LDS.LMS.LHS

COMPACT THERMAL CONTROLLER

LDS.LMS.LHS

- SMART TUNE - PID CONTROL
- UNIVERSAL INPUT, 3 WIRE - TC, RTD
- PROCESS, BAND, DEVIATION AND CONTROL FAULT ALARMS
- IP 65 AND NEMA 4X FRONT PROTECTION

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OVERVIEW

Designed to offer outstanding performance in an economic 1/ 16 DIN package, these controllers provide a comprehensive solution for a wide variety of applications such as food processing, plastic manufacturing, heat sealing and laboratory heating equipment.
Universal- thermocouple or RTD input coupled with a responsive, SMART auto-tuning PID control algorithm that is equipped with special functions including, soft start and non linear cooling. A complete set of process protection alarms, high and low limit, band and deviation are included. The 3 models offer a choice of display formats; LDS single 3 digit + error indication, LMS/ LHS dual 3 digit LED display with output and status beacons. Logic or Relay outputs are user configurable as either control or alarm function. IP65/ NEMA 4X panel sealing allows these units to be used in wash down or dusty applications.

SOFT START FUNCTION

The Soft-start feature provides both time and temperature based output power limit protection. Limiting the heater power during startup reduces potential thermal stress on the heating elements.
Both the Soft-start time and temperature threshold are configurable.

PROCESS PROTECTION ALARMS

Process (high or low limit), Band and Deviation alarm outputs are available with the additional flexibility of latching and masking functions until the process variable reaches the alarm threshold plus or minus hysteresis. Band and deviation alarms are also masked after a set point change until process variable reaches the alarm threshold. The alarm latching function holds the alarm on until it is acknowledged.

PRODUCT SPECIFICATION

Case:	polycarbonate dark grey colour V0 self-extinguishing rated UL-94.
Selfextinquishing degree:	V0 according to UL94.
Front protection:	designed and tested for IP 65 (*) and NEMA 4X (*) for indoor locations
Rear terminal:	rear safety cover. IP 20 protection.
Dimension:	1/16 DIN (48x48 mm) according to DIN 43700; 100mm depth.
Weight:	160g.
Power supply:	- (switching mode) 100V to 240V AC 50/60Hz (-15% to + 10% of the nominal value). - 24V AC/DC (±10% of the nominal value).
Power consumption:	6VA.
Insulation resistance:	> 100Ω (Class III apparatus) according to IEC 1010-1.
Insulation strenght:	1500 Vrms.
Normal mode rejection ratio:	60dB @ 50/60Hz.
EMC/Safety:	this instrument is marked CE. It conforms to council directives 89/336/EEC (reference harmonised standard EN-50081-2 and EN-50082-2), 73/23/EEC and 93/68/EEC (reference harmonised standard EN 61010-1).
Installation category:	II.
Sampling time:	500mSec typical.
Accuracy:	±0,3 fsv ±1 digit @ 25°C and nominal power supply voltage.
Temperature drift:	< 200 ppm/°C of fsv selected (RJ excluded), < 400 ppm/°C of fsv for RTD range -19.9/99.9.
Reference junction drift:	0.1°C/°C.
Ambient temperature:	0 to +50°C.
Common mode rejection ratio:	120dB @ 50/60Hz.
Storage temperature:	-30 to 70°C.
Humidity:	from 20% to 85% RH non condensing.

CONTROL ACTION

Algorithm:	PID + SMART.
Types:	- one control output (heating) - two control outputs (heating and cooling).

Output types: relay or SSR.
Output action: time proportional.
Proportional band: from 1.0% (heating) or 1.5% (heating and cooling) to 100% of the input span.
If PB = 0 the control algorithm becomes ON/OFF.
Hysteresis: (in ON/OFF control): from 0.1% to 10.0% of the input span.
Integral time: from 1 second to 20 minutes
Derivative time: from 0 to 10 minutes.
Integral preload: - for one control output, from 0 to 100% of the output span.
- for two control outputs, from -100% to 100% of the output span.
Heating cycle time: from 1 second to 200 seconds.
Cooling cycle time: from 1 second to 200 seconds.
Relative cooling gain: from 0.20 to 1.00.
Overlap/dead band: from - 20% to 50%.

MEASURING INPUTS

Input: thermocouples (J, L, K, N, T) or RTD Pt 100.
the input type is keyboard programmable.
Line impedance: 100Ω max for TC input
< 20Ω per wires for RTD input.
Engineering unit: °C or °F programmable.
Reference junction: automatic compensation from 0 to 50°C.
Sensor break: down scale or up scale programmable. On RTD input,
a special test is provided to signal OVERRANGE when input resistance is less than 15Ω
(Short circuit sensor detection)
Calibration: according to IEC 584-1 and DIN 43710-1977.

Standard Range Table

	°C	°F	
TC L	0 / +800	0 / +999	DIN 43710-1977
TC J	0 / +800	0 / +999	IEC 584-1
TC K	0 / +999	0 / +999	IEC 584-1
TC N	0 / +999	0 / +999	IEC 584-1
TC T	0 / +400	0 / +752	IEC 584-1
RTD Pt 100	-19.9/99.9	-	DIN 43760
RTD Pt 100	-199/500	-199/999	DIN 43760

OUTPUTS

Main output: **1.** Relay SPDT, contact rating 3A @ 250V AC on resistive load.
2. Logic output for SSR:
- Logic level 1: 14V DC ±20% @ 20mA max; 24V DC max ±20% @ 1mA
- Logic level 0: < 0.5V DC.
Cooling output (LHS only): Relay SPST and contact normally open, contact rating 1A @ 250V AC on resistive load.

ALARMS

Action: direct or reverse.
Function: programmable as process, band or deviation alarm.
Reset: programmable as automatic or manual reset.
Masking: programmable as masked or standard alarm.
Hysteresis: from 0.1% to 10.0% of the input span.

Process alarm
Operative mode: "high" or "low", (programmable).
Threshold: in engineering units within the input range.

Band alarm
Operative mode: inside or outside band, (programmable).
Threshold: from 0 to 500 units.

Deviation alarm
Operative mode: "high" or "low", (programmable).
Threshold: from -199 to +500 units.

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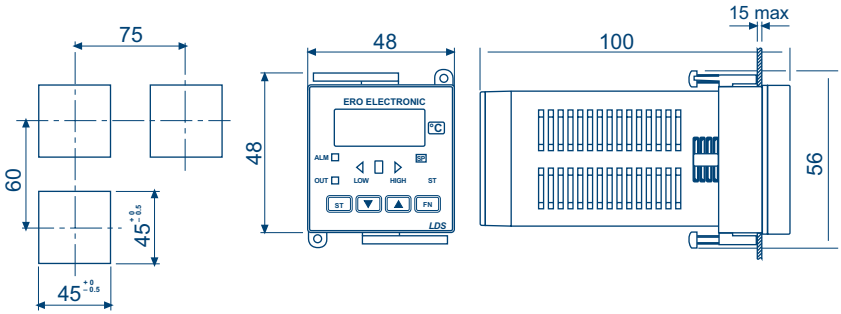
HOW TO ORDER LDS . LMS

FAMILY	MODEL	INPUT	CONTROL ACTION	HEATING OUTPUT	OPTION	POWER SUPPLY	CUSTOMISATION
L Temperature controller	DS 3 Digit + deviation bar-graph MS dual display	4 TC - RTD	9 SMART or PID	1 Relay 6 SSR	0 not provided 1 1 alarm	30 100/240V AC 50 24V AC/DC	000 Std ERO Label 0XX Std ERO Label
L		**4**	**9**				

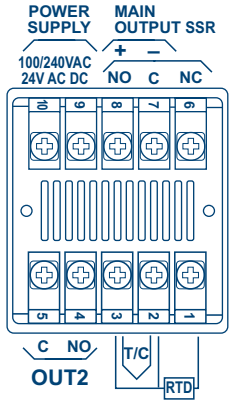
HOW TO ORDER LHS

MODEL	INPUT	CONTROL ACTION	HEATING OUTPUT	COOLING/ALARM OUTPUT	OPTION	POWER SUPPLY	CUSTOMISATION
LHS Dual display temperature controller with H/C output	4 TC - RTD	9 SMART or PID	1 Relay 6 SSR	1 Relay	0 not provided	30 100/240V AC 50 24V AC/DC	000 Std ERO Label 0XX Std ERO Label
LHS	**4**	**9**		**1**		**0**	**000**

DIMENSIONS AND PANEL CUT - OUT



REAR TERMINAL BLOCK



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