

# Digital Indicating Controller LT23A SERIES



**48x48mm compact body**

**Easy to use small size controller at reasonable price**

**CE RoHS compliance**

LT 23A series is a 48×48mm digital indicating controller with indicating accuracy of  $\pm 0.5\%$  and the control cycle of approximately 0.5 seconds.

There are two type of mounting methods, terminal block type and socket type.

3 types of auto tuning functions and overshoot suppression functions are provided and highly safe control is achieved. Combination of internal computing function and enriched input and output option support various usage scenarios.

Special loader software provides ease of setting operations and data acquisition.



## FEATURES

### ● Compact design

Short depth of instrument (case 60mm) saves the space of instrument and control board.

### ● Enriched input types

Thermocouple group, resistance thermometer group, DC voltage / DC group can be selected. Input types can be changed within each group.

### ● Outstanding controllability

Control system can be selected from two-position control, PID control and self-tuning.

It has overshoot suppression function and high functionality PID.

### ● 3 type of auto tuning

Can be selected from normal, rapid-response, safe tuning on the control target.

### ● Various input / output signal (optional) are available

Current transformer input 2 points, event output 3 points (Max), remote signal input 2 points, communication interface (RS485).

### ● Terminal block type and socket type are available

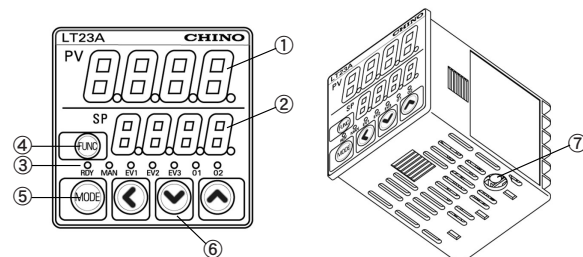
### ● Conformance to international safety standards

Conformance to CE marking, RoHS

### ● Loader software is available

Various parameter settings and data acquisition can be done easily using loader software (sold separately).

## PARTS NAMES OF FUNCTIONS



- ① Upper display : Displays PV values (preset temperature, etc) or settings items.
- ② Lower display : Displays SP values (set temperature, etc) and other parameter values.
- ③ Status display lamp  
RDY : Lights when READY (Control stop)  
MAN : Lights when MANUAL (manual mode)  
EV1 to EV3 : Lights when event outputs are ON.  
O1 to O2 : Lights when the control output is ON.
- ④ [FUNC] key : The operations which has been set beforehand can be done by pushing the key for 1s or more. The function is disabled at factory default.
- ⑤ [MODE] key : Switches the display.
- ⑥ <, >, V, ^ Key : Used for incrementing numeric values and performing arithmetic shift operation.
- ⑦ Recorder connector : Connects to a personal computer by using USB loader cable.

## MODELS

LT23A□□□□□□□□

	Measur- ing input	Control output	I/O option	Terminal type	Power	Extra	Specifications	
LT23A							48mmX48mm front size	
1							Thermocouple input	
2							RTD input	
8							DC voltage/current input	
							Control output 1	Control output 2
*2	1	0					ON-OFF pulse	—
	5	0					SSR drive pulse output	—
*1	5	3					SSR drive pulse output	Current output
*1	5	5					SSR drive pulse output	SSR drive pulse output
	3	0					SSR drive pulse output	—
*1	3	3					Current output	Current output
	00						—	
	01						Event output 3 points	
*1,*3	02						Event output 3 points, CT input 2 points, External signal input 2 points	
*1,*3	03						Event output 3 points, CT input 2 points, Communication interface RS485	
*5	04						Event output 2 points (independent contact)	
*1,*3,*5	05						Event output 2 points (independent contact), CT input 2 points, External signal input 2 points	
*1,*3,*5	06						Event output 2 points (independent contact), CT input 2 points, Communication interface RS485	
	0						Terminal block type	
*4	S						Socket type	
	A						100-240 V AC	
	D						24V AC/DC	
	00						No additional treatment	
	Y0						Complying with the traceability certification	

\*1: Cannot be selected for the socket type \*2: Only 1a contact applicable for the socket type


\*3: Current transformer is sold separately \*4: Socket is sold separately

\*5: Cannot be selected for 24V AC/DC power supply

Note) For ON-OFF pulse 2 controll outputs, even output (option) will be used as control outputs.

There is 3 points (common) and 2 points (independent contact) so please select depending on the usage.


**48x48mm compact body**



48mm  
48mm  
60mm

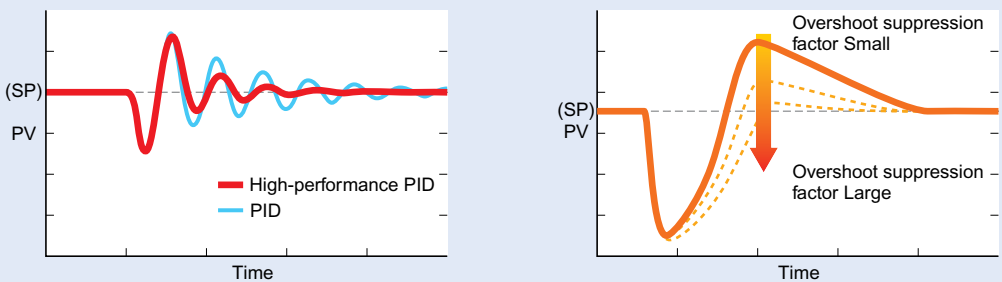
Compact body of 48x48mm and 60mm in depth. There is not only panel mounting type but also socket type, so it can correspond to multiple types of installations such as panel mounting type and DIN rail mounting type.

**IP66 protection structure of dust and water proof**



Front of LT23A employs IP66 protection structure of dust-proof and water-proof.

**Advanced controllability**



— High-performance PID  
— PID

Time

Time

Overshoot suppression factor Small


Overshoot suppression factor Large

**Easy-to-read display**


On the display, measuring value (PV) is indicated in green and setting value (SP) is indicated in orange LEDs

**Frequently used operation can be assigned to the FUNC key**

By assigning frequently used operation such as RUN/READY to the FUNC key, only one press of a button enables switching the functions.



**Easy-to-read display**



**Measuring input**  
\*Group selection by the model  
Thermocouple 12 types  
RTD 2 types  
DC Voltage / Current 6 types

**Current transformer input (option)**  
2 points

**External signal input (option)**  
2 points

**Loader connector**  
Support loader software 1 port

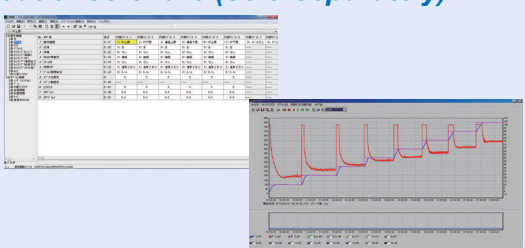
**Control output (select at model)**  
ON-OFF pulse outputs

**Event output (option)**  
3 points  
2 points (independent contact)

**Communication (option)**  
RS485 1 port

\*Various parameter settings are available from PC by using dedicated loader software. However, it requires exclusive loader cable (sold separately).


**Loader software (sold separately)**



Various parameter settings and data acquisition are available by connecting this controller to the PC which the loader software is installed.

**Internal event can be output as external contact output by logical operation**

On LT23A...



Event 1  
Event 2  
Event 3

3 points of event can be output

Result of the logical operation which performed on selected five points of various internal events is able to be assigned to the three points of external digital outputs. It can simplify process of event outputs which logical operation was conventionally performed on receiver side.

## SPECIFICATIONS

### Input specifications

Input signal: Group selection by the models (Thermocouple, Resistance Thermometer, DC voltage/current)  
 Range type: Refer to a measuring range table  
 Input sampling cycle: 500ms  
 Accuracy rating:  $\pm 0.5\%FS \pm 1\text{digit}$

### Control specifications

Output type: ON-OFF pulse output type: 1c 250V AC, 30V DC 3A (resistance load)  
 Current output type: 0 to 20 A DC, 4 to 20 mA DC (It can be changed by the setting)  
 SSR drive pulse output type: 19V DC  $\pm 15\%$ , Internal resistance 82 $\Omega$ , Allowable current Max. 24mA DC

### General specifications

Operation temperature: 0 to 50°C  
 Power supply voltage range: AC power supply model 100 to 240 V AC, 50/60Hz  
 DC power supply model 24 V AC, 50/60Hz/24V to 48V DC  
 Power consumption: AC power supply model 12 VA or/and lower  
 DC power supply model 7 VA or/and lower (24V AC) 5W or/and lower (24V DC)  
 Safety standards: CE marking compliant product  
 Structure: IP66 (front part)  
 Weight: Terminal block type: 150g  
 Socket type: 200g (including socket)

## ACCESSORY

Item	Model
Attachment (for terminal block type)	LTA-P205
Manual	L2A-11-□
Gasket (for terminal block type)	LTA-P206

## ACCESSORY (Sold separately)

Item	Model
Hard cover	LTA-P202
Soft cover	LTA-P203
Terminal cover	LTA-P204
Current transformer	LTA-P207 (5.8mm hole dia.), LTA-P208 (12mm hole dia.)
Attachment (for terminal block type)	LTA-P205
Gasket (for terminal block type) 20 pieces	LTA-P206
Socket	LTA-P201
Plug conversion cable for LT23A	LTA-P209
Shunt resistor 250 $\Omega$	RZ-EX250

## OPTIONAL SOFTWARE

Item	Model
Loader software (cable included)	LTA-S001
Loader software	LTA-S002
Loader cable	LTA-S003

## MEASURING RANGE

Input type	C01 Set value	Measuring rang	Measuring accuracy
Thermocouple	K	1 -200 to 1200°C	$\pm 0.5\%FS \pm 1\text{digit}$
		2 0 to 1200°C	
		3 0.0 to 800.0°C	
		4 0.0 to 600.0°C	
		5 0.0 to 400.0°C	
		6 -200.0 to 400.0°C	
	J	9 0.0 to 800.0°C	Minus area is $\pm 1.0\%FS \pm 1\text{digit}$
		10 0.0 to 600.0°C	
		11 -200.0 to 400.0°C	
	E	13 0.0 to 600.0°C	Range with decimal point is $\pm 0.5\%FS \pm 2\text{digit}$
	T	14 -200.0 to 400.0°C	
	R	15 0 to 1600°C	
	S	16 0 to 1600°C	Under 260°C: $\pm 5\%FS$ , 260-800°C: $\pm 1\%FS$
	B	17 0 to 1800°C	
	N	18 0 to 1300°C	
	Platinel II	19 0 to 1300°C	
	WRe5-26	20 0 to 1400°C	
		21 0 to 2300°C	
RTD	DIN U	24 -200.0 to 400.0°C	$\pm 0.5\%FS \pm 1\text{digit}$
	DIN L	25 -100.0 to 800.0°C	
	Pt100	41 -200 to 500°C	
	JPt100	42 -200 to 500°C	
	Pt100	43 -200 to 200°C	
	JPt100	44 -200 to 200°C	
	Pt100	45 -100 to 300°C	
	JPt100	46 -100 to 300°C	
	Pt100	51 -50.0 to 200.0°C	
	JPt100	52 -50.0 to 200.0°C	
	Pt100	53 -50.0 to 100.0°C	
	JPt100	54 -50.0 to 100.0°C	
	Pt100	63 0.0 to 200.0°C	
	JPt100	64 0.0 to 200.0°C	
DC voltage/current	Pt100	67 0 to 500°C	$\pm 0.5\%FS \pm 1\text{digit}$
	JPt100	68 0 to 500°C	
	0 to 1V	84	
	1 to 5V	86	
	0 to 5V	87	
	0 to 10V	88	
	0 to 20mA	89	
	4 to 20mA	90	

\*Lower limit of indication value of B thermocouple is 20°C

●Applicable standards

• Thermocouple

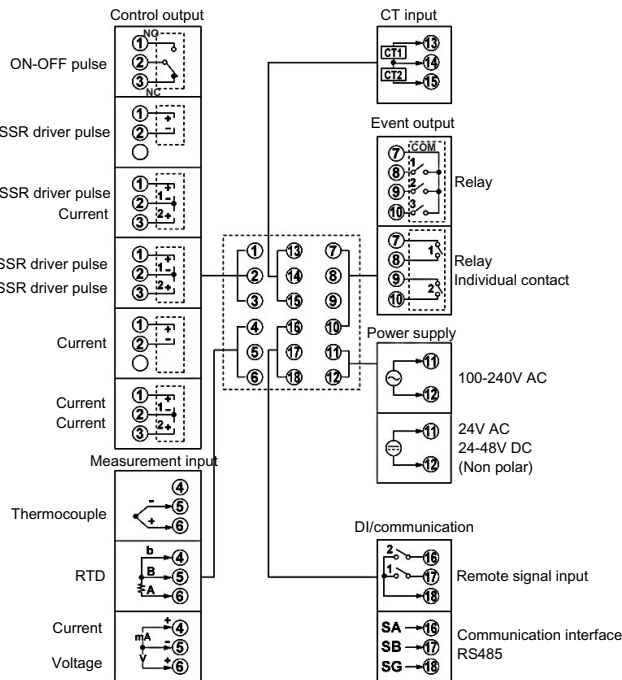
K, J, E, T, R, S, B, N : JIS C 1602-1995  
 Platinel II : Engelhard Industries(ITS90)  
 WRe5-26 : ASTM E988-96(Reapproved 2002)  
 DIN U, DIN L : DIN43710-1985

• Resistance thermometer

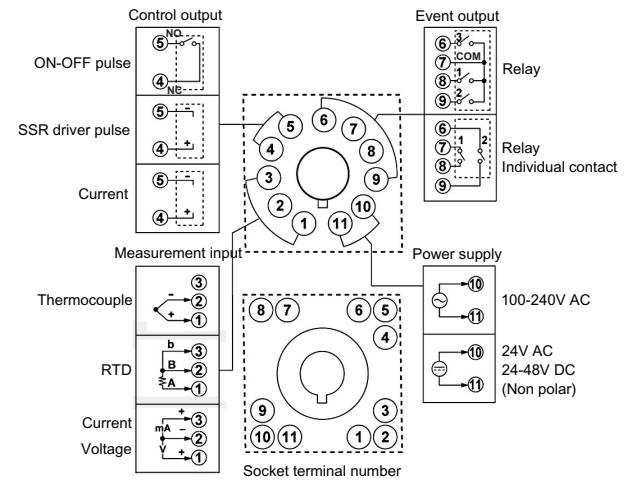
Pt100 : JIS C 1604-1997  
 JPt100 : JIS C 1604-1989

## ■ TERMINAL BOARD

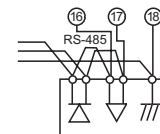
### ● Terminal block type



### ● Socket type



### ● RS485 communication connection



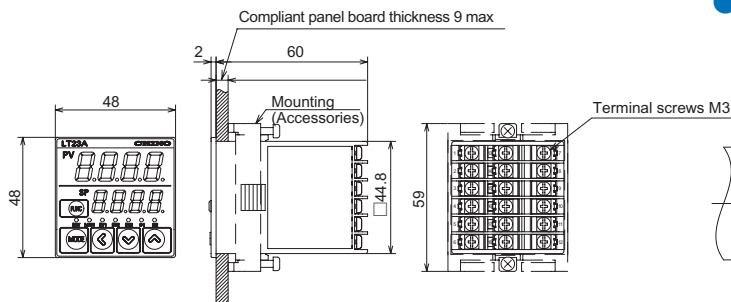
#### ⚠ Cautions for handling

Do not connect the external resistor because this unit has a built in termination resistor.

Example: Method to connect with 5 line type instrument.

## ■ DIMENSIONS

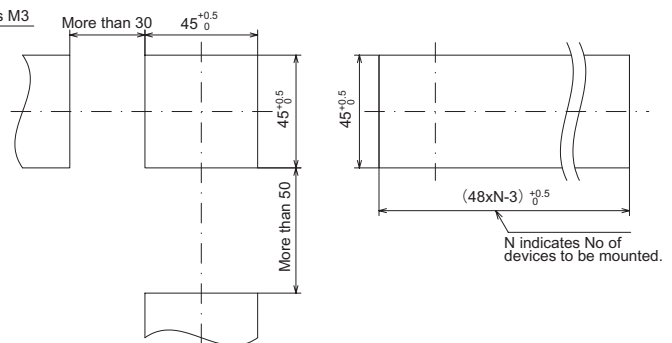
### ● Terminal block type



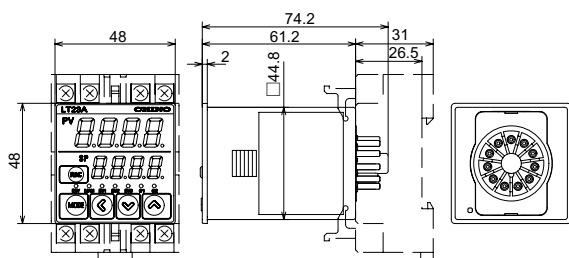
### ● Panel cutout

#### ● Separate installation

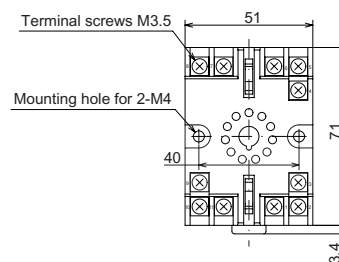
#### ● Closed installation



### ● Socket type



### ● Wiring terminal block



Unit : mm

Specifications subject to change without notice. Printed in Japan (I) 2014. 8

## CHINO CORPORATION

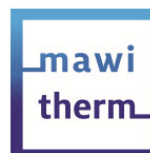
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# Digital Indicating Controller LT35A/37A SERIES



LT 35A/37A series is digital indicating controller with indicating accuracy of  $\pm 0.2\%$  and the control cycle of approximately 0.3 seconds.

3 types of auto tuning functions and overshoot suppression functions achieve superior control stability. Combination of internal computing function and enriched input and output option support various usage scenarios.

Special loader software provides ease of setting operations and data acquisition.

## FEATURES

### ● Compact design

Short depth of instrument (case 65mm) saves the space of instrument and control board.

### ● Universal input

Input types is user-changeable from among thermocouple, resistance thermometer, DC voltage and DC current.

### ● Outstanding controllability

Control system can be selected from two-position control and PID control.

It has overshoot suppression function and high-functional PID.

### ● 3 type of auto tuning

Can be selected from normal, rapid-response, stable tuning on the control target.

### ● Various input / output signal (optional) are available

Current transformer input 2 points, event output 3 points (Max), remote signal input 4 points, communication interface (RS485).

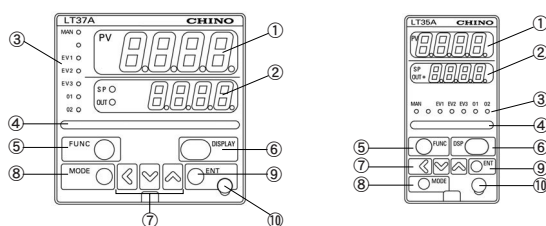
### ● Conformance to international safety standards

CE marking, RoHS

### ● Loader software is available

Various parameter settings and data acquisition can be done easily using loader software (sold separately).

## PARTS NAMES OF FUNCTIONS



- ① Upper display : Displays PV values (measuring temperature, etc.) or setting items.
- ② Lower display : Displays SP values (preset temperature, etc.) and other parameter set values.
- ③ Status display lamp : MAN : Lights when MANUAL (manual mode)  
EV1 to EV3 : Lights when event outputs are ON.  
01 to 02 : Lights when the control output is ON.
- ④ Multiple functions indicating lamp : User-settable max. 3 sets combination of condition and status as preferred functions (alarm, READY, etc.).
- ⑤ [FUNC] key : Press 1 second or longer, then enters frequently used functions and operations set in advance. The function is disabled at factory default.
- ⑥ [DISPLAY]/[DSP] key : Switch display in operation mode. Or back to operation mode from parameter setting mode.
- ⑦ [MODE] key : Switches the display.
- ⑧ <, V, ^ Key : Used for incrementing numeric values and performing arithmetic shift operation.
- ⑨ [ENT] key : Starts to change settings and set value
- ⑩ Loader connector : Connects to a personal computer by using USB loader cable.



## MODELS

LT35A□□□□□□□□□□/LT37A□□□□□□□□□□

	Measur- ing input	Control output	I/O option	Terminal type	Power	Extra	Specifications	
LT35A							48mmX96mm front size	
LT37A							96mmX96mm front size	
0							Universal input	
							Control output 1	Control output 2
1	0						ON-OFF pulse output	—
5	0						SSR drive pulse output	—
5	3						SSR drive pulse output	Current output
5	5						SSR drive pulse output	SSR drive pulse output
3	0						Current output	—
3	3						Current output	Current output
*4	1						Event output: 3 points	
	2						Event output 3 points, Transmission signal output (current output)	
*2,*4	4						Event output 2 points (independent contact)	
*2	5						Event output 2 points (independent contact), Transmission signal output (current output)	
	0						—	
*1	1						Current transformer input 2 points External signal input: 4 points	
*1	2						Current transformer input 2 points External signal input: 4 points Communication interface RS485	
	0						Terminal block type	
	A						100 to 240 V AC	
	D						24V AC/DC	
	00						No additional treatment	
	Y0						Complying with the traceability certificate	
*3	T0						Tropical treatment	
*3	K0						Sulfur resistance treatment	

\*1: Current transformer is sold separately.

\*2: 24V AC/DC power supply can not be selected.

\*3: Non-conforming to CE, UL/cUL.

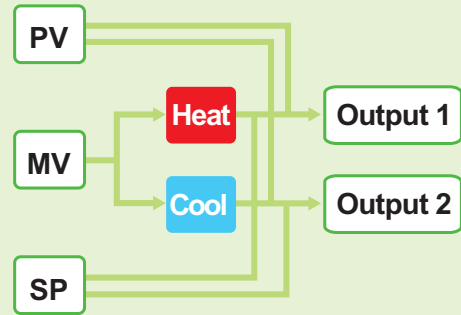
\*4: Event output are 2 types, specify models of 3 point (common) or 2 points (independent).

### Compact size



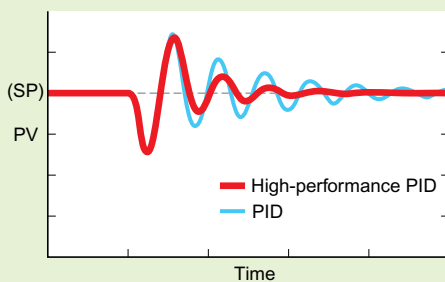
There are size 48x96mm and 96x96mm available. Depth is only 65mm, so it is space saving for any installation.

### Correspond to heat / cool control

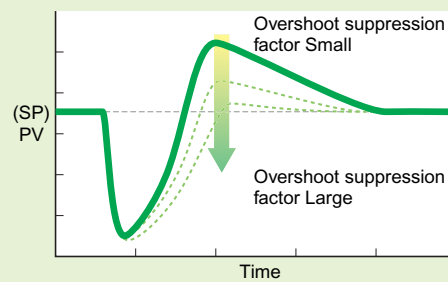


Control output of heat or cool can be assigned to the output 1 and 2. PV and SP can also be assigned and used as transmission signal output.

### Advanced controllability



In addition to the conventional PID, "High-performance PID" is available which has unique algorithm aim to converge hunting quickly to decrease settling time.

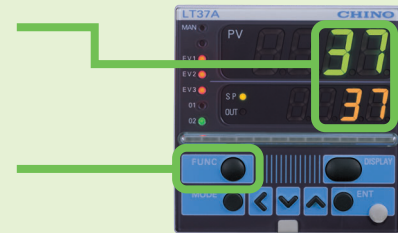


By "Overshoot suppression function" which controls overshoot at SP changing and/or disturbance response, the control has been able to develop stronger resistance for disturbance and superior stability.

**Easy-to-read display** On the display, measuring value (PV) is indicated in green and setting value (SP) is indicated in orange LEDs.

### Frequently used operation can be assigned to the FUNC key

By assigning frequently used operation such as Auto/Manual and RUN/READY to the FUNC key, only one press of a button enables switching the functions.

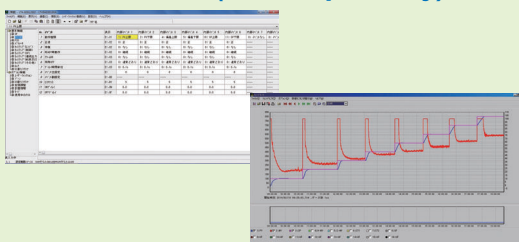


### Various combinations of input and output



\*Various parameter settings are available from PC by using dedicated loader software. However, it requires dedicated loader cable (sold separately).

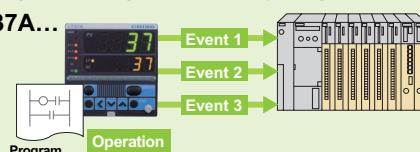
### Loader software (sold separately)



Various parameter settings and data acquisition are available by connecting this controller to the PC which the loader software is installed.

### Internal event can be output as external digital (contact) output by logical operation.

On LT37A...



3 points of event can be output

Result of the logical operation which performed on selected five points of various internal events is able to be assigned to the three points of external digital outputs. It can simplify process of event outputs which logical operation was conventionally performed on receiver side.

## SPECIFICATIONS

### Input specifications

Input signal: Universal input (Thermocouple, Resistance Thermometer, DC voltage/current)  
 Range type: Refer to a measuring range table  
 Input sampling cycle: 300ms  
 Accuracy rating:  $\pm 0.2\%FS \pm 1\text{digit}$   
 Reference junction compensation accuracy:  $\pm 0.5^\circ\text{C}$  (at ambient temperature  $23^\circ\text{C} \pm 2^\circ\text{C}$ )

### Control specifications

Output type: ON-OFF pulse output type 1c 250V AC/ 30V DC 3A (resistance load)  
 Current output type 0 to 20mA DC, 4 to 20 mA DC (It can be changed by the setting)  
 SSR drive pulse output type 19V DC $\pm 15\%$ , Internal resistance  $82\Omega$ , Allowable current Max. 24mA DC

### Event output

Output point: Max. 3 points  
 Contact capacity: 250V AC/ 30V DC 2A (resistance load)  
 Output type: Relay output 1a  
 Type: Absolute value, deviation, loop diagnosis, timer, heater disconnection and etc. Total 30 types  
 \*Event output is a standard feature.

### General specifications

Ambient temperature range: 0 to  $50^\circ\text{C}$   
 Power supply voltage range: AC power supply: 100 to 240 V AC, 50/60Hz

DC power supply: 24 V AC, 50/60Hz/24V DC  
 Power consumption: AC power supply: 12 VA and/or lower  
 DC power supply: 12 VA and/or lower (24V AC) 8W and/or lower (24V DC)  
 Safety standards: CE marking compliant product  
 Weight: LT35A 250g, LT37A 300g

## OPTION

External signal input: Input point: 4 points  
 Function: AUTO/MANUAL, RUN/READY, SV, Timer Stop/Start and etc. Total 17 functions  
 Transmission signal output: Output type: 0 to 20mA DC or 4 to 20mA DC current output  
 Allowable load resistance:  $600\Omega$  and/or lower  
 Output accuracy:  $\pm 0.2\%FS$  (at ambient temperature  $23^\circ\text{C} \pm 2^\circ\text{C}$ ), however, 0 to 1mA is at  $\pm 1\%FS$   
 Current transformer input: (CT) Input point: 2 points  
 CT sold separately:  $\varnothing 5.8$  (LTA-P207),  $\varnothing 12$  (LTA-P208)  
 Measuring current: 0.4 to 50.0A  
 Display accuracy:  $\pm 5\%FS$   
 Communication interface: Communication type: RS485  
 Connection unit: Max. 31 units  
 Communication speed: Max. 38,400bps  
 Communication protocol: MODBUS  
 Terminating resistor: Connection prohibited

## MEASURING RANGE

Input type	C01 Set value	Measuring range	Accuracy
Thermocouple	1	-200 to 1200°C	$\pm 0.2\%FS \pm 1\text{digit}$ Minus area is $\pm 0.4\%FS \pm 1\text{digit}$ Under $260^\circ\text{C}$ : $\pm 4.0\%FS$ , $260-800^\circ\text{C}$ : $\pm 0.4\%FS$ $\pm 0.2\%FS \pm 1\text{digit}$ , Minus area is $\pm 0.4\%FS \pm 1\text{digit}$ $0 \sim 300^\circ\text{C}$ : $\pm 2.5\%FS$ , $300$ to $800^\circ\text{C}$ : $\pm 1.5\%FS$ , $800$ to $1900^\circ\text{C}$ : $\pm 0.5\%FS$ $\pm 0.2\%FS \pm 1\text{digit}$ , Minus area is $\pm 0.4\%FS \pm 1\text{digit}$ $\pm 1.5K$
	2	0 to 1200°C	
	3	0.0 to 800.0°C	
	4	0.0 to 600.0°C	
	5	0.0 to 400.0°C	
	6	-200.0 to 400.0°C	
	7	-200.0 to 200.0°C	
	8	0 to 1200°C	
	9	0.0 to 800.0°C	
	10	0.0 to 600.0°C	
	11	-200.0 to 400.0°C	
	12	0.0 to 800.0°C	
	13	0.0 to 600.0°C	
	14	-200.0 to 400.0°C	
	15	0 to 1600°C	
	16	0 to 1600°C	
	17	0 to 1800°C	
	18	0 to 1300°C	
	19	0 to 1300°C	
RTD	20	0 to 1400°C	$\pm 0.2\%FS \pm 1\text{digit}$
	21	0 to 2300°C	
	22	0 to 1300°C	
	23	0 to 1900°C	
	24	-200.0 to 400.0°C	
	25	-100.0 to 800.0°C	
	26	0.0 to 360.0 K	
	41	-200.0 to 500.0°C	
	42	-200.0 to 500.0°C	
	43	-200.0 to 200.0°C	
	44	-200.0 to 200.0°C	
	45	-100.0 to 300.0°C	
	46	-100.0 to 300.0°C	
	47	-100.0 to 200.0°C	
	48	-100.0 to 200.0°C	
	49	-100.0 to 150.0°C	
	50	-100.0 to 150.0°C	
	51	-50.0 to 200.0°C	
	52	-50.0 to 200.0°C	
	53	-50.0 to 100.0°C	
	54	-50.0 to 100.0°C	
	55	-60.0 to 40.0°C	
	56	-60.0 to 40.0°C	
	57	-40.0 to 60.0°C	
	58	-40.0 to 60.0°C	
	59	-10.00 to 60.00°C	
	60	-10.00 to 60.00°C	
	61	0.0 to 100.0°C	
	62	0.0 to 100.0°C	
	63	0.0 to 200.0°C	
	64	0.0 to 200.0°C	
	65	0.0 to 300.0°C	
	66	0.0 to 300.0°C	
	67	0.0 to 500.0°C	
	68	0.0 to 500.0°C	
DC voltage/current	81	0 to 10mV	$\pm 0.2\%FS \pm 1\text{digit}$
	82	-10 to 10mV	
	83	0 to 100mV	
	84	0 to 1V	
	86	1 to 5V	
	87	0 to 5V	
	88	0 to 10V	
	89	0 to 20mA	
	90	4 to 20mA	

\*Lower limit of indication value of B thermocouple is  $20^\circ\text{C}$

### Applicable standards

#### Thermocouple

K, J, E, T, R, S, B, N : JIS C 1602-1995  
 Platinel II : Engelhard Industries (ITS90)  
 WRe5-26 : ASTM E988-96 (Reapproved 2002)  
 DIN U, DIN L : DIN43710-1985  
 NiMo : ASTM E1751-00

PR40-20 : Johnson Matthey  
 CR-AuFe : Hayashi Denko

#### Resistance thermometer

Pt100 : JIS C 1604-1997  
 JPt100 : JIS C 1604-1989

## ACCESSORY

Item	Model
Attachment (for terminal block type)	LTA-P307
Manual	L3A-11-□

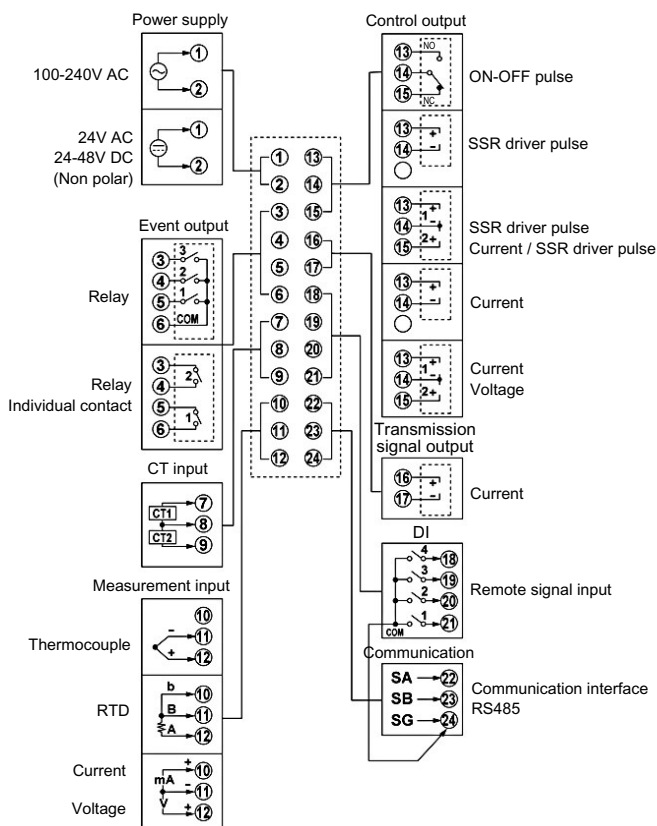
## OPTIONAL SOFTWARE

Item	Model
Loader software (cable included)	LTA-S001
Loader software	LTA-S002
Loader cable	LTA-S003

## ACCESSORY (Sold separately)

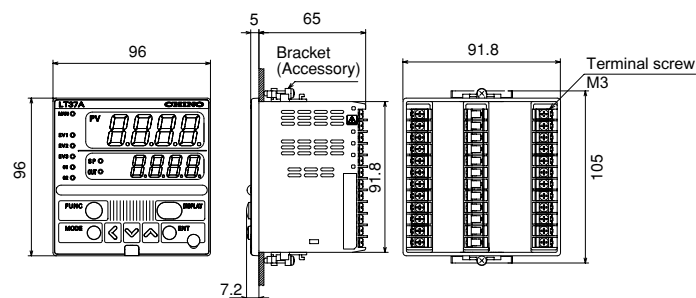
Item	Model
Hard cover	LT35A LTA-P301
	LT37A LTA-P302
Soft cover	LT35A LTA-P303
	LT37A LTA-P304
Terminal cover	LT35A LTA-P305
	LT37A LTA-P306
Current transformer	LTA-P207 (5.8 mm hole dia.) LTA-P208 (12 mm hole dia.)
Attachment	LTA-P307
Shunt resistor 250Ω	EZ-RX250

## TERMINAL BOARD

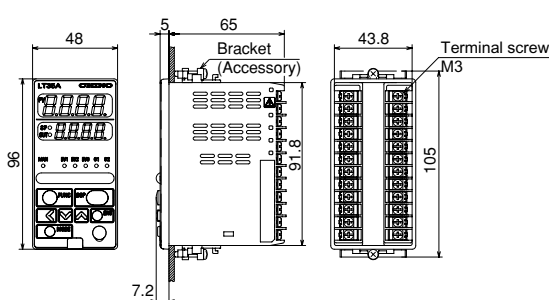


## DIMENSIONS

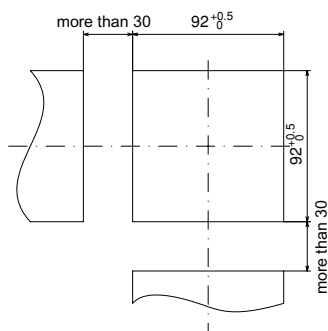
### LT37A



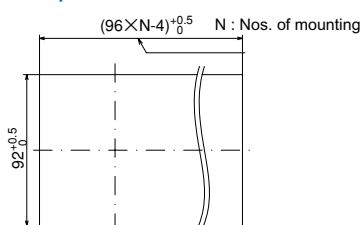
### LT35A



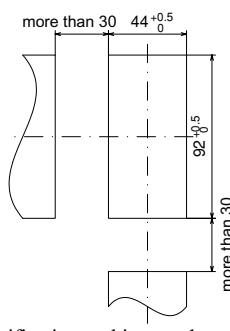
### Panel cutout



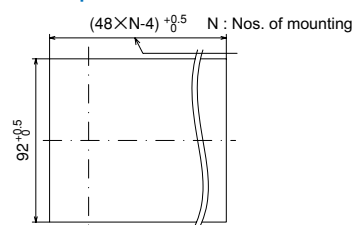
### Minimum clearance for plural installation



### Panel cutout



### Minimum clearance for plural installation



Unit : mm

Specifications subject to change without notice. Printed in Japan (I) 2014. 12

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# Digital Indicating Controller LT45A/47A SERIES



LT45A/47A series is digital indicating controller with indicating accuracy of  $\pm 0.1\%$  and the control cycle of approximately 0.1 second.

3 types of auto tuning functions and overshoot suppression functions achieve superior control stability.

Combination of internal computing function and enriched input and output option support various usage scenarios.

Special loader software provides ease of setting operations and data acquisition.

## FEATURES

### Compact design

Short depth of instrument (case 65mm) saves the space of instrument and control board.

### Universal input

Input type is user-changeable from among thermocouple, resistance thermometer, DC voltage and DC current.

### Outstanding controllability

Control system can be selected from two-position control and PID control.

It has overshoot suppression function and high-functional PID.

### 3 types of auto tuning

Can be selected from normal, rapid-response, stable tuning on the control target.

### Various input / output signal (optional) are available.

Current transformer input 2 points, event output 3 points (Max), remote signal input 4 points and communication interface (RS485).

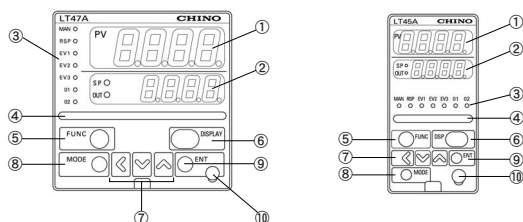
### Conformance to international safety standards

CE marking, RoHS

### Loader software is available

Various parameter settings and data acquisition can be done easily using loader software (sold separately).

## PARTS NAMES OF FUNCTIONS



- ① Upper display: Displays PV values (temperature, etc.).
- ② Lower display: Displays SP values (preset temperature, etc.) or setting items.
- ③ Status display lamp: MAN: Lights when MANUAL (manual mode).  
RSP: Lights when remote SP input. (Local SP input when light OFF)  
EV1 to EV3: Lights when event outputs are ON  
01 to 02: Lights when the control output is ON
- ④ Multiple functions indicating lamp: User-settable max. 3 sets combination of condition and status as preferred functions (alarm, READY, etc.).
- ⑤ [FUNC] key: Press 1 second or longer, then enters frequently used functions and operations set in advance. The function is disabled at factory default.
- ⑥ [DISPLAY]/[DSP] key: Switch display in operation mode. Or back to operation mode from parameter setting mode.
- ⑦ [MODE] key: Switches the display
- ⑧ <, V, ^ Key: Used for incrementing numeric values and performing arithmetic shift operation.
- ⑨ [ENT] key: Start to change setting and set value.
- ⑩ Loader connector: Connects to a personal computer by using USB loader cable.



## MODELS

LT45A□□□□□□□□/LT47A□□□□□□□□

	Measur- ing input	Control output	I/O option	Terminal type	Power	Extra	Specifications	
LT45A							48mmX96mm front size	
LT47A							96mmX96mm front size	
0							Universal input	
							Control output 1	Control output 2
*3	1	0					ON-OFF pulse output	—
	2	0					ON-OFF servo output	—
	5	0					SSR drive pulse output	—
	5	3					SSR drive pulse output	Current output
	5	5					SSR drive pulse output	SSR drive pulse output
	5	6					SSR drive pulse output	Voltage output
	3	0					Current output	—
	3	3					Current output	Current output
	3	6					Current output	Voltage output
	6	0					Voltage output	—
	6	6					Voltage output	Voltage output
	1						Event output 3 points	
	2						Event output 3 points, Transmission signal output (current output)	
	3						Event output 3 points, Transmission signal output (voltage output)	
*3,5	4						Event output: 2 points (independent contact)	
*3	5						Event output: 2 points (independent contact), Transmission signal output (current output)	
*3	6						Event output: 2 points (independent contact) Transmission signal output (voltage output)	
0							—	
*1,2	1						Current transformer input: 2 points, External signal input: 4 points	
*1,2	2						Current transformer input: 2 points, External signal input: 4 points, Communication interface RS485	
*1,2	3						Current transformer input: 2 points, External signal input: 2 points, Remote signal input	
	4						Current transformer input: 2 points, External signal input: 2 points, Remote signal input, Communication interface RS485	
0							Terminal block type	
	A						100 to 240V AC, Terminal block type	
	D						24V AC/DC, Terminal block type	
	00						No additional treatment	
	Y0						Complying with the traceability certification	
	T0						Tropical treatment	
	K0						Sulfur resistance treatment	

\*1: Current transformer is sold separately.

\*2: Current transformer input not available when

ON-OFF servo output is selected as control output. Then it becomes motorized feedback input.

\*3: 24V AC/DC power supply can not be selected.

\*4: Non-conforming to CE, UL/cUL.

\*5: Event output are 2 types, specify models of 3 point (common) or 2 points (independent).

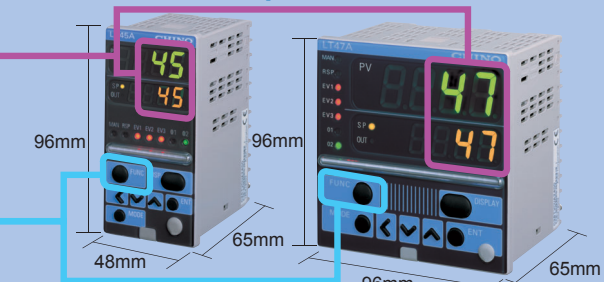
### Compact Bodies

#### Easy-to-read display

On the display, measuring value (PV) is indicated in green and setting value (SP) is indicated in orange LEDs.

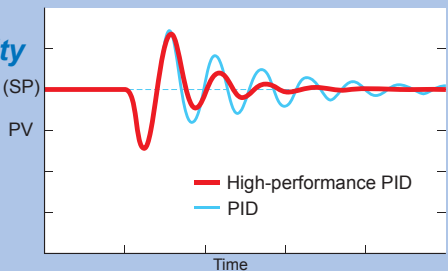
#### Frequently used operation can be assigned to the FUNC key

By assigning frequently used operation such as Auto/Manual and RUN/READY to the FUNC key, only one press of a button enables switching the functions.

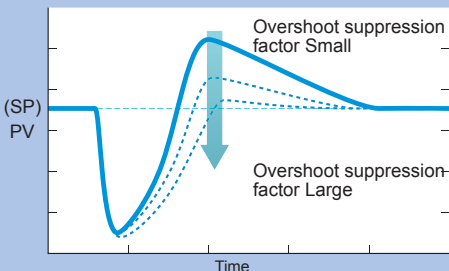


There are size 48x96mm and 96x96mm available.  
Depth is only 65mm, so it is space saving for any installation

### Advanced controllability



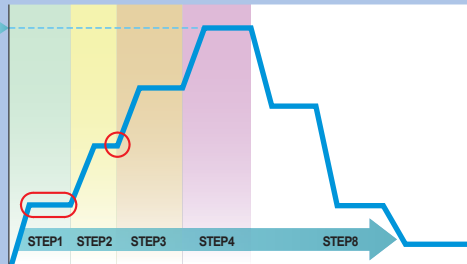
In addition to the conventional PID, "High-performance PID" is available which has unique algorithm aim to converge hunting quickly to decrease settling time.



By "Overshoot suppression function" which controls overshoot at SP changing and/or disturbance response, the control has been able to develop stronger resistance for disturbance and superior stability.

### Step control

Preset maximum 8 setting values and each step can reserve hold time and ramp setting. This function delivers maximum 8 steps program control



### Three types of Auto tuning

Along with the standard algorithm, auto tuning for a target which has relatively good responsiveness and for a target which has good heat-retention are provided to perform appropriate control easily.

#### Zone PID control

When PID parameter change is necessary depending on the temperature range such a case as furnace temperature control, pre-registered 8 groups of PID parameters are assigned to every set temperature ranges (max. 8 zones) and perform operation by automatically changing the parameter depending on the measuring value (or setting value).

### Various combinations of input and output

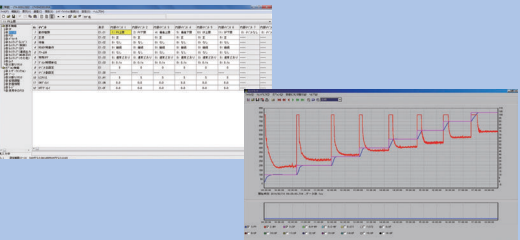
- Universal input**
  - Thermocouple 15 types
  - RTD 2 types
  - DC Voltage / Current 9 types
- Remote signal input (option)**
  - 1 point
- Current transformer input (option)**
  - 2 points
- External signal input (option)**
  - 4 points
- Communication (option)**
  - RS485 1 port



- Control output (select at model)**
  - ON-OFF pulse output
  - ON-OFF servo output
  - Current output
  - SSR drive pulse output
- Transmission signal output (option)**
  - Measuring value (PV)
  - Setting value (SP)
  - Control output (MV) etc.
- Event output (option)**
  - 3 points
  - 2 points (independent contact)
- Loader connector**
  - Support loader software 1 port

\*Various parameter settings are available from PC by using dedicated loader software. However, it requires dedicated loader cable (sold separately).

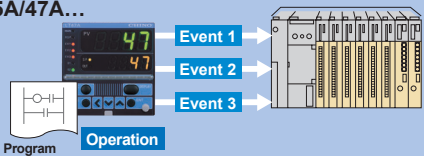
### Loader software (sold separately)



Various parameter settings and data acquisition are available by connecting this controller to the PC which the loader software is installed.

### Internal event can be output as external digital (contact) output by logical operation.

On LT45A/47A...



3 points of event can be output

Result of the logical operation which performed on selected five points of various internal events is able to be assigned to the three points of external digital outputs. It can simplify process of event outputs which logical operation was conventionally performed on receiver side.

## SPECIFICATIONS

### Input specifications

Input signal: Universal input (Thermocouple, Resistance Thermometer, DC voltage/current)  
 Range type: Refer to a measuring range table  
 Input sampling cycle: 100ms  
 Accuracy rating:  $\pm 0.1\%FS \pm 1\text{digit}$   
 Reference junction compensation accuracy:  $\pm 0.5^\circ\text{C}$  (at ambient temperature  $23^\circ\text{C} \pm 2^\circ\text{C}$ )

### Control specifications

Output type: ON-OFF pulse output type 1c 250V AC/ 30V DC 3A (resistance load)  
 ON-OFF servo output type 1a 250V AC 8A(resistance load), FB resistance: 100 to 2500 $\Omega$   
 Current output type 0 to 20mA DC, 4 to 20 mA DC (It can be changed by the setting)  
 Voltage output type 1 to 5V, 0 to 5V, 0 to 10V (It can be changed by the setting)  
 SSR drive pulse output type 19V DC $\pm 15\%$ , Internal resistance 82 $\Omega$ , Allowable current Max. 24mA DC

### Event output

Output point: Max. 3 points  
 Contact capacity: 250V AC/ 30V DC 2A (resistance load)  
 Output type: Relay output 1a  
 Type: Absolute value, deviation, loop diagnosis, timer, heater disconnection and etc. Total 33 types  
 \*Event output is a standard feature.

### General specifications

Ambient temperature range: 0 to 50 $^\circ\text{C}$   
 Power supply voltage range: AC power supply: 100 to 240 V AC, 50/60HzDC  
 power supply: 24 V AC, 50/60Hz/24V DC

Power consumption:  
 DC power supply:

AC power supply: 12 VA and/or lower  
 12 VA and/or lower (24V AC) 8W and/or lower (24V DC)  
 CE marking compliant product  
 LT45A 250g, LT47A 300g

### OPTION

External signal input:  
 Transmission signal output:

Input point: 4 points  
 Function: AUTO/MANUAL, RUN/READY, SV, Timer Stop/Start and etc. Total 20 functions  
 Current output type: 0 to 20mA DC or 4 to 20mA DC current output  
 Allowable load resistance: 600 $\Omega$  and/or lower  
 Output accuracy:  $\pm 0.1\%FS$  (at ambient temperature  $23^\circ\text{C} \pm 2^\circ\text{C}$ ), however, 0 to 1mA is at  $\pm 1\%FS$   
 Voltage output type: 0 to 5V DC/ 1 to 5V DC or 0 to 10V DC voltage output  
 Allowable load resistance: 1000 $\Omega$  and/or higher  
 Output accuracy:  $\pm 0.1\%FS$  (at ambient temperature  $23^\circ\text{C} \pm 2^\circ\text{C}$ ), however, 0 to 0.05V is at  $\pm 1\%FS$   
 (CT) Input point: 2 points  
 CT sold separately:  $\varnothing 5.8$  (LTA-P207),  $\varnothing 12$  (LTA-P208)  
 Measuring current: 0.4 to 50.0A  
 Display accuracy:  $\pm 5\%FS$   
 Communication type: RS485  
 Connection unit: Max. 31 units  
 Communication speed: Max. 38,400bps  
 Communication protocol: MODBUS  
 Terminating resistor: Connection prohibited

Current transformer input

Communication interface

## MEASURING RANGE

Input type	C0.1 Set value	Measuring range	Accuracy
Thermocouple	K	1 -200 to 1200 $^\circ\text{C}$	$\pm 0.1\%FS \pm 1\text{digit}$
		2 0 to 1200 $^\circ\text{C}$	
		3 0.0 to 800.0 $^\circ\text{C}$	
		4 0.0 to 600.0 $^\circ\text{C}$	
		5 0.0 to 400.0 $^\circ\text{C}$	
		6 -200.0 to 400.0 $^\circ\text{C}$	
		7 -200.0 to 200.0 $^\circ\text{C}$	
	J	8 0 to 1200 $^\circ\text{C}$	Minus area is $\pm 0.2\%FS \pm 1\text{digit}$
		9 0.0 to 800.0 $^\circ\text{C}$	
		10 0.0 to 600.0 $^\circ\text{C}$	
		11 -200.0 to 400.0 $^\circ\text{C}$	
	E	12 0.0 to 800.0 $^\circ\text{C}$	
		13 0.0 to 600.0 $^\circ\text{C}$	
	T	14 -200.0 to 400.0 $^\circ\text{C}$	
		15 0 to 1600 $^\circ\text{C}$	
	R	16 0 to 1600 $^\circ\text{C}$	Under 100 $^\circ\text{C}$ : $\pm 0.2\%FS$ , 100 to 1600 $^\circ\text{C}$ : $\pm 0.15\%FS$
		17 0 to 1800 $^\circ\text{C}$	
	S	18 0 to 1300 $^\circ\text{C}$	Under 260 $^\circ\text{C}$ : $\pm 0.4\%FS$ , 260-800 $^\circ\text{C}$ : $\pm 0.4\%FS$ , 800 to 1800 $^\circ\text{C}$ : $\pm 0.2\%FS$
		19 0 to 1300 $^\circ\text{C}$	
	Platinel II	20 0 to 1400 $^\circ\text{C}$	$\pm 0.1\%FS \pm 1\text{digit}$ , Minus area is $\pm 0.2\%FS \pm 1\text{digit}$
		21 0 to 2300 $^\circ\text{C}$	
	WRe5-26	22 0 to 1300 $^\circ\text{C}$	0~300 $^\circ\text{C}$ : $\pm 2.5\%FS$ , 300 to 800 $^\circ\text{C}$ : $\pm 1.5\%FS$ , 800 to 1900 $^\circ\text{C}$ : $\pm 0.5\%FS$
		23 0 to 1900 $^\circ\text{C}$	
	PR40-20	24 -200.0 to 400.0 $^\circ\text{C}$	$\pm 0.1\%FS \pm 1\text{digit}$ , Minus area is $\pm 0.2\%FS \pm 1\text{digit}$
		25 -100.0 to 800.0 $^\circ\text{C}$	
	DIN U	26 0.0 to 360.0K	$\pm 1.5K$
		27 0.0 to 360.0K	
RTD	Pt100	41 -200.0 to 500.0 $^\circ\text{C}$	$\pm 0.1\%FS \pm 1\text{digit}$
		42 -200.0 to 500.0 $^\circ\text{C}$	
	JPt100	43 -200.0 to 200.0 $^\circ\text{C}$	
		44 -200.0 to 200.0 $^\circ\text{C}$	
	Pt100	45 -100.0 to 300.0 $^\circ\text{C}$	
		46 -100.0 to 300.0 $^\circ\text{C}$	
	JPt100	47 -100.0 to 200.0 $^\circ\text{C}$	
		48 -100.0 to 200.0 $^\circ\text{C}$	
	Pt100	49 -100.0 to 150.0 $^\circ\text{C}$	
		50 -100.0 to 150.0 $^\circ\text{C}$	
	JPt100	51 -50.0 to 200.0 $^\circ\text{C}$	
		52 -50.0 to 200.0 $^\circ\text{C}$	
	Pt100	53 -50.0 to 100.0 $^\circ\text{C}$	
		54 -50.0 to 100.0 $^\circ\text{C}$	
	JPt100	55 -60.0 to 40.0 $^\circ\text{C}$	
		56 -60.0 to 40.0 $^\circ\text{C}$	
	Pt100	57 -40.0 to 60.0 $^\circ\text{C}$	$\pm 0.15\%FS \pm 1\text{digit}$
		58 -40.0 to 60.0 $^\circ\text{C}$	
	JPt100	59 -10.00 to 60.00 $^\circ\text{C}$	
		60 -10.00 to 60.00 $^\circ\text{C}$	
	Pt100	61 0.0 to 100.0 $^\circ\text{C}$	$\pm 0.1\%FS \pm 1\text{digit}$
		62 0.0 to 100.0 $^\circ\text{C}$	
	JPt100	63 0.0 to 200.0 $^\circ\text{C}$	
		64 0.0 to 200.0 $^\circ\text{C}$	
	Pt100	65 0.0 to 300.0 $^\circ\text{C}$	$\pm 0.1\%FS \pm 1\text{digit}$
		66 0.0 to 300.0 $^\circ\text{C}$	
	JPt100	67 0.0 to 500.0 $^\circ\text{C}$	
		68 0.0 to 500.0 $^\circ\text{C}$	
DC voltage/current	0 to 10mV	81	$\pm 0.15\%FS \pm 1\text{digit}$
		82 -10 to 10mV	
	0 to 100mV	83	$\pm 0.1\%FS \pm 1\text{digit}$
		84 0 to 1V	
	1 to 5V	86	
		87 0 to 5V	
	0 to 10V	88	
		89 0 to 20mA	
	4 to 20mA	90	

\*Lower limit of indication value of B thermocouple is 20 $^\circ\text{C}$

●Applicable standards

• Thermocouple  
 K,J,E,T,R,S,B,N : JIS C 1602-1995  
 Platinel II : Engelhard Industries(ITS90)  
 WRe5-26 : ASTM E988-96(Reapproved 2002)  
 DIN U,DIN L : DIN43710-1985  
 NiMo : ASTM E1751-00

PR40-20 : Johnson Matthey  
 CR-AuFe : Hayashi Denko

• Resistance thermometer  
 Pt100 : JIS C 1604-1997  
 JPt100 : JIS C 1604-1989

## ACCESSORY

Item	Model
Attachment (for terminal block type)	LTA-P307
Manual	L4A-11-□

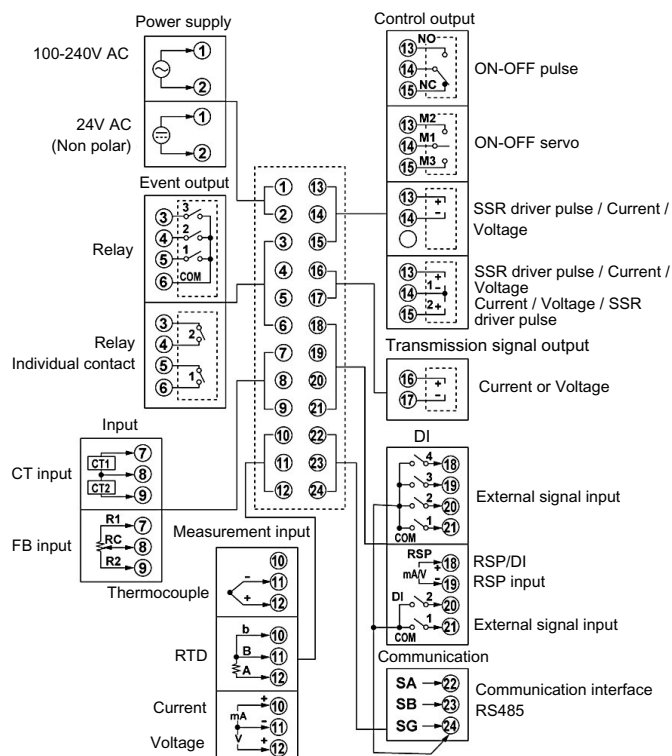
## OPTIONAL SOFTWARE

Item	Model
Loader software (cable included)	LTA-S001
Loader software	LTA-S002
Loader cable	LTA-S003

## ACCESSORY (Sold separately)

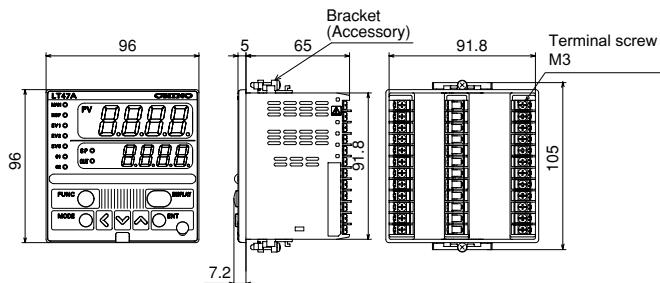
Item	Model
Hard cover	LT45A LTA-P301
	LT47A LTA-P302
Soft cover	LT45A LTA-P303
	LT47A LTA-P304
Terminal cover	LT45A LTA-P305
	LT47A LTA-P306
Current transformer	LTA-P207 (5.8 mm hole dia.) LTA-P208 (12 mm hole dia.)
Attachment	LTA-P307
Shunt resistor 250Ω	EZ-RX250

## TERMINAL BOARD

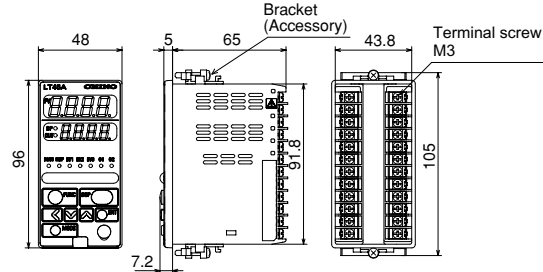


## DIMENSIONS

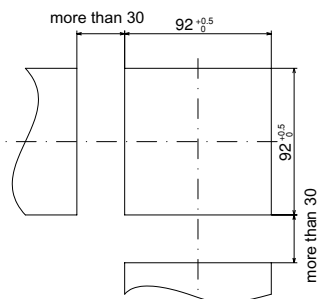
### LT47A



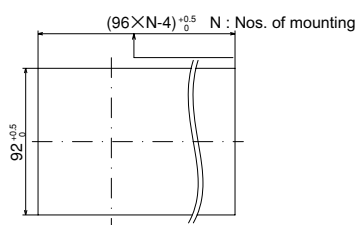
### LT45A



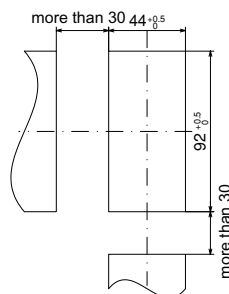
### Panel cutout



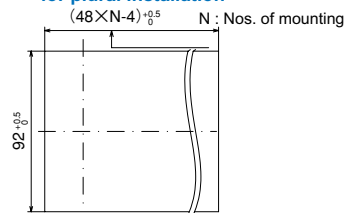
### Minimum clearance for plural installation



### Panel cutout



### Minimum clearance for plural installation



Unit : mm

Specifications subject to change without notice. Printed in Japan (I) 2014. 12

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