

A dramatic night cityscape with a lightning bolt striking a skyscraper. The scene is viewed from an elevated position, showing a dense urban area with numerous high-rise buildings. The city lights are visible, and the ocean is on the right side of the frame. The sky is dark and cloudy, with a bright lightning bolt striking the top of a tall building in the center. The overall atmosphere is intense and powerful.

Novaris

Lightning and Surge Protection

The background of the slide is a high-angle, nighttime photograph of a coastal city. A massive lightning bolt strikes the top of a tall, modern skyscraper in the center of the frame. The city is illuminated by its own lights, and the ocean is visible on the right side of the image.

Novaris

Lightning and Surge Protection

Intrinsically Safe Process control training

presented by

Grant Paul

Novaris Pty Ltd

Hazardous area – an area where concentrations of flammable gases, vapors, or dusts may occur.

- Offshore platforms
- Petrochemical plants
- Oil and gas tankers
- Gas pipelines
- Mines
- Flour mills



Novaris Intrinsically Safe (IS) range

Ex ia IIC T4. (Type ia, Group 2C gases, Temperature category 4).

Gas zones

Zone 0	Flammable atmosphere highly likely to be present - may be present for long periods or even continuously (>10%)
Zone 1	Flammable atmosphere possible but unlikely to be present for long periods (<10%, >0.1%)
Zone 2	Flammable atmosphere unlikely to be present except for short periods of time - typically as a result of a process fault condition. (<0.1%)

Gas groups

Group	Representative Gases
I	All Underground Coal Mining. Firedamp (methane)
IIA	Industrial methane, propane, petrol and the majority of industrial
IIB	Ethylene, coke oven gas and other industrial gases
IIC	Hydrogen, acetylene, carbon disulphide

IIC marked equipment can be used for both IIA and IIB

Temperature classification (Auto-ignition)

T-Class	Hazards which will not ignite at temperatures below:
T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C
T6	85°C

Gas	Temperature
Methane	580 °C
Hydrogen	560 °C
Propane	493 °C
Ethylene	425 °C
Acetylene	305 °C
Naphtha	290 °C
Carbon disulfide	102 °C

Equipment Code	Description	Suitable for zones
Ex ia	Intrinsic safety 'ia'	0, 1, 2
Ex ib	Intrinsic safety 'ib'	1,2
Ex ic	Intrinsic Safety 'ic'	2
Ex d	Flameproof protection	1,2
Ex p	Purge/pressurized protection	1,2
Ex px	Purge/pressurized protection 'px'	1,2
Ex py	Purge/pressurized protection 'py'	1,2
Ex pz	Purge/pressurized protection 'pz'	2
Ex e	Increased safety	1,2
Ex m	Encapsulation	1,2
Ex ma	Encapsulation	0,1,2
Ex mb	Encapsulation	1,2
Ex mc	Encapsulation	2
Ex o	Oil immersion	1,2
Ex q	Sand / powder (quartz) filling	1,2
Ex n	Type - n protection	2
Ex s	Special protection	Normally 1 and 2

Equipment category

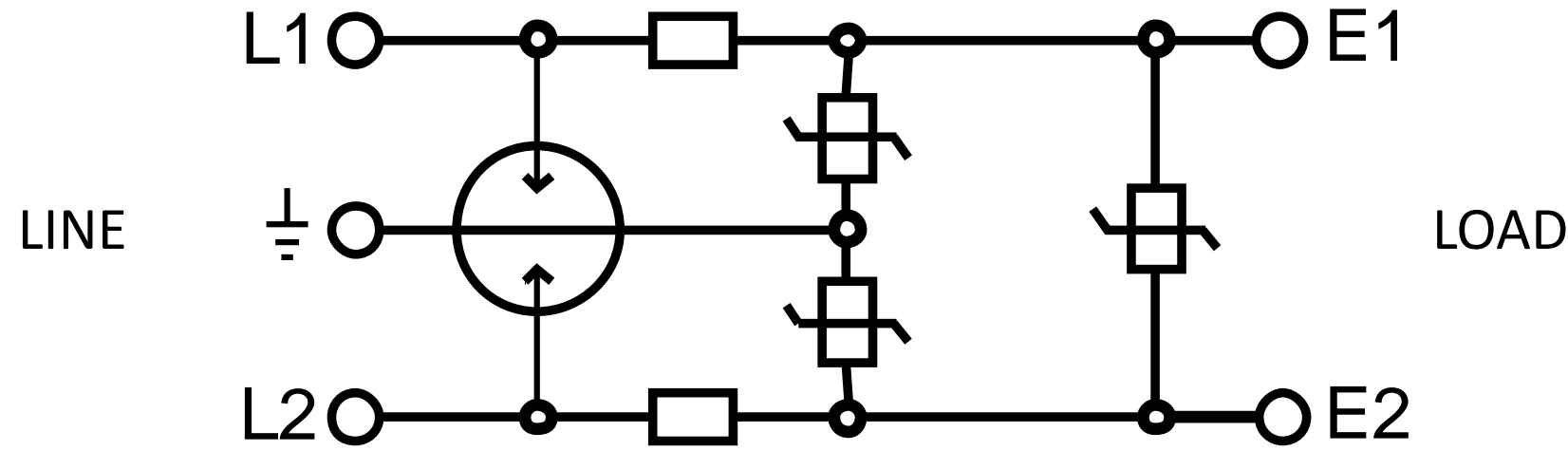
Category 1	equipment may be used in zone 0, zone 1 or zone 2 areas
Category 2	equipment may be used in zone 1 or zone 2 areas
Category 3	equipment may only be used in zone 2 areas

Novaris Intrinsically Safe (IS) range

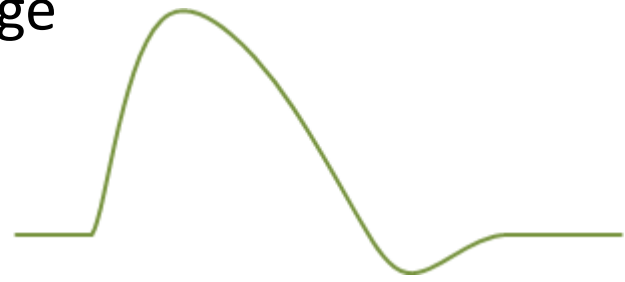
Ex ia IIC T4. (Type ia, Group 2C gases, Temperature category 4).

- Plug in surge arrester module
- Only 7mm wide
- High Energy Design
- Multistage Protection
- IECEx ia IIC T4 certified
- Failsafe design
- Suitable for all signalling applications





Surge



MOV

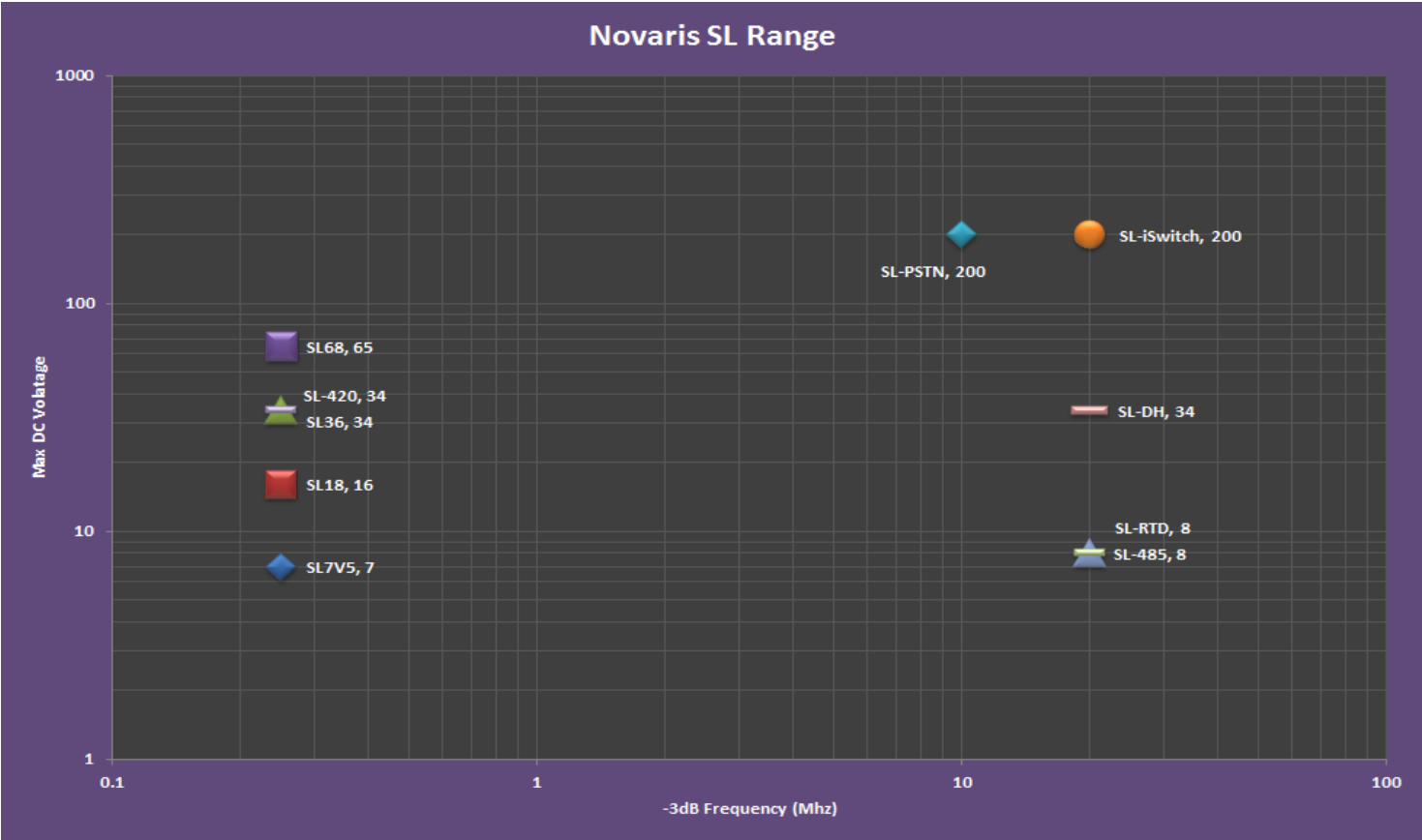


GDT



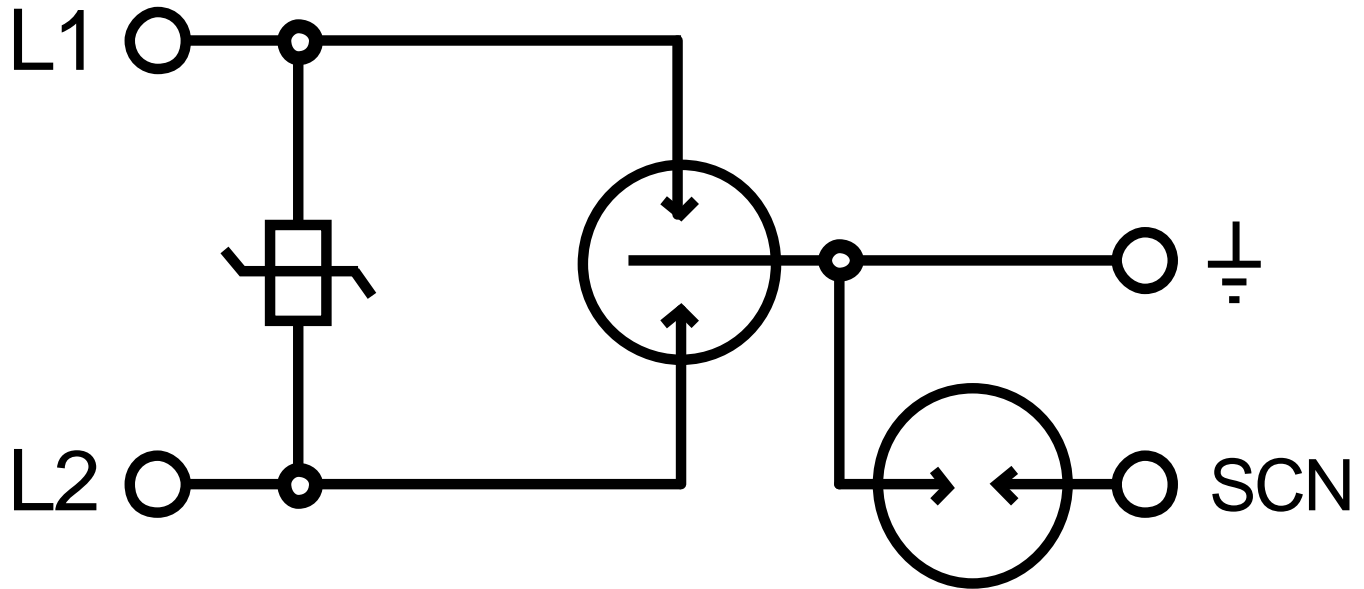
2nd MOV





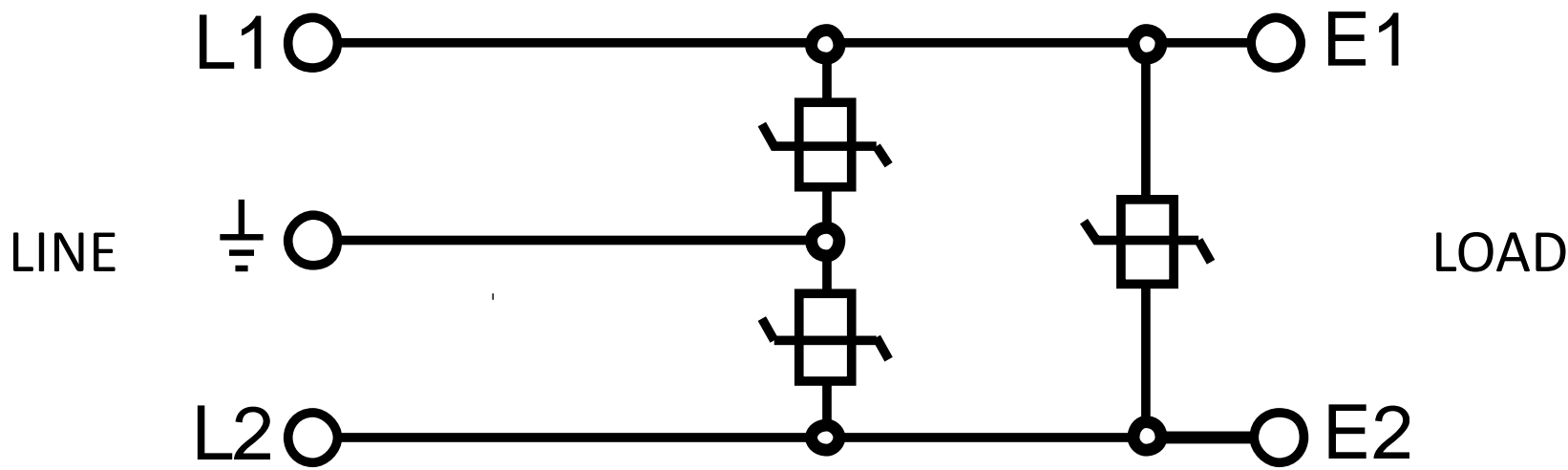
- Protection for 2, 3 and 4 wire process control transmitters
- All mode protection
- Does not affect calibration
- IECEx ia IIC T4 Certified
- M20x1.5 (IECEx Exd Certified)
- ½" NPT
- ¾" NPT

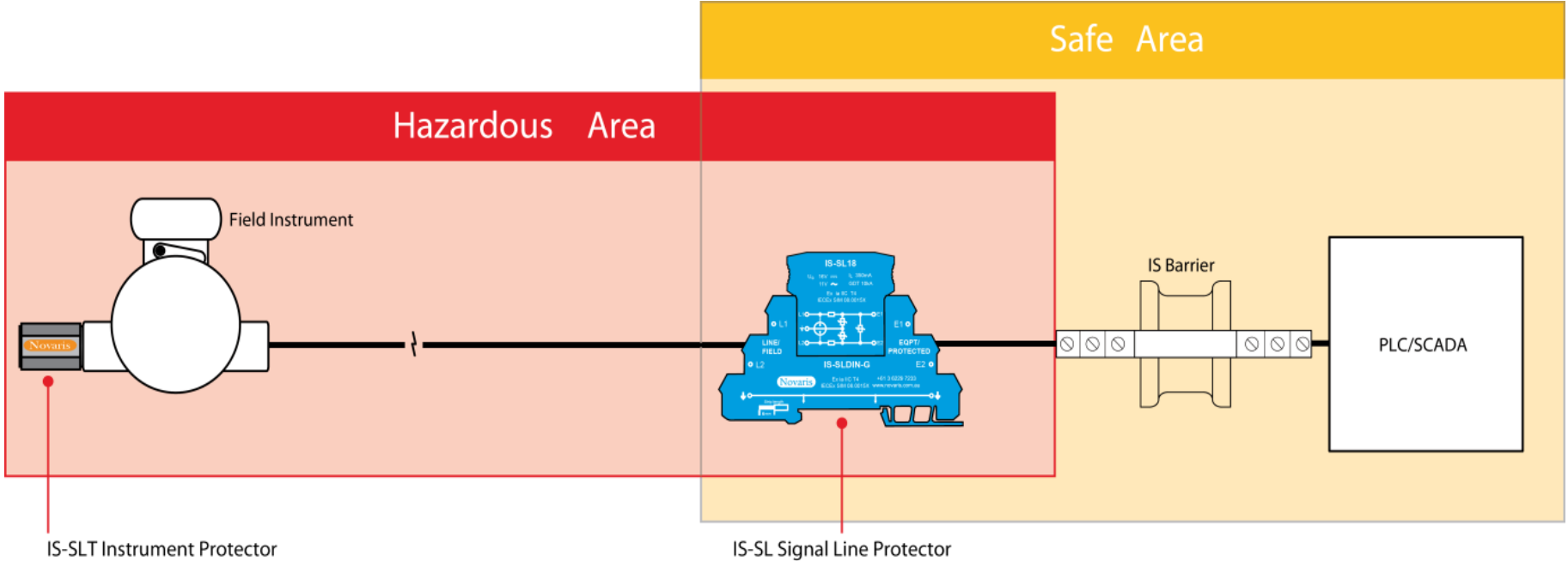


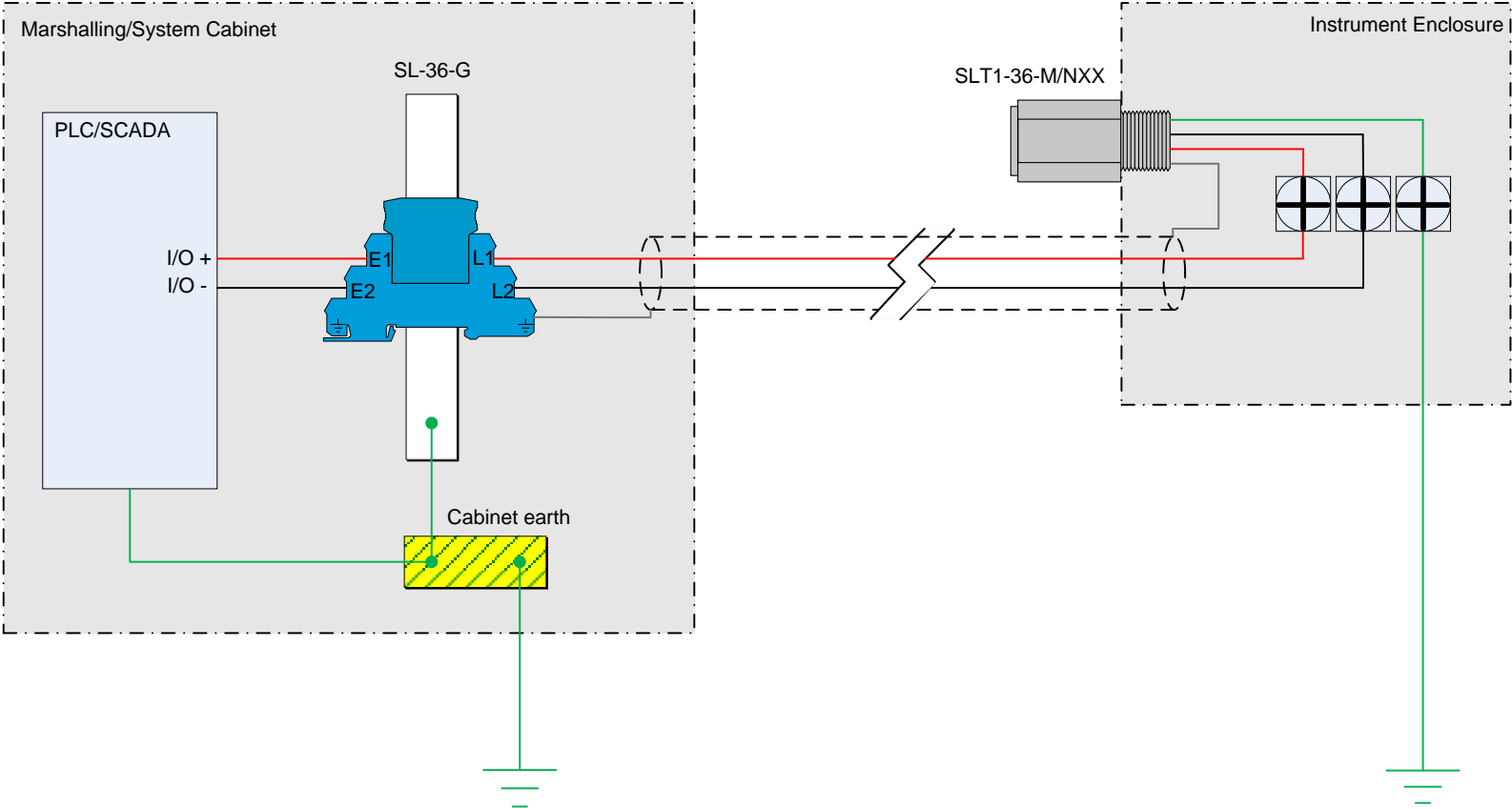


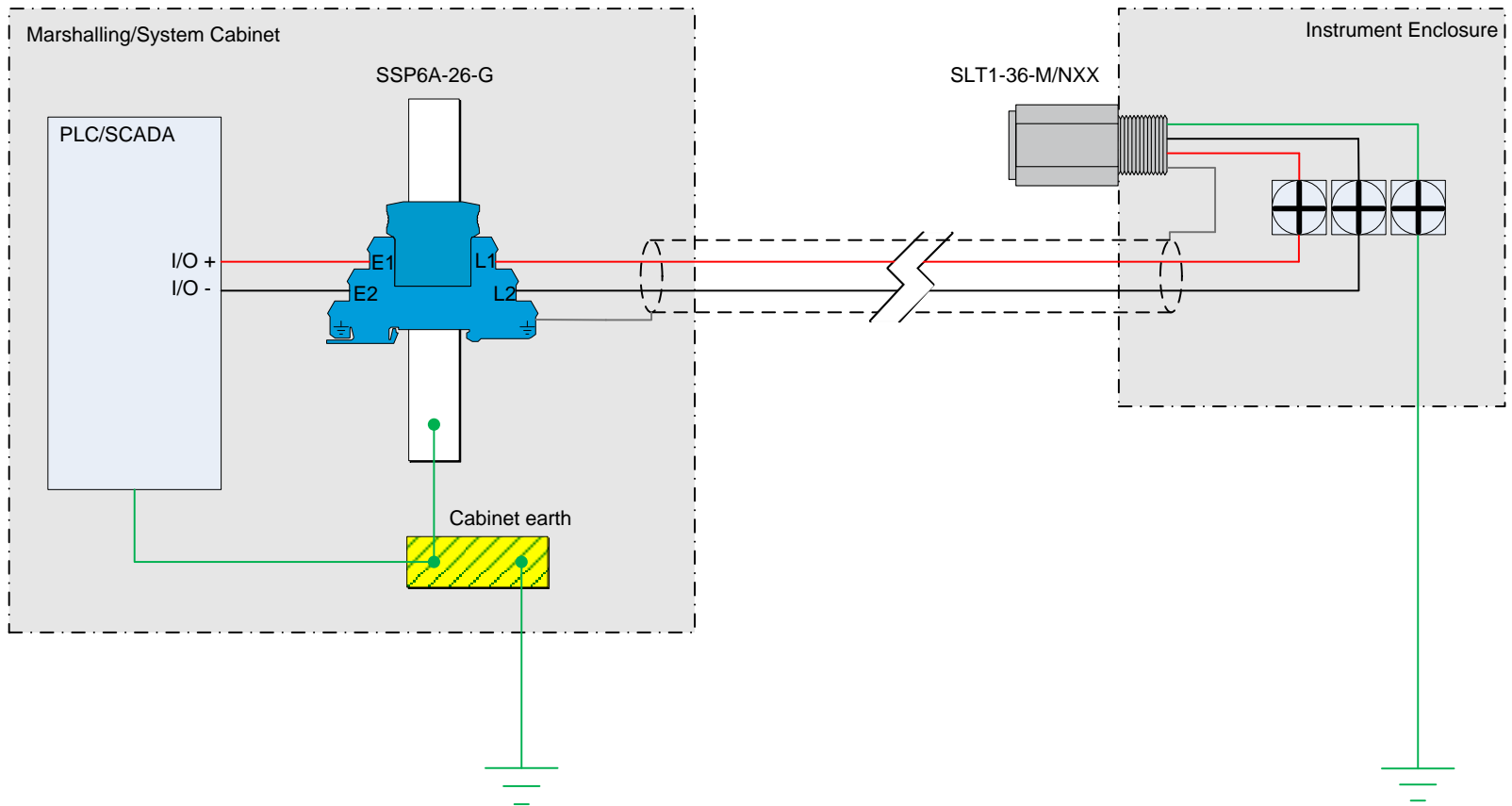
- Plug in surge arrester module
- Only 7mm wide
- 9.6kA I_{max} MOV Protection
- IECEx ia IIC T4 certified
- Up to 6A pass through current

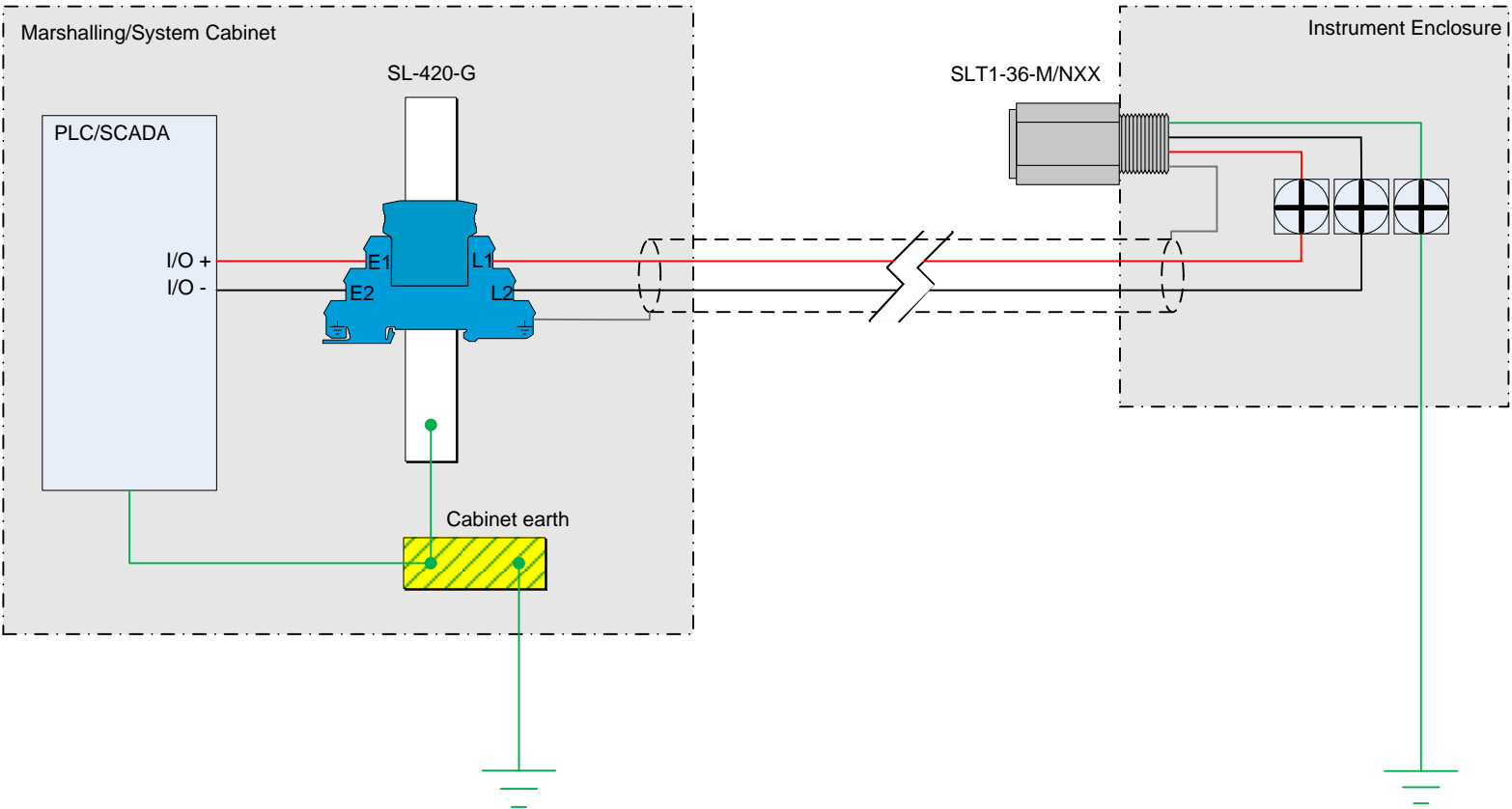


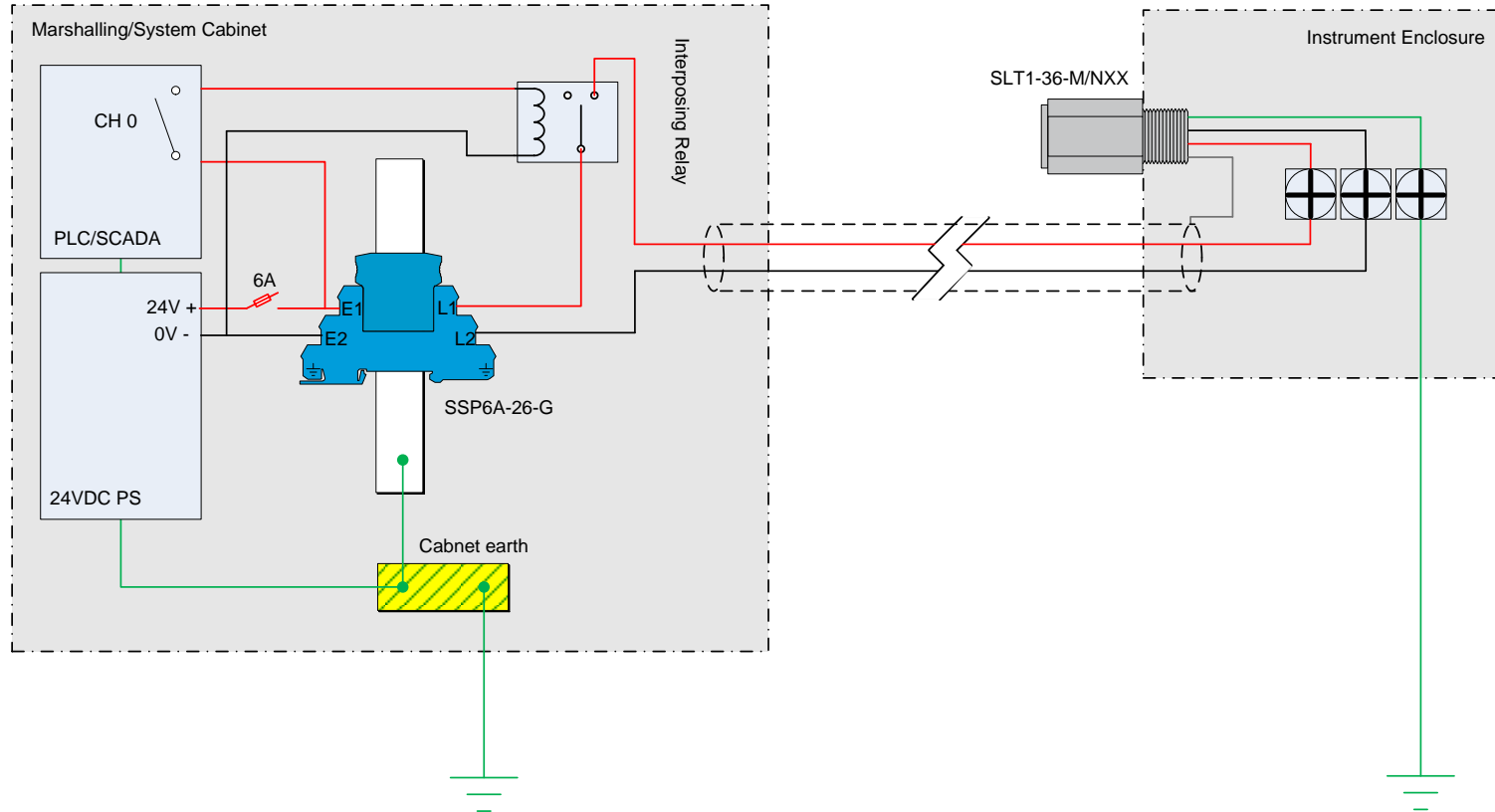


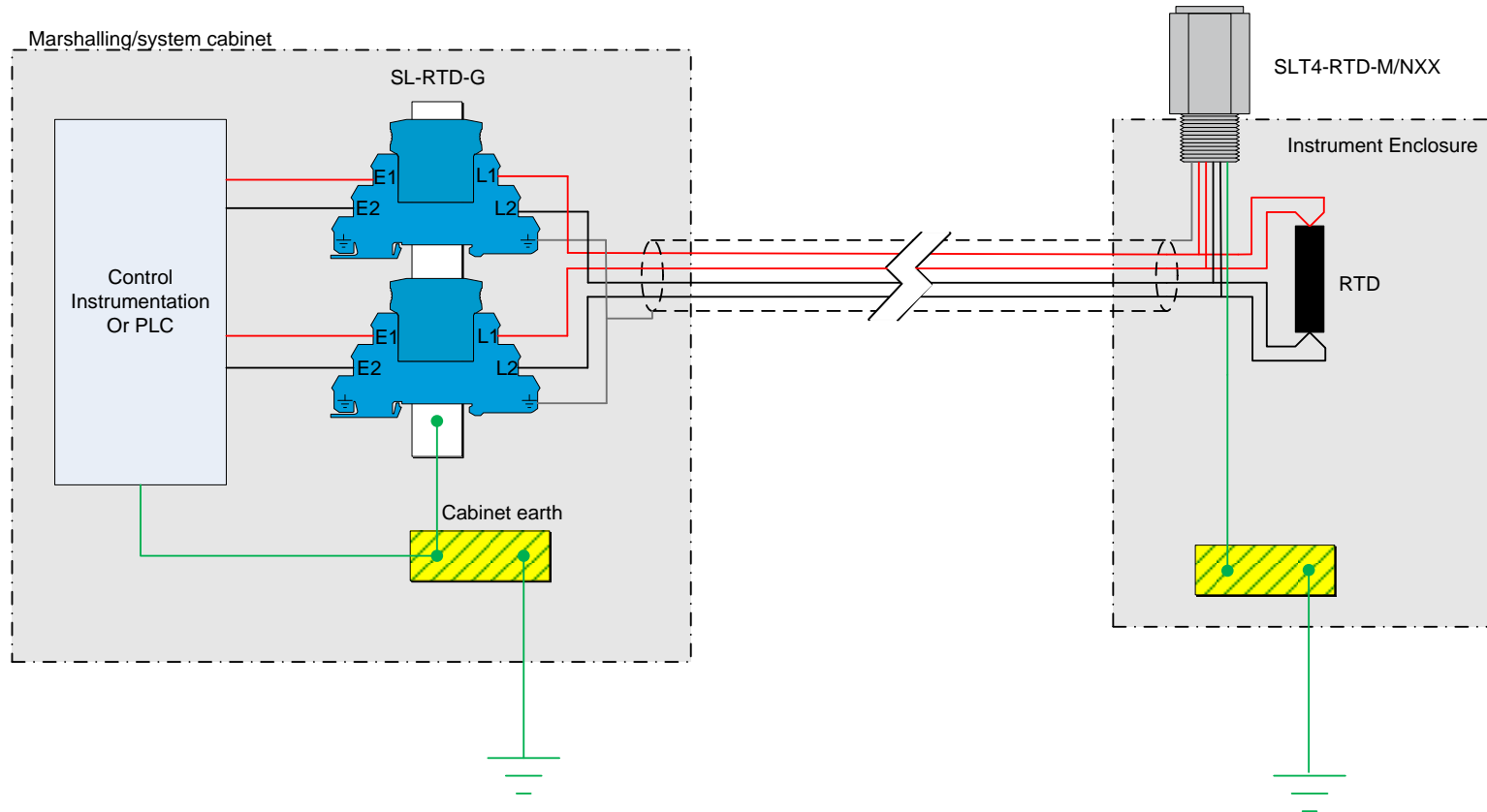


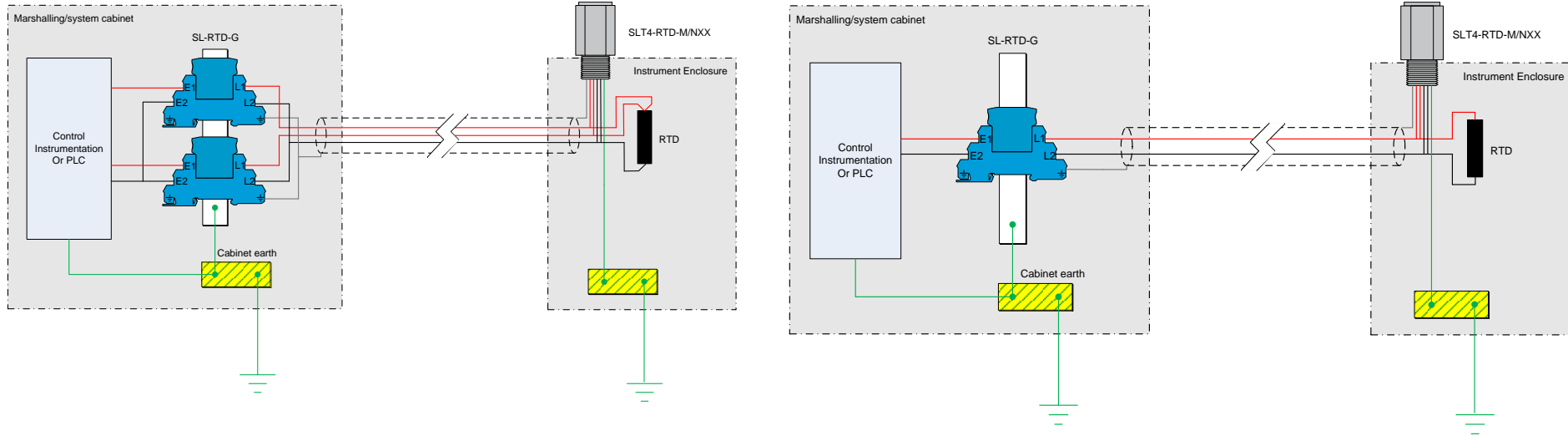


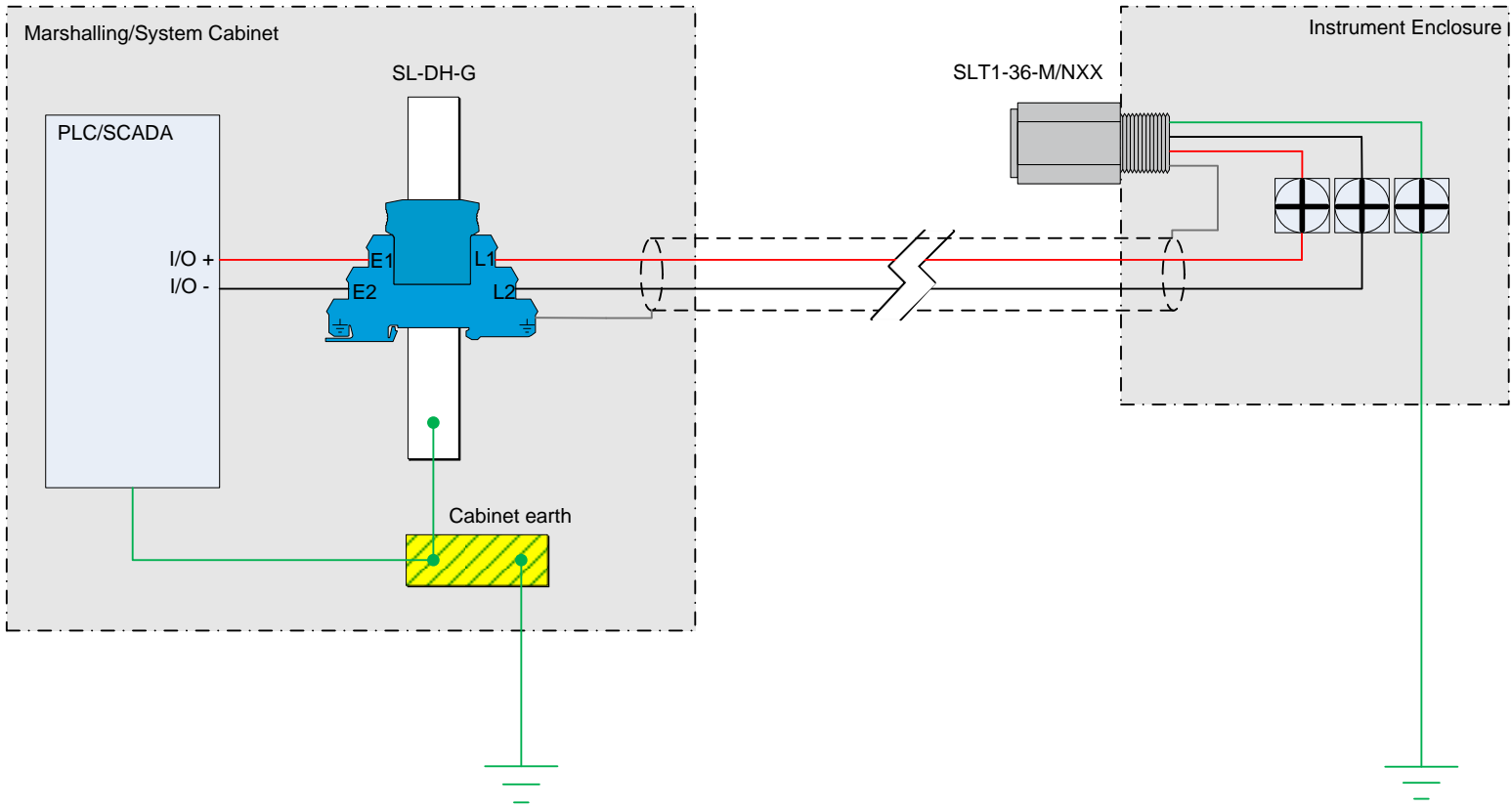


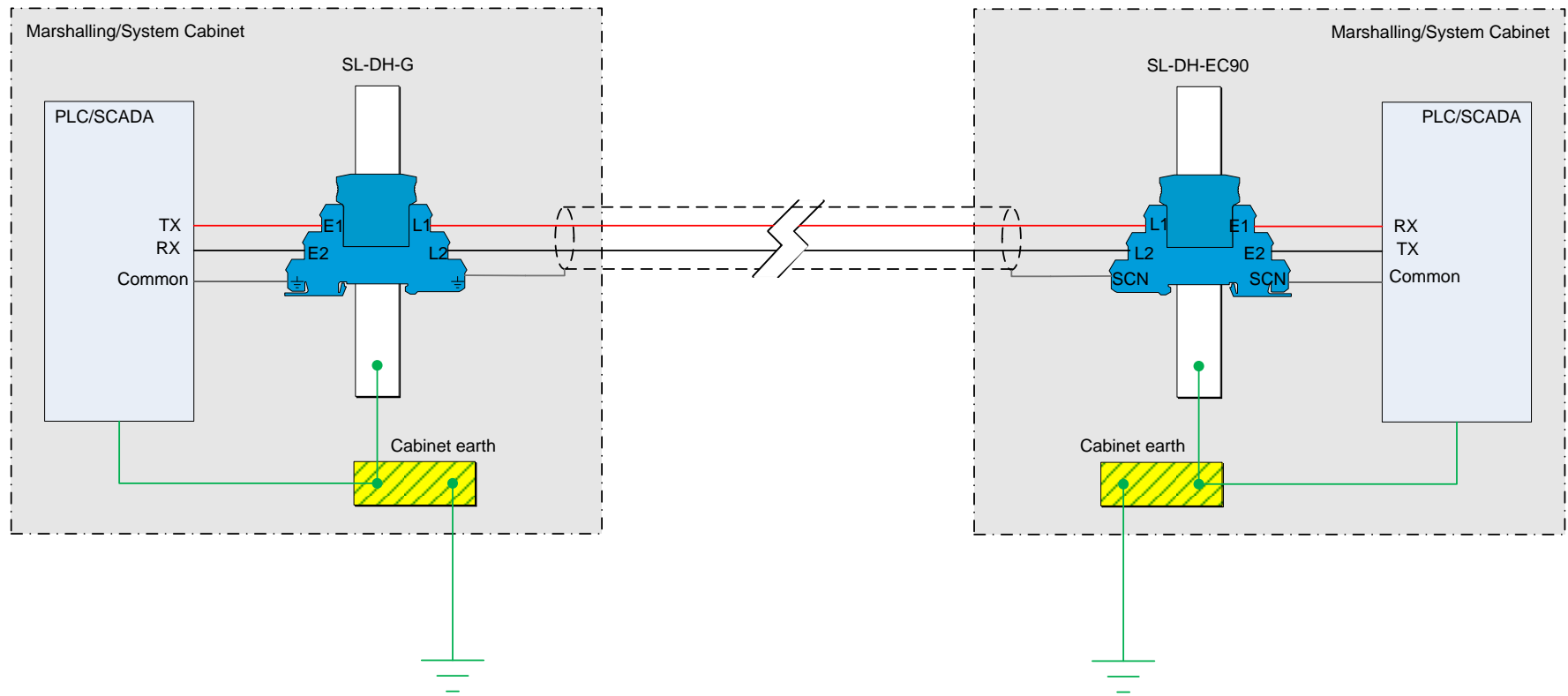


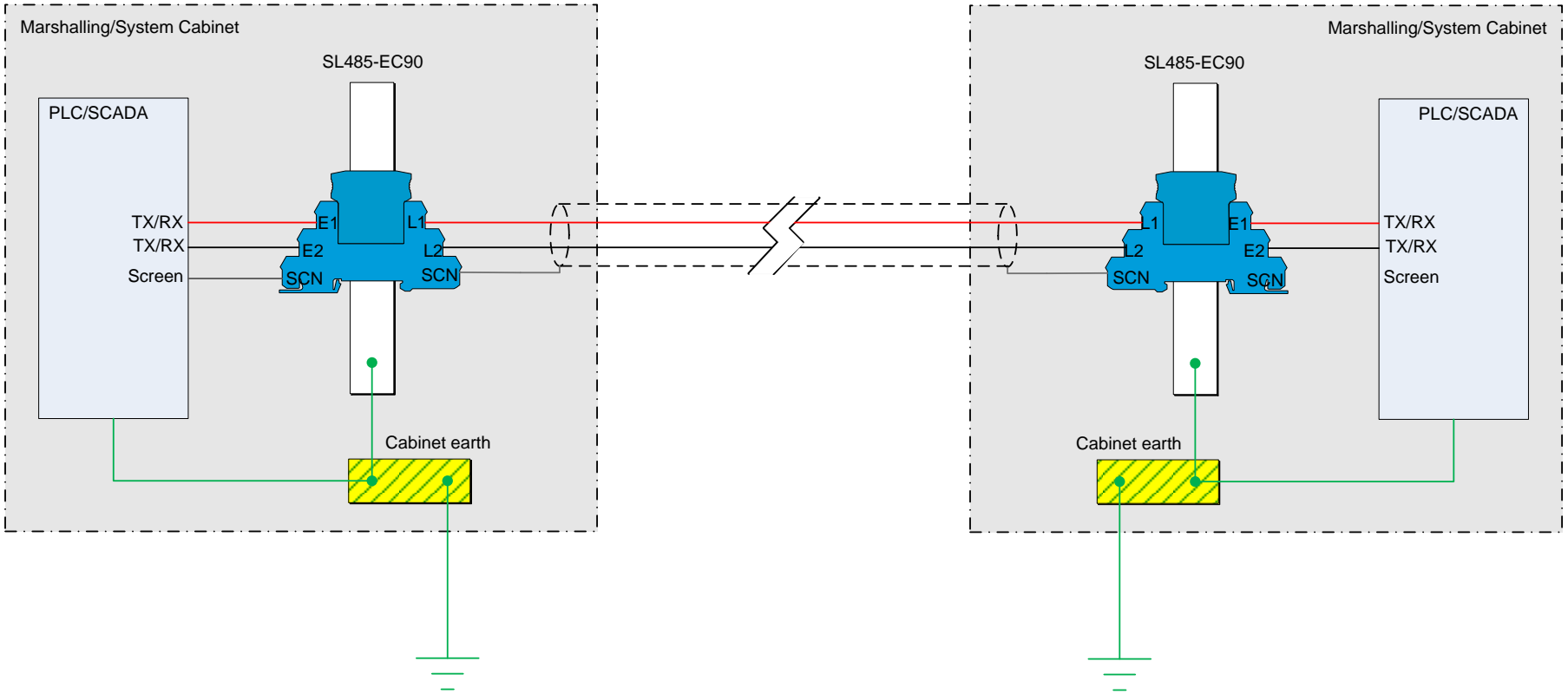


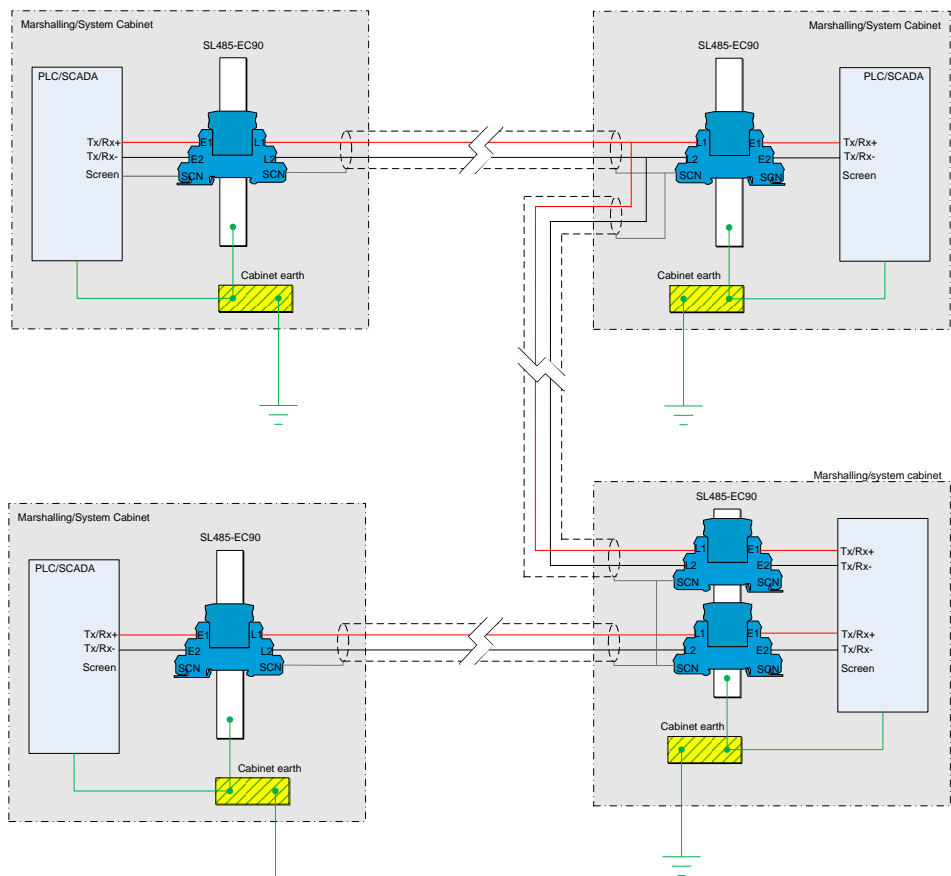


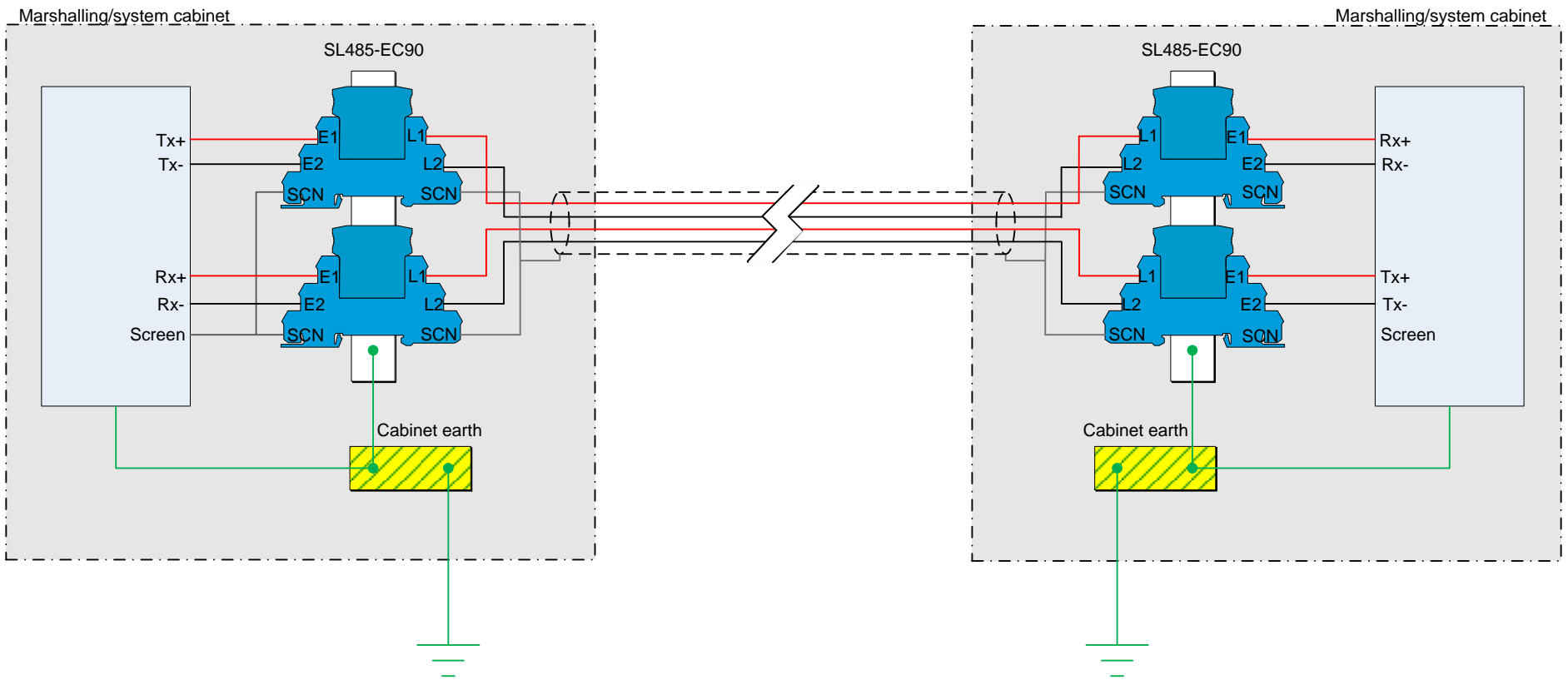












Signal/Protocol	PLC/Cabinet	Meter/Instrument
±5V Analogue or Digital	SL7V5-G or SSP6A-14-G	SLT1-7V5-M/NXX
±12V Analogue or Digital	SL18-G or SSP6A-14-G	SLT1-18-M/NXX
±24V Analogue or Digital	SL36-G or SSP6A-26-G	SLT1-36-M/NXX
±48V Analogue or Digital	SL68-G or SSP6A-65-G	SLT1-68-M/NXX
±110V Analogue or Digital	SSP6A-130-G	SDT2-130-M/NXX
4-20mA Loop	SL420-G (also SL420i-G)	SLT1-36-M/NXX
4 Wire RTD	2 x SL-RTD-G	SLT4-RTD-M/NXX
3 Wire RTD	2 x SL-RTD-G	SLT4-RTD-M/NXX
2 Wire RTD	SL-RTD-G	SLT4-RTD-M/NXX
HART	SL-DH-G	SLT1-36-M/NXX
RS232	SL-DH-G	SL-DH-EC90
RS485	SL485-EC90 (also SL485i-EC90)	SL485-EC90
RS422	2 x SL485-EC90	2 x SL485-EC90
Profibus DP	SL485-EC90	SL485-EC90
Profibus PA	SSP6A-38-G	SSP6A-38-G
Profinet	UTP-RJ45-24CAT6	UTP-RJ45-1CAT6
Modbus	Check physical layer	Check physical layer
Modbus – TCP	UTP-RJ45-24CAT6	UTP-RJ45-1CAT6
Industrial Ethernet Network	UTP-RJ45-24CAT6	UTP-RJ45-1CAT6
Computer Network (Ethernet)	UTP-RJ45-24CAT6	UTP-RJ45-1CAT6

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