

SLIMLINE & A-LINE

PROCESS CONTROLLERS



Usually interfaced to proximity sensors or probes, these units monitor variables such as speed, level or temperature. Other process control relays include power supply modules, flip flop relays, switching amplifiers and opto-electronic control relays. The Slimline is our 11-pin plug-in range and the A-Line is our Din-rail alternative.

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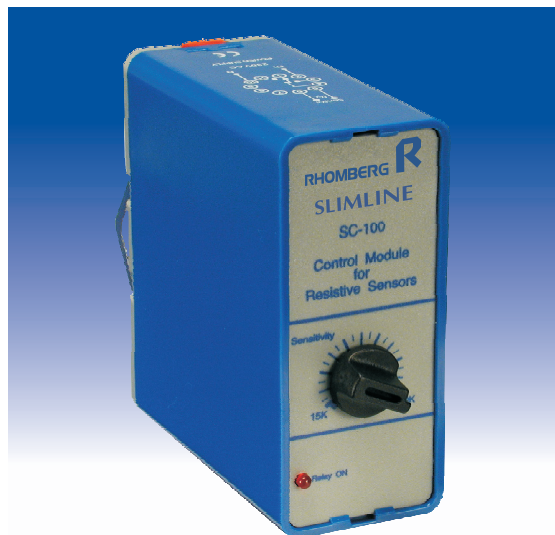


SC-100

Control Module for Resistive Sensors

SLIMLINE

MONITORING RELAYS



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	100	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- Single-point level control of conductive materials.
- High or low level alarm for conductive materials.
- Daylight switch or flame detector in conjunction with Light Dependent Resistors (LDR).
- Detection of the absence of conductive liquids in metal pipes (boiler systems).
- Monitoring of soil moisture in agricultural irrigation systems.
- Safe, low voltage, remote stop or start control over extended distances.

Features

- AC modulation of probe signal to prevent plating and electrolytic corrosion.
- Low voltage probe signal for human safety.
- Adjustable sensitivity from 15k to 500k Ohm.
- 10A SPDT relay output.

Description of Operation

The **SC-100** senses conductivity between two probe terminals, providing a relay output if conductivity exceeds the setpoint. It is therefore suitable as a low cost solution for a variety of applications where the level of conductivity needs to be monitored without extreme precision.

Liquid Level Control: In conjunction with two conductive probes (e.g. CP-2C) it controls the level of conductive liquids or provides a high/low level alarm output. When the probes are dry, the relay of the SC-100 will be off. As soon as the level of the liquid rises sufficiently to touch the probes, the relay will energise. Sensitivity can be adjusted to tune out the effects of foam, condensation or long distance wire impedance.

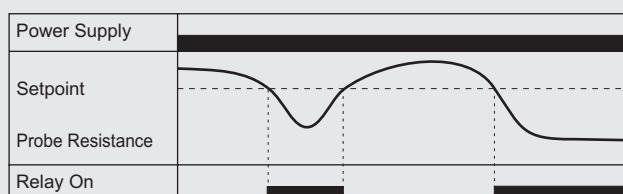
Flame Detector/ Daylight Switch: In conjunction with a suitable Light Dependent Resistor (LDR) the unit can monitor light intensity. When the light intensity drops below the set value, the relay energises. The unit can thus be applied to monitor the flame in a burner or control security lights when the sun sets.

Temperature Control: In conjunction with a suitable thermistor, the unit can monitor temperature, providing a relay output if the temperature drops below or exceeds the setpoint.

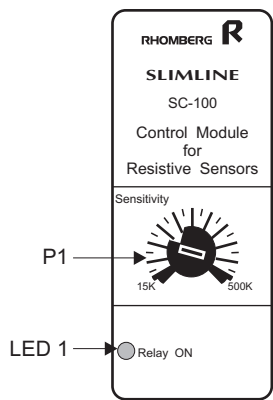
Soil Moisture Monitoring: In conjunction with two suitable conductive probes, the moisture content of soil can be monitored. When the soil is dry, the relay will be de-energised. The conductivity of the soil increases with increase in moisture. When the conductivity rises above the setpoint, the relay energises.

Remote Start or Stop: Were a remote start or stop is required and the cable length or size is a problem, the SC-100 offers a cost saving solution. Due to its 500k sensitivity, high cable impedance problems are solved.

Operational Diagram



Description of Controls



P1: **The Sensitivity of the Probe** is adjusted on P1. Turning P1 clockwise increases the threshold resistance at which the unit switches.

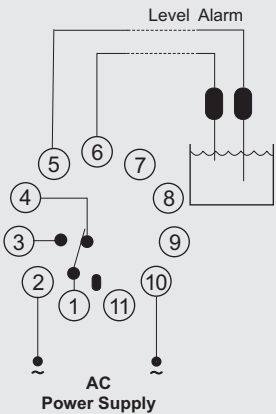
LED 1: The LED marked “**Relay ON**” illuminates when the relay is energised.

Wiring and Connection

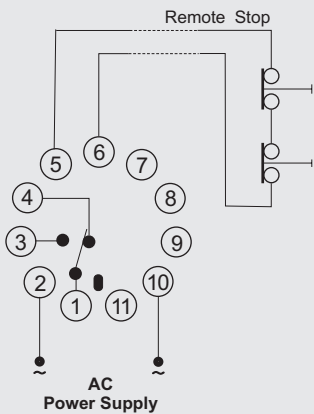
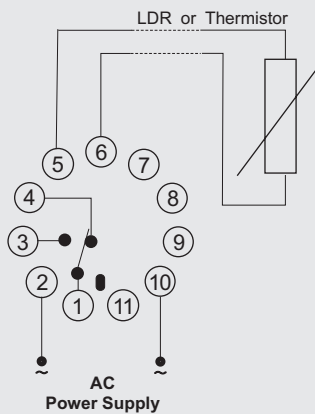
Power Supply	
Phase/ Positive	2
Neutral/ Negative	10

Relay contacts	
Normally open	1+3
Normally closed	1+4

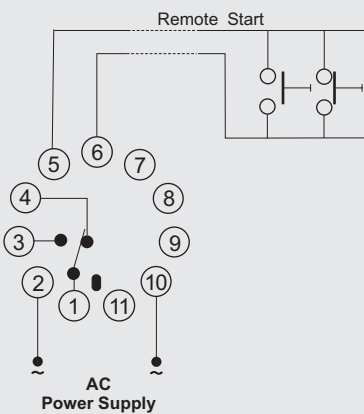
Conductive Probes	
To be connected between pins 5 and 6.	



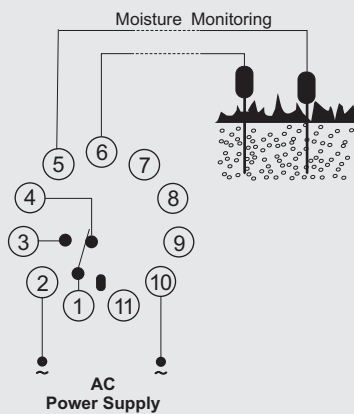
OR



OR



OR



Technical Specifications

POWER SUPPLY

(AC only - see SC-130 for DC applications)
Supply voltage: 12, 24, 110, 230, 400, 415, 525V AC $\pm 15\%$
Isolation (probe input to power supply): 2kV
Power consumption: 3VA (approx.)
6VA for 415, 525V (approx.)

PROBE INPUT

Sensitivity: approx. 15 - 500k Ohm (adjustable).
Probe voltage: 12V AC.
Probe frequency: 50Hz.



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	130	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- Level control of conductive liquids.
- Borehole pump control.
- Filling and draining of tanks and reservoirs.
- Control of sewerage pumps.
- Dosing of liquids chemicals or fertilisers.
- 2-wire remote stop-start control over extended distances.
- Monitoring and controlling of processes in conjunction with Light Dependent Resistors (LDR)

Features

- Failsafe feature.
- Programmable for charging and discharging operation.
- AC modulation of probe signal to prevent plating and electrolytic corrosion.
- Low voltage probe signal for human safety.
- Adjustable sensitivity.
- DC or AC power supply option.
- 10A SPDT relay output.

Description of Operation

The **SC-130** is a level control unit for conductive liquids. In conjunction with three conductive probes (e.g. CP-1C, CP-2C or CP-3C) it controls the level of the liquid in a reservoir between a high and a low level. It is programmable for failsafe operation in the following modes.

Charging (Filling) Reservoirs: When the level in the reservoirs drops below the low level probe, the relay energises. The relay then remains energised until the level reaches the high level probe. As soon as the high level probe becomes submerged, the relay de-energises and remains off until the level has dropped sufficiently to clear the low level probe.

Discharging (Draining) of Reservoirs: When the level in the reservoir rises sufficiently to submerge the high level probe, the relay energises. The relay then remains energised until the level has dropped below the low level probe. As the liquid clears the low level probe, the relay de-energises and remains off until the level has risen sufficiently to submerge the high level probe.

Sensitivity Adjustment: Sensitivity of the unit is adjustable to cater for

- Line impedance of long distance wiring between the probes and the unit,
- the conductivity of the liquids and
- unwanted matter, such as foam.

Choice of Probes: Any metal may serve as a probe. However, factors such as corrosion resistance, physical arrangement and the probability of erratic sensing of foam or condensation between probes, should be considered.

For optimum performance and ease of installation, the use of covered stainless steel probes (type CP-3C) is recommended. The length of probes may be shortened by cutting the probe to the required length or lengthened by using the extension rods (type EP-1C) and distance discs (type DD-3).

Operational Diagrams

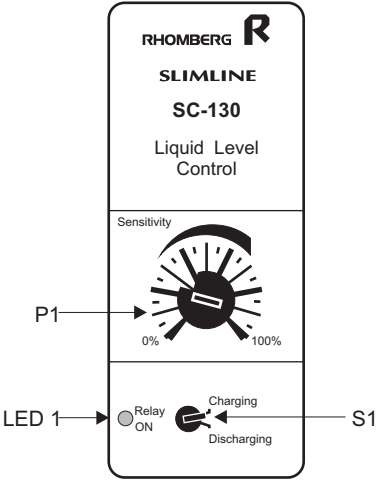
Charging (Filling) of Reservoirs

Power Supply	On
Low Level Probe Submerged	Relay On
High Level Probe Submerged	Relay Off
Relay On	Relay On

Discharging (Draining) of Reservoirs

Power Supply	On
Low Level Probe Submerged	Relay On
High Level Probe Submerged	Relay On
Relay On	Relay On

Description of Controls



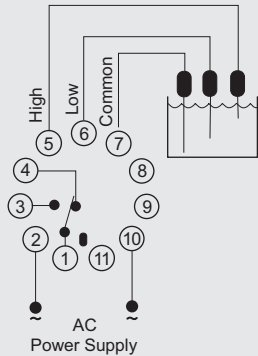
- P1: The **Sensitivity** of the liquid sensing input is adjusted on P1. Turning P1 clockwise increases sensitivity.
- S1: The **Mode of Operation** is selected on S1. If set to “charging” the unit provides failsafe filling of reservoirs. If set to “discharging” the unit provides failsafe draining of reservoirs.
- LED 1: The LED marked “**Relay On**” illuminates when the relay is energised.

Wiring and Connection

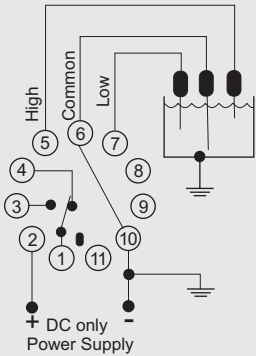
Power Supply	
Phase/ Positive	2
Neutral/ Negative	10

Relay contacts	
Normally open	1+3
Normally closed	1+4

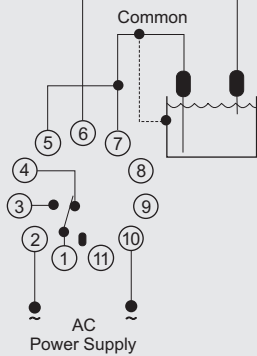
Level Probes	
Common probe	Pin 7
Low level probe	Pin 6
High level probe	Pin 5



APPLICATION 1
Connection of three probe (CP-3C)



APPLICATION 2
Connection of three probe (CP-3C) for DC applications.



APPLICATION 3
Single level control

Important: In DC power supply applications pin 6 will be COMMON and pin 7 will be LOW. (Application 2)

Technical Specifications

POWER SUPPLY	
AC:	Supply voltage: 12, 24, 110, 230, 400, 415, 525V ±15% Isolation (probe input to power supply): 2kV Power consumption: 3VA (approx.) 6VA for 415, 525V (approx.)
DC:	Supply voltage: 10-30V, 48, 60, 110V ±15% Isolation: no galvanic isolation Power consumption: 100mA (10-30V), 30mA for higher ranges

LEVEL SENSING INPUT	
Probe voltage:	4V AC.
Probe frequency:	100Hz.
Sensitivity:	0 to 50kOhm (adjustable).
Response time:	0,5 seconds.



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
AC	130	230	A	D

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- Level control of conductive liquids.
- Borehole pump control.
- Filling and draining of pump reservoirs.
- Control of sewerage pumps.
- Dosing of liquids, chemicals or fertilisers.
- 2-wire remote stop-start control over extended distances.
- Monitoring and controlling of processes in conjunction with Light Dependent Resistors (LDR).

Features

- Failsafe feature.
- Programmable for charging or discharging operation.
- AC modulation of probe signal to prevent plating and electrolytic corrosion.
- Low voltage probe signal for human safety.
- Adjustable sensitivity.
- Power ON and Relay ON LEDs.
- 5A SPDT or DPDT relay output.

Description of Operation

The **AC-130** is a level control unit for conductive liquids. In conjunction with three conductive probes (e.g. CP-3 or CP-3C), it controls the level of the liquid in a reservoir between a high and a low level. It is programmable for failsafe operation in the following modes:

Charging (Filling) Reservoirs: When the level in the reservoir drops below the low probe, the relay energises. The relay then remains energised until the level reaches the high level probe. As soon as the high level probe becomes submerged, the relay de-energises and remains off until the level has dropped sufficiently to clear the low level probe.

Discharging (Draining) of Reservoirs: When the level in the reservoir rises sufficiently to submerge the high level probe, the relay energises. The relay then remains energised until the level drops below the low level probe. As the liquid clears the low level probe, the relay de-energises and remains off until the level rises sufficiently to submerge the high level probe.

Sensitivity Adjustment: Sensitivity of the unit is adjustable to cater for:

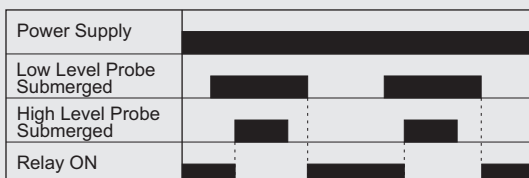
- line impedance of long distance wiring between probes and the unit,
- the conductivity of the liquids
- unwanted matter, such as foam.

Choice of probes: Any metal may serve as a probe. However, factors such as corrosion resistance, physical arrangement and the probability of erratic sensing of foam and condensation between probes, should be considered.

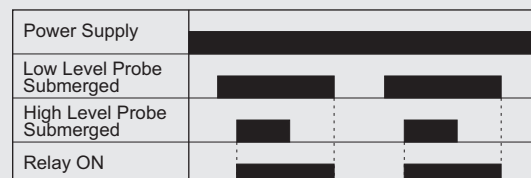
For optimum performance and ease of installation, the use of covered stainless steel probes (type CP-3C) is recommended. The length of the probes may be shortened by cutting the probe to the required length or lengthened by using extended rods (type EP-1C) and distance discs (type DD-3).

Operational Diagrams

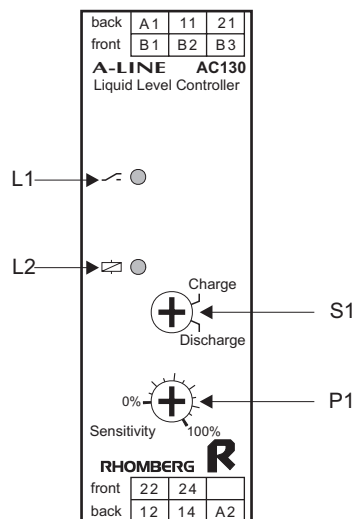
Charging (filling) of reservoirs



Discharging (draining) of reservoirs



Description of Controls



L1: The red “Relay ON” LED marked  illuminates when the relay is energised.

L2: The green “Power ON” LED marked  illuminates when power is supplied to the unit.

S1: The **Mode of Operation** is selected on S1. If set to “charging” the unit provides failsafe filling of reservoirs. If set to “discharging” the unit provides failsafe draining of reservoirs.

P1: The **Sensitivity** of the liquid sensing input is adjusted on P1. Turning P1 clockwise increases the sensitivity.

Wiring and Connection

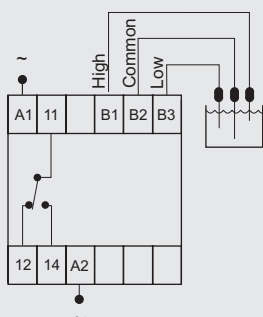
Relay Contacts-DPDT		
CONTACT1	Normally Open	11 + 14
	Normally Closed	11 + 12
CONTACT2	Normally Open	21 + 24
	Normally Closed	21 + 22

Relay Contacts-SPDT		
Normally Open	11 + 14	
Normally Closed	11 + 12	

Power Supply	
Phase/Positive	A1
Neutral/Negative	A2

Level Probes	
High Level	B1
Common	B2
Low Level	B3

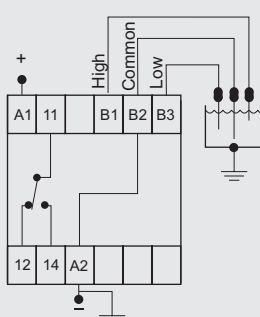
AC-130 SPDT



APPLICATION 1

Connection of three probes (CP-3C)

AC-130 SPDT

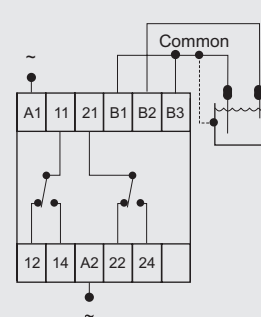


APPLICATIONS 2

Connection of three probes (CP-3C) for DC applications.

Important: In DC power supply applications terminal B3 and terminal A2 will be COMMON.

AC-130 DPDT



APPLICATION 3

Single level control

Technical Specifications

POWER SUPPLY			
Type	Voltage	Tolerance	Consumption
AC Transformer (2kV galvanic isolation)	12, 24, 115, 230 (220-240), 400 (380-415), 525V	±15%	2VA (approx.)
DC	48, 60, 110V	±15%	30mA (approx.)
DC	12, 24V	±15%	100mA (approx.)

RELAY			
Relay Options (250V, 5A)	SPDT	DPDT	SPDT & Instantaneous

HOUSING		
Voltage	250V and below	Above 250V
Housing Width	22,5mm	45mm

LEVEL SENSING INPUT	
Probe voltage	4V AC
Probe frequency	100Hz
Sensitivity	0 to 100kOhm (adjustable)
Response	0.5 seconds

Note: Other sensitivity ranges are available on request.

Additional information in Section J, page 131.

SC-230

Level Control Module
for use with Namur Sensors

SLIMLINE

MONITORING RELAYS



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	230	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- Level control of non-conductive liquids or granular materials.
- Non-contact level control of metallic materials using inductive sensors (e.g. metal filings, ball bearings).
- Direction control on machinery.
- Level control of aggressive or pressurised liquids through glass.

Features

- Failsafe feature.
- Interfaces with industrial standard NAMUR sensors (inductive or capacitive).
- Low power sensor signal to DIN 19234.
- Programmable charge or discharge modes.
- Programmable single or double sensor selection.
- Independent indication of each sensor status.
- Separate cable fault indication for each sensor.
- Failsafe operation under cable fault conditions.
- Direct interface with solid state relay.
- Protected NPN output for direct interface with PLCs or counters.
- 10A SPDT relay output.
- DC or AC power supply option.

Description of Operation

The **SC-230** interfaces with the industrial standard NAMUR sensors and although designed for level control, there are other applications for which it may be used. The switching sequence occurs as follows: When both sensor inputs are sensing, the output of the unit changes state. The output state switches again only when both sensors are no longer sensing. The unit may be used with capacitive or inductive NAMUR sensors for high and low level detection as shown in the connection diagram. It is programmable for failsafe operation in the following modes.

Dual Sensor Mode

Charging: The relay energises when both sensor are not sensing. The relay will de-energise only when both sensors are sensing.

Discharging: The relay energises when both sensors are sensing. The relay will de-energise only when both sensors are not sensing.

Single Sensor Mode

The unit may also be configured for single sensor, single level switching.

Cable Fault: The unit is equipped with cable fault detection which detects short-circuit or open-circuit conditions on either sensor. When there is a cable fault, the respective sensing LED will flash at 1Hz. Both sensing LEDs will flash in the case of single sensor operation. The relay will de-energise into a failsafe mode under cable fault conditions.

Output: The unit features three types of output:

- An NPN open collector output for switching electronic process control equipment (eg. counters, PLC's etc.)
- An output capable of driving a solid state relay.
- A relay contact output suitable for switching loads.

Operational Diagrams

Dual Sensor Mode: Charging

Power Supply	████████████████████
Sensor Fault	L Sensor Fault ████████████████████ H Sensor Fault ████████████████████
L sensor (LED 3)	
H sensor (LED 1)	
Relay On	████████████████████ ████████████████████ ████████████████████ ████████████████████

Dual Sensor Mode: Discharging

Power Supply	████████████████████
Sensor Fault	
L Sensor (led 3)	
H Sensor (led 1)	
Relay On	████████████████████ ████████████████████ ████████████████████ ████████████████████

Single Sensor Mode: Charging

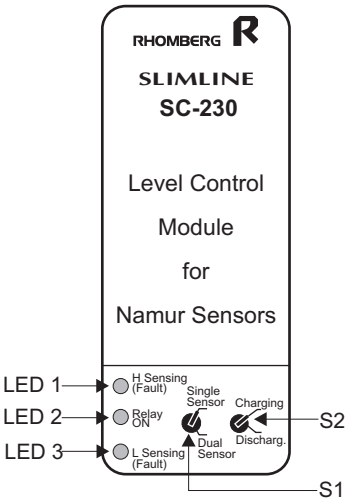
Power Supply	████████████████████
Sensor Fault	
L sensor (LED 1 & 3)	
Relay On	████████████████████ ████████████████████ ████████████████████

Single Sensor Mode: Discharging

Power Supply	████████████████████
Sensor Fault	
L sensor (LED 1 & 3)	
Relay On	████████████████████ ████████████████████ ████████████████████

F = Flashing LED to indicate sensor fault

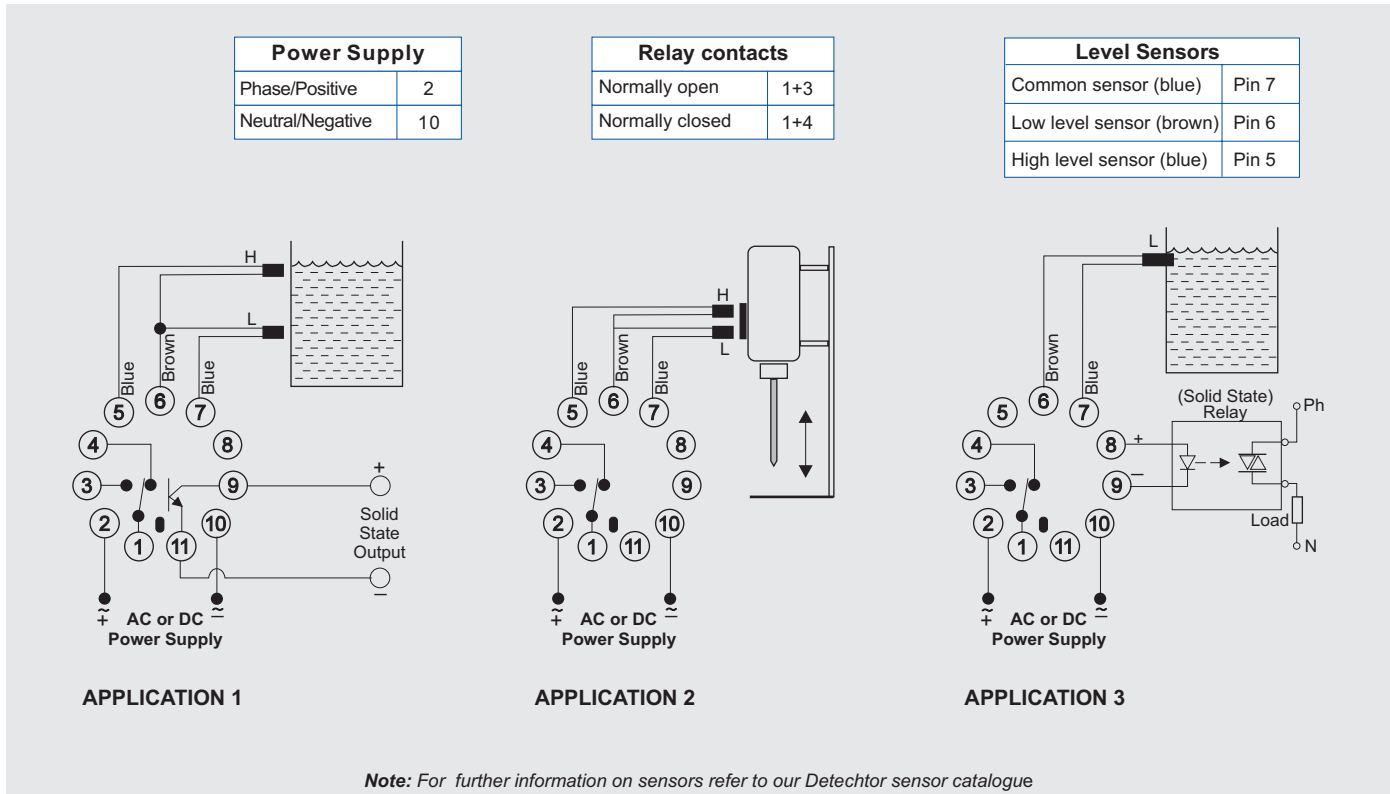
Description of Controls



- S1: The **Sensor Configuration** is selected on S1. If set to “Single Sensor”, the unit is configured for single level switching (single sensor connected between pins 6 and 7). If set to “Dual Sensor”, the unit is configured for dual level switching (low level sensor connected between pins 6 and 7 and high level sensor connected between pins 5 and 6).
- S2: The **Mode of Operation** is selected on S2. If set to “Charging”, the unit provides failsafe filling of reservoirs. If set to “Discharging”, the unit provides failsafe draining of reservoirs.
- LED 1: The LED marked “**H Sensing (fault)**” illuminates when the High (H) level sensor is sensing. The LED flashes if either a sensor fault or a cable fault is detected (flash rate 1 Hz).
- LED 2: The LED marked “**Relay ON**” illuminates when the relay is energised.
- LED 3: The LED marked “**L Sensing (fault)**” illuminates when the Low (L) level sensor is sensing. The LED flashes if either a sensor fault or a cable fault is detected (flash rate 1Hz).

Note: Both LED1 and LED3 will illuminate together under single sensor mode.

Wiring and Connection



Technical Specifications

POWER SUPPLY	SENSOR INPUT
AC: Supply voltage: 12, 24, 110, 230, 400, 415, 525V ±15% Isolation (sensor input to power supply): 2kV Power consumption: 3VA (approx.) 6VA for 415, 525V (approx.)	Type NAMUR (DIN 19234). Maximum Sensing Speed: 25Hz (when using relay output). Short Circuit Current: 20mA DC. Open Circuit Current: 8,2V DC.
DC: Supply voltage: 10-30V, 48, 60, 110V ±15% Isolation: no galvanic isolation Power consumption: 100mA (10-30V) 30mA for higher ranges.	

Additional information in Section J, page 131.

SC-300

Control Module for Namur Sensors

SLIMLINE

MONITORING RELAYS



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	300	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Features

- Failsafe feature.
- Direct interfaces with Namur two-wire proximity sensors (inductive, capacitive and opto-electronic).
- Sensor cable fault detection with LED indication (open circuit, short circuit).
- Proximity switching in hostile supply voltage environments (transients, surges).
- High reliability proximity switching compared to limit switches.
- Cost efficient sensor replacement.
- Cost efficient module replacement.
- 2 Wire sensor installation.
- Impervious to interference between sensor and amplifier over long cable runs.
- Low power sensor signal to DIN 19234.
- Control module available in voltages from 12V DC to 525V AC.
- 10A SPDT single pole or 2 x 5A double pole relay outputs.

Description of Operation

The **SC-300** is a control module for NAMUR sensors (DIN 19234). It converts the low current signal of the sensor into a relay switching action. Monitoring the current flow to the sensor, it will detect cable faults such as open circuits or short circuit conditions. The unit can be configured for target response or space response, thus providing failsafe operation. A LED indicates whenever a target is registered by the sensor.

Target Response: If the sensor is connected to the target response input (pin 5), the relay will energise when the sensor registers a target. When no target is sensed, the relay will de-energise.

Space Response: If the sensor is wired to the space response input (pin 7), the relay will de-energise when the sensor registers a target. When no target is sensed, the relay will energise.

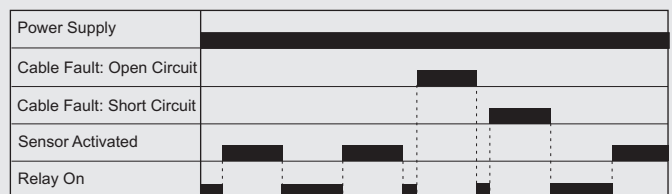
Cable Fault: When cable fault occurs on the sensor line, the relay de-energise and LED 3 on the module will indicate a fault condition. When the cable fault is an open circuit (cable fracture), both the "cable fault" LED and the "input sensing" LED will illuminate. If the fault is a short circuit in the cable, only the "cable fault" LED will illuminate.

Operational Diagrams

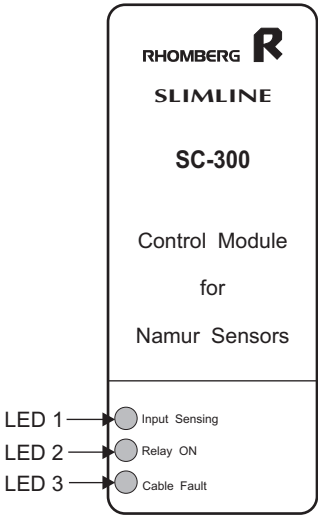
Target Sensing



Space Sensing



Description of Controls



LED 1: The LED marked “**Input Sensing**” illuminates when the namur sensor detects a target. It also illuminates if the sensor is disconnected or the sensor leads are severed (open circuit).

LED 2: The LED marked “**Relay ON**” illuminates when the relay is energised .

LED 3: The LED marked “**Cable Fault**” illuminates when:

- a short circuit occurs on the sensor leads.
- an open circuit occurs on the sensor leads or the sensor is disconnected.

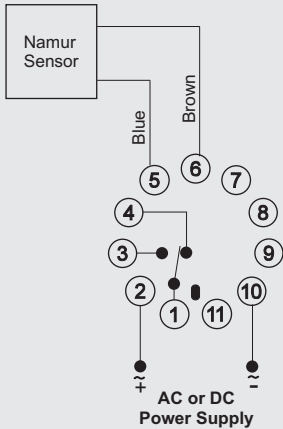
Note: An **Open Circuit** condition will cause both LED 1 as well as LED 3 to illuminate. A **Short Circuit** condition will cause only LED 3 to illuminate.

Wiring and Connection

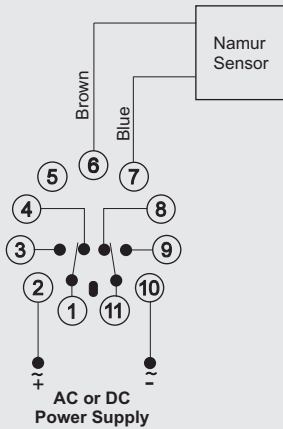
Power Supply	
Phase/Positive	2
Neutral/Negative	10

Relay Contacts SPDT	
Normally open	1+3
Normally closed	1+4
Relay Contacts DPDT	
Normally open	1+3
Normally closed	1+4
Normally open	11+9
Normally closed	11+8

NAMUR Sensor Input	
Target sensing:	Connect the brown wire to pin 6. Connect the blue wire to pin 5.
Space sensing:	Connect the brown wire to pin 6. Connect the blue wire to pin 7.



APPLICATION 1
Target sensing



APPLICATION 2
Space sensing

Note: For further information on our NAMUR sensors refer to our Detector catalogue.

Technical Specifications

POWER SUPPLY	
AC:	Supply voltage: 12, 24, 110, 230, 400, 415, 525V ±15% Isolation (sensor input to power supply): 2kV Power consumption: 3VA (approx.) 6VA for 415, 525V (approx.)
DC:	Supply voltage: 10-30V, 48, 60, 110V ±15% Isolation: no galvanic isolation Power consumption: 100mA (10-30V), 30mA for higher ranges

SENSOR INPUT	
Type:	NAMUR (DIN 19234)
Maximum Sensing Speed:	25Hz
Short Circuit Current:	20mA DC
Open circuit voltage:	8,2V DC

SC-301

Intrinsically Safe Control
Module for Namur Sensors
(EX iB) GR 2C, T6

SLIMLINE

MONITORING RELAYS



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	301	220V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- Intrinsically safe sensor application.
- High reliability proximity switching.
- Proximity switching in hostile environments (transients, surges).
- Liquid level sensing in hazardous areas .
- Sensing with sensor-cable fault detection.

Features

- Intrinsically safe classification: (Ex ib) Gr 2C, T6.
- Direct interface with Namur two-wire proximity switches.
- Failsafe operation.
- Sensor cable fault detection and indication.
- Low power sensor signal to DIN 19234.
- Single pole or double pole relay outputs.

Description of Operation

The **SC-301** is a control module for NAMUR sensors (DIN19234). It converts the low current signal of the sensor into a relay switching action. Monitoring the current flow to the sensor, it will detect cable faults such as open-circuit or short-circuit conditions. The unit can be configured for target or space response, thus providing failsafe operation. A LED illuminates whenever a target is registered by the sensor.

Target Response: If the sensor is connected to the target response input (pin 5), the relay will energise when a target is registered by the sensor. When no target is present, the relay will de-energise.

Space Response: If the sensor is connected to the space response input (pin 7), the relay will de-energise when a target is registered by the sensor. When no target is present, the relay will energise.

Intrinsically Safe: The circuit has been specially designed to comply with the standards for intrinsically safe electrical apparatus. Intrinsically safe operation is only possible if the wiring and connection diagrams are followed.

Cable Fault: When a cable fault occurs on the sensor line, the relay de-energises and a LED on the module will indicate a fault condition. When the cable fault is an open-circuit (cable fracture), both the "Cable Fault" LED and the "Input Sensing" LED will illuminate. If the fault is a short-circuit in the cable, only the "Cable Fault" LED will illuminate.

Operational Diagrams

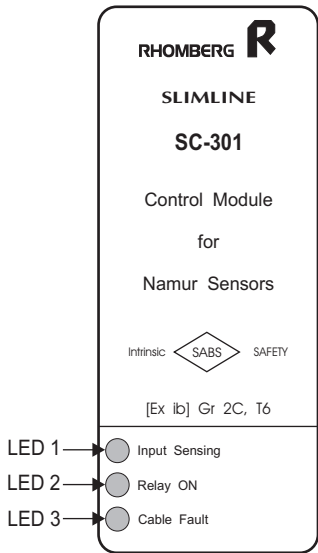
Target Sensing

Power Supply	
Cable Fault: open circuit	
Cable Fault: short circuit	
Sensor activated	
Relay On	

Space Sensing

Power Supply	
Cable Fault: open circuit	
Cable Fault: short circuit	
Sensor activated	
Relay On	

Description of Controls



LED 1: The LED marked “**Input sensing**” illuminates when the namur sensor detects a target. It also illuminates if the sensor is disconnected or the sensor leads are open-circuit.

LED 2: The LED marked “**Relay ON**” illuminates when the relay is energised.

LED 3: The LED marked “**Cable Fault**” illuminates when:

- A short circuit occurs on the sensor leads
- An open circuit occurs on the sensor leads or the sensor is disconnected

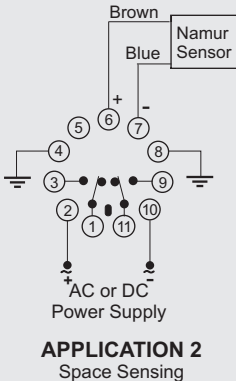
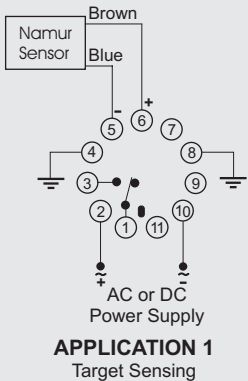
Note: An open-circuit condition will cause both LED 1 and LED 3 to illuminate. A short-circuit condition will cause only LED 3 to illuminate.

Wiring and Connection

Power Supply	
Phase/Positive	2
Neutral/Negative	10

Relay Contacts SPST	
Normally open	1+3
Relay Contacts DPST	
Normally open	1+3
Normally open	11+9
SPST & DPST 250V/5A/100VA	

NAMUR Sensor Input	
Target sensing: Connect the brown wire to pin 6. Connect the blue wire to pin 5.	
Space sensing: Connect the brown wire to pin 6. Connect the blue wire to pin 7.	
Earth Connection: Pins 4 & 8 must be connected to Earth.	



IMPORTANT NOTE:

1. Pins 4 & 8 must be connected to earth for intrinsically safe operation.
2. The control module must be installed in an approved flame-proof enclosure or outside the classified area.
3. Ensure that the maximum relay contact voltage and current does not exceed 250V and 5A, respectively. Also ensure that the product of these two values of voltage and current does not exceed 100 VA.
4. The unit must be plugged into an approved 11-pin socket (See Slimline S3-B socket on page 144)

Note 1: For further information on sensors refer to our Detector catalogue.

Note 2: For application where intrinsic safety is not required, see SC-300 on page 76.

Technical Specifications

POWER SUPPLY

- AC: Supply voltage: 110, 220V ±15%
Isolation (sensor input to power supply): 2kV
Power consumption: 3VA approximately
- DC: Supply voltage: 24V ±15%
Isolation: no galvanic isolation
Power consumption: 100mA

SENSOR INPUT

- Type: NAMUR (DIN 19234)
- Quiescent Voltage: ≤ 8.2V DC
- Short circuit current: ≤ 25mA

SENSOR INPUT CONTINUES...

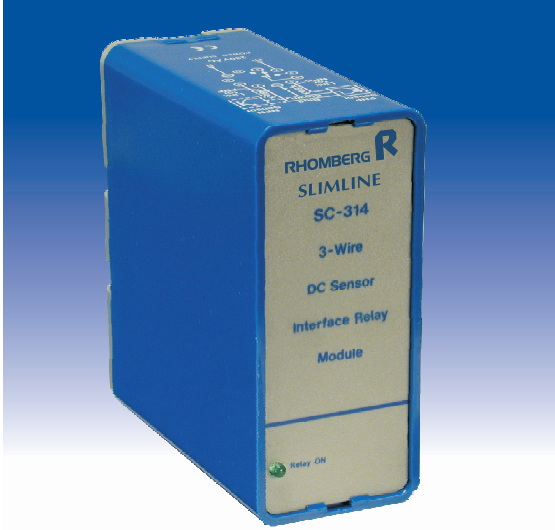
- Max External Capacitance: ≤ 300nF (AC supply)
≤ 700nF (DC supply)
- Max External Inductance: ≤ 2mH
- Relay options: SPST (pins 1 & 3, NO)
DPST (pins 1 & 3 NO / pins 11 & 9, NO)
- Maximum relay current: 5A
- Maximum relay voltage: 250V
- Maximum product of relay current and voltage: 100VA
- Internal fuse rating: (AC supply) 100mA, 250V

SC-314

3-wire DC Sensor Interface Relay Module

SLIMLINE

MONITORING RELAYS



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	314	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- For converting a DC sensor signal to a relay output for direct switching of currents up to 10A.
- Where a switching interface is required between a DC sensor and AC circuits.
- For interfacing low voltage DC sensors with AC voltage up to 525V AC.

Features

- Interfaces with all types of 3-wire NPN or PNP DC sensors (inductive, capacitive and opto-electronic).
- LED indication of relay status.
- Robust power supply.
- Cost efficient interface for DC sensors in AC environments.
- Cost efficient module replacement.
- 10A SPDT relay output.

Description of Operation

The **SC-314** has been designed to interface with both NPN and PNP type 3-wire DC sensors. The high output current switching capability provides a robust sensor interface for power switching applications. The unit provides a cost effective interface method for all 3-wire DC type sensors.

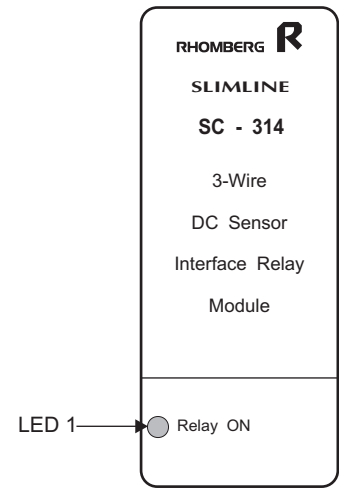
When power is applied to the unit, it is ready to operate. If the sensor output should conduct (switch ON), the relay will energise and the LED illuminates.

Operational Diagram



Description of Controls

LED 1: The LED marked “Relay ON” illuminates when the relay is energised.

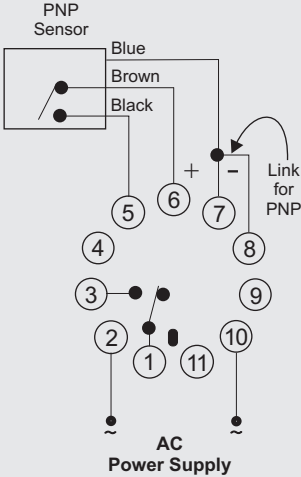


Wiring and Connection

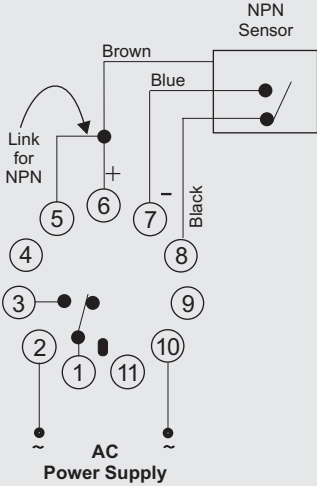
Power Supply	
Phase/Positive	2
Neutral/Negative	10

Relay Contacts SPDT	
Normally open	1+3
Normally closed	1+4

Sensor Input	
PNP sensor input: Connect the brown wire (+ve) to pin 6. Connect the blue wire (-ve) to pin 7. Connect the black wire (output) to pin 5. Link between pins 7+8.	NPN sensor input: Connect the brown wire (+ve) to pin 6. Connect the blue wire (-ve) to pin 7. Connect the black wire (output) to pin 8. Link between pins 5+6.



APPLICATION 1
Interface with PNP sensor



APPLICATION 2
Interface with NPN sensor

Note: For further information on our sensors refer to our Detector catalogue

Technical Specifications

SUPPLY VOLTAGE	DC OUTPUT SUPPLY FOR SENSORS
AC: 12, 24, 110, 230, 400, 415, 525V ±15% Isolation (sensor input to power supply): 2kV Power consumption: 3VA (approx.) 6VA for 415, 525V (approx.)	10-15V at 30mA SENSORS INPUT: (PNP pin 5, NPN pin 8) Each sensor must be able to conduct at least 80mA to operate the modules internal relay. Maximum switching speed: 25Hz (when using relay output).



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	320	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- Back-up system for tacho generator on mine hoists.
- Over-speed detection on mine loco's, fork-lift trucks, etc.
- Sequence starting on interdependent conveyor belts.
- Starter motor disabling on diesel engines.
- Conveyor belt slip detection.
- Conveyor belt tearing detection.
- Indication of production speed or manufacturing feed rates.
- Indication of rotational speed.

Features

- Failsafe feature.
- Direct interface with NAMUR two-wire proximity sensors or limit switches.
- Low power sensor signal to DIN 19234.
- Sensor cable fault indication.
- Programmable speed ranges: 10 RPM to 10 000 RPM.
- Programmable for over-speed or under-speed detection.
- 0 to 1mA proportional output for tachometer instruments (PQ72).
- 4-20mA available on request.
- Speed setpoint adjustable on calibrated scale 0-100%.
- Start-up delay.
- 10A SPDT relay output.

Description of Operation

The **SC-320** is a multi-range tachometer relay, interfacing with NAMUR (DIN 19234) proximity sensors or limit switches. The sensor will provide a pulse every time a metal object enters the sensing area (e.g. A nut or bolt on a rotating shaft or the teeth of a gear wheel). Monitoring the frequency of pulses received from the sensor, the module provides either over-speed or under-speed detection, as well as a proportional output for a PQ-72 tachometer instrument in five-overlapping ranges from 10 RPM to 10 000 RPM. The mode of operation is programmable and the unit features sensor cable fault indication.

Start-up Delay: When power is applied to the module, the relay energises immediately, ignoring abnormal speed conditions experienced during initiation.

Over-speed Sensing: When programmed for over-speed sensing, the relay de-energises if the speed exceeds the limit. When the speed drops below 10% of the setpoint, the relay energises.

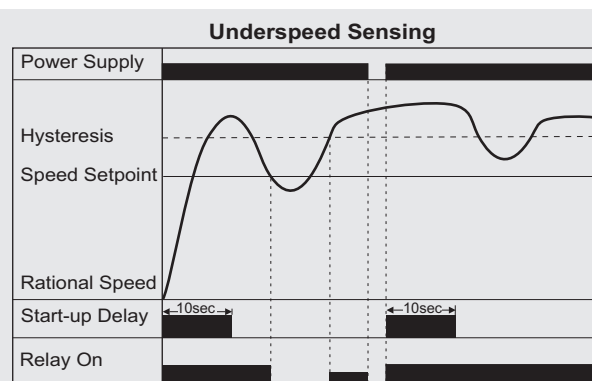
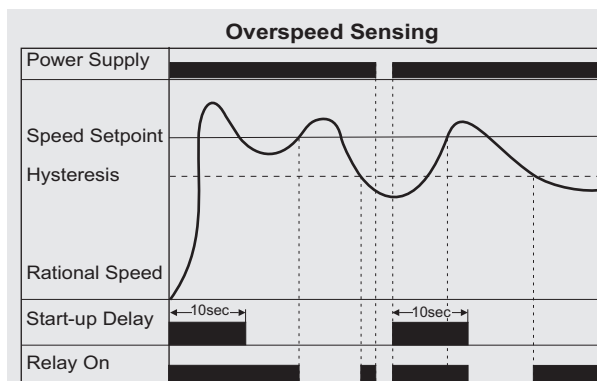
Under-speed Sensing: When programmed for under-speed sensing, the relay de-energises if the speed drops below the setpoint. When the speed rises above 10% of the set limit, the relay energises.

Cable Fault: When cable fault occurs on the sensor line, a LED on the module will indicate fault condition. When the cable fault is an open circuit (cable fracture), both the "cable fault" LED and the "input sensing" LED will illuminate. If the fault is a short circuit in the cable, only the "cable fault" LED will illuminate.

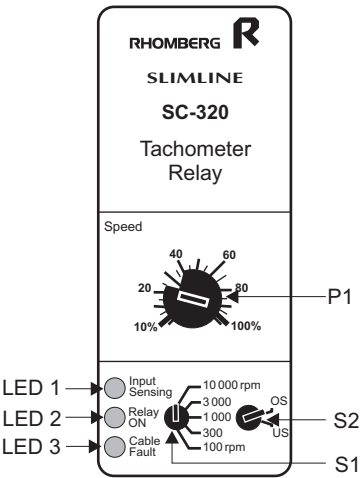
Hysteresis: Hysteresis represents the difference between the tripping point and the recovery point of the unit. The hysteresis is fixed to 10% to prevent relay chatter when the speed fluctuates around the setpoint.

Response time: If the 10 seconds response time on the lower speed ranges (100 and 300 RPM) is too slow, it is recommended to increase the number of target points on the rotating surface. This results in a multiplication and hence a higher RPM range when a faster response time is required.

Operational Diagrams



Description of Controls



P1: The **Over-speed / Under-speed Threshold** is adjusted on P1. Maximum setting of 100% corresponds with the speed selected on S1.

S1: The **Speed Range** is set on S1.

S2: The **Mode of Operation** is set on S2. If set to “OS” the unit operates as an over-speed detector. If set to “US” the unit provides under-speed detection.

LED 1: The LED marked “**Input Sensing**” illuminates when the NAMUR sensor detects a target. It also illuminates if the sensor is disconnected or the sensor leads are severed (open circuit).

LED 2: The LED marked “**Relay ON**” illuminates when the relay is energised.

LED 3: The LED marked “**Cable Fault**” illuminates when:

- a short circuit occurs the sensor leads, or,
- an open-circuit fault occurs on the sensor leads or the sensor is disconnected.

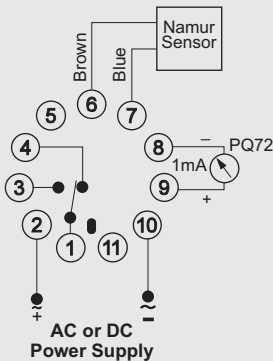
Note: An **open circuit** condition will cause both LED1 as well as LED3 to illuminate. A **short circuit** condition will cause only LED3 to illuminate.

Wiring and Connection

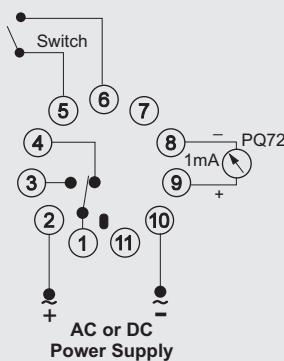
Power Supply	
Phase/Positive	2
Neutral/Negative	10

Relay Contacts	
Normally open	1+3
Normally closed	1+4

Sensing Input
NAMUR sensor input: Connect brown wire to the pin 6. Connect the blue wire to pin 7.
Limit switch input: Connect the switch between pin 5 and pin 6.
Analogue Output
Connect the instrument PQ72 to pin 9(+) and pin8 (-), observing polarity.



APPLICATION 1
NAMUR sensor input



APPLICATION 2
Limit switch input

Note: For further information on our sensors refer to our Detechtor catalogue.

Technical Specifications

POWER SUPPLY	
AC:	Supply voltage: 12, 24, 110, 230, 400, 415, 525V ±15% Isolation (sensor input to power supply): 2kV Power consumption: 3VA (approx.) 6VA for 415, 525V (approx.)
DC:	Supply voltage: 10-30V, 48, 60, 110V ±15% Isolation: no galvanic isolation Power consumption: 100mA (10-30V) 30mA for higher ranges.

SENSOR INPUT	
Type:	NAMUR (DIN 19234)
Short Circuit Current:	20mA DC
Open Circuit Voltage:	8,2V DC
Hysteresis:	10% (fixed)

Speed Range	Approximate Response time
10-100 RPM	10 seconds
30-300 RPM	10 seconds
100-1 000 RPM	1 second
300-3 000 RPM	1 second
1000- 10 000 RPM	1 second

Repeatability: 1%
Start-up delay: approximately 10 seconds
(Available 0-15 seconds on special order)
Analogue output: 0-1mA DC (proportional).
(0-20mA or 4-20mA available as an order option)
Maximum load: 7k Ohm
Accuracy: 5% of full scale

Additional information in Section J, page 131.



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	410	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- Long distance proximity sensing of objects on conveyors.
- Crane and hoist protection on over travel.
- Gap detection on mechanical handling systems.
- Pile-up detection on mechanical handling systems.
- Automatic initiation of vehicle washing systems.
- Level control of solids and granular substances (e.g. brick manufacturing).
- Control of security gates on both domestic and industrial properties.
- Contrast sensing between dark and light (e.g. coding stripes on material handling systems).
- Single beam safety barrier for a access control to certain hazardous areas.
- Edge control on material alignment.
- Material measurement control.

Features

- Failsafe feature.
- Directly interfaces with the R02 Detector range of rectangular and tubular opto-electronic sensors.
- 10 metre sensing distance with the appropriate barrier heads.
- Programmable for dark or light response.
- Adjustable on and off response delay of 0-5 seconds.
- Signal modulated beam to stop foreign light source interference.
- Adjustable light intensity.
- High speed solid state (NPN) open collector output.
- Direct interface with solid state relays.
- Opto sensor cable fault detection (SC-411 only).
- 10A SPDT relay output.

Description of Operation

The **SC-410** and **SC-411** are specifically designed for opto-electronic sensing applications. Operating in conjunction with the infra-red proximity or barrier heads type R02, the SC-410/411 provides remote sensing of objects up to 10 metres.

Sensing: The unit provides a modulated current to the infra-red light transmitter. It simultaneously monitors the signal returning from the receiver. If the transmitted light reaches the receiver, the module records a valid signal. Signals generated by a foreign light source such as the sun will be ignored. The light intensity of the transmitter can be adjusted on the SC-410/411 to compensate for semi-transparent objects or to fine tune the system in reflective (proximity) sensing applications.

Output: The unit features three types of outputs:

- An NPN open collector output for switching electronic process control equipment (e.g. counters, PLC's etc.).
- An output capable of driving a solid state relay.
- A relay contact output suitable for switching loads.

Programming: For failsafe operation, the output of the unit can be inverted via the programming key for either dark response or light response.

Light response: In this mode the relay will energise and the output transistor will conduct when the light beam is sensed (i.e. light barrier not blocked or light reflected by target).

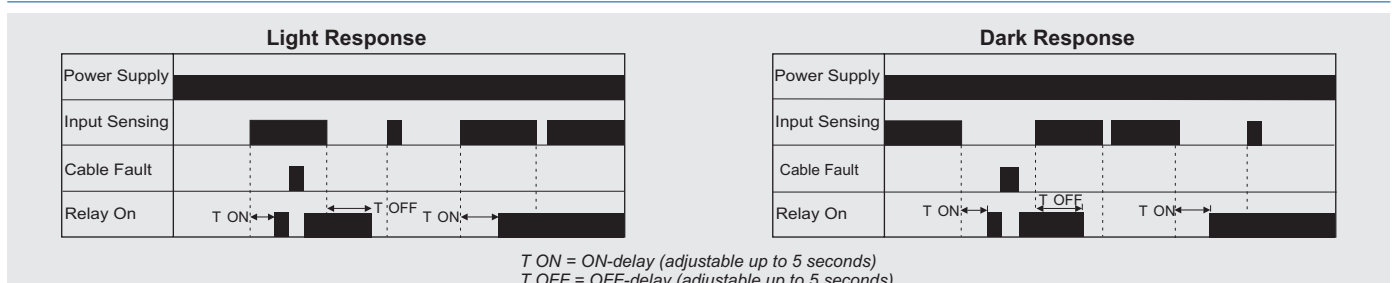
Dark response: In this mode the relay will energise and the output transistor will conduct when the light beam is interrupted (i.e. light barrier blocked or no reflective target present).

Response delay: The ON/OFF response of the relay and output transistor can be delayed up to 5 seconds. Both delays can be adjusted separately, thus providing extended operation of the output for fleeting targets (gap detection) or ignoring signals of insufficient duration (pile-up control).

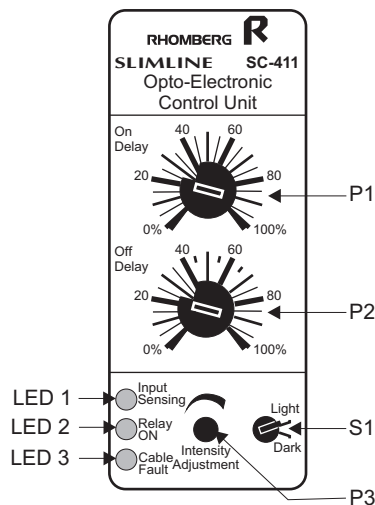
Cable fault: Cable fault detection on the receiver and transmitter ensures failsafe operation. A short or open circuit on either the transmitter or receiver cables will cause a cable fault. In the event of a cable fault the relay will de-energise.

Note (SC-411): If the full loop impedance of the transmitter cable exceeds 2.5 ohms, a cable fault will be detected. Ideally a screened cable of 0.25 ohms/ metre or less should be used.

Description of Operations



Description of Controls



P1: The **ON-response Delay** is adjusted on P1.

P2: The **OFF-response Delay** is adjusted on P2.

P3: The **Light Intensity** is adjusted on P3, using a fine screwdriver. 20 Turns clockwise will adjust sensitivity from minimum to maximum.

S1: **Function Selection** is provided by S1. If set to "Light", the relay energises when the beam is sensed. If set to "Dark", the relay energises when the beam is interrupted.

LED1: The LED marked "**Input Sensing**" illuminates whenever the light beam is sensed by the receiver.

LED 2: The LED marked "**Relay On**" illuminates when the output has responded and the relay is energised.

LED 3: The LED marked "**Cable Fault**" light illuminates when a cable fault is detected.

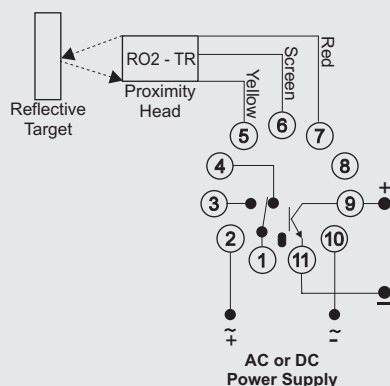
Wiring and Connection

Power Supply	
Phase/Positive	2
Neutral/Negative	10

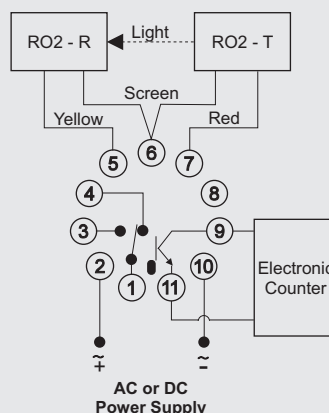
Relay Contacts	
Normally open	1+3
Normally closed	1+4

Solid State Transistor	
Negative (NPN emitter) to pin 11.	
Positive (open collector) to pin 9.	
Note:	
1. Pin 11 is internally linked to pin 6.	
2. For DC power supply, pins 6, 10 and 11 are common.	

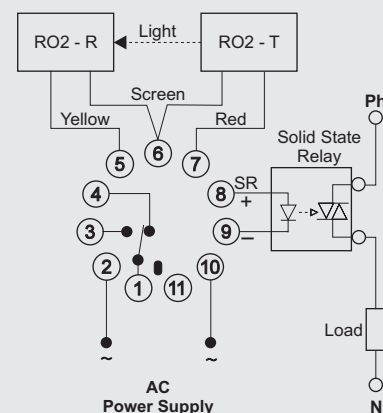
Solid State Relay	
Control voltage to be tapped between pin 8 ("SR" + 12V) and pin 9.	
Sensor Heads	
Yellow (Receiver Input)	Pin 5
Red (Transmitter Output)	Pin 7
Screen (Negative, Common)	Pin 6



APPLICATION 1
Proximity sensing: Sensing a reflective target in conjunction with proximity sensor head.



APPLICATION 2
Barrier sensing: Sensing a target in conjunction with barrier (transmitter-receiver) heads. Transistor output feeding into and electronic counter.



APPLICATION 3
Solid state relay: Rapid switching of loads via external solid state relay.

Note: For further information on sensors refer to our Detector catalogue.

Technical Specifications

POWER SUPPLY
AC: Supply voltage: 12, 24, 110, 230, 400, 415, 525V $\pm 15\%$
Isolation (sensor input to power supply): 2kV
Power consumption: 3VA (approx.)
6VA for 415, 525V (approx.)

DC: Supply voltage: 10-30V, 48, $\pm 15\%$
Isolation: no galvanic isolation (common negative)
Power consumption: 100mA (10-30V)
30mA for higher ranges.

RESPONSE
ON - Delay = 0.03 - 5 seconds (adjustable)
OFF - Delay = 0.03 - 5 seconds (adjustable)

SOLID STATE RELAY OUTPUT (PIN 8-9)
Maximum output source current: 8mA.
Open circuit output voltage: 12V DC.

TRANSMITTER (PIN 6-7)
Current pulse: 1.5A/25 microseconds.
Maximum wire impedance: 2.5 Ohms (use coaxial cable).
Short circuit current: 20 mA (average).

RECEIVER (PIN 5-6)
Short circuit current: 3mA
Open circuit voltage: 8.2V

OPEN COLLECTOR TRANSISTOR OUTPUT (PIN 9-11)
Type: NPN transistor.
Output sink current: 100mA.
Maximum voltage: 30V DC.

Additional information in Section J, page 131.



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	501	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

Monitoring and/or controlling temperatures:

- of bearings on large industrial machines
- of electrical machines (e.g. Windings bearings, etc.),
- of large commercial and industrial refrigeration systems
- of injection moulding heads
- in large offices or buildings where there is a centralised air-conditioning Plant
- in hot houses
- in boilers
- in liquid chemical tanks

Features

- Failsafe feature.
- Interfaces with industrial standard PT-100 temperature sensors.
- Six programmable overlapping temperature ranges between -50°C to 300°C.
- Programmable for over and under-temperature.
- Temperature level adjustment on calibrated scale 0 - 100%.
- High repetitive accuracy.
- Programmable inversion of relay output for fail-to-safe operation.
- 0 to 1mA proportional output for each temperature range (with PQ72 instrument).
- 4-20mA available on request.
- Proportional output is limited to 1,2 mA to protect analogue instruments.
- Latching on under-temperature or over-temperature (programmable).
- Sensor or cable fault detection and indication with automatic relay de-energisation for failsafe operation.
- 10A SPDT relay output.

Description of Operation

The **SC-501** is a multi-range temperature control module, interfacing with a standard PT-100 resistive temperature sensor. The module provides either over-temperature or under-temperature detection as well as a 0 - 1mA proportional output (e.g. PQ72 instrument) in six overlapping temperature ranges from -50 to 300°C. Relay tripping and recovery levels are adjustable from 0 - 100% of the programmed temperature range. The relay mode of operation is programmable and includes a latching facility. The unit also features sensor fault detection.

Over-temperature sensing: When programmed for over-temperature sensing, the relay will de-energise if the temperature exceeds the setpoint. The relay will energise again if the temperature drops to the recovery level. The recovery level is adjustable from 0 - 100% of the programmed temperature range.

Under-temperature sensing: When programmed for under-temperature sensing, the relay will de-energise if the temperature drops below the setpoint. The relay will energise again if the temperature rises to the recovery level. The recovery level is adjustable from 0 - 100% of the programmed temperature range.

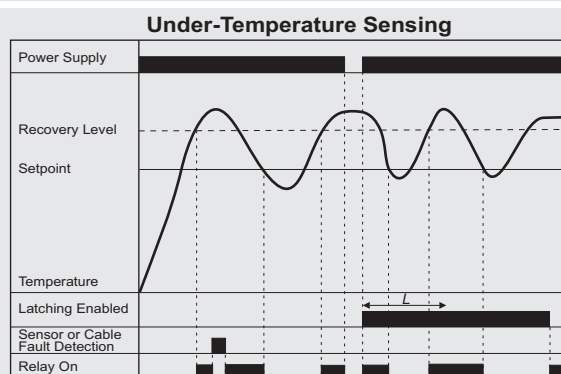
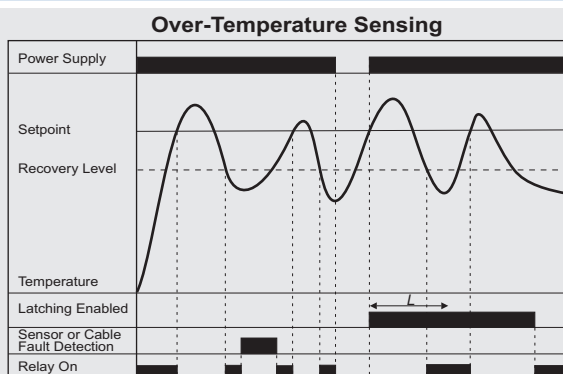
0 to 1mA Output: The module provides a 0 - 1mA proportional output which spans the selected temperature range. If the upper limit of the temperature range is exceeded, the output current is limited at 1,2mA to protect analogue meters. The output has been designed to be used with both digital and analogue instruments.

Latching: When latching is armed, the relay will not recover from a tripped condition but will remain de-energised until reset. The unit may be reset by either breaking and re-applying the power to the unit or by momentarily disabling the latching circuit (e.g. push-to-open switch).

Sensor or cable fault: If the PT-100 sensor, or its connecting cable, has either an open-circuit or a short-circuit fault, the relay will de-energise and the LED marked "Sensor Fault" will illuminate.

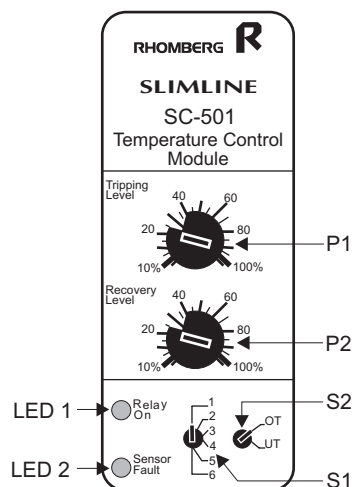
Hysteresis: The hysteresis of the unit may be adjusted by varying the difference between the tripping level and the recovery level. To prevent relay "chatter", this difference should always exceed 2%.

Operational Diagrams



L = Latching is disabled for approximately 10 seconds at power up

Description of Controls



P1: **Tripping Level** is adjusted on P1. The setting of 0% and 100% correspond with the minimum and maximum levels selected on S1.

P2: **Recovery Level** is adjusted on P2. The settings of 0% and 100% correspond with the minimum and maximum levels set on S1.

S1: The **Temperature Sensing Range** is set on S1.

S2: **Function Selection** is provided on S2. If set to "OT", the unit operates as an over-temperature detector. If set to "UT", the unit operates as an under-temperature detector

LED1: The green LED marked "**Relay ON**", illuminates when the relay is energised.

LED 2: The red LED marked "**Sensor Fault**", illuminates when:

- A short circuit occurs in either the PT-100 sensor or its connection cable.
- An open-circuit fault occurs in either the PT-100 sensor or its connection cable.
- The sensor is disconnected.

Wiring and Connection

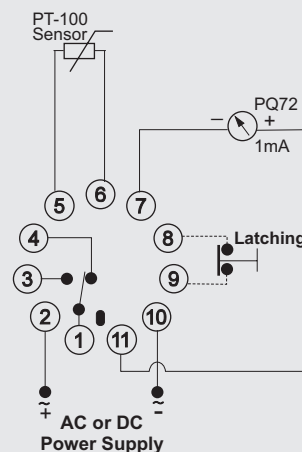
Power Supply	
Phase/Positive	2
Neutral/Negative	10

Relay Contacts	
Normally open	1+3
Normally closed	1+4

Latching
Latching to be enabled by interconnecting pin 8 & pin 9 (e.g. Push-to-open reset switch)

Analogue Output
Connect the instrument to pin 7 (-) and pin 11 (+) observing polarity.

PT-100 Temperature Sensor Table Of Temperatures vs. Resistance (DIN 48760)			
C	Ohm	C	Ohm
-50	80.25	130	149.82
-40	84.21	140	153.57
-30	88.17	150	157.32
-20	92.13	160	161.05
-10	96.07	170	164.76
0	100.00	180	168.47
10	103.90	190	172.16
20	107.79	200	175.84
30	111.67	210	179.51
40	115.54	220	183.17
50	119.40	230	186.82
60	123.24	240	190.46
70	127.07	250	194.08
80	130.89	260	197.70
90	134.70	270	201.30
100	138.50	280	204.88
110	142.28	290	208.46
120	146.06	300	212.03



Technical Specifications

POWER SUPPLY	
AC:	Supply voltage: 12, 24, 110, 230, 400, 415, 525V $\pm 15\%$ Isolation (sensor input to power supply): 2kV Power consumption: 3VA (approx.) 6VA for 415, 525V (approx.)
DC:	Supply voltage: 12, 24V $\pm 15\%$ Isolation: no galvanic isolation Power consumption: 100mA
CONNECTION CABLE	
2 - core, unscreened. Resistance of long cables affect temperature accuracy (Approximately 1°C per 0.3 ohms)	
SENSOR INPUT	
Type: PT-100 resistive temperature sensor Short-circuit current: 1mA Open-circuit voltage: 220mV	

TEMPERATURE SENSING RANGE	
	S1
-50 to 50 C	1
0 to 100 C	2
50 to 150 C	3
100 to 200 C	4
150 to 250 C	5
200 to 300 C	6
Repetitive accuracy: 1%	
ANALOGUE OUTPUT	
Rating 0 to 1mA (proportional). 0-20mA or 4-20mA also available as an order option. Maximum voltage between pins 7 and 11 (pin 11 positive): 12V DC Maximum load: 7k Ohm. Current limits at 1.2mA to protect analogue instruments.	

Additional information in Section J, page 131.

Thermistor Motor Protection Module



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	510	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

SLIMLINE

■ Application Example

- Detects overheating of equipment such as motors, alternators and transformers, using a PTC sensor as a measuring device.

■ Features

- Failsafe feature.
- Interfaces with PTC sensors as per DIN 44081.
- The SC-511 has a fault latching feature, can be reset via an external open via the reset button on the unit.
- Test button to simulate fault condition on the SC-511.
- Sensor or cable fault detection and indication with an automatic relay de-energisation for failsafe operation.
- 10A SPDT relay output.

■ Description of Operation

The **SC-510** and **SC-511** are thermistor motor protection modules, interfacing with PTC sensors as per DIN 44081 for the protection of motors, alternators, transformers, etc. The modules monitor the variation in resistance of the sensors and cause their relays to de-energise as soon as the nominal trip temperature (TNF) of the sensors is exceeded.

Both modules also feature sensor fault and cable fault detection which means that if either a short circuit or an open circuit is detected the relay is de-energised.

Module Triggering: The relay of each module will de-energise as soon as the equipment monitored is subjected to a thermal overload, short circuit or break in the sensor measuring circuit. The green relay indication LED will also go off in such an event.

Module Reset: The SC-510 will automatically reset once the temperature falls below the set threshold, or restoration of either sensor fault or cable fault. When the latching feature on the SC-511 is enabled, the module will not reset once the temperature falls below the reset threshold, or

restoration of either sensor fault or cable fault.

The SC-511 can then only be reset by:

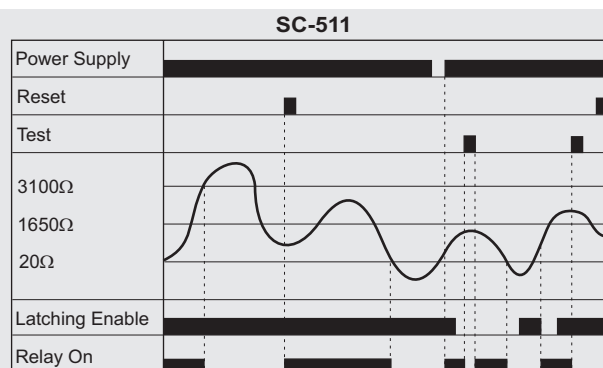
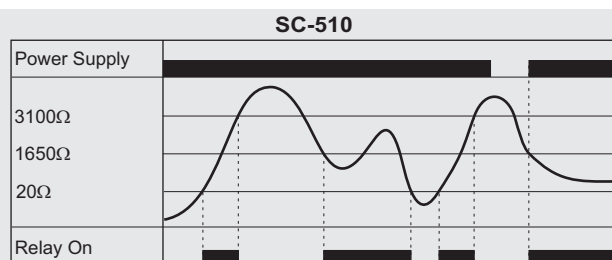
- Pressing the reset push button on the unit,
- Opening the external contact,
- Interrupting the power supply to the module.

Note: If the power supply to the module is interrupted, the relay will subsequently be re-energised if the sensor detects a normal temperature when the power supply voltage is restored.

Test: The TEST button on the SC-511 can be used to simulate a fault condition. The relay will subsequently de-energise and the red cable fault LED will illuminate. The module must be reset if the latching feature is enabled.

Temperature pre-warning: In the event of the equipment being monitored having a second PTC sensor whose nominal trip temperature is lower than the first, then a second module may be used to give an early warning and thus prevent a major shut-down.

■ Operational Diagrams



SC-610

Flip flop relay without memory

SC-611

Flip flop relay with memory

SLIMLINE

MONITORING RELAYS



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	610	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- The direction control of conveyor lines.
- The re-direction of counting pulses to a counter.
- Change-over control for duty cycling of pumps.
- Generator set battery cycling during start-up.

Features

- Many power supply options.
- Direct connection of a NPN sensor (SC-611)
- 10A SPDT or a 5A DPDT relay.

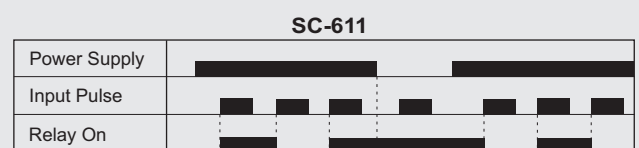
Description of Operation

The unit is ready to operate when power is connected to pins 2 and 10.

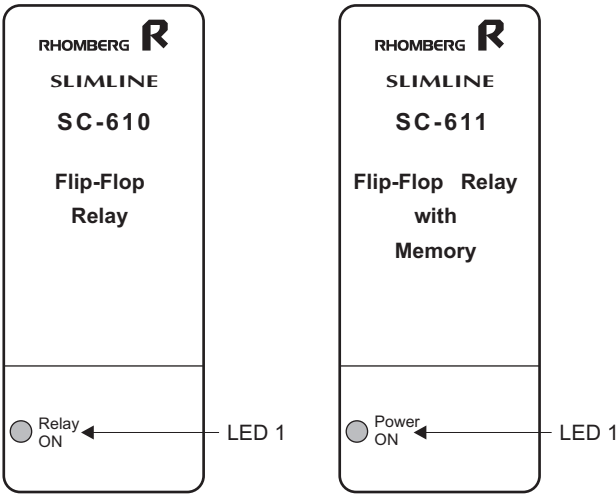
SC-610 (Without memory): On power-up the relay will be de-energised. When an input is received between pins 5 and 7 the relay will energise. On each subsequent input received, the relay will change its state (toggle). When power is removed, the relay will de-energise.

SC-611 (With memory): On power-up the relay will be in the state it was in when power was removed. Each input received subsequently on pin 5 and 7 will cause the relay to change its state (toggle). When power is removed the relay remains in its last state.

Operational Diagrams



Description of Controls



LED1: **SC-610**: The LED will illuminates when the relay is on.

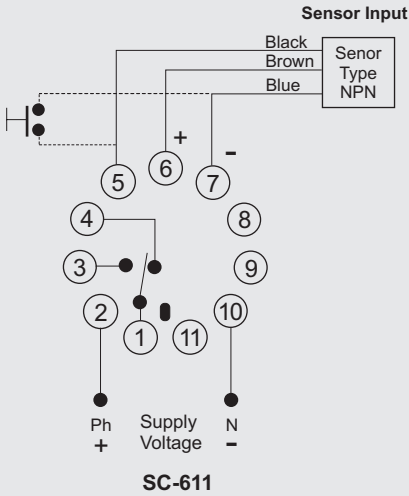
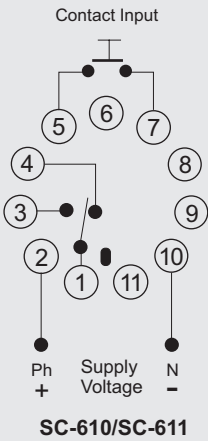
SC-611: The LED will illuminate when power is applied to unit.

Wiring and Connection

Power Supply	
Phase/Positive	2
Neutral/Negative	10

Relay Contacts	
Normally open	1+3
Normally closed	1+4

Pulse Input (SC-610)	
Connect contact between pin 5 and pin 7.	
Pulse Input (SC-611)	
Connect positive lead (brown) to pin 6. Connect NPN output lead (black) to pin 5. Connect negative lead (blue) to pin 7.	



Note: For further information on sensors refers to our Detector catalogue.

Technical Specifications

POWER SUPPLY	
AC:	Supply voltage: 12, 24, 110, 230, 400, ±15% Isolation (reset to power supply): 2kV Power consumption: 3VA (approx.)
DC:	Supply voltage: 12, 24, 48, 60, 110V ±15% Isolation: no galvanic isolation Power consumption: 100mA for 12V and 24V 30mA for 48V and higher

INPUT	
SC-610	SC-611
Short circuit current: 8.5mA	Short circuit current: 1mA
Open Circuit Voltage: 8.2V	Open Circuit Voltage: 8.2V
Input reset speed: 20 millisecs.	Input reset speed: 10 millisecs.

12V DC Output:
Voltage tolerance: 10-15V DC.
Source Current: 50mA (max.).

SC-900

Power Supply Module

SLIMLINE

MONITORING RELAYS



ORDERING CODE

TYPE	MODEL	VOLTAGE	OUTPUT	TYPE
SC	900	230V	24	DRG

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- Power supply to sensitive electronic equipment.
- Power supply to counter up to 36V DC.
- Power supply to panel indicators.

Features

- Cost effective power supply.
- A large variety of output supply options (see table below).
- High input voltage ranges (up to 525V AC).
- Ease of installation due to 11-pin plug-in concept.

Description of Operation

The **SC-900** series of power supply modules allow a wide input voltage range for a low voltage output supply. The unit makes a convenient step down voltage supply for switchboards, etc.

AC Output Supply: This method delivers a low voltage AC supply with the convenience of the 11-pin plug-in concept. The 11-pin plug-in concept allows switchboard manufacturers to pre-wire the board hence reducing lead times.

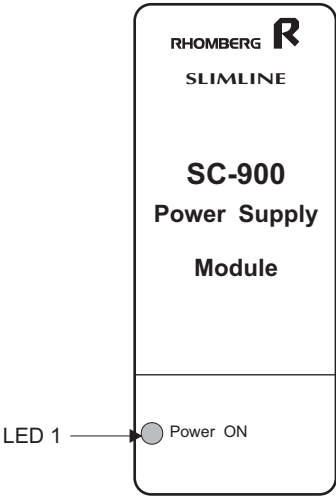
DC Unregulated Supply: Full wave rectification and smoothing is used to deliver a DC voltage output with a minimal ripple. This supply can be used where a fully regulated supply is not a specific requirement.

DC Regulated Supply: This supply is a fully regulated supply with all the advantages such as:

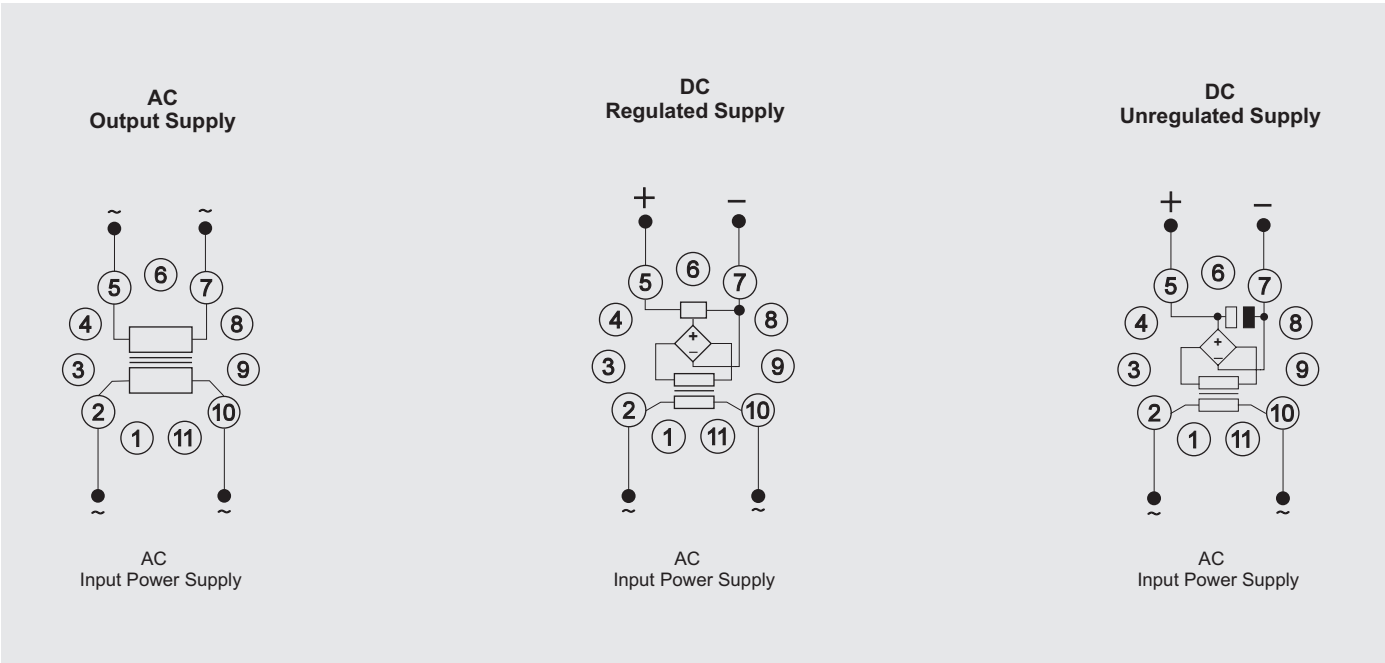
- Overload protected/ short circuit proof
- Low ripple factor
- Over temperature shut down
- Very stable supply through fluctuations in input supply and temperature changes

Description of Controls

LED1: The LED marked “Power ON” will illuminate when power is applied.



Wiring and Connection



Technical Specifications

INPUT SUPPLY VOLTAGE

AC: 12, 24, 110, 230, 400, 415, 525V ±10%
Isolation (input to input): 2kV
Power consumption: 6VA (approx.)

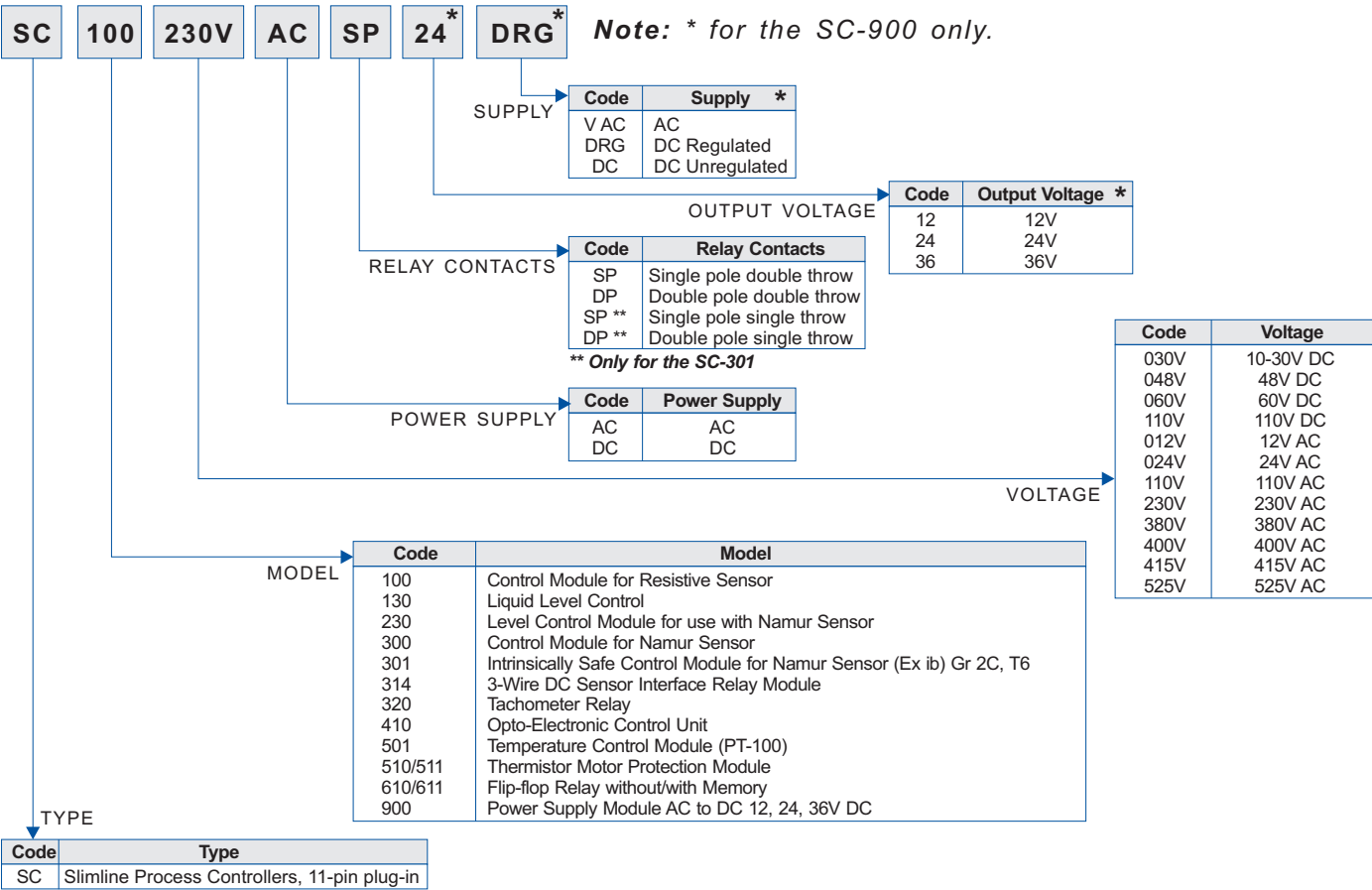
OUTPUT SUPPLY					
Type	AC	DC		DCRG	
Output Voltage	AC Supply [±10%] Output Current	DC Unregulated [±10%]		DC Regulated [±1%]	
		Output Current	% Ripple	Output Current	% Ripple
12	300mA	200mA	<5	150mA	<0,5
24	150mA	120mA	<5	100mA	<0,5
36	100mA	100mA	<5	80mA	<0,5

Additional information in Section J, page 131.

HOW TO ORDER

PROCESS CONTROLLERS

Slimline Ordering Code



A-line Ordering Code

