

INTRODUCTION

This document explains how to install ABB OVR Surge Protective Devices (SPDs) for twisted pair data communication/signal/telephone lines and RTD installations:

OVR 06Q, OVR 15Q, OVR 30Q, OVR 50Q, OVR 110Q, OVR TNQ, OVR RS485Q, OVR RTDQ

1. Safety note:



Warning! Installation by person with electrotechnical expertise only.

Warnung! Installation nur durch elektrotechnische Fachkraft.

Avvertenza! Fare installare solo da un elettricista qualificato.

Avertissement! Installation uniquement par des personnes qualifiées en électricité.

Advertencia! La instalación deberá ser realizada únicamente por electricistas especializados.

2. Before installation

2.1 Check that the voltage drop caused by the resistance of the unit does not interfere with the normal operation of the system.

Line Resistance	
OVR 06Q, OVR 15Q OVR 30Q, OVR 50Q, OVR 110Q, OVR RS485Q, OVR RTDQ	1.0 Ω
OVR TNQ	4.3 Ω

2.2 Be sure that the SPD's bandwidth will not restrict the system bandwidth.

	Bandwidth (-3 dB)
OVR 06Q, OVR 15Q, OVR 30Q, OVR 50Q, OVR 110Q, OVR RS485Q	45 MHz
OVR TNQ	20.0 MHz
OVR RTDQ	800.0 kHz

2.3 Ensure that the current passing through the SPD does not exceed:

	Maximum curent
OVR 06Q, OVR 15Q OVR 30Q, OVR 50Q, OVR 110Q	750 mA DC or AC RMS
OVR RTDQ	700 mA DC or AC RMS
OVR TNQ, OVR RS485Q	300 mA DC or AC RMS

2.4 Make sure that the system's maximum line voltage (DC or AC) will never exceed the maximum working voltage of the SPD. Otherwise the SPD will clamp signal voltages as though they were transient overvoltages.

	Nominal Working Voltage	Maximum DC Working Voltage	Maximum AC Working Voltage
OVR 06Q	6 V	7.78 V	5 V
OVR 15Q	15 V	18.8 V	13 V
OVR 30Q	30 V	37.8 V	26 V
OVR 50Q	50 V	57.8 V	41 V
OVR 110Q	110 V	132 V	93 V
OVR TNQ	-	296 V	-
OVR RS485Q	15 V	16.7 V	11 V
OVR RTDQ	6 V	7.78 V	5 V

3. Installation

3.1 Series connection

ABB OVR SPDs are connected in series with the data communication, signal, measurement, or telephone line.

Figure 1: Series connection for OVR 06Q, OVR 15Q, OVR 30Q, OVR 50Q, OVR 110Q, OVR RS485Q or OVR TNQ.



Figure 2: Series connection for OVR RTDQ.



The dirty, or line side of the SPD should be connected to the cable carrying the incoming transient overvoltages.

The output or clean side of the SPD ensures a transient free signal to the equipment being protected (see Figures 1 and 2).

The screw terminals should be tightened between 0.3-0.5 Nm (do not exceed 0.5 Nm). Cable stripping length is 8 mm.

Note: Do NOT use power driven screwdrivers to make connections to the OVR SPD. Hand tighten only.

3.2 SPD location

SPDs are usually located either:
(a) near to where the lines requiring protection enter or leave the building, or
(b) close to the equipment being protected (or actually within its control panel)

Either way, it is important that the SPD's connection to earth (or SPD earth bond) is kept short (see Section 3.7 - Earthing).

3.3 Enclose the SPD

SPDs should be installed within a panel or enclosure.

The SPD should be ideally installed within an existing cabinet/cubicle or in an enclosure to the required IP rating.

Suitable enclosures are available from ABB, such as OVR WBX SLQ.

SPDs should always be installed in a dry environment.

3.4 Fixing methods

OVR Q Series SPDs have two mounting options.

(a) Flat mounting

Fixing holes through the SPD enable it to be screwed to flat surfaces (see Figure 3).

(b) DIN rail mounting

The SPD has a built-in DIN rail clip for mounting to 'top hat' or G DIN rails (see Figure 4)

3.5 Line, clean, screen and earth connections

Cable wires should be terminated with a boot lace ferrule.

The line end of the SPD should be connected to the dirty, incoming cable.



Figure 3: Flat mounting.

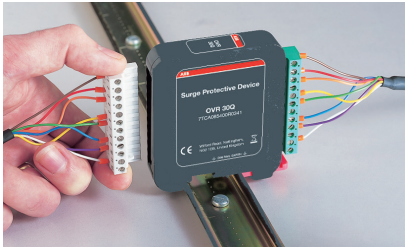


Figure 4: Mounting on top hat DIN rail.

The clean end of the SPD should be connected to the cable going to the equipment.

Cable screens (terminals labelled 'S') are isolated from earth (except on OVR TNQ and RTDQ where they are directly bonded) and are only connected to earth briefly during a surge event (see Section 3.7 for earthing the unit).

The connections for each of the four twisted pair lines (three 3-wire lines with the OVR RTDQ) are labelled on the unit (see Figures 5(a) & 5(b), overleaf).

For further information on the OVR RTDQ contact ABB for Application Note OVR AN001.

Hand tighten connections - do not use power driven screwdrivers.

3.6 Keep clean cables away from dirty cables

Cables connected to the SPD's clean end should never be routed next to dirty line cables or dirty SPD earth bonds (see Figure 6, overleaf).

If rows of SPDs are installed close to each other, dirty line cables & earth bonds must be kept at least 5 cm apart from clean cables (See Figure 7, overleaf). ... continued overleaf

Note: When using the DIN rail mounting option in conjunction with a base plate (ie DIN rail not directly bonded on to the cabinet chassis) ensure the earth bond to the base plate (or DIN rail itself) is kept clear of the clean cables.

3.7 Earthing

Protectors for mains power supplies and SPDs for data/signal/ measurement/ telephone lines should be connected to the same earth point.

The SPD should therefore be bonded to the main electrical earth or earth star point.

The SPD must be connected to earth, either:

- (a) through installation on a ‘top hat’ or G DIN rail (which in turn is connected to earth), or
- (b) by connecting a crimped earth cable to the SPD via the M5 threaded hole in the unit (see Figure 3)

The best way to ensure a good earth connection when using a DIN rail is to mount the DIN rail in a metal cabinet.

The entire length of the DIN rail should be in contact with the metal of the cabinet (if the cabinet is painted this should be removed where the rail is to be mounted to give a good electrical connection).

The DIN rail should then be bonded to the cabinet at its mounting points and the chassis of the cabinet bonded to the main electrical earth or earth star point.

Alternatively if a non-metal housing is used the DIN rail should be bonded to a metal base plate. The base plate should then be bonded to the earth star point.

The following guidelines refer to non-DIN rail earthing and the earthing of DIN rail base plates.

The SPD or base plate earth bond should be less than 1 metre long (otherwise the effectiveness of the SPD will be reduced). 10 mm² stranded green/yellow cable should be used for this bond.

- SPD or base plate earth bonds of 2, 3 or 4 metres are allowed if:
- 2, 3 or 4 parallel earth bonds are used and
 - these parallel earth bonds are kept at least 5 cm apart from each other

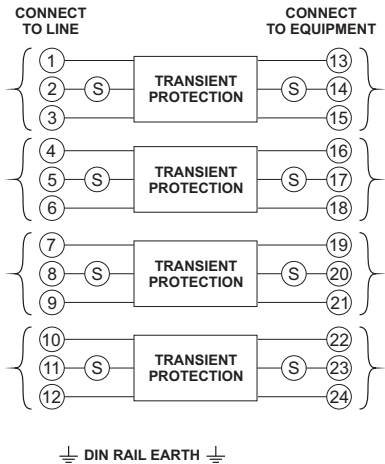


Figure 5(a): Series connection for OVR 06Q, OVR 15Q, OVR 30Q, OVR 50Q, OVR 110Q, OVR RS485Q or OVR TNQ.

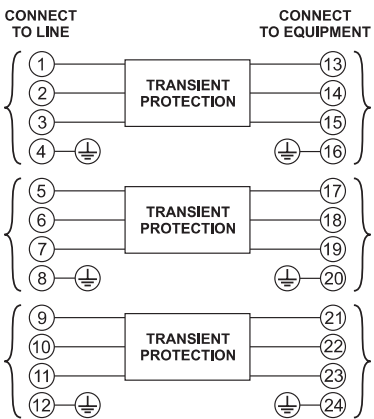


Figure 5(b): Series connection for OVR RTDQ.

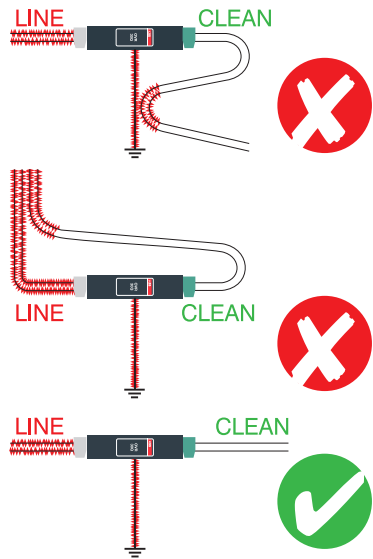


Figure 6: Cable routing

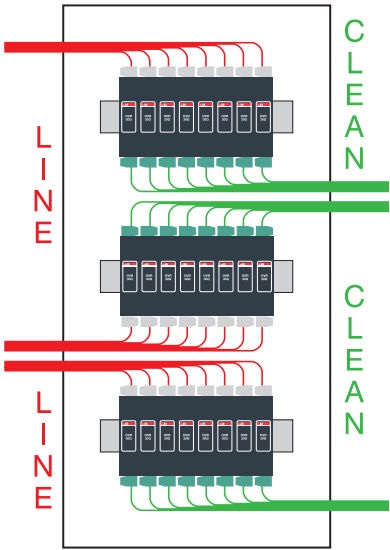


Figure 7: Positioning of adjacent rows of SPDs.

Where even 4 metres of connecting lead is not sufficient, the incoming line should be re-routed to bring it within 4 metres of the earth.

If the line cannot be re-routed the SPD can, as a last resort, be connected to the electrical earth local to the equipment being protected (eg the earth bar of the local power distribution board) (see Figure 8).

Environment
Consider the protection of the environment!
Used electrical and electronic equipment must NOT be disposed of with domestic waste. The device contains valuable raw materials which can be recycled. Therefore, contact ABB for disposal of this equipment.

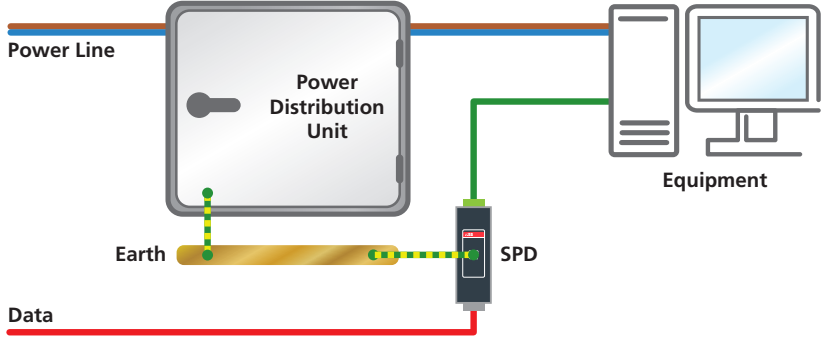
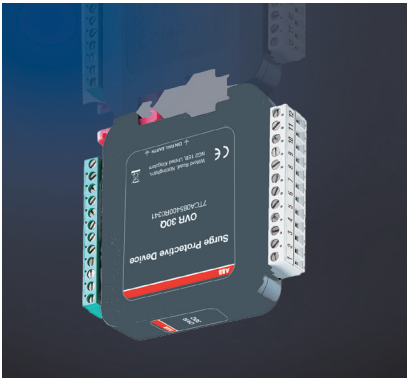


Figure 8: If connection to the main electrical earth is not possible, the SPD can be connected to the earth local to the protected equipment.



For Q Series Surge Protective Devices
OVR 06Q, OVR 15Q, OVR 30Q, OVR 50Q, OVR 110Q, OVR TNQ, OVR RS485Q & OVR RTDQ

INSTALLATION INSTRUCTIONS



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