

1/16 DIN controller

- Programmable open or closed loop servomotor control.
- Control output programmable as 3-wire servomotor or time proportional output.
- 2 logic inputs used for the selection of:
 - operative set point,
 - AUTO/MANUAL mode.
- AUTO/MANUAL transfer with programmable valve positioning.
- SMART function (Auto-tuning algorithm).
- ECP software package further simplifies the instrument configuration.
- SDDE driver, it is a simple object oriented interface between ERO instruments and Windows[®] applications on PC.

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LFS Servo

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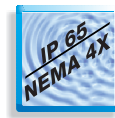
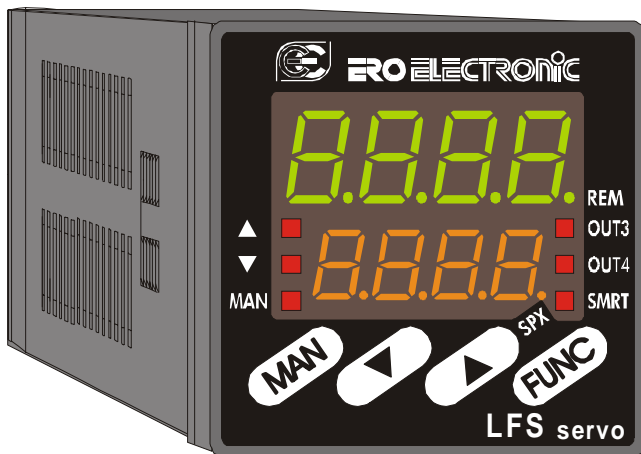
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PRELIMINARY

LFS - Servo



GENERAL SPECIFICATIONS

Case:	Polycarbonate - Self extinguishing degree according to UL 746 C
Front protection:	designed and tested for IP 65 (*) and NEMA 4X (*) for indoor locations (when panel gasket is installed). (*) Test performed in accordance with IEC 529, CEI 70-1 and NEMA 250-1991 STD.
Dimensions:	(according to DIN 43700) 48 x 48 mm - Depth 122 mm
Weight:	250 g max.
Power supply (switching mode):	from 100 to 240 V AC. 50/60 Hz (+10 % to -15 % of the nominal value)
Power consumption:	5.5 W max.
Insulation:	a double or reinforced insulation is guaranteed between the power supply input and all the instrument inputs and outputs.
Common mode rejection ratio:	> 120 dB @ 50/60 Hz.
Normal mode rejection ratio:	> 60 dB @ 50/60 Hz.
Electromagnetic compatibility and safety requirements:	This instrument is marked CE. Therefore, it is conforming to council directives 89/336/EEC (reference harmonized standard EN 50081-2 and EN 50082-2) and to council directives 73/23/EEC and 93/68/EEC (reference harmonized standard EN 61010-1).
Installation category:	II
Sampling time:	- 250 ms for linear inputs - 500 ms for TC inputs
Accuracy:	± 0.2% f.s.v. @ 25 °C (77 °F) and nominal power supply voltage.
Operative temperature:	from 0 to +50 °C (32 to 122 °F).
Storage temperature:	from -20 to +70 °C (-4 to 158 °F).
Humidity:	from 20% to 85 % RH not condensing

INPUT

Thermocouple

Burn out:	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:	> 1MΩ.
Calibration:	according to IEC 584-1.

STANDARD RANGE TABLE

TC tipo	°C	Scale	°F
L	-100 / 900		-150 / 1650
L	-100.0 / 900.0		
J	-100 / 1000		-150 / 1830
J	-100.0 / 999.9		
K	-100 / 1370		-150 / 2500
K	-100.0 / 999.9		
N	-100 / 1400		-150 / 2550
R	-50 / 1760		-60 / 3200
S	-50 / 1760		-60 / 3200
T	-200 / 400		-330 / 750
T	-199.9 / 400.0		



Linear input (mA and V)

Read-out: keyboard programmable from -1999 to 4000.
Decimal point: programmable in any position.

STANDARD RANGE TABLE

Input	Impedance
0 - 20 mA	< 5 Ω
4 - 20 mA	< 5 Ω
0 - 60 mV	> 1 M Ω
12 - 60 mV	> 1 M Ω
0 - 5 V	> 400 k Ω
1 - 5 V	> 400 k Ω
0 - 10 V	> 400 k Ω
2 - 10 V	> 400 k Ω

LOGIC INPUTS

The LFS-Servo is equipped with 2 logic inputs (contact closure).
 The first is used for the operative set point selection SP, SP2.
 The second is used for AUTO/MANUAL mode selection.

CONTROL OUTPUT

A) Closed loop servomotor output.

Feedback potentiometer range: from 100 Ω up to 1K Ω .
 The initial and final stroke points are keyboard programmable.
Servomotor dead band: from 1 % to 50 % of the selected feedback potentiometer span.
Control action: direct or reverse programmable.
Valve position limiter: low and high limiters programmable.

B) Open loop servomotor output with valve position indication.

Indication potentiometer range: from 100 Ω up to 1K Ω .
 The initial and final stroke points are keyboard programmable.
Servomotor dead band: from 1 % to 50 % of the selected servomotor stroke time.
Servomotor stroke time: programmable from 25 seconds to 3 minutes.
Control action: direct or reverse programmable.

C) Open loop servomotor output without valve position indication.

Servomotor dead band: from 1 % to 50 % of the selected servomotor stroke time.
Servomotor stroke time: from 25 seconds to 3 minutes.
Control action: direct or reverse programmable.

D) One time proportioning output.

Output used: output 1
Control action: direct or reverse programmable.
Output cycle time: from 1 second to 200 seconds.
Output power limiting: high limit programmable.

E) Two time proportioning outputs.

Output used: output 1 and 3
Output cycle time: from 1 second to 200 seconds.
Output power limiting: high limit programmable.

CONTROL ACTION

Algorithm: PID + SMART
Types:
 - one control output (heating)
 - two control outputs (heating and cooling)
Proportional Band: programmable from 1.0 % to 200.0% of the input span.
 Setting a PB equal to 0 the control action becomes ON/OFF.
Hysteresis (for ON/OFF control action): from 0.1% to 10.0 % of the input span.
Integral time: from 1 second to 20 minutes.
Derivative time: from 1 second to 10 minutes or excluded.
Integral preload:
 - for one control output, from 0 to 100% of the output range.
 - for two control outputs, from -100 % to +100 % of the heating/
 cooling output range.
AUTO/MANUAL mode: selectable by front pushbutton or logic input.
Relative cooling gain: from 0.20 to 1.00 referred to the proportional band.
Overlap / dead band: from - 20 % (dead band) to + 50 % (overlap) of the proportional band.

LFS - Servo

OUTPUTS

Out 1 and 2

Function: - Servo-motor output
- One time proportional output.
Relay type: two interlocked SPST relays.
Contact rating: 3 A @ 250 Vac on resistive load

Out 3

Function: - Time proportional output.
- Alarm 1 output
Relay type: SPST relay.
Contact rating: 2 A @ 250 Vac on resistive load

Out 4

Function: - Alarm 2 and/or alarm 3 output
Relay type: SPST relay.
Contact rating: 2 A @ 250 Vac on resistive load

ALARMS

Alarm functions: each alarm can be configured as process alarm, band alarm or deviation alarm.
Alarm reset: automatic or manual reset programmable on each alarm.
Mask Alarm: programmable on each alarm.

Process alarm:

Operative mode: high or low programmable.
Threshold: programmable in engineering unit within the entire range.
Hysteresis: programmable from 0.1 % to 10.0 % of the input span.

Band alarm:

Operative mode: inside or outside band programmable.
Threshold: programmable from 0 to 500 units.
Hysteresis: programmable from 0.1 % to 10.0 % of the input span.

Deviation alarm:

Operative mode: high or low programmable.
Threshold: programmable from -500 to +500 units.
Hysteresis: programmable from 0.1 % to 10.0 % of the input span.

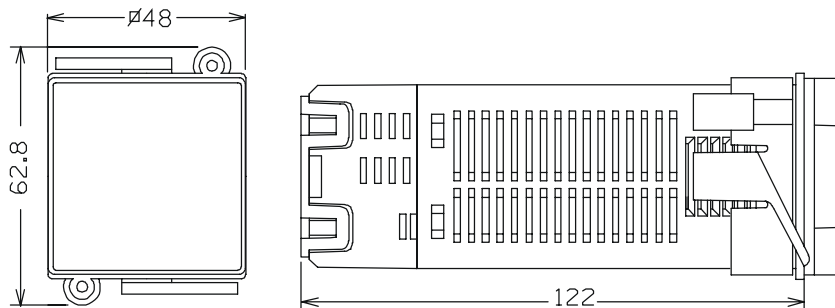
SET POINTS

Set points: 2 set point are available (SP and SP2) transfer may be driven by logic input (contact closure).
Set point limiters: set point low limit and set point high limit are programmable.

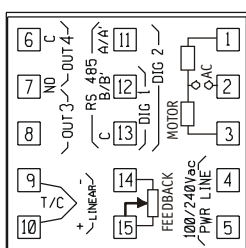
SERIAL INTERFACE

Type: Isolated RS 485
Protocol type: MODBUS, JBUS, ERO polling/selecting.
Baud rate: 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 95 for ERO protocol.
- from 1 to 255 for all the other protocols.
Output voltage levels: according to EIA standard.

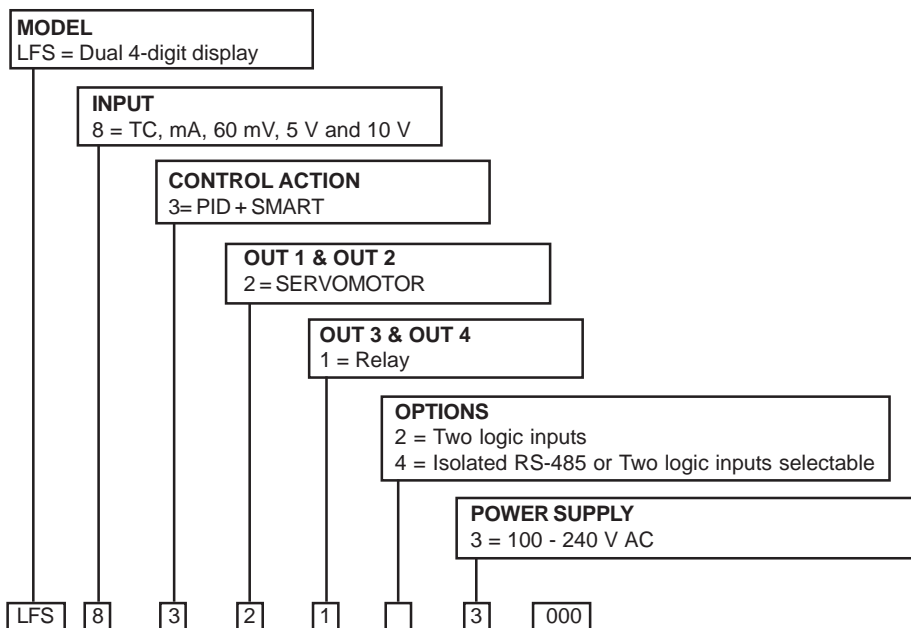
DIMENSIONS



REAR TERMINAL BLOCK



HOW TO ORDER



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