

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.

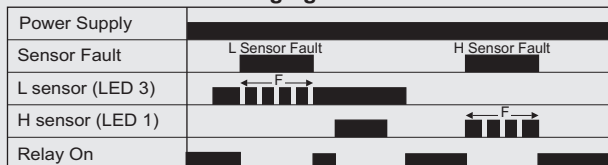
Cable Fault: The unit is equipped with cable fault detection which detects short-circuit or open-circuit conditions on either sensor. When there is a cable fault, the respective sensing LED will flash at 1Hz. Both sensing LEDs will flash in the case of single sensor operation. The relay will de-energise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

Output: The unit features three types of output:

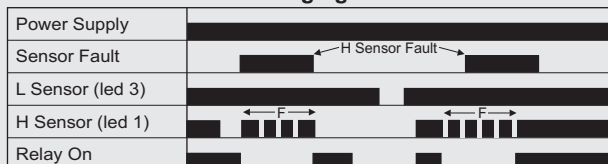
- An NPN open collector output for switching electronic process control equipment (eg. counters, PLC's etc.)
- An output capable of driving a solid state relay.
- A relay contact output suitable for switching loads.

Operational Diagrams

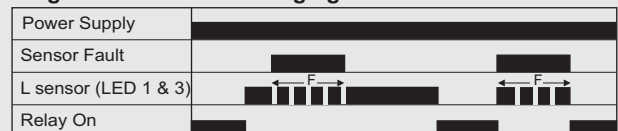
Dual Sensor Mode: Charging



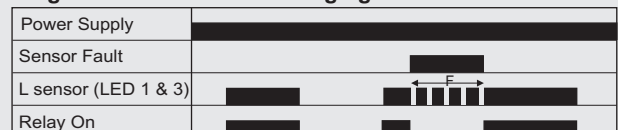
Dual Sensor Mode: Discharging



Single Sensor Mode: Charging



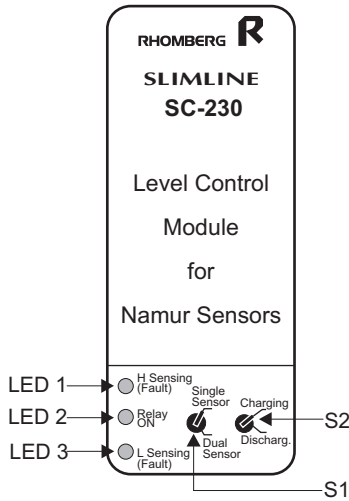
Single Sensor Mode: Discharging



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).

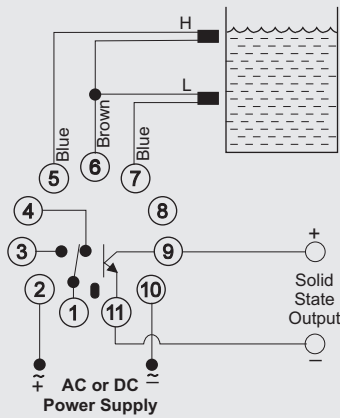
Note: Both LED1 and LED3 will illuminate together under single sensor mode.

Wiring and Connection

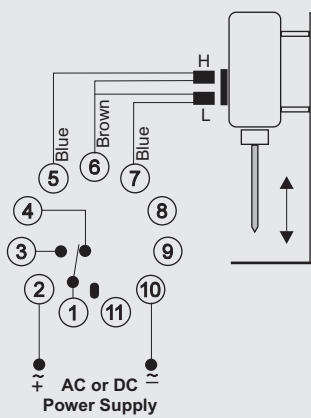
Power Supply	
Phase/Positive	2
Neutral/Negative	10

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

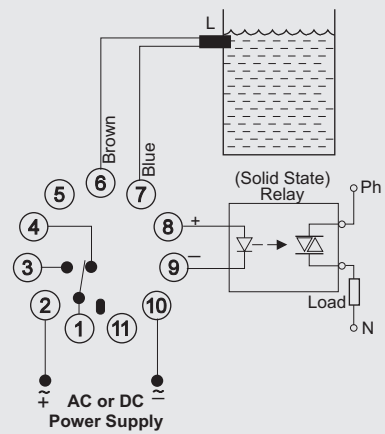
Level Sensors	
Common sensor (blue)	Pin 7
Low level sensor (brown)	Pin 6
High level sensor (blue)	Pin 5



APPLICATION 1



APPLICATION 2



APPLICATION 3

Note: For further information on sensors refer to our Detector sensor 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 (when using relay output).
Short Circuit Current: 20mA DC.
Open Circuit Current: 8,2V DC.

Additional information in Section J, page 131.