L41 / L91
Temperature Limit Controller

L41

L91

CE SA FM APPROVED UL LISTED RoHS

The L41 / L91 is a microprocessor based specially designed limit controller to protect the equipment from high temperature and low temperature. A latched relay cuts power to the process if safe values are exceeded. These units must be reset before the process continues. The temperature controller takes an input from the universal input which is fully programmable for PT100, thermocouple types J, K, T, E, B, R, S, N, L, C, P and 0~60mV. The controller equipped with 2 Amp form C relay as limit control output and equipped with the optional RS-232 or RS-485 communication, retransmission output and transmitter power supply.

Features

- Fastest Sampling Rate of 200 msec
- Universal Input
- High or Low or High / Low Limit
- Normal / Latching Alarm Output
- Limit Annunciator
- Remote Reset / Remote Lock via Event Input
- PV /SP Retransmission
- Connect with HMI for Alarm Monitoring
- Network up to 247 Controllers on RS-485 (Modbus Protocol)
- FM, UL, CSA, CE, RoHS, REACH Approval
- Available in ¼ DIN and 1/16 DIN Size

Specifications

Specification	L41	L91
Power Supply	90-250 VAC, 47-63 Hz, 11-26 VAC/VDC, SELV, Limited Energy	
Power Consumption	10VA, 5W Maximum	
Over Voltage Category	II	
Signal Input		
Type	Thermocouple: J, K, T, E, B, R, S, N, L, P(L41 only), C(L41 only); RTD: PT100 DIN, PT100 JIS; mV: 0~60 mV; Current: 0~20mA; Voltage: 0~1 V, 0~10V	
Resolution	18 Bits	
Sampling Rate	5 Times / Second (200 msec)	

Input Characteristics	Type	Range	Accuracy @ 25° C	Input Impedance
	J	-120° C to 1000° C (-184° F to 1832° F)	± 2° C	2.2 MΩ
	K	-200° C to 1370° C (-328° F to 2498° F)	± 2° C	2.2 MΩ
	T	-250° C to 400° C (-418° F to 752° F)	± 2° C	2.2 MΩ
	E	-100° C to 900° C (-148° F to 1652° F)	± 2° C	2.2 MΩ
	B	0° C to 1820° C (- 32° F to 3308° F)	± 2° C (200° C to 1800° C)	2.2 MΩ
	R	0° C to 1767.8° C (- 32° F to 3214° F)	± 2° C	2.2 MΩ
	S	0° C to 1767.8° C (- 32° F to 3214° F)	± 2° C	2.2 MΩ
	N	-250° C to 1300° C (-418° F to 2372° F)	± 2° C	2.2 MΩ
	L	-200° C to 900° C (-328° F to 1652° F)	± 2° C	2.2 MΩ
	P (L41 only)	0° C to 1395° C (32° F to 2543° F)	± 2° C	2.2 MΩ
	C (L41 only)	0° C to 2315° C (32° F to 4199° F)	± 2° C	2.2 MΩ
	PT100(DIN)	-210° C to 700° C (-346° F to 1292° F)	± 0.4° C	1.3 KΩ
	PT100(JIS)	-200° C to 600° C (-328° F to 1112° F)	± 0.4° C	1.3 KΩ
	mV	-8mV to 70mV	± 0.05%	2.2 MΩ
	mA	-3mA to 27mA	± 0.05%	L41: 70.5 Ω, L91: 100Ω
	VDC	-1.3VDC to 11.5VDC	± 0.05%	L41: 302 KΩ, L91: 510 KΩ

Temperature Effect	1.5μV /° C
Sensor Lead Resistance Effect	**Thermocouple:** 0.2 μV /° Ω **3-wire RTD:** 2.6° C /Ω of Difference of Resistance of two leads **2-wire RTD:** 2.6° C /Ω of Sum of Resistance of two leads
Burn-out Current	200nA
CMRR	120 dB
NMRR	55dB
Sensor Break Detection	Sensor open for Thermocouple, RTD, mV inputs, Below 1mA for 4 to 20mA, Below 0.25V for 1 to 5V
Sensor Break Response Time	Within 4 seconds for TC, RTD and mA inputs, 0.1 second for 4-20 mA and 1-5V inputs

Specifications

Specification	L41			L91	
Output 1 / Output 2					
Relay Rating	2A / 240 VAC, life cycles 200,000 for resistive load				
Pulsed Voltage	Source Voltage 5V, current limiting resistance 66 Ω				
Triac Output	Rating: 1A / 240 VAC, Inrush current: 20A for 1 cycle, Minimum Load Current: 50 mA rms, Max. Off-state Leakage: 3 mA rms, Max. On-state Voltage: 1.5 V rms, Insulation Resistance: 1000 MΩ min. at 500 VDC, Dielectric Strength: 2500 VAC for 1 minute				
Limit Control Function	High Limit, Low limit and High / Low Limit programmable				
Alarm Function	Process Value High, Process Value Low				
Alarm Mode	Normal, Latching				
Transmitter Power Supply (Output 2)					
Transmitter Power Supply Output Characteristics	Type	Tolerance	Maximum Output Current	Ripple Voltage	Isolation Barrier
	20V	± 1V	25mA	0.2Vp-p	500 VAC
	12V	± 0.6V	40mA	0.1Vp-p	500 VAC
	5V	± 0.25V	80mA	0.05Vp-p	500 VAC
Digital Filter					
Function	First Order				
Time Constant	0, 0.2, 0.5, 1, 2, 5, 10, 20, 30, 60 Seconds, Programmable				
Event Input					
Logic Low	-10V minimum, 0.8V maximum				
Logic High	2V minimum, 10V maximum				
Event Input Functions	Remote reset, remote lockout				
Data Communication					
Interface	RS-485 or RS-232				
Protocol	Modbus RTU (Slave Mode)				
Address	1 to 247				
Baud Rate	2.8KBPS to 115.2KBPS				
Parity Bit	None, Even or Odd				
Stop Bit	1 or 2 Bits				
Data Length	7 or 8 Bits				
Communication Buffer	50 Bytes				
Analog Retransmission					
Output Signal	4 - 20mA, 0 - 20 mA, 0 - 10VDC, 0 - 5VDC, 1 - 5VDC				
Resolution	15 Bits				
Accuracy	± 0.05% of Span ± 0.0025% / ° C				
Load Resistance	0 to 500Ω for current output, 10KΩ minimum for Voltage Output				
Output Regulation	0.01% for full load change				
Output Setting Time	0.1 second (stable to 99.9%)				
Isolation Breakdown	1000VAC min				

Specifications

Specification	L41	L91
Analog Retransmission		
Integral Linearity Error	± 0.005% of span	
Temperature Effect	± 0.0025% of span / ° C	
Saturation Low	0mA or 0VDC	
Saturation High	22.2mA or 5.55V, 11.1V min	
Linear Output Ranges	0 - 22.2mA (0 - 20mA / 4 - 20mA), 0 - 5.55VDC (0 - 5VDC / 1 - 5VDC), 0 - 11.1VDC (0 - 10VDC)	
User Interface		
Keypad	4 Keys	
Display Type	4 Digit LCD Display	
No of Display	2	1
Upper Display Size	0.55”（14mm)	0.4”（10mm)
Lower Display Size	0.55”（14mm)	N.A.
Environmental and Physical Specifications		
Operating Temperature	-10° C to 50° C	
Storage Temperature	-40° C to 60° C	
Humidity	0 to 90 % RH (Non - Condensing)	
Altitude	2000 Meters Maximum	
Pollution	Degree II	
Insulation Resistance	20MΩ Minimum (@500V DC)	
Dielectric Strength	2000VAC, 50/60 Hz for 1 Minute	
Vibration Resistance	10 to 55 Hz, 10m/s2 for 2 Hours	
Shock Resistance	200 m/s2(20g)	
Housing	Flame Retardant Polycarbonate	
Mounting	Panel Mounting	
DIN Size	1 / 4	1/16
Dimensions (W*H*D) (mm)	96*96*65 mm	48*48*94 mm
Mounting (W*H) (mm)	92*92 mm	45*45 mm
Depth behind Panel	53 mm	86 mm
Weight (grams)	250 grams	150 grams
Approval Standards		
Safety	FM Class 3545 (Oct. 1998), UL61010C-1, CSA C22.2 No. 24-93, EN61010-1 (IEC1010-1), RoHS, REACH	
Protective Class	IP65 for panel with additional option, IP50 for panel without additional option, IP20 for terminals and housing with protective cover. All indoor use	IP30 front panel, indoor use, IP20 housing and terminals (with protective cover)
EMC	EN61326	

L41 Ordering Code

L41 – □ □ □ □ □ □

Power Input

4: 90-250 VAC, 47-63 HZ
5: 11-26 VAC or VDC,
SELV, Limited Energy

Signal Input

1: Standard Input
Thermocouple: J, K, T, E, B, R, S, N, L, C, P
RTD: PT100 DIN, PT100 JIS
mV: 0~60 mV
2: Voltage: 0-1 V
3: Voltage: 0-10 V
4: Current: 0-20mA
5: Voltage: 0-5 V
9: Special Order

Output 1

0: None
1: Form C relay rated 2A / 240VAC
2: Pulsed voltage to drive SSR, 5V / 30mA
6: Triac Output 1A / 240VAC, SSR
C: Pulsed voltage to drive SSR, 14V / 40mA
9: Special Order

Output 2

0: None
1: Form C Relay 2A / 240VAC
2: Pulsed voltage to drive SSR, 5V / 30mA
6: Triac Output, 1A / 240VAC, SSR
7: Isolated 20V / 25mA DC Output Power Supply
8: Isolated 12V / 40mA DC Output Power Supply
9: Isolated 5V / 80mA DC Output Power Supply
C: Pulsed voltage to drive SSR, 14V / 40mA
H: Special Order

Communication

0: None
1: RS-485 Interface
2: RS-232 Interface
3: Retransmit 4-20mA / 0-20mA
4: Retransmit 1-5V / 0-5V
5: Retransmit 0-10V
9: Special Order

Options

0: IP50 Standard
1: IP65 Water Resistant Rubber Installed

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RTD: PT100 DIN, PT100 JIS
mV: 0~60 mV
2: Voltage: 0-1 V
3: Voltage: 0-10 V
4: Current: 0-20mA
5: Voltage: 0-5 V
9: Special Order

Output 1

0: None
1: Form C relay rated 2A/240VAC
2: Pulsed voltage to drive SSR, 5V/30mA
6: Triac Output 1A / 240VAC, SSR
C: Pulsed voltage to drive SSR, 14V/40mA
9: Special Order

Output 2

0: None
1: Form C Relay 2A/240VAC
2: Pulsed voltage to drive SSR, 5V / 30mA
6: Triac Output, 1A / 240VAC, SSR
7: Isolated 20V / 25mA DC Output Power Supply
8: Isolated 12V / 40 mA DC Output Power Supply
9: Isolated 5V / 80mA DC Output Power Supply
A: RS-485
B: Event Input
H: Special Order
C: Pulsed voltage to drive SSR, 14V/40mA
D: Retransmit 4-20mA / 0-20mA
E: Retransmit 1-5V / 0-5V
F: Retransmit 0-10V

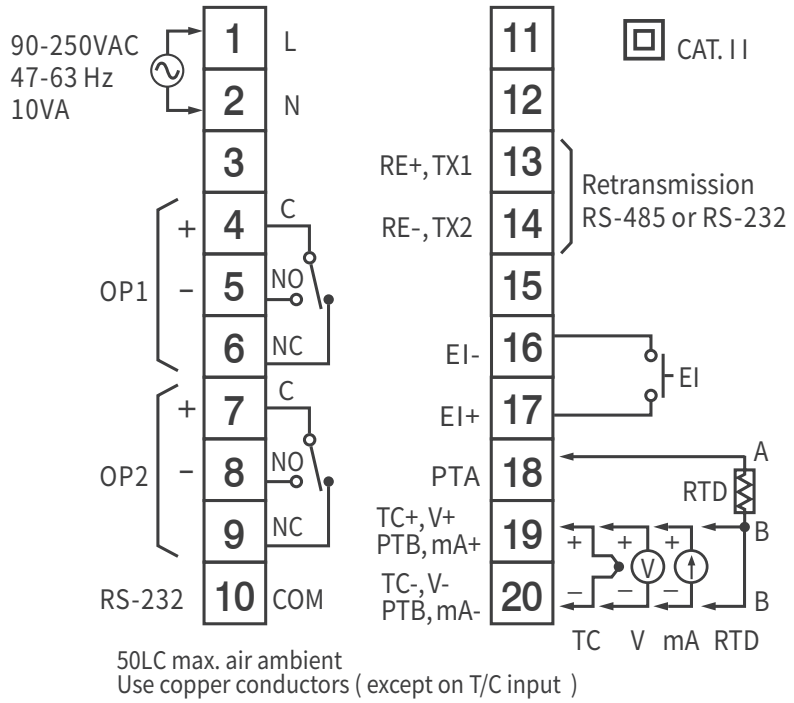
Accessories

OM94-6 = Isolated 1A/240VAC Triac Output Module (SSR)
OM94-7 = 14V/40mA SSR Drive Module
DC94-1 = Isolated 20V / 25mA DC Output Power Supply
DC94-2 = Isolated 12V / 40mA DC Output Power Supply
DC94-3 = Isolated 5V / 80mA DC Output Power Supply
CM94-1 = Isolated RS-485 Interface Module for L41
CM94-2 = Isolated RS-232 Interface Module for L41
CM94-3 = Isolated 4-20mA / 0-20mA Retransmission Module for L41
CM94-4 = Isolated 1-5V / 0-5V Retransmission Module for L41
CM94-5 = Isolated 0-10V Retransmission Module for L41
CC91-3 = Programming Port Cable for L41
CM96-1 = Isolated RS-485 Interface Module for L91
CM96-3 = Isolated 4-20mA / 0-20mA Retransmission Module for L91
CM96-4 = Isolated 1-5V / 0-5V Retransmission Module for L91
CM96-5 = Isolated 0-10V Retransmission Module for L91
EI96-1 = Event Input Module for L91
CC91-2 = Programming Port Cable for L91

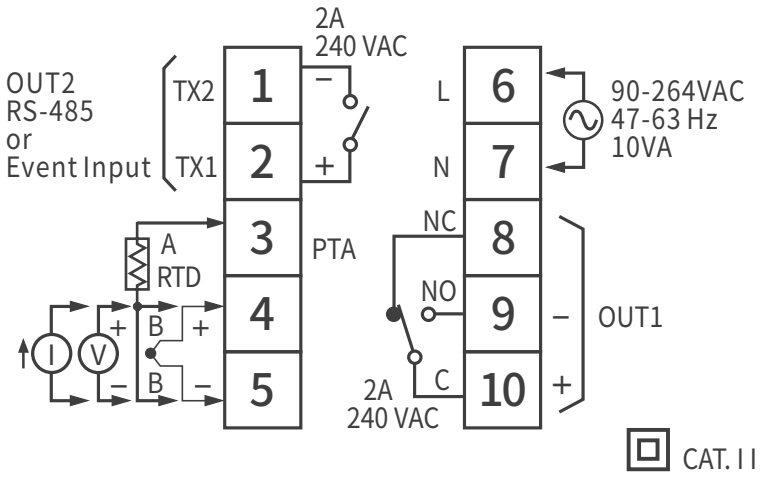
Related Products

» SNA-10A = Smart Network Adaptor for Third Party Software, Converts 255 channels of RS-485 or RS-422 to RS-232 Network
» SNA-12A = Smart Network Adaptor for programming port to RS-232 Interface
» BC-SET= Configuration Software

L41


90-250VAC
47-63 Hz
10VA
1 L
2 N
3
OP1 + 4 C
– 5 NO
6 NC
OP2 + 7 C
– 8 NO
9 NC
RS-232 10 COM
11
12
RE+, TX1 13
RE-, TX2 14
Retransmission
RS-485 or RS-232
15
EI- 16
EI+ 17
EI
PTA 18
A
RTD
B
TC+, V+
PTB, mA+ 19
TC-, V-
PTB, mA- 20
B
TC V mA RTD
CAT. I I
50LC max. air ambient
Use copper conductors (except on T/C input)

L91


OUT2
RS-485
or
Event Input
TX2 1
TX1 2
2A
240 VAC
3 PTA
A
RTD
B
4
B
5
L 6
N 7
90-264VAC
47-63 Hz
10VA
NC 8
NO 9
OUT1
C 10
2A
240 VAC
CAT. I I