LHI.LHL

SAFETY LIMIT - ALARM UNITS

CE · cULus · IP 65 NEMA 4X · FM APPROVED

- UNIVERSAL, 3 WIRE- TC, RTD AND LINEAR INPUT
- APPROVED SAFETY FUNCTIONS
- RS 485 MODBUS SERIAL COMMS OPTION
- DIN RAIL MOUNTING VERSION
- IP 65 AND NEMA 4X FRONT PROTECTION
- **LHL / LIMITROL®- FM APPROVED SAFETY LIMITER**
- **LHI / INDICATOR & LIMIT ALARM**

OVERVIEW

The LHL, LHI meets or exceeds factory Mutual (FM) Approval Standard temperature Limit Switches Class 3545.
They are designed to automatically shut down a process when the measured value exceeds a pre-programmed value.

SPECIAL FUNCTIONS

Alarm masking

Puts the alarms in the stand by condition (mask) during instrument power up or masks a deviation or band alarm if the alarm condition is a result of a set point change. In both situations the instrument maintains the alarm masking for the duration of the alarm condition.

Logic input

These instruments are equipped with a logic input used to acknowledge an alarm condition by an external contact.

Maximum and/or minimum data hold

The LHI is able to memorize the maximum and the minimum measured value. This function is automatically enabled at instrument power up and it is always active.

Power supply failure indication

These instruments are able to signal if a power failure occurs during normal instrument operation.
Power fail recovery settings are user configurable.

PRODUCT SPECIFICATION

Case:	polycarbonate dark grey colour
Self-extinguishing degree:	V0 according to UL 94.
Front protection:	designed and tested for IP 65 (*) and NEMA 4X (*) for indoor locations (when panel gasket is installed).
	(*) Test were performed in accordance with IEC 529, CEI 70-1 and NEMA 250-1991 STD.
Rear terminal:	rear safety cover. IP 20 protection.
Dimensions:	48 x 48mm (according to DIN 43700);
	depth: - 122mm for models with RS-485.
	- 105mm for models without RS-485.
Weight:	250g max
Power supply:	- from 100 to 240V AC. 50/60 Hz (-15 % to +10 % of the nominal value)
	- 24V DC/AC (±10 % of the nominal value).
Power consumption:	5VA
Insulation resistance:	>100MΩ according to IEC 1010-1.
Isolation voltage:	1500V r.m.s. according to IEC 1010-1.
Common mode rejection ratio:	120dB @ 50/60Hz.
Normal mode rejection ratio:	60dB @ 50/60Hz.
EMC/Safety:	this instrument is marked CE. It conforms to council directives 89/336/EEC (reference harmonized standard EN-50081-2 and EN-50082-2), 73/23/EEC and 93/68/EEC (reference harmonized standard EN 61010-1).
Installation category:	II.
Sampling time:	- for linear inputs = 250mSec.
	- for TC or RTD inputs = 500mSec
Accuracy:	+ 0.2% f.s.v. @ 25°C and nominal power supply voltage.
Operative temperature:	from 0 to +50°C.
Storage temperature:	from -20 to +70°C.
Humidity:	from 20% to 85% RH not condensing.

MEASURING INPUTS

All the inputs are factory calibrated and selectable by the front keyboard.

Thermocouples

Engineering unit:	°C and °F keyboard programmable.
Sensor break:	detection of the open input circuit (wires or sensor) with underrange or overrange selectable indication.
Cold junction:	automatic compensation for an ambient temperature between 0 and 50°C.
Cold junction compensation error:	0.1°C/°C.
Input impedance:	> 100KΩ.
Calibration:	according to IEC 584-1.

RTD input

Type:	Pt 100 3 wire connection.
Calibration:	according to DIN 43760.
Line resistance:	max 20Ω/wire with no appreciable error.
Engineering unit:	°C and °F keyboard programmable.
Burn out:	detection of sensor open and of one or more wires open. detection of sensor short circuit.

Linear inpu

Type:	(mA and V) see table.
Read-out:	keyboard programmable from -1999 to 4000.
Decimal point:	programmable in any position.

Standard range table

TC type	°C	°F
B	0/1820	+32/3300
C(W5)	0/2300	0/4170
D(W3)	0/2300	0/4170
E	-100/800	-150/1470
G(W)	0/2300	0/4170
L	-100/900	-150/1650
J	-100/1000	-150/1830
K	-100/1370	-150/2500
N	-100/1400	-150/2550
Platinel II	-100/1400	-150/2550
R	-50/1760	-60/3200
S	-50/1760	-60/3200
T	-100/400	-330/750
U	-100/600	-330/1110

Standard range table

RTD type	°C	°F
Pt 100	-200/850	-330/1560

Standard range table

Input	Impedance
0-20 mA	5Ω
4-20 mA	5Ω
0-60 mV	>1MΩ
12-60 mV	>1MΩ
0-5 V	>400 kΩ
1-5 V	>400 kΩ
0-10 V	>400 kΩ
2-10 V	>400 kΩ

SERIAL INTERFACE (optional)

Type:	RS-485.
Protocol type:	MODBUS, JBUS.
Baud rate:	keyboard programmable from 600 to 19200 BAUD.
Byte format:	7 or 8 bit programmable.
Parity:	even, odd or none programmable.
Stop bit:	one.
Address:	from 1 to 255.
Output voltage levels:	according to EIA standard.

OUTPUTS LHL

These instruments are equipped with 2 independent outputs.
The first one is used as a limiter output while the second operates as an alarm output.

Output 1

Type:	relay.
Contact rating:	3A at 250V AC on resistive load.
Action:	fail safe (relay energized in no shutdown alarm status).
Output status indication:	one red LED marked RESET:
	- flashes during a shutdown alarm condition if the shutdown condition has not been acknowledged
	- lights during a shutdown alarm condition if the shutdown condition has been acknowledged
	- off when the shutdown alarm condition is not present.

Output 2 (optional)

Type:	relay.
Contact:	SPST (normally open).
Contact rating:	2A at 250V AC on resistive load.
Action:	programmable
	- direct (relay energized in alarm condition)
	- reverse (relay deenergized in alarm condition)
Output status indication:	one red LED marked ALM:
	- flashes when the instrument is in the alarm condition.
	- lights when the instrument is in the alarm condition and it has been acknowledged.
	- off when no alarm condition is present.

OUTPUTS LHI

Output 1

Type:	relay.
Contact:	SPDT.
Contact rating:	3A at 250V AC on resistive load.
Action:	programmable
	- direct (relay energized in alarm condition)
	- reverse (relay deenergized in alarm condition)
Output status indication:	one red LED marked AL1:
	- flashes when the instrument is in alarm condition.
	- lights when the instrument is in alarm condition and it has been acknowledged
	- off when no alarm condition is present.

Output 2 (optional)

Type:	relay.
Contact:	SPST (normally open)
Contact rating:	2A at 250V AC on resistive load.
Action:	programmable
	- direct (relay energized in alarm condition)
	- reverse (relay deenergized in alarm condition)
Output status indication:	one red LED marked AL2:
	- flashes when the instrument is in alarm condition
	- lights when the instrument is in alarm condition but the alarm condition has been acknowledged
	- off when no alarm condition is present

SAFETY LIMITER LHL

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Function:	- high limiter
	- low limiter
	- high and low limiter.
Set point (threshold) of the limiter:	programmable, in engineering units, within the readout range.
Hysteresis:	programmable from 0.1% to 10.0% of the readout span.
After a shutdown:	when resetting the safety limiter (and restarting the process), it is necessary that:
	1. the condition which generated the shutdown, no longer exists.
	2. the operator has acknowledged the shutdown condition, by a front push-button, external contact or serial link.

ALARMS LHL (limitrol FM- FACTORY MUTUAL approved safety limiter)

Alarm function is programmable as: a process alarm, band alarm or deviation alarm.

note:

1. the band and deviation alarms are referred to the limiter threshold so that if the threshold has been modified, the alarm will also change.

2. when the instrument is programmed as a high/low limiter, the band and deviation alarms are not available.

Alarm reset:
- automatic
- manual
- "silence" function

note: the "Silence" function is a typical function of the alarm annunciators and it is usually applied to audible alarm indications.

Process alarm

Operative mode: programmable as a high or low alarm.

Alarm threshold: programmable in engineering units within the readout range.

Hysteresis: from 0.1% to 10.0% of the readout span.

Band alarm

Operative mode: programmable as inside band or outside band.

Alarm threshold: programmable from 0 to 500 units.

Hysteresis: from 0.1% to 10.0% of the readout span.

Deviation alarm

Operative mode: deviation high or deviation low.

Threshold: programmable from -500 to +500 units.

Hysteresis: from 0.1% to 10.0% of the readout span.

ALARM LHI

Type: process alarm.

Operative mode: programmable as high or low alarm.

**Alarm threshold:** programmable in engineering units within the readout range.

Hysteresis: from 0.1 % to 10.0% of the readout span.

Alarm reset:
- automatic
- manual
- "silence" function.

note: the "Silence" function is a typical function of the alarm annunciators and it is usually applied to audible alarm indications.
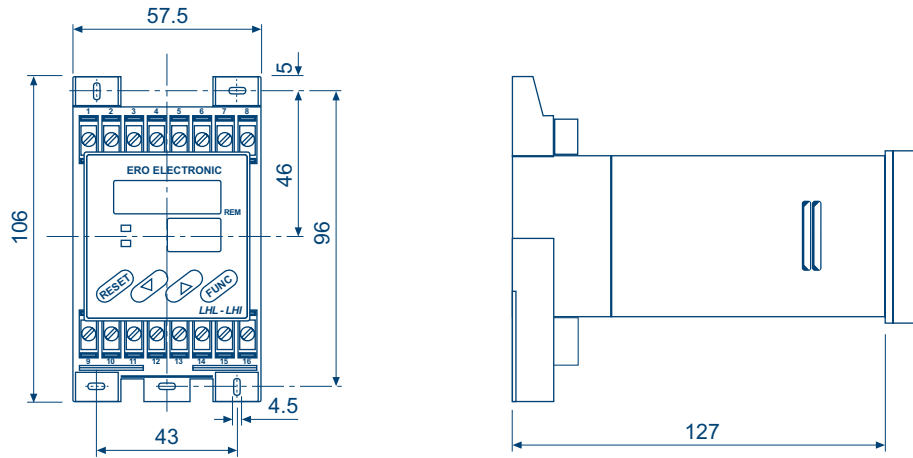
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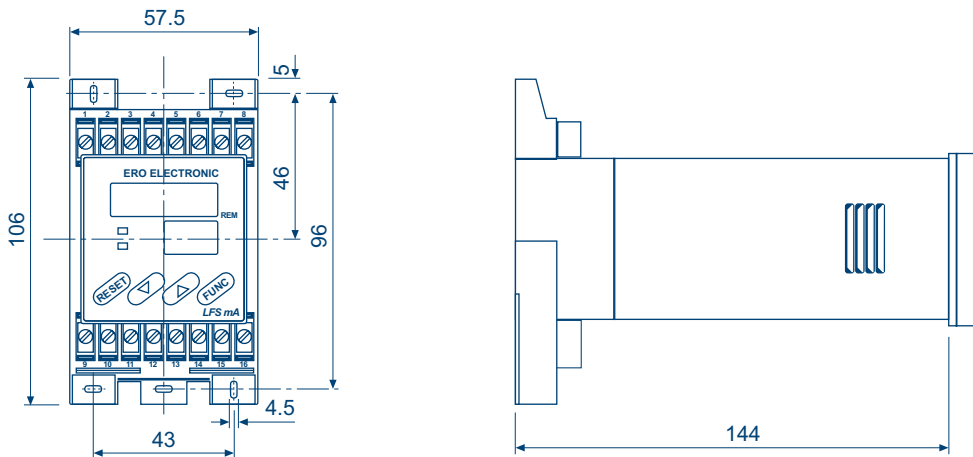DIMENSIONS AND PANEL CUT - OUT STANDARD VERSION [without RS-485 comms option]
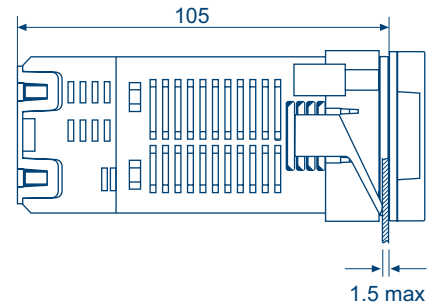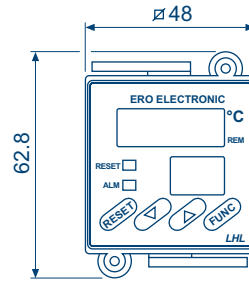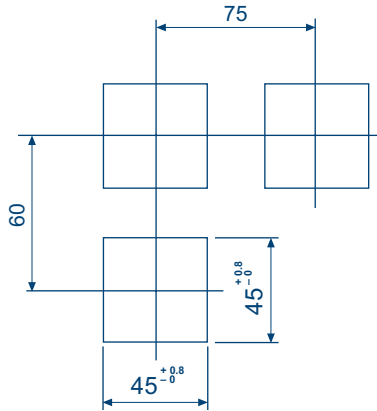
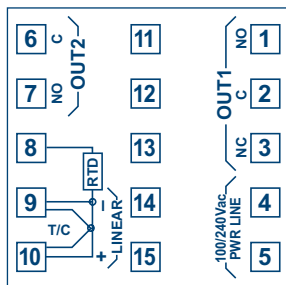DIMENSIONS AND PANEL CUT - OUT STANDARD VERSION [with RS-485 comms option]
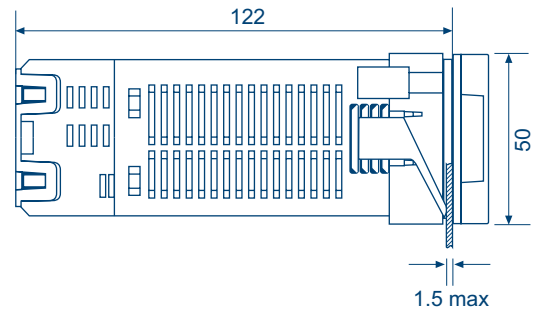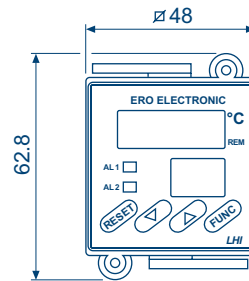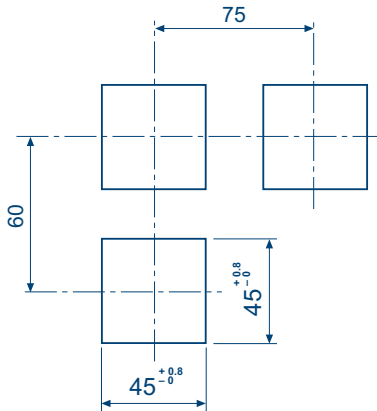
DIMENSIONS AND PANEL CUT - OUT REAR OF BOARD VERSION [without RS-485 comms option]
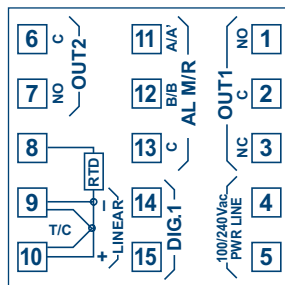

DIMENSIONS AND PANEL CUT - OUT REAR OF BOARD VERSION [with RS-485 comms option]
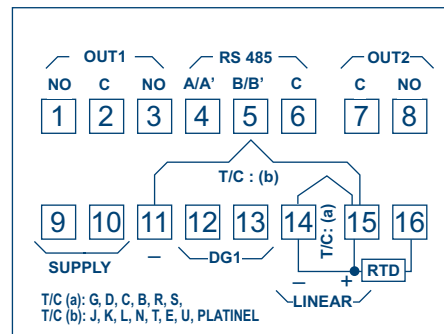
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REAR TERMINAL BLOCK
without RS-485

REAR TERMINAL BLOCK
with RS-485

REAR TERMINAL BLOCK
REAR-OF-BOARD VERSIONS

T/C (a): G, D, C, B, R, S,
T/C (b): J, K, L, N, T, E, U, PLATINEL

HOW TO ORDER

MODEL	INPUT	OUTPUT 1	OPTIONS	POWER SUPPLY	VERSION	CUSTOM.
LHL High/low limiter	9 TC, RTD, mV, mA, V.	1 Relay	00 not provided	3 100/240V AC	0 Standard version	00 Std ERO Label
LHI Indicator			10 Output 2	5 24V AC/DC	R Rear-of-board version	
			11 Output 2 + RS-485 + logic input (**)			
	9	1				00

(**) This option requires the long case format (depth 122 mm) and it uses the rear terminal block.
All the other models use the short case format (depth 105 mm) and they use the rear terminal block.

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