# Level Control Module for use with NAMUR Sensors





# ORDERING CODE TYPE MODEL VOLTAGE SUPPLY 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

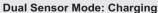
The unit may also be configured for single sensor, single level switching.

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



Power Supply		
Sensor Fault	L Sensor Fault	H Sensor Fault
L sensor (LED 3)	F-F	
H sensor (LED 1)		← F→
Relay On		

### **Dual Sensor Mode: Discharging**

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

### Single Sensor Mode: Charging



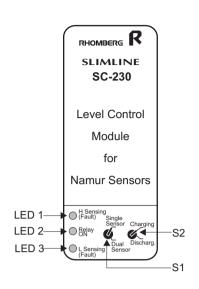
### Single Sensor Mode: Discharging

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

F = Flashing LED to indicate sensor fault



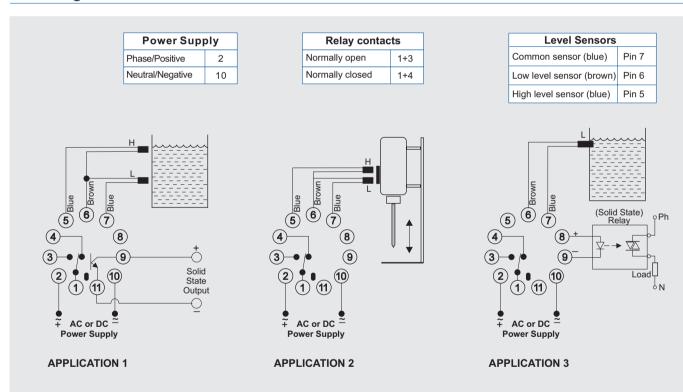
# Description of Controls



- 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



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

OC: 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.