LC3050
Level Controller

Description

The Spirax Sarco LC3050 is a level limiting alarm for use in conductive liquids as a high or a low alarm, and is defined as a 'special design water level limiter' in the context of EN 12952-11. It is suitable for use with steam or hot water boilers operating up to 32 bar at 239 °C.

The LC3050 is a dual voltage unit, 230 Vac or 115 Vac for use with Spirax Sarco high or low level, self-monitoring high integrity probes.

The LC3050 has two LED's, indicating normal and alarm conditions, and a test button (AL). The other buttons on the keypad are non-functional.

The unit can be panel, DIN rail or chassis mounted.

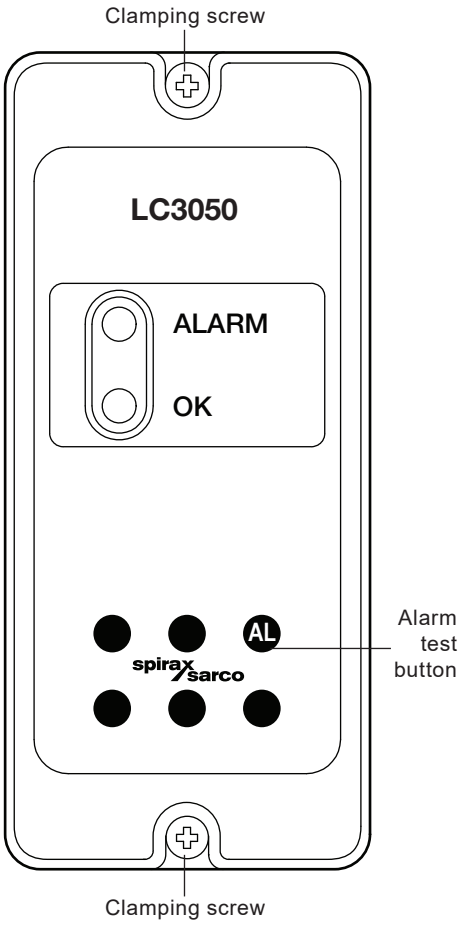
An automatic cyclic test of the probe, probe cable and controller is carried out every few seconds by internally simulating a fault in the probe.

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

WARNING; 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.

Principal features:

- SIL certification for the LC3050/LP30 system.
- High integrity, self-monitoring low or high level alarm.
- Dual mains supply, 230/115 Vac.
- UL and TÜV approved.
- LED indication of status.
- Infrared communications.



Approvals

An assessment upon the LP3050/LP30 Low Level Alarm System concluded it meets the requirements of IEC 61508-2:2010, to Saftey Intergrity Level of SIL2 when used in a 1001 architecture and SIL3 when used in 1002 architecture.

This product complies with the Electromagnetic Compatibility Directive 2014/30/EU and all its requirements.

This product meets all the Requirements of the Directive and is suitable for Class A Environments (eg Industrial). The LC3050 meets the requirements of the Directive by meeting the Controlling standard:

- EN 61326-1: 2013 - Electrical equipment for measurement control and laboratory use - EMC requirements Part 1: General requirements.

In addition the LC3050 meets the EMC requirements of the following standards:

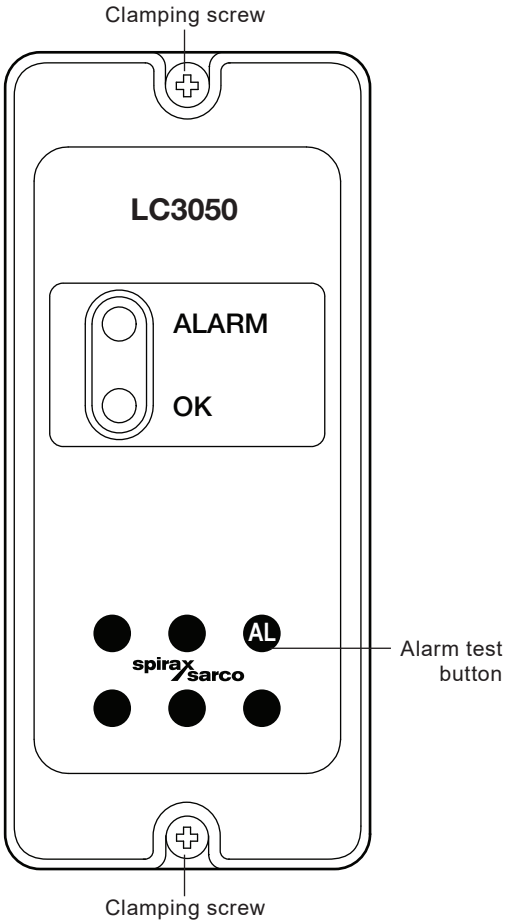
- EN 12953-9: 2007 - Shell boilers Part 9: Requirements for limiting devices of the boiler and accessories.
- EN 12952-11: 2007 - Water-tube boilers and auxiliary installations Part 11: Requirements for limiting devices of the boiler and accessories.

The product complies with Low Voltage Directive (2014/53/EU) by meeting the standards of:

- EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control and laboratory use.

The LC3050 has been type-tested as a Special Design Water Level Limiter by meeting the Standard:

- Vd TÜV requirements for water level control and limiting devices, Water Level 100 (07.2010).
- UL listed (open)



Function/Inputs/Outputs

Function

The LC3050 is normally configured to warn of a change in level outside normal limits for steam or hot water boilers, tanks or vessels, by de-energising an alarm relay. Spirax Sarco high-integrity, self-monitoring probes can indicate internal faults or water ingress.

The LC3050 compares the resistance to earth from the probe, through the water, to the boiler or vessel shell. If a change in water level causes this resistance to change beyond a set limit, a timer is engaged which alters the state of internal relays after a pre-set delay. This signal is normally used to trigger an alarm, and cut the supply to the burner.

Input/output

The product accepts inputs from the LP30 low level probe or the LP31 high level probe.

With the water level normal the green LED will be lit, and the boiler panel will indicate a normal water level. The green LED briefly extinguishes every few seconds showing that the automatic cyclic test is being carried out.

A compensation tip on the probe signals an alarm if the probe should become faulty through water ingress or an internal wiring fault.

Outputs can be remotely accessed via the RS485/MODBUS communications.

Other features

The LC3050 can communicate via an infrared link between adjacent controllers. It enables the alarm status of the LC3050 to be passed to a product fitted with RS485 (user). User products are those fitted with a graphics display. The LC3050 is defined as a slave unit. No set-up or adjustment is needed.

Technical data LC3050

Power supply	Mains voltage range		220/240 Vac setting (198 V to 264 V)
			110/120 Vac setting (99 V to 132 V)
	Frequency		50 - 60 Hz
	Power consumption		230 V/30 mA or 115 V/60 mA
Environmental	General		Indoor use only
	Maximum altitude		2 000 m (6 562 ft) above sea level
	Ambient temperature limits		0 - 55 °C
	Maximum relative humidity		80% up to 31 °C decreasing linearly to 50% at 40 °C
	Overvoltage category		III
			2 (as supplied)
	Pollution degree		3 (when installed in an enclosure) **-** Minimum of IP54 or UL50/NEMA Type 3, 3S, 4, 4X, 6, 6P or 13.
	Enclosure rating (front panel only)		NEMA type 4 hose down only (UL approval) and IP65 (verified by TRAC Global)
	LVD (safety)		Electrical Safety EN 61010-1 UL61010-1, 3rd Edition, 2012-05 CAN/CSA-C22.2 No. 61010-1, 3rd Edition, 2012-05
	EMC	Immunity/Emissions	Suitable for heavy industrial locations
	Enclosure	Material	Polycarbonate
	Front panel	Material	Silicone rubber, 60 shore.
	Solder		Tin/lead (60/40%)
Cable/wire and connector data	**Mains and signal connector**	Termination	Rising clamp plug-in terminal blocks with screw connectors. **Caution:** Use only the connectors supplied by Spirax Sarco Ltd. - Safety and Approvals may be compromised otherwise.
		Cable size	0.2 mm² (24 AWG) to 2.5 mm² (12 AWG).
		Stripping length	5 - 6 mm
	Level probe cable/wire	Type	High temperature
		Shield type	Screened
		Number of cores	4
		Gauge	1 – 1.5 mm² (18 - 16 AWG)
		Maximum length	50 m (164 ft)
		Recommended type	Prysmian (Pirelli) FP200, Delta Crompton Firetuf OHLS
Input technical data	Minimum conductivity		30 µS/cm or 30 ppm at 25 °C

Technical data LC3050 (continued)

Output technical data	**Relays**	Contacts	2 x single pole changeover relays (SPCO)
		Voltage ratings (maximum)	250 Vac
		Resistive load	3 amp @ 250 Vac
		Inductive load	1 amp @ 250 Vac
		ac motor load	¼ HP (2.9 amp) @ 250 Vac
			1/10 HP (3 amp) @ 120 Vac
		Pilot duty load	C300 (2.5 amp) - control circuit/coils
		Electrical life (operations)	3 x 10^5 or greater depending on load
		Mechanical life (operations)	30 x 10^6
	Infrared	Physical layer	IrDA
		Baud	38400
		Range	10 cm
		Working angle	15°
		Eye safety information	Exempt from EN 60825-12: 2007 Safety of laser products - does not exceed the accessible emission limits (AEL) of Class 1

Safety information, installation and maintenance

Warning: This document does not contain sufficient information to install the unit safely. The unit operates at a potentially fatal mains voltage. Before attempting to install the unit read the Installation and Maintenance Instructions (IM-P402-131) supplied with it.

Caution: before installing and connecting the power ensure there is no condensation within the unit. The product may be installed on a DIN rail, on a chassis plate, or in a panel cutout. A bezel is supplied.

The product must be installed in a suitable industrial control panel or fireproof enclosure to provide impact and environmental protection. A minimum of IP54 (EN 60529) or Type 3, 3S, 4, 4X, 6, 6P and 13 (UL50/NEMA 250) is required. Spirax Sarco can provide suitable plastic or metal enclosures

Do not install the product outdoors without additional weather protection.

Do not attempt to open the product - it is sealed and has no replaceable parts or internal switches.

Do not cover or obstruct the infrared beam between products.

Your attention is drawn to IEE Regulations (BS 7671, EN 12953, EN 12952 and EN 50156). Elsewhere, other regulations will normally apply.

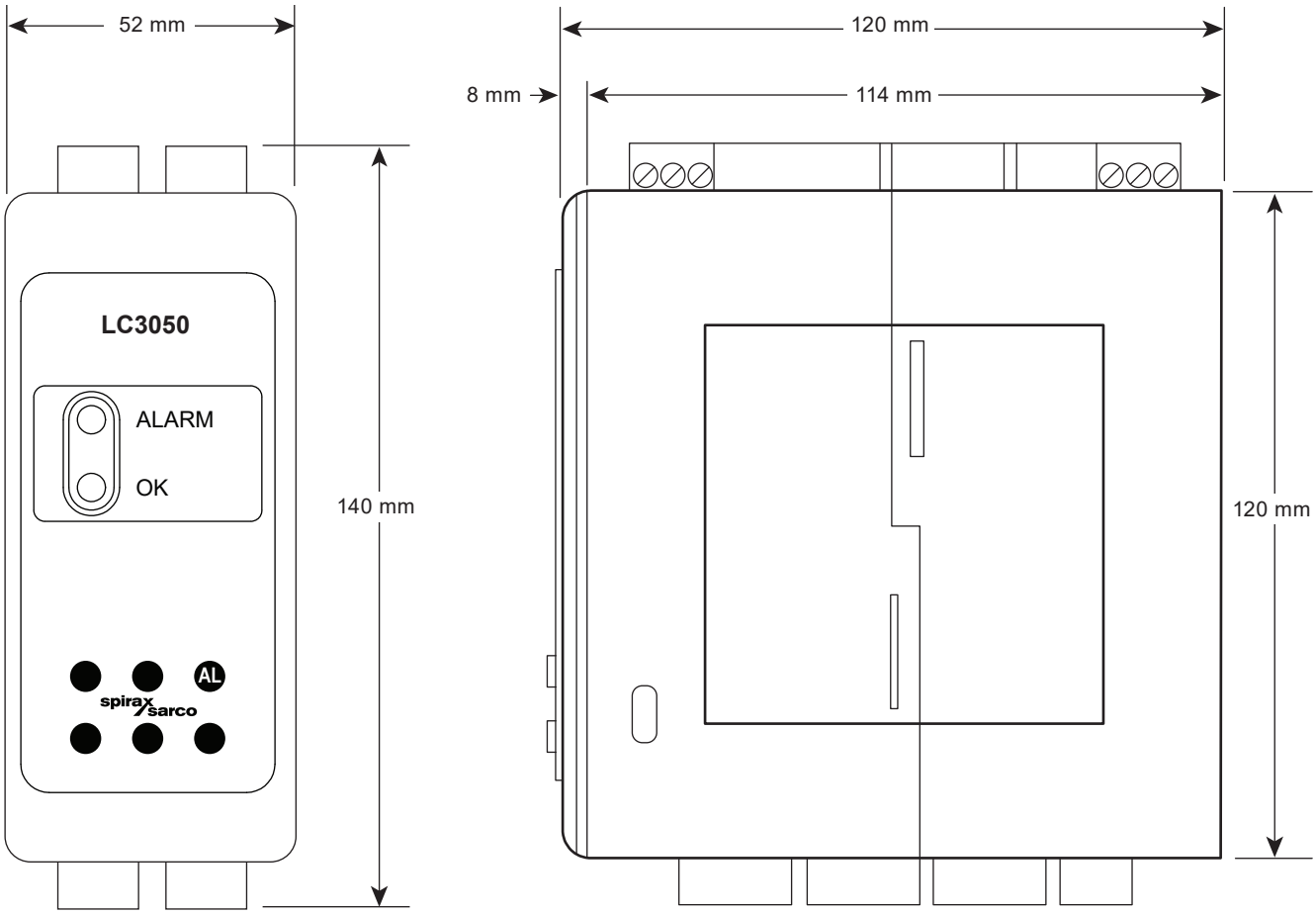
All wiring materials and methods shall comply with relevant EN and IEC standards where applicable.

No special servicing, preventative maintenance or inspection of the product is required.

Boiler water level controls and level alarms do, however, require testing and inspection. General guidance is given in Health and Safety Executive Guidance Notes BG01 and INDG436.

Dimensions/weight (approximate) in mm and g.

Weight 430 g.



How to specify

High-integrity self-monitoring level controller with fail-safe operation and self-testing facilities. LED indication of alarm and safe status. Infrared communications facility. A test button facility shall be provided on the front panel.

How to order

Example: 1 off Spirax Sarco LC3050 level high-integrity, self-monitoring level controller.