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# spirax/sarco

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AB Issue 5

## LC3000 Level Controller

Self-monitoring controller for low level alarm systems

- Self-testing
- International approvals
- High integrity, fail-safe operation
- Dual voltage
- LEDs indicate status

### Description

The Spirax Sarco LC3000 is an advanced level controller with built-in cyclic self-testing facilities. It is used with a self-monitoring, high integrity level probe to provide either a high or a low water level alarm in steam and hot water boilers. The LC3000 is a dual voltage unit with LED indication of the following conditions:-

<b>Green</b>	Normal - level correct
<b>Red</b>	High/low level or failure alarm

A test button is fitted so that a full test of the controller and probe can be carried out. Provision is made for the wiring of a remote test button if required.

In most countries, steam boilers operating with limited supervision require two self-monitoring level probes and controllers to provide two independent low level alarms. A high level alarm is also advised, and is compulsory in some countries.

### Operation

The LC3000 detects a change in electrical conductivity between a probe immersed in water, or exposed, in steam or air. In a low level alarm application, the tip is normally immersed, completing a low resistance path to earth. This is detected by the LC3000 and both relays are kept energised, signalling normal water level. If the water level drops below the probe tip, causing the resistance to rise, both relays are released after about 5 - 6 seconds. This normally shuts down the burner and sounds the alarm.

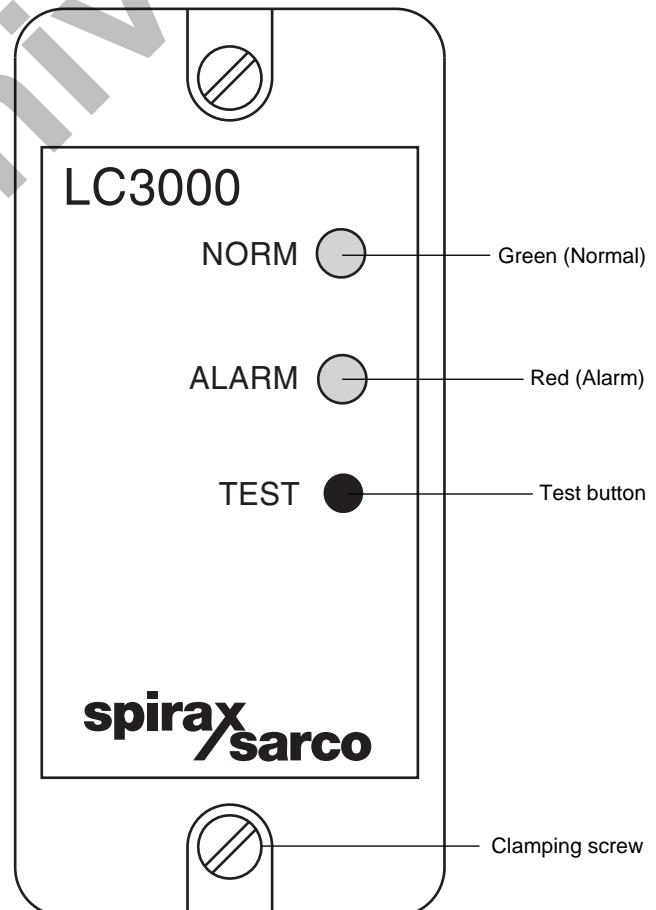
For a high level alarm, the probe tip is above the normal water level, and the resistance path to earth is high. If the water level rises sufficiently to touch the probe tip, the resistance to earth becomes low, causing relays to release and a high level alarm to sound. The controller may also be wired to cut off the feedwater supply. The LC3000 also continuously monitors the probe insulation resistance, to compensate for any build-up of conductive scale or dirt on the probe insulators or internal water leakage which could affect its proper working.

Every few seconds during normal operation the LC3000 simulates a low insulation resistance fault in the probe in order to check the integrity of the probe, probe cable, and controller. Provided the controller internally signals an alarm, the fault is removed before the relays de-energise, and a new cycle starts.

If the test fails to give an internal alarm it is an indication that an actual fault exists, so a separate circuit in the LC3000 de-energises both output relays after a further few seconds. This sounds an alarm and normally shuts down the burner or feedwater supply. A manual test button is fitted in order to carry out full testing of the probe and controller.

### Materials

Enclosure base and connector	NORYL SE1 GFN 2
Enclosure cover and intermediate plate	R-ABS 90.00



### Limiting conditions

Ambient temperature range	0 to +55°C
Maximum probe cable length	50 m
Minimum water conductivity at operating temperature when used with an LP30 probe	30 µS/cm or 30 ppm
Protection rating	IP40
Pollution degree	2
Installation category (overvoltage category)	II

### Electrical data

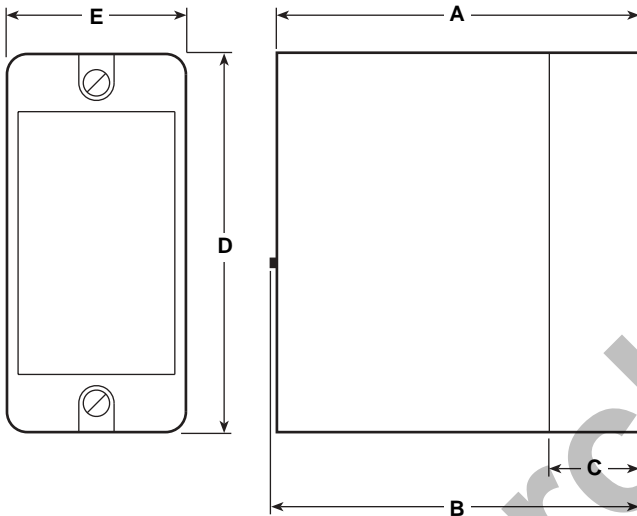
The supply voltage is selected during installation.

Mains supply voltage	230 V setting	198 - 264 V
	115 V setting	99 - 132 V
Supply frequency	50 - 60 Hz	
Power requirements	6 VA	
Internal fuse	100 mA (T) 20 mm anti-surge type	
Alarm relay contact rating	250 Vac, 2.5 A resistive and 1 A inductive	

Relays must be protected by external 3 A quick-blow fuse.

## Dimensions/weight (approximate) in mm and kg

A	B	C	D	E	Weight
106	111	24	112	52	0.5



## Safety information, installation and maintenance

This document does not contain sufficient information to install the product safely. See the Installation and Maintenance Instructions supplied with the product.

### Important:

All boiler water level and alarm controls require regular testing and inspection.

### Installation note:

The controller must be installed in a metal or plastic enclosure to provide environmental and impact protection. Suitable enclosures are supplied by Spirax Sarco. The controller can be mounted on a 'top hat' section DIN rail using the mounting clip provided, or the clip may be removed and the controller screwed directly to a chassis plate.

## How to specify

High integrity level controllers shall be Spirax Sarco self-monitoring type LC3000 with fail-safe operation and self-testing facilities. They shall be used for low level alarm systems and incorporate green and red LED's indicating current status. A test button facility shall be included on the front panel.

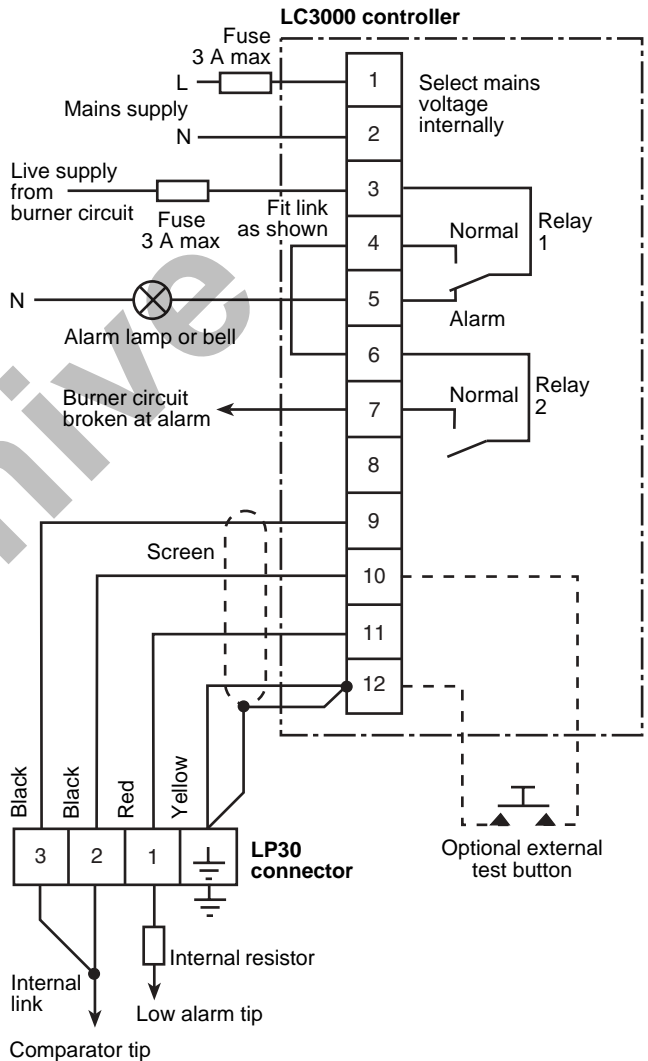
## How to order

**Example:** 1 off Spirax Sarco LC3000 level controller.

## Available spares

Internal fuse 100 mA (T) 20 mm glass cartridge, anti-surge fuses (set of 3) - Stock number 4033380.

## Wiring diagram



## Detail showing wiring of the LP31 for high alarm

