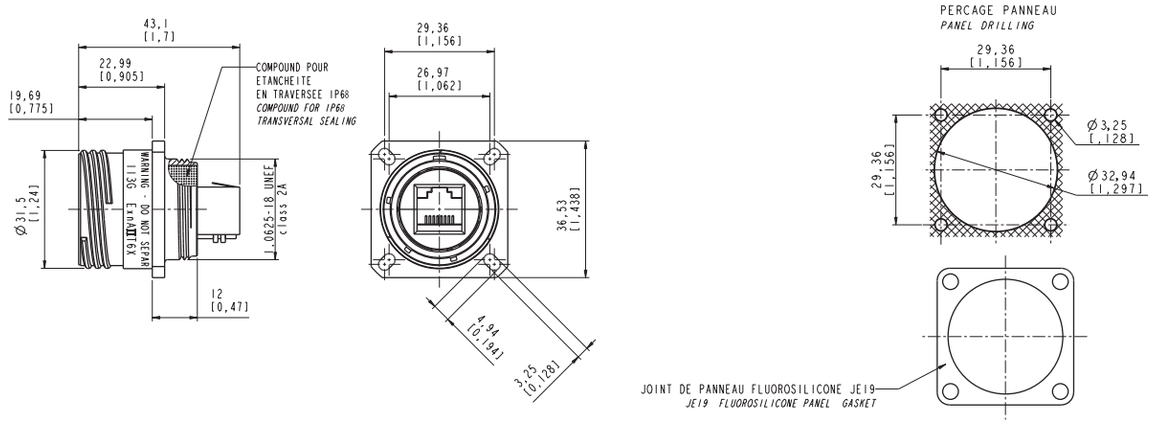
### RJFTVX6 PLUG




**PART NUMBERS:**

Nickel Plated plug: **RJFTVX6MN**
Olive drab cadmium plug**: RJFTVX6MG**
IP68 metallic cap: **RJFTVC6N**
IP68 metallic cap: **RJFTVC6G**

### RJFTVX2 receptacle




**PART NUMBERS:**

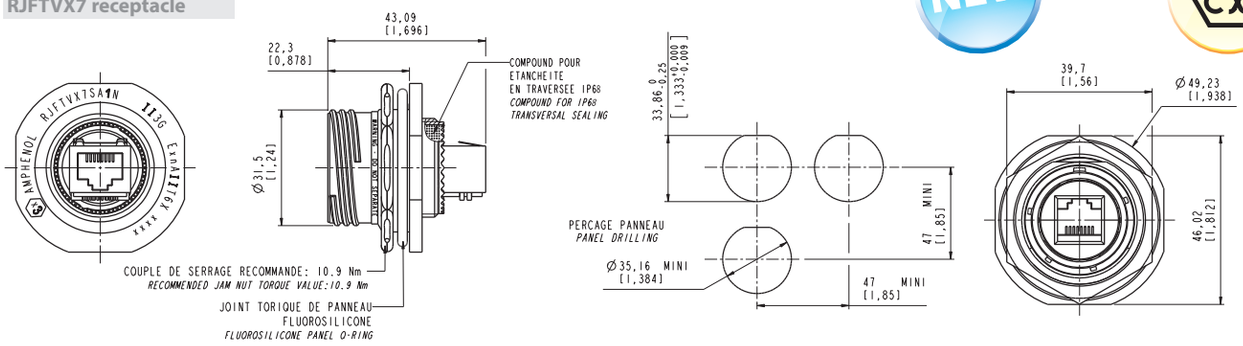
RECEPTACLE

Nickel Plated • RJ45 back termination • coding A-: **RJFTVX2SA1N**
Olive drab cadmium • RJ45 back termination • coding A: **RJFTVX2SA1G**

RECEPTACLE CAP

Nickel: **RJFTVC2N**
Olive drab cadmium: **RJFTVC2G**

## RJFTVX7 receptacle




**PART NUMBERS:**

RECEPTACLE

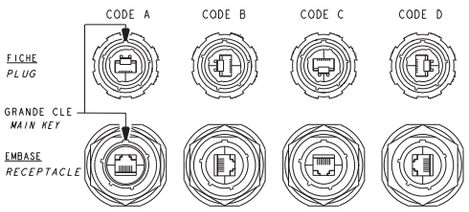
Nickel Plated • RJ45 back termination • coding A-: **RJFTVX7SA1N**

Olive drab cadmium • RJ45 back termination • coding A: **RJFTVX7SA1G**

RECEPTACLE CAP

IP68 metallic cap: **RJFTVC7N**

IP68 metallic cap: **RJFTVC7G**




**REMARK:** As receptacles are compounded (IP68 transversally sealing), coding position has to be specified in the part number: "A" (standard), "B", "C" or "D".

**Receptacles can be provided with RJ45 cordsets.**
**There are 4 standard lengths as described hereunder *(with coding "A")*:**

Nickel plated / 0,3 meters RJ45 cordsets: RJFTVX2SA2**N**03100BTX

Nickel plated / 0,5 meters RJ45 cordsets: RJFTVX2SA2**N**05100BTX

Nickel plated / 1,0 meters RJ45 cordsets: RJFTVX2SA2**N**10100BTX

Nickel plated / 1,5 meters RJ45 cordsets: RJFTVX2SA2**N**15100BTX

For Olive Drab Cadmium plating replace the "N" with a "G" in the P/N.

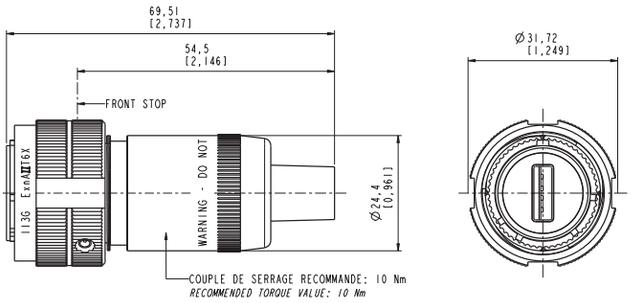
## USBFTVX • Rugged and sealed USB connector

With USBFTVX, you can insert a standard USB 2.0 cordset into a metallic plug which will protect it from shocks, dust and fluids. This range is fitted to be used in Atex zone 2 environments 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. USBFTVX features the same main characteristics than USBFTV series (see page 25)

### CHARACTERISTICS

| | |
|---|---|
| Ex marking | II3G ExnAIIT6 X |
| Operating temperature range | -40°C / +70°C |
| Voltage | 60 Veff max |
| Power | 20 W max |
| Outside cable diameter | 4mm to 6mm |
| Sealing | IP68 |
| Data transmission | USB 2.0 up to 480 Mb/s |

### USBFTVX6 PLUG




**PART NUMBERS:**

PLUG

Nickel: **USBFTVX6N**

Olive drab cadmium: **USBFTVX6G**

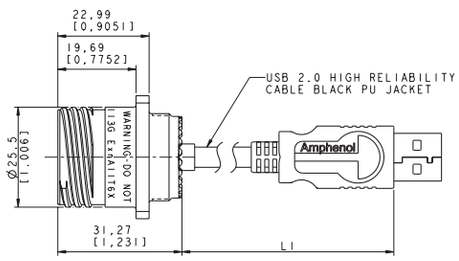
PLUG CAP

Nickel: **USBFTVC6N**

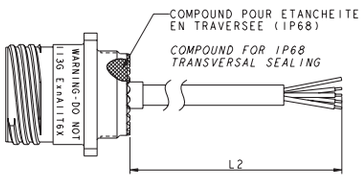
Olive drab cadmium: **USBFTVC6G**

## USBTVX2 & USBTVX2 receptacles

### Square Flange Receptacle Type USBFTV2

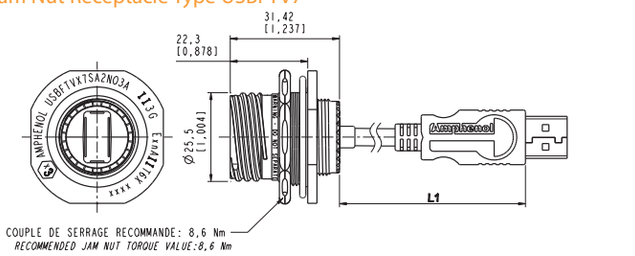



Cable end Type "A" (Standard USB "A" Plug)

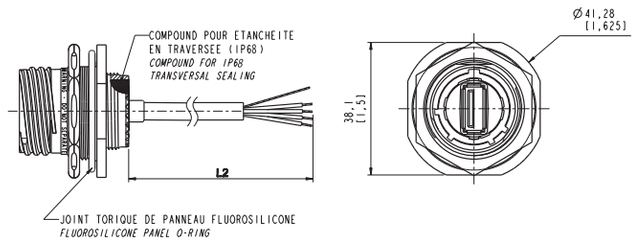



Cable end Type "OPEN" (No connector)

### Jam Nut Receptacle Type USBFTV7




Cable end Type "A" (Standard USB "A" Plug)




Cable end Type "OPEN" (No connector)

**RECEPTACLE CAPS PART NUMBERS:**

Nickel plated cap for USBFTVX2: **USBFTVC2N**
Nickel plated cap for USBFTVX7: **USBFTVC7N**

Olive drab cadmium cap for USBFTVX2: **USBFTVC2G**
Olive drab cadmium cap for USBFTVX7: **USBFTVC7G**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Series**<br>**USB Field TV** | **USBF TVX** | **2S** | **A** | **2** | **N** | **03** | **A** |
| **Shell Type**<br>**2S :** Square flange receptacle **7S:** Jam nut receptacle | | | | | | | |
| **Coding**<br>**"A" (Standard) or "B"** | | | | | | | |
| **Back Terminations**<br>**2:** Rugged USB cable | | | | | | | |
| **Shells Plating**<br>**N:** Nickel **G:** Olive drab cadmium plating | | | | | | | |
| **USB cable length**<br>**03:** 30 cm [11.81 inches] **05:** 50 cm [19.68 inches] **10:** 1 meter [39.37 inches] | | | | | | | |
| **USB cable end**<br>**A:** Standard USB-A plug **OPEN:** Open cable (no connector) | | | | | | | |

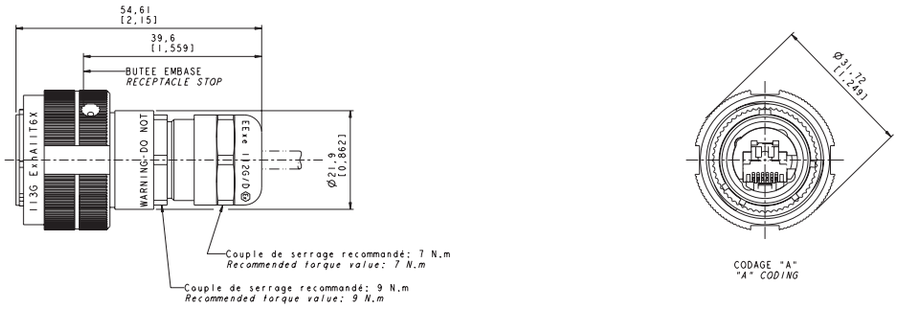
## RJ11FTVX • Rugged and sealed RJ11/12 connector

RJ11FTVX allows you to use a standard phone RJ11 / RJ12 connection in Atex zone 2 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.

### CHARACTERISTICS

| | |
|---|---|
| Ex marking | II3G ExnAIIT6 X |
| Operating temperature range | -40°C / +60°C |
| Voltage | 60 Veff max |
| Power | 20 W max |
| Outside cable diameter | 4mm to 5.5mm |
| Sealing | IP68 |
| Coupling mechanism | Tri Start thread with anti-decoupling device (MIL-DTL-38999 series III) |
| Mating cycles | 500 min |
| Salt spray | 48h with nickel plating / 500 h with oliv drab cadmium plating |
| Coding | 4 mechanical user-defined coding / Polarization settings (insert rotation) |
| Fire retardant / Low Smoke | UL94 V0 and NF16 101 & 16 102 |
| R11 cordset retention in the plug | 100 N in the Axis |

## RJ11FTVX6 PLUG




**PART NUMBERS:**

PLUG

Nickel plated: **RJF11TVX6MN**

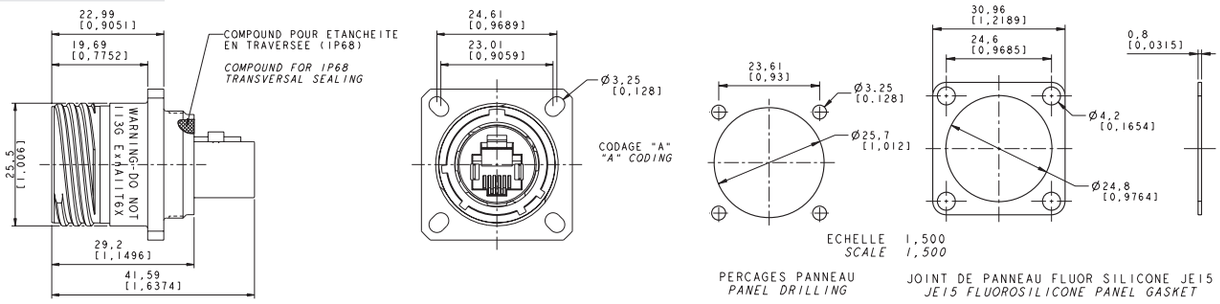
Olive drab cadmium: **RJ11FTVX6MG**

CAP

Nickel plated: **RJ11FTVC6N**

Olive drab cadmium: **RJ11FTVC6G**

## RJ11FTVX2




**PART NUMBERS:**

RECEPTACLE

Nickel Plated - Female RJ45 back termination – coding A-: **RJ11FTVX2SA1N**

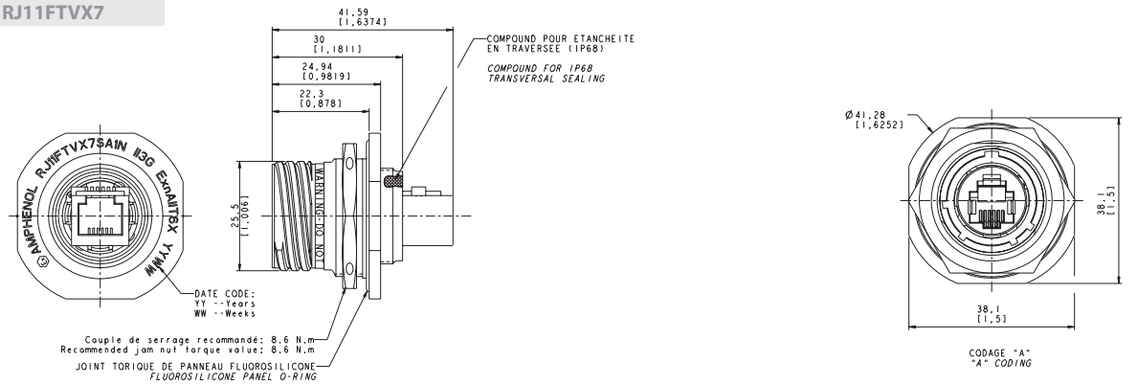
Olive drab cadmium - Female RJ45 back termination – coding A: **RJ11FTVX2SA1G**

RECEPTACLE CAP

Nickel plated: **RJ11FTVC2N**

Olive drab cadmium: **RJ11FTVC2G**

## RJ11FTVX7




**PART NUMBERS:**

RECEPTACLE

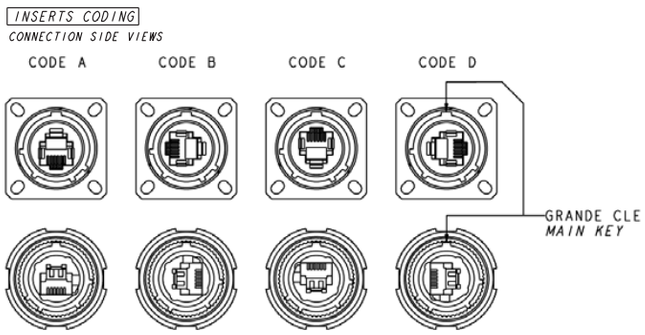
Nickel Plated - Female RJ45 back termination - coding A-: **RJ11FTVX7SA1N**

Olive drab cadmium - Female RJ45 back termination - coding A: **RJ11FTVX7SA1G**

RECEPTACLE CAP

Nickel: **RJ11FTVC7N**

Olive drab cadmium: **R11JFTVC7G**

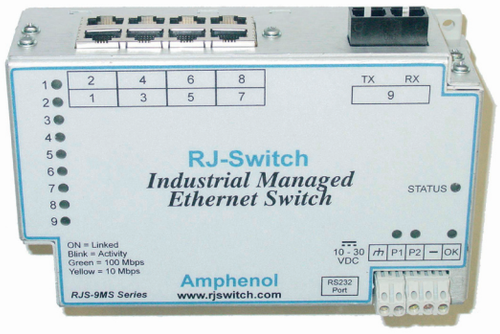



**REMARK:**

As receptacles are compounded (IP68 transversally sealing), coding position has to be specified in the part number: "A" (standard), "B", "C" or "D".

# RJ SWITCH

## Industrial Gigabit Ethernet Switch IP30




### Applications

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

### 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.

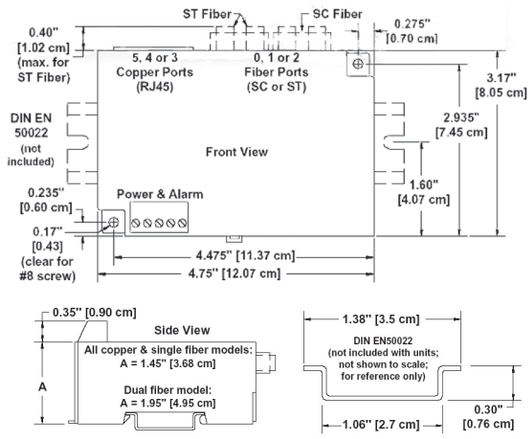
This wide range of Ethernet switches is available with following features:

- Unmanaged, Real-Time Ring and Managed models
- RJ45 ports and up to two fiber optics ports (mutlimode or singlemode)
- 5 or 9 port models
- **Up to 3 Gigabit ports are offered**

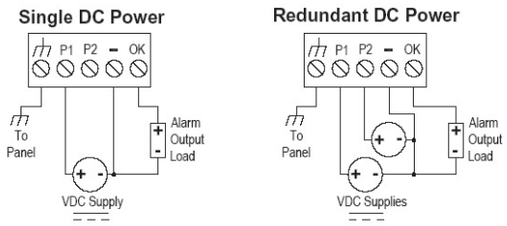
### KEY FEATURES

- 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
  - 3 ports 10/100/1000 - BaseT(X) (*)
- 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
  - 3 ports 10/100/1000 - BaseT(X) (*)

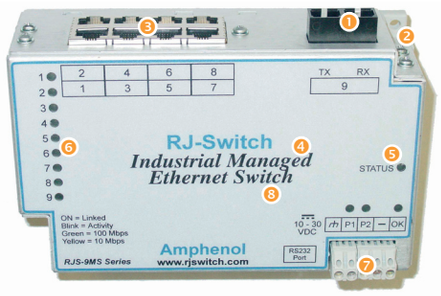
## Dimensions *(example for 5 Port Ring Models)*




## Power and alarm wiring




## Description




1. SC or ST fiber connector (1, 2 or none)
2. DIN-Rail or Panel Mounting Fixture
3. 5 or 9 connectors (RJ45, SC or ST fiber)
4. Unmanaged, Ring or Managed Capability
5. Indicators for Power, Alarm Output Status
6. Indicators for Link Status and Datarate
   - 10 Mbps
   - 100 Mbps
   - 1000 Mbps
7. Terminal block for Redundant Power Inputs + Alarm Output
8. IP30 Iridized Aluminum Enclosure





(*) depend on models

## MANAGED, RING & UNMANAGED SWITCH FEATURES

### IEEE Ethernet Standards

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

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

### 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<br>EN 60079-15 (Zone 2 locations - EEx nA II T4 x) |

### Ethernet features

| | |
|---|---|
| RJ45 ports | 5 or 9 Shielded RJ45 ports 10/100 or 1000 BaseT(x) |
| Fiber optic ports | LC or SC or ST connectors<br>Datarate 100BaseFX *(100Mbps) or 1000 Mbps for 9RG & 9MG models*<br>Wavelength 1300 nm center<br>Fiber multimode (mm) optimal: 62.5/125 um<br>Fiber singlemode (sm) optimal: 9/125 um<br>Fiber max distance *(Full duplex)*: 2km *(mm)*, 15 or 40 km *(sm) (except gigabit)*<br>*0,5km (mm), 10km (sm) for 9RG & 9MG models* |
| Ethernet switch type | Intelligent store & forward |
| Full / Half Duplex | Configurable |
| RJ45 speed | 10, 100 or 1000 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)*<br>5 us + frame time @ 100 Mbps |
| MAC addresses supported | 8192 (MG & RG); 2048 for all other models |
| Memory bandwidth | 32 Gbps (MG & RG); 3.2 Gbps for all other models |

### Environmental

| | |
|---|---|
| Operating Temperature | - 40°C to +85°C *(5 ports model + RJS 9ES)*<br>- 40°C to +70°C *(All other models)* |
| Storage Temperature | - 40°C to +85°C |
| Humidity (non-condensing) | 5 to 95 % RH |

**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)*<br>250 V *(50 times for 100 µs)* |

### Status *Ring & Managed models only*

| | |
|---|---|
| "OK" contact output<br>*(or 10 - 50V DC depends on models)* | 10 – 30V DC<br>Maximum current 0.5 A |

### Power Supply

| | |
|---|---|
| Input Power *(depends on models)* | 2 W to 9W typical, all ports active at 100 Mbps |
| Redundant Inputs | 10 - 50V DC *(models RJS-5RS ; RJS-9RS)*<br>10 - 30V DC *(all other models)* |

## Part Number Code

| Series | RJS | 5ES | 1 | - | - |
|---|---|---|---|---|---|
| **RJ-Switch** | | | | | |
| **Type of Electronics** | | | | | |
| **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 | | | | | |
| **RJ45 or fiber ports** | | | | | |
| **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) | | | | | |
| **Style of Fiber connectors** | | | | | |
| **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 | | | | | |
| **Pre-set for Ring models only** | | | | | |
| **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-5RS-2-ST-E1**

| Series | RJS | 9RG | CC |
|---|---|---|---|
| **RJ-Switch** | | | |
| **Type of Electronics** | | | |
| **9RG:** 9 ports, Unmanaged RING Ethernet Switch including 3 gigabit ports | | | |
| **9MG:** 9 ports, Managed Ethernet Switch including 3 gigabit ports | | | |
| **RJ45 or fiber (FO) ports** | | | |
| **CC:** 6 ports RJ45 100 Mbps + 3 gigabit RJ45 ports | | | |
| **MM:** 6 ports RJ45 100 Mbps + 1 port gigabit RJ45 + 2 ports FO multimode gigabit (LC connectors) | | | |
| **SS:** 6 ports RJ45 100 Mbps + 1 port gigabit RJ45 + 2 ports FO multimode gigabit (LC connectors) | | | |

**Note:** 9RG models have ports 8&9 (FO or gigabit RJ45) pre-set for a ring.

# ATEX ZONE 2 RUGGED & IP68 SEALED ETHERNET SWITCH

This Ethernet Switch is a combination of rugged packaging with locking device for Zone 2 hazardous location, with fault-tolerant network redundancy.

## Outstanding features :

- IP65/68 Sealing
- ATEX Zone 2II3G ExnAII T4X *(EN60079-15 & EN60079-0)*
- Plug and Play simplicity
- Ring redundancy
- Operating temperature: -40°F to 170°F *(-40°C to +75°C)*

## Industrial Applications

- Oil & Gas
- Process Control
- Factory Automation

P/N: RJSPC-EX-5ES1-PLG-CAPS

**Note: this part number includes:**

- One ATEX Zone 2 IP68 Plug and Play Ethernet switch equipped with caps on Ethernet connectors
- One power plug equipped with anti decoupling nut
- Five Ethernet plugs equipped with anti decoupling spring

P/N: RJSPC-EX-5RS1-PLG-CAPS

**Note: this part number includes:**

- One ATEX Zone 2 IP68 RING Ethernet switch equipped with caps on Ethernet connectors
- One power plug equipped with anti decoupling nut
- Five Ethernet plugs equipped with anti decoupling spring

## Key Features

- 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

## Description (example for Ring model)

- Waterproof IP68 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 (models RJSPC-EX)

1. LEDs indicating activity, link status, datarate (10/100 Mbps)
2. LED indicating ring status
3. 5 rugged IP68 RJ Field Ethernet ports
4. Real-time ring feature
5. IP68 polyester enclosure reinforced with glass fiber
6. OK power & ring status
7. LEDs indicating power
8. Anti-decoupling nut for power plug
9. Anti-decoupling spring for ethernet plugs