Digital Indicating Controller
LT45A/47A SERIES

LT45A/47A series is digital indicating controller with indicating accuracy of ±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**
- **Upper display:** Displays PV values (temperature, etc.).
- **Lower display:** Displays SP values (preset temperature, etc.) or setting items.
- **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
- **Multiple functions indicating lamp:**
  - User-settable max. 3 sets combination of condition and status as preferred functions (alarm, READY, etc.).
  - Press 1 second or longer, then enters frequently used functions and operations set in advance. The function is disabled at factory default.
  - Switch display in operation mode. Or back to operation mode from parameter setting mode.
  - Used for incrementing numeric values and performing arithmetic shift operation.
  - Start to change setting and set value.
  - Connects to a personal computer by using USB loader cable.

**MODELS**

<table>
<thead>
<tr>
<th>MODELS</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT45A</td>
<td>48mmX96mm front size</td>
</tr>
<tr>
<td>LT47A</td>
<td>96mmX96mm front size</td>
</tr>
<tr>
<td>0</td>
<td>Universal input</td>
</tr>
<tr>
<td>1</td>
<td>Event output 1</td>
</tr>
<tr>
<td>2</td>
<td>Event output 3</td>
</tr>
<tr>
<td>3</td>
<td>Event output 3</td>
</tr>
<tr>
<td>4</td>
<td>Event output 2</td>
</tr>
<tr>
<td>5</td>
<td>Event output 2</td>
</tr>
<tr>
<td>6</td>
<td>Event output 2</td>
</tr>
</tbody>
</table>

**TERMINAL BLOCK TYPE**

<table>
<thead>
<tr>
<th>TERMINAL BLOCK TYPE</th>
<th>Standard input/output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100 to 240V AC, Terminal block type</td>
</tr>
<tr>
<td>D</td>
<td>24V AC/DC, Terminal block type</td>
</tr>
<tr>
<td></td>
<td>00 No additional treatment</td>
</tr>
<tr>
<td></td>
<td>Y0 Complying with the traceability certification</td>
</tr>
<tr>
<td></td>
<td>T0 Tropical treatment</td>
</tr>
<tr>
<td></td>
<td>K0 Sulfur resistance treatment</td>
</tr>
</tbody>
</table>

*1 : Current transformer input 2 points, External signal input:4 points
*2 : Current transformer input 2 points, External signal input:4 points, Communication interface RS485
*3 : Current transformer input 2 points, External signal input:2 points, Remote signal input:1 point
*4 : Current transformer input 2 points, External signal input:2 points, Communication interface RS485
*5 : Event output are 2 types, specify models of 3 point (common) or 2 points (independent)
**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.

**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.

**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)
  - 4 points
- External signal input (option)
  - 2 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:** ±0.1%FS ±1digit

**Control specifications**
- **Output type:** ON-OFF pulse output type 1c
- **Contact capacity:** 250V AC/30V DC 3A

**Event output**
- **Output point:** Max. 3 points
- **Contact capacity:** 250V AC/30V DC 2A (Resistance load)
- **Type:** Relay output 1a
- **Output type:** ON-OFF pulse output type 1c
- **Contact capacity:** 250V AC/30V DC 3A

**General specifications**
- **Ambient temperature range:** 0 to 50°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

**MEASURING RANGE**

<table>
<thead>
<tr>
<th>Input type</th>
<th>Measuring range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>0°C to 1200°C</td>
<td>±0.1%FS ±1digit</td>
</tr>
<tr>
<td>J</td>
<td>0°C to 120°C</td>
<td>Minus area is ±0.2%FS ±2digit</td>
</tr>
<tr>
<td>E</td>
<td>0°C to 120°C</td>
<td>Under 100°C: ±0.2%FS, 100 to 1600°C: ±0.15%FS</td>
</tr>
<tr>
<td>R</td>
<td>0°C to 120°C</td>
<td>Under 260°C: ±0.4%FS, 260 to 800°C: ±0.2%FS, 800 to 1800°C: ±0.2%FS</td>
</tr>
<tr>
<td>Thermocouple</td>
<td>0°C to 1200°C</td>
<td>±0.1%FS ±1digit, Minus area is ±0.2%FS ±1digit</td>
</tr>
<tr>
<td>PT100</td>
<td>0°C to 500°C</td>
<td>±0.1%FS ±1digit</td>
</tr>
<tr>
<td>PT100</td>
<td>0°C to 100°C</td>
<td>±0.15%FS ±1digit</td>
</tr>
<tr>
<td>PT100</td>
<td>0°C to 50°C</td>
<td>±0.1%FS ±1digit</td>
</tr>
<tr>
<td>RTD</td>
<td>0°C to 100°C</td>
<td>±0.1%FS ±1digit</td>
</tr>
<tr>
<td>DC voltage/current</td>
<td>0 to 10mV</td>
<td>±0.1%FS ±1digit</td>
</tr>
</tbody>
</table>

**Power consumption:**
- AC power supply: 12 VA and/or lower
- DC power supply: 12 VA and/or lower (24V AC) 8W and/or lower

**Safety standards:** CE marking compliant product

**Weight:** LT45A 250g, LT47A 300g

**OPTION**

- **External signal input:** Input point: 4 points
- **Function:** AUTO/MANUAL, RUN/READY, SV, Timer
- **Transmission signal output:** Current type output: 0 to 20mA DC or 4 to 20mA DC
- **Current transformer input:** CT sold separately: Ø5.8 (LTA-P207), Ø12 (LTA-P208)
- **Communication interface:** Communication speed: Max. 38,400bps

**Resistance thermometer**
- **PT100:** JIS C 1602-1995
- **JPH100:** JIS C 1604-1997
- **Resistance thermometry:** JIS C 1602-1995

**NOTES:**
- Lower limit of indication value of B thermocouple is 20°C
- Applicable standards:
  - **Thermocouple**
    - Platinum: IEC53:1999
    - DIN U/DIN L : DIN43710-1985
    - NiMo : ASTME E1751-00

- **Primer:** PR40.20 : Johnson Matthey
- **Transfer:** Hayashi Denko

<table>
<thead>
<tr>
<th>Event output position</th>
<th>Changeable area</th>
<th>Changeable position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>±0.1%FS ±1digit</td>
<td>±0.1%FS ±1digit</td>
</tr>
<tr>
<td>2</td>
<td>±0.1%FS ±1digit</td>
<td>±0.1%FS ±1digit</td>
</tr>
<tr>
<td>3</td>
<td>±0.1%FS ±1digit</td>
<td>±0.1%FS ±1digit</td>
</tr>
</tbody>
</table>

- **Event output is a standard feature.**
### ACCESSORY

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment (for terminal block type)</td>
<td>LTA-P307</td>
</tr>
<tr>
<td>Manual</td>
<td>L4A-11-1</td>
</tr>
</tbody>
</table>

### OPTIONAL SOFTWARE

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loader software (cable included)</td>
<td>LTA-S001</td>
</tr>
<tr>
<td>Loader software</td>
<td>LTA-S002</td>
</tr>
<tr>
<td>Loader cable</td>
<td>LTA-S003</td>
</tr>
</tbody>
</table>

### ACCESSORY (Sold separately)

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard cover</td>
<td>LTA-P301</td>
</tr>
<tr>
<td>LT45A</td>
<td>LTA-P302</td>
</tr>
<tr>
<td>LT47A</td>
<td>LTA-P303</td>
</tr>
<tr>
<td>Soft cover</td>
<td>LTA-P304</td>
</tr>
<tr>
<td>LT45A</td>
<td>LTA-P305</td>
</tr>
<tr>
<td>LT47A</td>
<td>LTA-P306</td>
</tr>
<tr>
<td>Terminal cover</td>
<td>LTA-P307</td>
</tr>
<tr>
<td>Current transformer</td>
<td>LTA-P207</td>
</tr>
<tr>
<td>(5.8 mm hole dia.)</td>
<td>LTA-P208</td>
</tr>
<tr>
<td>(12 mm hole dia.)</td>
<td></td>
</tr>
<tr>
<td>Attachment</td>
<td>LTA-P307</td>
</tr>
<tr>
<td>Shunt resister 250Ω</td>
<td>EZ-RX250</td>
</tr>
</tbody>
</table>

### DIMENSIONS

#### LT47A

- **Panel cutout**
  - more than 30
  - (68 X N/4) + N : Nos. of mounting

- **Minimum clearance for plural installation**
  - more than 30
  - (68 X N/4) + N : Nos. of mounting

#### LT45A

- **Panel cutout**
  - more than 30

- **Minimum clearance for plural installation**
  - (48 X N/4) + N : Nos. of mounting

#### LT47A

- **Panel cutout**
  - more than 30

- **Minimum clearance for plural installation**
  - (48 X N/4) + N : Nos. of mounting

Unit : mm

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**Specifications subject to change without notice. Printed in Japan (1) 2014. 12**