Overview
The UT35A and UT32A digital indicating controllers employ an easy-to-read, 14-segment large color LCD display, along with navigation keys, thus greatly increasing the monitoring and operating capabilities. A ladder sequence function is included as standard. The short depth of the controller helps save instrument panel space. The UT35A and UT32A also support open networks such as Ethernet communication.

The UT35A and UT32A have a DIN rail mounting type (with option code /MDL). For more details, please see General Specification GS 05P01D81-01EN.

Features
• A 14-segment, active (PV display color changing function) color LCD display is employed. Two five-digit, high-resolution displays are possible. Alphabet letters can be displayed in an easy-to-read manner. The guide display shows parameter names.
• Easy to operate Navigation keys (SET/ENTER and Up/Down/Left/Right arrow keys) are employed to facilitate making settings.
• 65 mm depth The small depth enables the mounting in a thin and small instrumented panel.
• Ladder sequence function is included as standard. This function allows for creating a simple sequence control. Dedicated LL50A Parameter Setting Software (sold separately) allows for performing programming using a ladder language.
• Various built-in open network functions such as Ethernet are available. Easy connection with various vendors’ PLCs is possible. (UT32A support CC-Link and RS485 communication only.)
• Quick setting function Setting only the minimum necessary parameters for operation is possible.
• Equipped with a multitude of functions Universal I/O and retransmission output are included as standard. PID control, heating/cooling control, etc. are available.
• LL50A Parameter Setting Software (sold separately) The parameters and ladder programs of UTAdvanced digital indicating controller can be built from a PC using this software. It makes data management even easier.
• Dust-proof and drip-proof IP66 (for front panel) (Not applicable to side-by-side close mounting.) NEMA4 (Hose-down test only)

Functional Specifications
Control Specifications
(1) Control Mode Single-loop control
(2) Control period 200 ms

Table of Number of Inputs and Outputs

<table>
<thead>
<tr>
<th>Model and suffix code (See the model code)</th>
<th>Number of analog input points</th>
<th>Number of analog output points (*)</th>
<th>Number of contact input points</th>
<th>Number of contact output points (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT35A</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>+1X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+2X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UT32A</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>+1X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+2X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1: Excluding control output
*2: In the case cooling control output is analog output, it cannot be used for transmission output.
*3: Excluding control output relays

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7th Edition Mar.14, 2016 (YK)
Control Computation Function

(1) Types of control
- PID control
- ON/OFF control (*4)
- Two-position two-level control (*5)
- Heating and cooling control (*5)

*4: Not selectable for Position proportional type
*5: Selectable for heating and cooling control

(2) Control Computation Function
(a) Target setting point and the number of PID parameter groups
Respectively, four sets of target setpoints, alarm setpoints, and PID parameters can be set.
(b) Selecting the PID parameter group
The following PID parameter groups can be selected.
- Target setpoint number (SPNO) (The PID number can be set arbitrarily.)
- Measured input value PID
- Target setpoint zone PID
- Reached target setpoint zone PID
(c) Auto-tuning
- Tuning results can be selected from two options, Normal or Stable.
- Tuning output limit can be set. (It cannot be used in heating/cooling control.)
(d) "Super" function: Overshoot-suppressing function
(e) "Super 2" function: Hunting-suppressing function
(f) STOP preset output function
(g) Input ERROR preset output function
(h) MANUAL preset output function

(3) Operation Mode Switching

(4) Control Parameter Setting Range

Proportional band
Integral time
Derivative time
ON/OFF control
hysteresis (one or two hysteretic points)
Preset output value
High/low output limit
Tight shut function
Rate-of-change limit of output
Output deadband

Alarm Functions

• Types of Alarm

<table>
<thead>
<tr>
<th>Measured value alarm</th>
<th>Deviation alarm</th>
<th>Rate-of-change alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV (measured value)</td>
<td>high/low limit alarm</td>
<td>high/low limit alarm</td>
</tr>
<tr>
<td>Deviation high/low limit alarm</td>
<td>high and low limits alarm</td>
<td>analog input PV high/low limit alarm</td>
</tr>
<tr>
<td>Feedback input high/low limit alarm</td>
<td>PV rate-of-change alarm</td>
<td></td>
</tr>
</tbody>
</table>

Setpoint alarm

<table>
<thead>
<tr>
<th>SP (setpoint) high/low limit alarm</th>
<th>Target SP high/low limit alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target SP deviation high/low limit alarm</td>
<td>Target SP deviation high and low limits alarm</td>
</tr>
<tr>
<td>Target SP deviation within high and low limits alarm</td>
<td></td>
</tr>
</tbody>
</table>

Output alarm

<table>
<thead>
<tr>
<th>Control output high/low limit alarm</th>
<th>Cooling control output high/low limit alarm</th>
</tr>
</thead>
</table>

Other alarms

<table>
<thead>
<tr>
<th>Heater disconnection alarm (for H/A option)</th>
<th>Self-diagnosis alarm</th>
</tr>
</thead>
</table>

Contact I/O Function

This function allows for allocating the input error condition, operation condition, alarm condition or other conditions to the contact input and contact output.

Contact input

<table>
<thead>
<tr>
<th>AUTO/MANUAL switching</th>
<th>REMOTE/LOCAL switching (only model with communication option)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOP/START switching</td>
<td>Switching to AUTO</td>
</tr>
<tr>
<td>Switching to MANUAL</td>
<td>Switching to REMOTE (only model with communication option)</td>
</tr>
<tr>
<td>AUTO-TUNING START/STOP switching</td>
<td>LCD backlight ON/OFF switching</td>
</tr>
<tr>
<td>Message interrupt displays 1 through 4</td>
<td>SP number specification</td>
</tr>
<tr>
<td>PID number specification</td>
<td></td>
</tr>
<tr>
<td>Manual preset output number specification</td>
<td></td>
</tr>
</tbody>
</table>

Contact output

Alarms 1 through 4 | Status output |

Ladder Sequence Function

(1) Number of I/O Points

<table>
<thead>
<tr>
<th>UT35A</th>
<th>UT32A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of digital input points</td>
<td>Up to 7</td>
</tr>
<tr>
<td>Number of digital output points</td>
<td>Up to 8</td>
</tr>
</tbody>
</table>

This is limited by the number of contact I/O signal points. (See the model code.)

(2) Types of Command

<table>
<thead>
<tr>
<th>Number of commands</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of basic command types</td>
<td>13</td>
</tr>
<tr>
<td>Number of application command types</td>
<td>73</td>
</tr>
</tbody>
</table>
### (3) Sequence Device

<table>
<thead>
<tr>
<th>Types of device</th>
<th>Number of points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital I/O</td>
<td></td>
</tr>
<tr>
<td>Input relay</td>
<td>7 (max)</td>
</tr>
<tr>
<td>Output relay</td>
<td>8 (max)</td>
</tr>
<tr>
<td>Internal device</td>
<td></td>
</tr>
<tr>
<td>M relay (bit data)</td>
<td>256</td>
</tr>
<tr>
<td>DAT register (data)</td>
<td>28</td>
</tr>
<tr>
<td>P register (parameter)</td>
<td>10</td>
</tr>
<tr>
<td>K register (constant)</td>
<td>30</td>
</tr>
<tr>
<td>Special device</td>
<td></td>
</tr>
<tr>
<td>Special relay (bit data)</td>
<td>12</td>
</tr>
</tbody>
</table>

Process data and process relay can be used besides the above-mentioned.

### Communication Function

<table>
<thead>
<tr>
<th>Function</th>
<th>Method</th>
<th>Interface</th>
<th>Targets</th>
<th>Max connection</th>
<th>Communication Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus/TCP</td>
<td>Server</td>
<td>Ethernet</td>
<td>PLC and others</td>
<td>2 connections</td>
<td></td>
</tr>
<tr>
<td>Modbus (RTU/ASCII)</td>
<td>Slave</td>
<td>RS-485</td>
<td>PLC and others</td>
<td>31 units</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slave</td>
<td>RS-485</td>
<td>PLC and others</td>
<td>Number of nodes: 42 (Remote device)</td>
<td></td>
</tr>
<tr>
<td>Peer to peer</td>
<td>Multi-drop</td>
<td>RS-485 (2 wire only)</td>
<td>UT75A, UT55A, UT52A, UT35A, UT32A, UP55A, UP35A, UP32A, UM33A&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Read/Write: 4 units Read only : 28 units</td>
<td></td>
</tr>
</tbody>
</table>

<sup>*1:</sup> UT digital indicating controller, Signal conditioner JUXTA, Power monitor POWERCERT can be connected.<br><sup>*2:</sup> UT digital indication controllers can be connected.
### Physical Interface

<table>
<thead>
<tr>
<th>Interface</th>
<th>Standard</th>
<th>Max segment length</th>
<th>Max. Connecting Configuration</th>
<th>Communication method</th>
<th>Baud rate</th>
<th>Maximum communication distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>IEEE802.3 (10BASE-T, 100BASE-TX)</td>
<td>100m</td>
<td>Cascade Max. 4 level (10BASE-T), Max. 2 level (100BASE-TX)</td>
<td>Two-wire half-duplex or four-wire half-duplex, start-stop synchronization, and non-procedural</td>
<td>600, 1200, 2400, 4800, 9600, 19200 or 38400 bps, Peer to peer communication is fixed at 19200 bps</td>
<td>1200m</td>
</tr>
<tr>
<td>RS-485</td>
<td>EIA RS-485</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROFIBUS-DP</td>
<td>Field bus (IEC61158)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC-Link</td>
<td>Remote device (Ver.1.10, Ver.2.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DeviceNet</td>
<td>Field bus (IEC61158)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*3: AUTO automatically sets the baud rate to that of the host controller (PROFIBUS-DP master).
**Hardware Specifications**

**Display Specifications**
- PV display
  - 5-digit, 14-segment active color LCD (white/red)
- Character height: 21.5 mm for UT35A and 13.0 mm for UT32A
- Data display
  - 5-digit, 11-segment color LCD (orange)
- Bar graph display
  - 12-segment color LCD (orange)

**Universal Input Specifications**
- Number of input points: 1
- Types of input, instrument range, and measurement accuracy (see the table below)

<table>
<thead>
<tr>
<th>Types of Input</th>
<th>Instrument Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermocouple</td>
<td>°C °F</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>-270.0 to 1270.0°C</td>
<td>±0.1% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td></td>
<td>±450.0 to 2500.0°F</td>
<td>±0.2% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>J</td>
<td>-270.0 to 1000.0°C</td>
<td>±0.1% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td></td>
<td>±450.0 to 250.0°F</td>
<td>±0.2% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>T</td>
<td>0.0 to 400.0°C</td>
<td>±0.15% of instrument range ±1 digit for 400°C or more</td>
</tr>
<tr>
<td></td>
<td>32 to 3300°F</td>
<td>±0.5% of instrument range ±1 digit for less than 400°C</td>
</tr>
<tr>
<td>B</td>
<td>0.0 to 1800.0°C</td>
<td>±0.1% of instrument range ±1 digit for 400°C or more</td>
</tr>
<tr>
<td></td>
<td>32 to 3300°F</td>
<td>±0.5% of instrument range ±1 digit for less than 400°C</td>
</tr>
<tr>
<td>S</td>
<td>0.0 to 1700.0°C</td>
<td>±0.15% of instrument range ±1 digit</td>
</tr>
<tr>
<td></td>
<td>32 to 3100°F</td>
<td>±0.25% of instrument range ±1 digit</td>
</tr>
<tr>
<td>R</td>
<td>0.0 to 1700.0°C</td>
<td>±0.15% of instrument range ±1 digit</td>
</tr>
<tr>
<td></td>
<td>32 to 3100°F</td>
<td>±0.25% of instrument range ±1 digit</td>
</tr>
<tr>
<td>N</td>
<td>-200.0 to 1300.0°C</td>
<td>±0.1% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td></td>
<td>-300.0 to 2400.0°F</td>
<td>±0.2% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>E</td>
<td>-270.0 to 1000.0°C</td>
<td>±0.1% of instrument range ±1 digit for 0°C or more</td>
</tr>
<tr>
<td></td>
<td>-450.0 to 1800.0°F</td>
<td>±0.2% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>L</td>
<td>-250.0 to 900.0°C</td>
<td>±0.1% of instrument range ±1 digit for 0°C or more</td>
</tr>
<tr>
<td></td>
<td>-300.0 to 1600.0°F</td>
<td>±0.2% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>U</td>
<td>0.0 to 400.0°C</td>
<td>±0.1% of instrument range ±1 digit for 400°C or more</td>
</tr>
<tr>
<td></td>
<td>200.0 to 1000.0°F</td>
<td>±0.5% of instrument range ±1 digit for less than 400°C</td>
</tr>
<tr>
<td>W(5)</td>
<td>0.0 to 2300.0°C</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
<tr>
<td></td>
<td>32 to 4200°F</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
<tr>
<td>Platinum 2</td>
<td>0.0 to 1390.0°C</td>
<td>±0.1% of instrument range ±1 digit</td>
</tr>
<tr>
<td></td>
<td>32.0 to 2500.0°F</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
<tr>
<td>PR20-40</td>
<td>0.0 to 1900.0°C</td>
<td>±0.05% of instrument range ±1 digit for 800°C or more</td>
</tr>
<tr>
<td></td>
<td>32 to 3400°F</td>
<td>±0.5% of instrument range ±1 digit for less than 800°C</td>
</tr>
<tr>
<td>W7/Resistors</td>
<td>0.0 to 2000.0°C</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
<tr>
<td></td>
<td>32 to 3600°F</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
</tbody>
</table>

The accuracy is that in the standard operating conditions: 23 ±2°C, 55 ±10%RH, and power frequency at 50/60 Hz.

- **1:** ±0.3°C and ±1 digit in the range between 0 and 100°C
- **2:** ±0.5°C ±1 digit in the range between -100 and 200°C

- Applicable standards: JIS, IEC and DIN (ITS-90) for thermocouples and resistance-temperature detectors (RTD)
- Input sampling period: Synchronized to control period
- Burnout detection
  - Upscale and downscale of function, and OFF can be specified for the standard signal of thermocouple and resistance-temperature detector (RTD).
- For integrated signal input, 0.1 V or 0.4 mA or less is judged as a burnout.
- Input bias current: 0.05 μA (for thermocouple and resistance-temperature detector (RTD))
- Resistance-temperature detector (RTD) measured current: About 0.16 mA
- Input resistance
  - 1 MΩ or more for thermocouple/mV input
  - About 1 MΩ for voltage input
  - About 250 Ω for current input (with built-in shunt resistance)
- Allowable signal source resistance
  - 250 Ω or less for thermocouple/mV input
  - Effect of signal source resistance: 0.1 μV/Ω or less
  - 2 kΩ or less for DC voltage input
- Effect of signal source resistance: about 0.01%/100 Ω
- Allowable wiring resistance
  - Up to 150 Ω per line for resistance-temperature detector (RTD) input (conductor resistance between the three lines shall be equal)
  - Effect of wiring resistance: ±0.1°C/10 Ω
- Allowable input voltage/current
  - ±10 V DC for thermocouple/mV/mA or resistance-temperature detector (RTD) input
  - ±20 V DC for V input
  - ±40 mA DC for mA input
- Noise reduction ratio
  - 40 dB or more (at 50/60 Hz) in normal mode
  - 120 dB or more (at 50/60 Hz) in common mode
- Reference junction compensation error
  - ±1.0°C (15 to 35°C)
  - ±1.5°C (-10 to 5°C and 35 to 50°C)

**Contact Input Specifications**
- Number of points: 2 points (standard)
  - For the maximum number of points, see the model and suffix code table.
- Input type: no-voltage contact input or transistor contact input
- Input contact capacity: 12 V DC, 10 mA or more
  - Be sure to use a contact with a minimum ON current of 1 mA or less
- ON/OFF detection
  - For no-voltage contact input:
    - Contact resistance 1 kΩ or less in ON state
    - Contact resistance 50 kΩ or more in OFF state
  - Transistor contact input:
    - 2 V or less in ON state
    - Leakage current 100 μA or less in OFF state
- Status detection minimum hold time: control period + 50 ms
- Application: SP switching, operation mode switching, event input
**Analog Output Specifications**

- **Number of points**
  - Control output (heating-side output): 1 point (standard), which is shared with transmission output
  - Cooling-side output: 1 point, which is shared with transmission output
- **Output functions**
  - Current output or voltage pulse output
- **Current output**
  - 4 to 20 mA DC or 0 to 20 mA DC / load resistance 600 Ω or less
  - **Current output accuracy**
    - ±0.1% of span (however, ±5% of span for 1 mA or less)
    - The accuracy is that in the standard operating conditions: 23 ±2°C, 55 ±10%RH, and power frequency at 50/60 Hz
- **Voltage pulse output**
  - **Application:** time proportional output
  - **ON voltage:** 12 V or more / load resistance of 600 Ω or more
  - **OFF voltage:** 0.1 V DC or less
  - **Time resolution:** 10 ms or 0.1% of output value, whichever is larger

**Retransmission Output Specifications**

- **Number of points:** 1 point (standard), which is shared with 15 V DC loop power supply
  - Additional 1 points when analog control output are not used.
- **Output function:** current output
  - 4 to 20 mA DC or 0 to 20 mA DC / load resistance 600 Ω or less
  - **Current output accuracy (conversion accuracy from PV display on the set scale):** ±0.1% of span (however, ±5% of span for 1 mA or less)
  - The accuracy is that in the basic operating conditions: 23 ±2°C, 55 ±10%RH, and power frequency at 50/60 Hz
  - This is not conversion accuracy through input and output but the performance of transmission output itself.

**15V DC Loop Power Supply Specifications**

- **Number of points:** 1 point (standard), which is shared with retransmission output
  - Control output (1 point) can also be used.
- **Supply voltage:** 14.5 to 18.0 V DC
- **Maximum supply current:** about 21 mA (with short-circuit current limiting circuit)

**Step Response Time Specifications**

- **Within 1 s**
  - (Response time at 63% of transmission output when a change is made stepwise in the range between 10 and 90% of input span)

**Relay Contact Output Specifications**

- **Types of contact and number of points**
  - Control relay output: one 1c-contact point
  - Control output of heating and cooling control: 2 1a-contact points
  - Alarm output: 3 1a-contact points (Common is separated)

- **Contact rating**
  - 1c-contact: 3 A at 250 V AC or 3 A at 30 V DC (resistance load)
  - 1a-contact:
    - For alarm output: 1 A at 240 V AC or 1 A at 30 V DC (resistance load)
    - For output of heating and cooling control relay output: 3 A at 240 V AC or 3 A at 30 V DC (resistance load)

- **Application:**
  - Time proportional output, alarm output, FAIL output, etc.

**Transistor Contact Output Specifications**

- **Number of points:** see the model and suffix code table
- **Output form:** open collector (sink current)
- **Output contact capacity:** Up to 24 V DC, 50 mA
- **Output time resolution:** min 200 ms
- **Application:** alarm output, FAIL output, etc.

**Position Proportional Output Specifications**

- **Position signal input**
  - Sliding resistance: 100 Ω to 2.5 kΩ of total resistance
  - 100% side and slide line: with disconnection detection
  - 0% side: without disconnection detection
  - **Current input:** 4 to 20 mA DC (with disconnection detection)
  - **Input resistance:** about 330 Ω
  - **Sampling period:** 50 ms
  - **Measurement resolution:** 0.1% of input span
  - **Position proportional relay output**
    - **UT35A:** Two 1a-contact points, 3 A at 250 V AC or 3 A at 30 V DC (resistance load)
    - **UT32A:** Two 1a-contact points, 3 A at 240 V AC or 3 A at 30 V DC (resistance load)

- **CT input resistance:** about 9.4 Ω
- **CT input range:** 0.0 to 0.1 Arms (0.12 Arms or more cannot be applied)
- **Heater current alarm setting range:** OFF, 0.1 to 300.0 Arms
- **Heater current measured value display range:** 0.0 to 360.0 Arms
- **The CT ratio can be set. CT ratio setting range:** 1 to 3300
- **Recommended CT:** CT from URD Co. Ltd.
  - **CTL-6-S-H:** CT ratio 800, measurable current range: 0.1 to 80.0 Arms
  - **CTL-12L-30:** CT ratio 3000, measurable current range: 0.1 to 180.0 Arms

- **Heater current measurement period:** 200 ms
- **Heater current measurement accuracy:** ±5% of CT input range span ±1 digit (CT error is not included)
- **Heater current detection resolution:** Within 1/250 of CT input range span
- **Disconnection detection**
  - **ON time:** Minimum 200 ms
  - (for time proportional output)
### Power Supply Specifications

**Application:** Power is supplied to the 2-wire transmitter.

**Supply voltage:** 21.6 to 28.0 V DC

**Rated current:** 4 to 20 mA DC

**Maximum supply current:** About 30 mA (with short-circuit current limiting circuit)

### Safety and EMC Standards

**Safety:**
Compliant with IEC/EN 61010-1 (CE), IEC/EN 61010-2-201 (CE), IEC/EN 61010-2-030 (CE), approved by CAN/CSA C22.2 No. 61010-1 (CSA), approved by UL 61010-1.

**Installation category:** II

**Pollution degree:** 2

**Measurement category:** I (CAT I) (UL, CSA)

**O (Other) (CE)**

**Rated measurement input voltage:** Max. 10 V DC

**Rated transient overvoltage:** 1500 V (*)

*: This is a reference safety standard value for measurement category I of CSA/UL 61010-1, and for measurement category O of IEC/EN 61010-2-030. This value is not necessarily a guarantee of instrument performance.

**EMC standards:**
Compliant with CE marking:
- EN 61326-1 Class A, Table 2 (For use in industrial locations).
- EN 61326-2-3

*: The instrument continues to operate at a measurement accuracy of within ±20% of the range during testing.

- EN 55011 Class A, Group 1
- EN 61000-3-2 Class A
- EN 61000-3-3

**EMC Regulatory Arrangement in Australia and New Zealand**
- EN 55011 Class A, Table 2 (For use in industrial locations),
- EN 61326-1
- EN 61326-2-1
- EN 61326-2-2
- EN 55011 Class A, Group 1
- EN 61000-3-3

**KC marking:** Electromagnetic wave interference prevention standard, electromagnetic wave protection standard compliance

### Power Supply Specifications and Isolation

**Power supply**

- **Rated voltage:** 100 to 240 V AC (+10%/-15%), 50/60 Hz
- **24 V AC/DC (+10%/-15%)** (When the /DC option is specified)

**Power consumption**

- UT35A: 18 VA (For the /DC option, DC: 9 VA, AC: 14 VA)
- UT32A: 15 VA (For the /DC option, DC: 7 VA, AC: 11 VA)

**Storage:** Nonvolatile memory

**Allowable power interruption time:** 20 ms (at 100 V AC)

**Withstanding voltage**

- 2300 V AC for 1 minute between primary and secondary terminals (UL, CSA)
- 3000 V AC for 1 minute between primary and secondary terminals (CE)
- 1500 V AC for 1 minute between primary terminals
- 500 V AC for 1 minute between secondary terminals

(Primary terminals = Power (*) and relay output terminals, Secondary terminals = Analog I/O signal terminals, contact input terminals, communication terminals, and functional grounding terminals.)

*: Power terminals for 24 VAC/DC models are the secondary terminals.

**Insulation resistance**

- Between power supply terminals and a grounding terminal: 20 MΩ or more at 500 V DC

**Isolation specifications**

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Internal circuits</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT32A with CC-Link option</td>
<td>Ethernet/PROFIBUS-DP/CC-Link/DeviceNet communication terminal</td>
</tr>
<tr>
<td>UT35A</td>
<td>Contact output (transistor) terminal</td>
</tr>
<tr>
<td>24 V DC loop power supply terminal</td>
<td>Contact input terminal (AI)</td>
</tr>
<tr>
<td>RS485 communication terminal (2 ports)</td>
<td>Contact output (transistor) terminal</td>
</tr>
<tr>
<td>Ethernet/PROFIBUS-DP/CC-Link/DeviceNet communication terminal</td>
<td>Communication terminal</td>
</tr>
</tbody>
</table>

The circuits divided by lines are insulated mutually.

### Environmental Conditions

**Normal operating conditions**

- **Ambient temperature:** -10 to 50°C (side-by-side mounting: -10 to 40°C)
- **If the CC-Link option is specified, 0 to 50°C for UT35A; 0 to 40°C for UT32A, side-by-side mounting:**
- **Ambient humidity:** 20 to 90% RH (no condensation)
- **Magnetic field:** 400 A/m or less
- **Continuous vibration (at 5 to 9 Hz) Half amplitude of 1.5 mm or less:**
- **For R.T.D. input:** ±0.01% of F.S./°C or less
- **Rapid vibration:** 14.7 m/s², 15 s or less
- **Impact:** 98 m/s² or less, 11 msec.
- **Installation altitude:** 2,000 m or less above sea level
- **Warm-up time:** 30 minutes or more after the power is turned on
- **Start-up time within 10 s**

### Transportation and Storage Conditions

- **Temperature:** -25 to 70°C
- **Ambient temperature change rate:** 20°C per hour or less
- **Humidity:** 5 to 95%RH (no condensation)

**Effects of Operating Conditions**

- **Effect of ambient temperature**
  - For voltage or TC input:
    - ±1 μV/°C or ±0.01% of F.S. (instrument range)/°C, whichever is greater
  - For RTD input:
    - ±0.05°C/°C (ambient temperature) or less
  - For current input:
    - ±0.01% of F.S. (instrument range)/°C
  - For analog output:
    - ±0.02% of F.S./°C or less
- **Effect of power supply fluctuation:**
  - For analog input: ±0.05% of F.S. (instrument range) or less
  - For analog output: ±0.05% of F.S. or less
  - (Each within rated voltage range)
### Block Diagram

#### Single Loop Control

- **PV input**
- **Input type**
- **Input unit**
- **Input range/scale**
- **PV input bias**
- **PV input filter**
- **Ratio bias computation**
- **Output limiter**
- **Manual operation**
- **Manual preset output**
- **Input error preset output**
- **Preset output**
- **AUTO (ON)/MAN (OFF) switch**
- **STOP (ON)/RUN (OFF) switch**
- **LOCAL/REMOTE**

---

When sensor burnout occurs:
- **Normal**
- **MAN**

---

**PV display**

**SPNO**

**SP**

**RT**

**R/L**

**SPH, SPL**

**SIDE**

**SH, SL**

**EPO**

**OH, OL**

**OLMT**

**PO**

**S/R**

**MPON**

**OT**

---

**Communication**

**DI1**

**DI2**

**A/M**

---

**Control computation**

**PV display**

**SP display**

---

**Output ladder calculation program** (signal goes to the control computation as is when without ladder program).

For ladder program, see the LL50A Parameter Setting Software User’s Manual.

---

**Output ladder calculation program** (signal goes to the output as is when without ladder program).

For ladder program, see the LL50A Parameter Setting Software User’s Manual.

---

**Output terminal assignment**

**O1RS**

**RTS**

**OUT**

**OUT**

**RET**

---

**Alarm Output terminal assignment**

**AL1**

**AL2**

**AL3**

---

**Current or voltage pulse**

**Relay**

**Current or voltage pulse** (Current when retransmission output)

---

**24 V loop power supply**

---

**Legend**

- Terminal
- Parameter
- Function
- Analog signal
- Contact signal
- Front panel key
# Terminal Arrangement

## Terminal Arrangement for UT35A Single Loop Control

- **Control output (Suffix code: Type 1~3)**
  - Terminal wiring differs in Heating/cooling control and Position proportional control.
  - Refer to the terminal of Proportional control output and Position proportional control output when the control output is relay.
  - Factory default: Control output is relay.

- **Heating/cooling control output**
  - Heating/cooling relay contact output
  - Heating and Cooling-side control output

- **Power supply**
  - 24 V AC/DC power supply

- **Current (mA) input**
  - Feedback input (Resistance load)
  - Current (mA) input range can be changed.

- **Contact input**
  - External contact input (transistor)

- **Position proportional control output**
  - PV input
  - TC input

- **Heater break alarm**
  - Heater break alarm-1
  - Heater break alarm-2

- **Retransmission output**
  - Retransmission output
  - 15 V DC loop power supply when control output is transistor.

- **Terminal wiring**
  - Factory default: PV input type is undefined.
  - Manufacturer: DC loop power supply.
  - Current output range can be changed.

- **Function can be assigned to the terminals with no function.**

### Power Supply
- 24 V AC/DC power supply (Option code /DC)

### Contact Input
- External contact input (transistor)

### Control Output
- Output (Suffix code: Type 1~3)

### Retransmission Output
- (Equipped as standard)
  - Can be used for 15 V DC loop power supply when control output is transistor.
  - Can not be used for retransmission output or 15 V DC loop power supply when control output is transistor.

### Heating/cooling Control Output
- Heating/cooling relay contact output

### Position Proportional Control Output
- PV input
  - PV high limit
  - PV low limit

### Heater Break Alarm
- Heater break alarm-1
  - Heater break alarm-2

### Terminal Connections
- The terminal connections are as follows:
  - **Terminal Arrangement**
  - **Terminal Wiring Diagram**

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Mar.14, 2016-00

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*Terminal Wiring Diagram*
## External Dimensions and Panel Cutout Dimensions

**UT35A**

- **Unit:** mm

### General Mounting

- External Dimensions: [96 (width) x 96 (height) x 65 (depth from the panel surface)]
- Panel cutout dimensions: [92+0.8/0 (width) x 92+0.8/0 (height)]

### Side-by-side Close Mounting

- External Dimensions: [96 (width) x 96 (height) x 65 (depth from the panel surface)]
- Panel cutout dimensions: [92+0.8/0 (width) x 92+0.8/0 (height)]

### Construction, Mounting, and Wiring

- **Dust-proof and drip-proof:** IP66 (Front panel) (Not applicable to side-by-side close mounting)/NEMA4
- **Material:** Polycarbonate resin (Flame retardancy: UL94 V-0)
- **Case color:** White (Light gray) or Black (Light charcoal gray)
- **Weight:** 0.5 kg or less
- **External dimensions (mm):** UT35A: 96 (width) x 96 (height) x 65 (depth from the panel surface)

**UT32A**

- **Unit:** mm

### General Mounting

- External Dimensions: [48 (width) x 96 (height) x 65 (depth from the panel surface)]
- Panel cutout dimensions: [45+0.6/0 (width) x 92+0.8/0 (height)]

### Side-by-side Close Mounting

- External Dimensions: [48 (width) x 96 (height) x 65 (depth from the panel surface)]
- Panel cutout dimensions: [45+0.6/0 (width) x 92+0.8/0 (height)]

- **Mounting position:** Up to 30 degrees above the horizontal. No downward tilting allowed.
- **Wiring:** M3 screw terminal with square washer (signal wiring and power)
# Model and Suffix Code

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UT35A</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 1:</td>
<td>-0</td>
<td>Standard type</td>
<td>Digital Indicating Controller (Power supply: 100-240 V AC) (provided with retransmission output or 15 V DC loop power supply, 2 DIs, and 3 DOs)</td>
</tr>
<tr>
<td>Type 2:</td>
<td>-1</td>
<td>Position proportional type</td>
<td></td>
</tr>
<tr>
<td>Type 3:</td>
<td>-2</td>
<td>Heating/cooling type</td>
<td></td>
</tr>
<tr>
<td>Functions</td>
<td>0</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2 additional DIs, 2 additional DOs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5 additional DIs, 5 additional DOs</td>
<td></td>
</tr>
<tr>
<td>Open networks</td>
<td>0</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>RS-485 communication (Max. 38.4 kbps, 2-wire/4-wire)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Ethernet communication (with serial gateway function)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>CC-Link communication (with Modbus master function)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>PROFINET communication (with Modbus master function)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>DeviceNet communication (with Modbus master function)</td>
<td></td>
</tr>
<tr>
<td>Display language (())</td>
<td>-1</td>
<td>English (Default. Can be switched to other language by the setting.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-2</td>
<td>German (Default. Can be switched to other language by the setting.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-3</td>
<td>French (Default. Can be switched to other language by the setting.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-4</td>
<td>Spanish (Default. Can be switched to other language by the setting.)</td>
<td></td>
</tr>
<tr>
<td>Case color</td>
<td>0</td>
<td>White (Light gray)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Black (Light charcoal gray)</td>
<td></td>
</tr>
<tr>
<td><strong>UT32A</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 1:</td>
<td>-0</td>
<td>Standard type</td>
<td>Digital Indicating Controller (Entry model)</td>
</tr>
<tr>
<td>Type 2:</td>
<td>-1</td>
<td>Position proportional type</td>
<td></td>
</tr>
<tr>
<td>Type 3:</td>
<td>-2</td>
<td>Heating/cooling type</td>
<td></td>
</tr>
<tr>
<td>Functions</td>
<td>0</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>RS-485 communication (Max. 38.4 kbps, 2-wire/4-wire)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2 additional DIs, 2 additional DOs</td>
<td></td>
</tr>
<tr>
<td>Open networks</td>
<td>0</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Display language (())</td>
<td>-1</td>
<td>English (Default. Can be switched to other language by the setting.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-2</td>
<td>German (Default. Can be switched to other language by the setting.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-3</td>
<td>French (Default. Can be switched to other language by the setting.)</td>
<td></td>
</tr>
<tr>
<td>Case color</td>
<td>0</td>
<td>White</td>
<td></td>
</tr>
</tbody>
</table>

*1: English, German, French, and Spanish are available for the guide display.

*2: When the /LP option is specified, the UT35A does not conform to the safety standards (UL and CSA) and CE marking (Products with /CT option are not intended for EEA-market).

*3: When the /HA option is specified, the UT35A does not conform to the safety standards (UL and CSA) and CE marking (Products with /CT option are not intended for EEA-market).

*4: The /LP option can be specified in the combination of Type 2 code (any of "0" or "1") and Type 3 code (any of "0" or "1").

*5: The /HA option can be specified in the combination of Type1 code (any of "/0" or "/1") and Type 3 code (any of "0" or "1").

*6: When the /CT option is specified, the UT35A does not conform to the safety standards (UL and CSA) and CE marking (Products with /CT option are not intended for EEA-market).
Items to be specified when ordering
Model and suffix codes, whether User’s Manual and QIC required.

Standard accessories
Brackets (mounting hardware), Unit label, Operation Guide

Special Order Items

<table>
<thead>
<tr>
<th>Model code</th>
<th>Suffix code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LL50A</td>
<td>00</td>
<td>Parameter Setting Software</td>
</tr>
<tr>
<td>X010</td>
<td></td>
<td>See the General Specifications(*) Resistance Module</td>
</tr>
</tbody>
</table>

*: Necessary to input the current signal to the voltage input terminal.

User’s Manual
Product user’s manuals can be downloaded or viewed at the following URL. To view the user’s manual, you need to use Adobe Reader 7 or later by Adobe Systems.