

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.

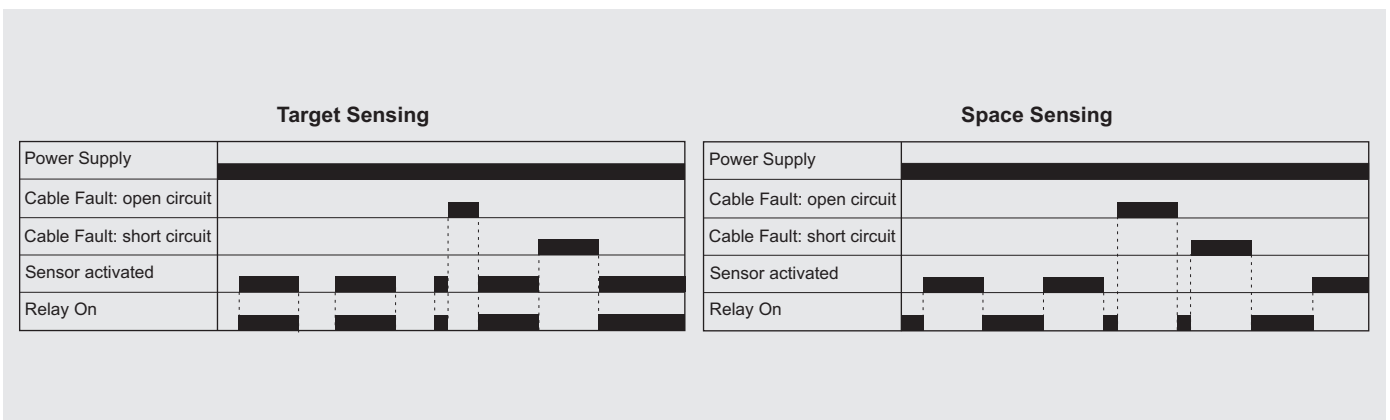
Target Response: If the sensor is connected to the target response input (pin 5), the relay will energise when a target is registered by the sensor. When no target is present, the relay will de-energise.

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.

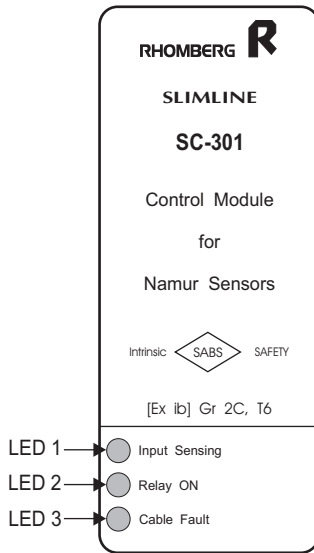
Cable Fault: When a cable fault occurs on the sensor line, the relay de-energises and a LED on the module will indicate a fault condition. When the cable fault is an open-circuit (cable fracture), both the "Cable Fault" LED and the "Input Sensing" LED will illuminate. If the fault is a short-circuit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

Operational Diagrams





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

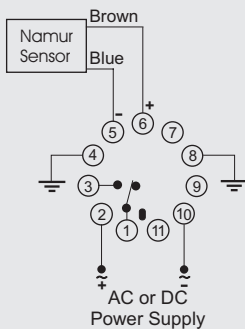
Note: An open-circuit condition will cause both LED 1 and LED 3 to illuminate. A short-circuit condition will cause only LED 3 to illuminate.

Wiring and Connection

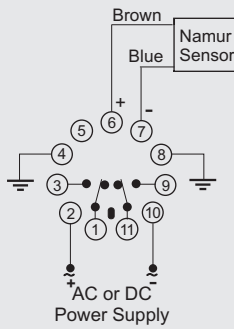
Power Supply	
Phase/Positive	2
Neutral/Negative	10

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.	



APPLICATION 1
Target Sensing



APPLICATION 2
Space Sensing

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

Additional information in Section J, page 131.