

## SES and SPC — “Smart End Seal” and “Smart Power Connection” for power line-based control and monitoring systems

The DigiTrace SES and SPC series of transmitters are used in freeze protection and process temperature maintenance applications. The system is unique in that the heating cable bus wires and power cables carry the monitoring signals. No additional field wiring is necessary.

The SES series of transmitters typically are placed at the end of a heating cable circuit to seal the end of the heating cable. The SES series comes in two types: temperature/continuity transmitter (SES-RTD) and continuity transmitter (SES-CONT).

The SPC series of transmitters typically are placed at the front of a heating cable circuit to provide a power connection to the heating cable. The SPC series comes in two types: pipe-mount (SPC-P) and wall-mount (SPC-W).

The SES-RTD, SPC-P and SPC-W transmitters replace conventional RTD sensing elements and associated wiring, sending

temperature and continuity information to the central NGC controller. The SES-CONT provides heating cable circuit continuity only.

The SES transmitter is designed for use only with 120 V and 208-277 V Raychem BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT and VPL-CT heating cables.

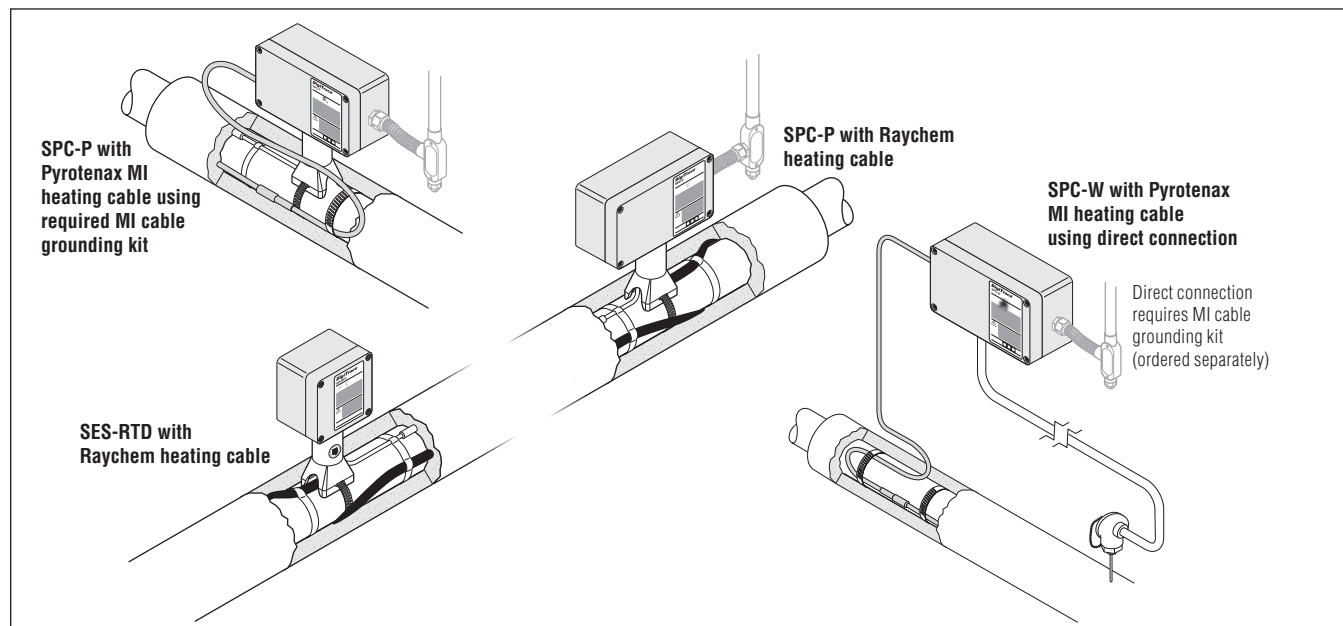
The SPC-P transmitter is designed for use only with 120 V and 208-277 V Raychem BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT and VPL-CT heating cables and Pyrotex Type A & D MI heating cables.

The SPC-W transmitter is designed for use with an external junction box to support all 120 V and 208-277 V heating cables that are approved for the appropriate area classification. The SPC-W transmitter also supports the direct connection of 120 V and 208-277 V Pyrotex Type A & D MI heating cables.

The SES/SPC transmitters require a programmable NGC controller, a Power Line Carrier Interface (PLI) module, and an optional power-switching contactor panel. Up to 127 strategically placed SES/SPC transmitters communicate with one PLI module (one PLI module per heat-tracing transformer). A typical controller, the NGC-30, can support up to four PLI modules.

### System Requirements

The SES/SPC system requires a dedicated heat-tracing transformer of 112.5 kVA or less and a MoniTrace 700-FEF front end filter to provide electrical noise isolation between the plant environment and the heat-tracing power. Connect only the heat tracing to the secondary of this transformer. Do not connect high power/noise sources such as variable-frequency drives to the primary of this transformer.



**Specifications**

Function	SES-CONT: Digital continuity transmitter SES-RTD: Digital temperature and continuity transmitter SPC-P: Digital temperature and continuity transmitter with pipe-mount power connection enclosure SPC-W: Digital temperature and continuity transmitter with wall-mount power connection enclosure
Address	Switch selectable with three rotary switches, 127 addresses, 1–127
Cables supported	SES: Raychem BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT and VPL-CT SPC-P: Raychem BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT and VPL-CT, Pyrotenax Type A & D MI SPC-W with external junction box: Heating cables that are approved for the appropriate area classification SPC-W with direct connection: Pyrotenax Type A & D MI
Cable voltage rating	120 V and 208–277 V
Maximum circuit breaker rating	50 A
Operating voltage	SES-CONT-1, SES-RTD-1, SPC-P-1, SPC-W-1: 90–132 Vac / 60 Hz SES-CONT-2, SES-RTD-2, SPC-P-2, SPC-W-2: 185–304 Vac / 60 Hz
Operating temperature range	–40°F to 140°F (–40°C to 60°C)
Enclosure rating	NEMA 4X
Maximum conductor size	SPC-P: 8 AWG
Entries	SPC-P: 1 x 0.5", 1 x 0.75" SPC-W: 1 x 0.5", 2 x 0.75"
Storage temperature range	–40°F to 167°F (–40°C to 75°C)
Temperature measurement range	SES-RTD, SPC-P: –40°F to 500°F (–40°C to 260°C) using RTD supplied with kit SPC-W: –90°F to 590°F (–68°C to 310°C) using 100 Ω platinum RTD, 3-wire, α = 0.00385 ohms/ohm/°C shielded cable of 15 Ω maximum per conductor
Temperature accuracy	± 2% of actual (± 3°F minimum)
Relative humidity	5% to 90%, noncondensing

**Approvals**

**SES:  
Hazardous Locations**



Class I, Div. 2, Groups A, B, C, D  
Class II, Div. 1 and 2, Groups E, F, G  
Class III

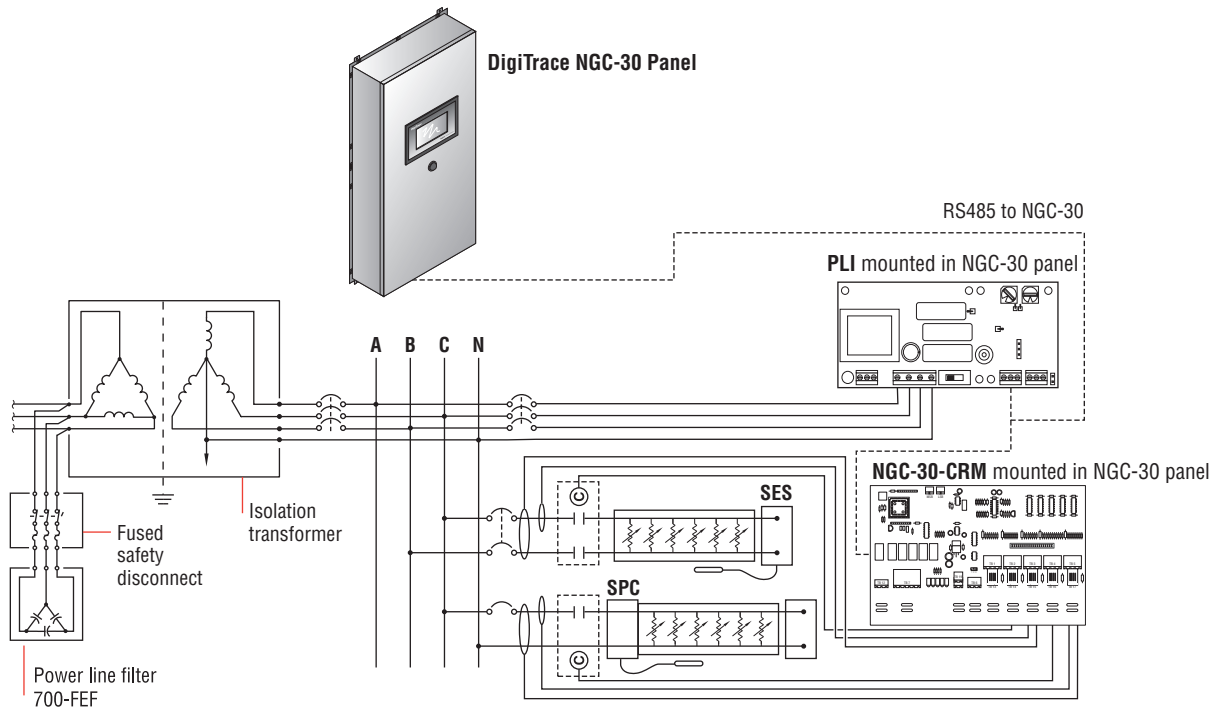
**SPC:  
Hazardous Locations**



Class I, Div. 2, Groups A, B, C, D  
Class II, Div. 1 and 2, Groups E, F, G  
Class III

**Line-Sensing Control and Monitoring**

Typical example of individual circuit control with NGC-30-CRM, PLI module, and SES transmitter for ground-fault trip/monitoring and temperature/heater current monitoring



**Ordering Details**

Description	Catalog number	Part number	Weight (lbs)
120 V temperature/continuity transmitter with end seal enclosure	SES-RTD-1	265212-000	3.2
208–277 V temperature/continuity transmitter with end seal enclosure	SES-RTD-2	677596-000	3.2
120 V continuity transmitter with end seal enclosure	SES-CONT-1	293536-000	3.0
208–277 V continuity transmitter with end seal enclosure	SES-CONT-2	398720-000	3.0
120 V temperature/continuity transmitter with pipe-mount power connection enclosure	SPC-P-1	P000001049	4.4
208–277 V temperature/continuity transmitter with pipe-mount power connection enclosure	SPC-P-2	P000001050	4.4
120 V temperature/continuity transmitter with wall-mount power connection enclosure	SPC-W-1	P000001051	4.0
208–277 V temperature/continuity transmitter with wall-mount power connection enclosure	SPC-W-2	P000001052	4.0
<b>Spare parts</b>			
120 V replacement transmitter board	SES-TT-1	815918-000	0.8
208–277 V replacement transmitter board	SES-TT-2	771274-000	0.8
Replacement RTD and stand assembly	SES-RTD-Replace	693618-000	0.8

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