

**IMPORTANT:** Please read these instructions carefully. Whilst straightforward, the installation of these devices is critical to their performance. Installation must be performed by a suitably qualified person in accordance with applicable standards.

## 1. Introduction

- 1.1** These user instructions apply to the Novaris intrinsically safe range of slimline signal line protectors.

### Cat No. (module only):

IS-SL7v5	IS-SL-iSwitch	IS-SL420i
IS-SL18	IS-SL-485	IS-SSP6A-14
IS-SL36	IS-SL-DH	IS-SSP6A-26
IS-SL-PSTN	IS-SL-RTD	IS-SSP6A-38

### Cat No. (base only):

IS-SLDIN-G	IS-SLDIN-EC90
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- 1.2** These products are multistage signal line protectors that protect against the effects of lightning induced surges and other transient overvoltages. They provide both common-mode and transverse-mode protection, which is essential for the effective protection of any system.

- 1.3** These products are intrinsically safe (IS) approved. Therefore, the plug-in modules must only be used with a corresponding IS approved base and visa-versa.

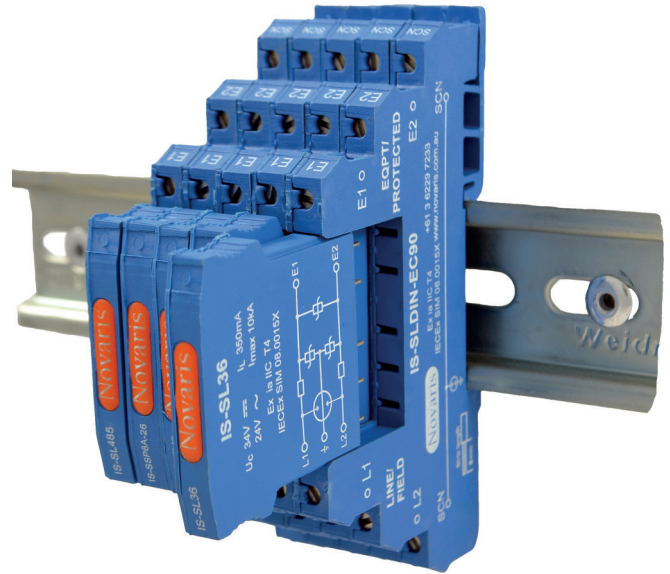


Figure 1: Novaris Slimline signal line protectors

## 2. Before Installation

- 2.1** Ensure that the maximum operating voltage of the signal line does not exceed the clamping voltage of the signal line protector as described in the specifications.
- 2.2** Ensure that the operating current of the signal line does not exceed the maximum load rating as described in the specifications.
- 2.3** If isolation between the earth terminals and the DIN rail is required, yet must be connected during a transient overvoltage, use the IS-SLDIN-EC90 base. If total isolation is required use the IS-SLDIN-I base.

- 2.4** Turn the power off before beginning the installation.

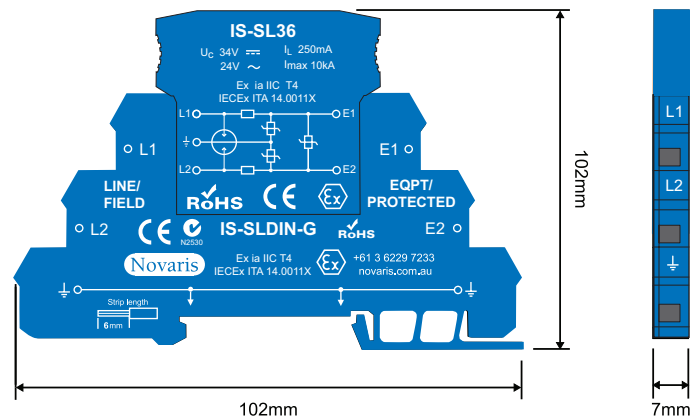


Figure 2: Dimensions of Slimline signal line protectors

## 3. Installation

- 3.1 Point of Connection:** The surge protector should be connected at the closest practical point to the equipment to be protected.
- 3.2 Mounting:** Slimline signal line protectors are most easily and effectively mounted on DIN rail using their integral clip. This also provides an excellent earth connection (provided the DIN rail is properly earthed).

If the unit is to be positioned in an exposed environment it should be mounted in an enclosure. Suitable polycarbonate enclosures are available from Novaris.

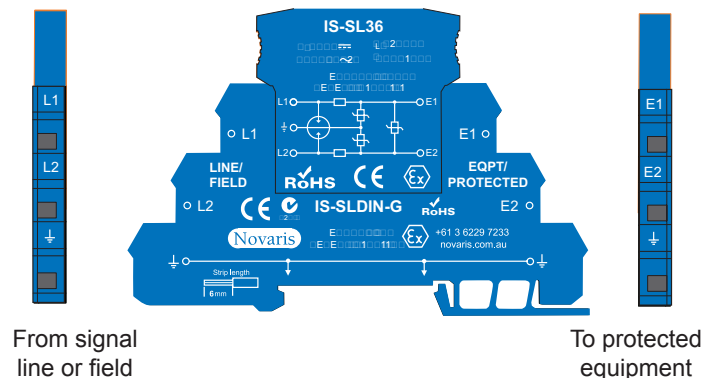


Figure 3: Signal line protectors are connected in series

**3.3 Isolation:** The signal wiring to the Novaris surge protection device must be galvanically isolated using a suitable safety barrier. An example of appropriate connection to an safety barrier is given in figure 6.

**3.4 Wiring:** Incorrect installation of surge protection devices (SPDs) can render them ineffective. The Novaris slimline signal line protectors connect in line (Figure 3). These should be located as close as possible to the equipment requiring protection.

**3.5 Earthing:** Earthing is important. Normally the DIN rail provides a low impedance earth connection to the frame. Where connection to a separate earth bar is required, wire this from the LINE/FIELD earth connection. Choose the most suitable base configuration to suit your application.

Figure 4 shows an incorrect wiring scheme where the transient voltage developed across the earth lead inductance directly adds to the common mode let through voltage of the SPD. This will appear across the terminals of the protected equipment and if sufficiently high could cause damage - despite the presence of the SPD.

Figure 5 shows the correct installation scheme. The earth reference from the protected equipment must connect to the EQPT/PROTECTED earth terminal of the SPD.

**IMPORTANT:** Because the earth is shunt-connected, the inductance of the connection has a significant effect on performance. Most importantly, **the length of the earth connection must be kept as short as possible**. This is not the case with the other connections because they are series-connected.

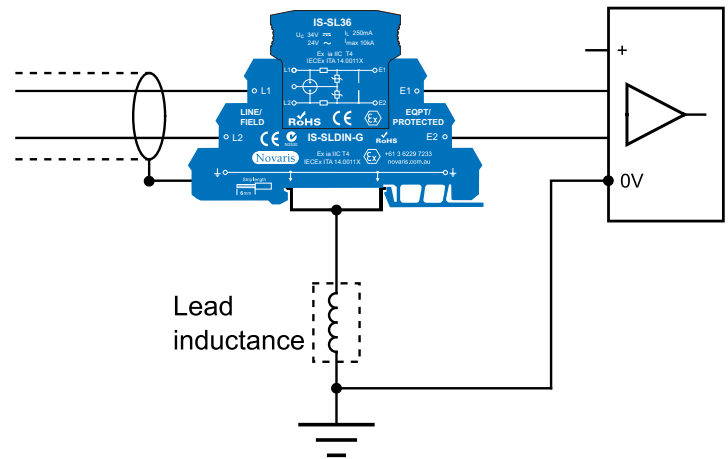


Figure 4: Incorrect installation scheme

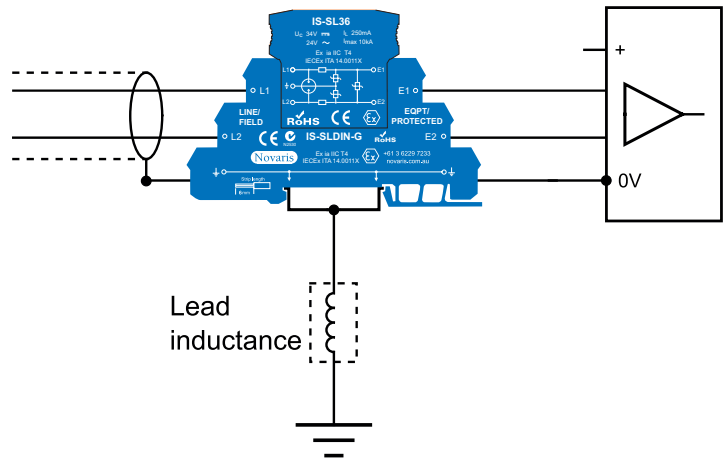


Figure 5: Correct installation scheme

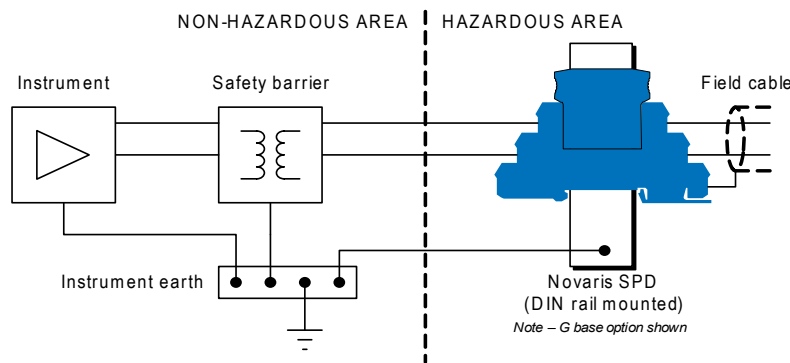


Figure 6: Installation after IS barrier

## 4. After Installation

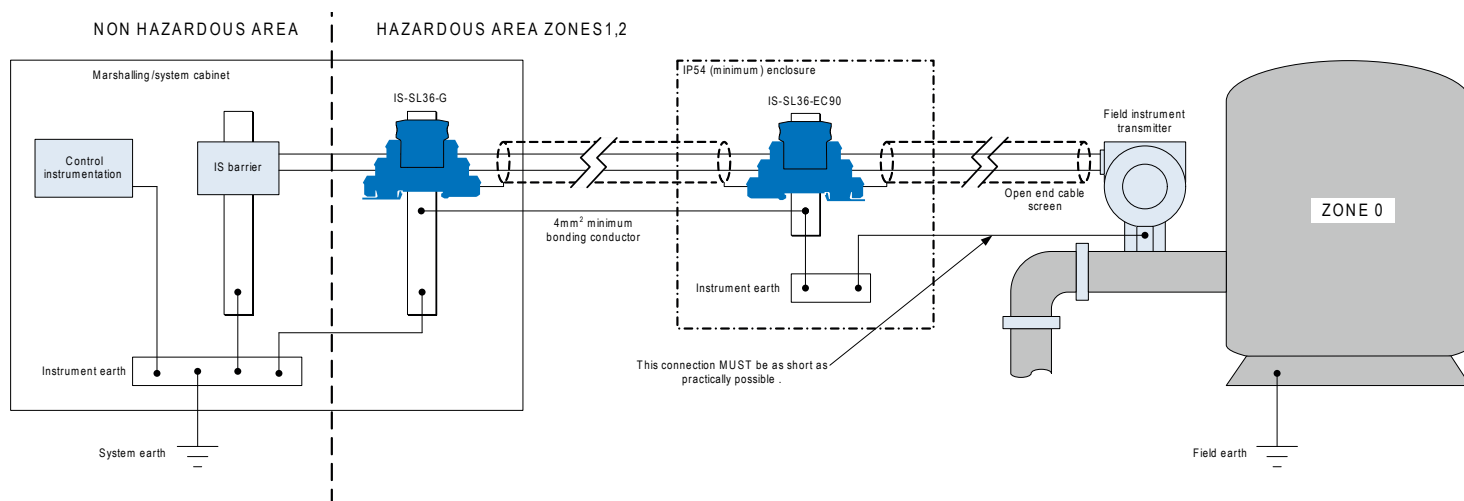
**4.1** Check the installation by testing that the equipment is still operating correctly.

**4.2** Novaris slimline signal line protectors are extremely robust and require very little maintenance. They feature failsafe overcurrent fusing. In the event of a surge that is large enough to damage the surge protection components, the fuses will operate. This is easily detectable as the signal will no longer pass. Under these circumstances the signal line protector should be replaced as soon as possible.

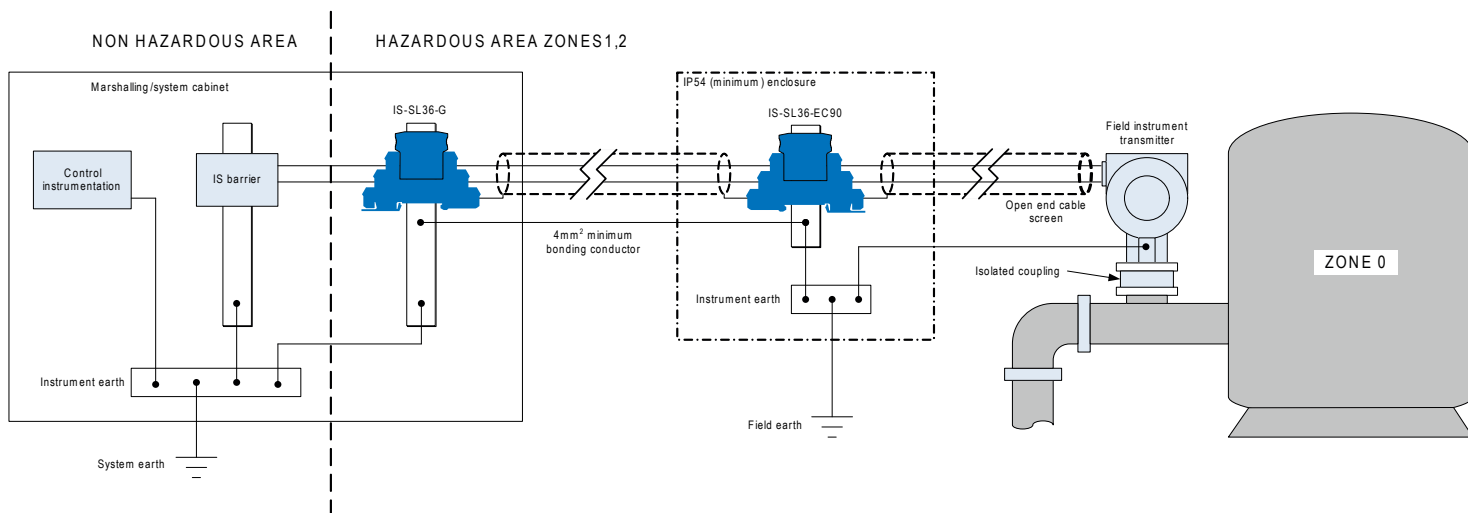
**4.3** Novaris slimline signal line protectors contain no user serviceable parts and must be replaced with genuine Novaris modules.

## 5. Hazardous Area Application

- 5.1** Field instrument protection should take place in Zone 1 and as close as practically possible to the Zone 0 boundary, preferably within one meter to prevent transient voltages from entering Zone 0. Ideally, the surge protector should be installed within the housing of the field instrument, however due to space restrictions it may be necessary to mount the unit in a suitable enclosure available from Novaris.
- 5.2** Figure 7 shows a typical hazardous area installation where the body of the field instrument is earthed through the metallic pipework. In this instance it is important to earth the Novaris slimline signal line protector to the instrument body. This connection **MUST** be as short as practically possible.



**Figure 7: Typical hazardous area installation where field instrument body is earthed through pipework.**



**Figure 8: Typical hazardous area installation where field instrument body is isolated from pipework.**

- 5.3** Figure 8 shows a typical hazardous area installation where the body of the field instrument is isolated from the pipework. In this case the Novaris slimline signal line protector and the field instrument body must be earthed at a common point, typically an earth bar.
- 5.4** When installing Novaris slimline signal line protectors into an intrinsically safe loop attention must be given to the input safety parameters as stated in the specifications table listed in this manual. The output safety parameters stated by the manufacturer of the intrinsically safe barrier must not exceed the input safety parameters of the Novaris slimline signal line protectors.
- 5.5** Where a surge protector meeting the 500V dielectric strength requirements is installed to protect the field instrument the bonding conductor connected between the instrument and field surge protectors is not necessary.

#### 6. Specifications

		IS-SL7v5	IS-SL18	IS-SL36	IS-SL485	IS-SL-DH	IS-SL-RTD	IS-SL-420i	SSP6A-14-G	SSP6A-28-G	SSP6A-38-G
<b>Electrical Specifications:</b>											
Connection Type		Series									
Modes of protection		Transverse and common mode									
Maximum continuous voltage (DC)	$U_c$	7V	16V	34V	8V	34V	7V	34V	14V	28V	34V
Maximum continuous voltage (AC)	$U_c$	5V	11V	24V	6V	24V	5V	-	11V	20V	30V
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	10kA							9.6kA (common mode)		
Maximum load current	$I_L$	250mA							30mA	6A	
Voltage protection level @ 5kV (10/700 $\mu$ s)	$U_p$	10V	20V	40V	30V	60V	20V	40V	26V	52V	70V
Line resistance		8.2 $\Omega$				3.9 $\Omega$		7 $\Omega$	0 $\Omega$		
3dB Frequency @ 50 $\Omega$	$f_c$	250kHz				20MHz		250kHz	100kHz		

#### Safety Parameters:

$U_i$		30V				30V			30V		
$I_i$		-				-			-		
$P_i$		1.3W				1.3W			2.2W		
$C_i$		0				0			0		
$L_i$		0				0			0		

#### Mechanical Specifications:

Operating temperature range (@ $I_L$ = max load current)		-20°C to 40°C									
Operating humidity		5 to 95%									
Terminal capacity		2.5mm <sup>2</sup>									
Terminal screw torque		0.5Nm									
Environmental		IP 20									
Mounting		TS35 DIN rail									
Weight		35g									

#### 7. Standards Compliance

##### IECEX Certification

Ex ia IIC T4

Cert No. IECEX ITA 14.0011X

##### ATEX Directive 94/9/EC

Ex II 1 G Ex ia IIC T4 Ga

Cert No. TUV 14 ATEX 7569 X

##### European Standards

EN 60079-0:2012; 60079-11:2012

ATEX 94/9/EC - 2006/95/EC -  
2011/65/EU

##### Other Compliances

EN 61643-21:2000

AS1768:2007

BS6651:1999

CP33:1996

IEEE C62.41:2002

ITU(CCITT) IX K17

UL497B



#### 8. Warnings

- These devices present a potential electrostatic charging hazard. Clean only with a damp cloth.
- This series of protectors do not satisfy the requirement for avoidance of build-up of electrostatic charge in accordance with clause 7.4.2 of EN 60079-0:2011. Manufacturers documentation must be followed to ensure that at installation, the risk from electrostatic discharge is minimized
- This series of protectors has the signal wires electrically connected to GND/Earth terminal
- Depending on the installation the circuits may have to be judged as an earthed circuit and the appropriate installation rules have to be applied.
- Less than 500V isolation exists between lines and earth. This is part of the surge protection characteristics.

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