Overview
The UT35A/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/UT32A also support open networks such as Ethernet communication.

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.
- Quick setting function
  Setting only the minimum necessary parameters for operation is possible.
- Equipped with a multitude of functions
  Universal I/O are included as standard. PID control, heating/cooling control, etc. are available.

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

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 zone 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
Operation mode switching
AUTO/MANUAL and RUN/STOP switching
REMOTE/LOCAL switching (only model with communication option)

(4) Control Parameter Setting Range

<table>
<thead>
<tr>
<th>Proportional band</th>
<th>0.1 to 999.9%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integral time</td>
<td>1 to 6000 sec. or OFF (using manual reset)</td>
</tr>
<tr>
<td>Derivative time</td>
<td>1 to 6000 sec. or OFF</td>
</tr>
<tr>
<td>ON/OFF control hysteresis (one or two hysteresis points)</td>
<td>0.0 to 100.0% of measured input range width</td>
</tr>
<tr>
<td>Preset output value</td>
<td>-5.0 to 105.0% (however, 0 mA or less cannot be output)</td>
</tr>
<tr>
<td>High/low output limiter</td>
<td>-5.0 to 105.0%</td>
</tr>
<tr>
<td>Low limit setpoint &lt; high limit setpoint</td>
<td></td>
</tr>
<tr>
<td>Tight shut function</td>
<td>When manual control is carried out with 4 to 20 mA output, control output can be reduced to about 0 mA.</td>
</tr>
<tr>
<td>Rate-of-change limiter of output</td>
<td>0.1 to 100.0%/sec., OFF</td>
</tr>
<tr>
<td>Output deadband</td>
<td>For heating and cooling control: -100.0 to 50.0%</td>
</tr>
<tr>
<td>For position proportional control: 1.0 to 10.0%</td>
<td></td>
</tr>
</tbody>
</table>

(5) Ladder computation period
Ladder computation period is the same as control period.

Alarm Functions
• Types of Alarm

<table>
<thead>
<tr>
<th>Measured value alarm</th>
<th>PV (measured value) high/low limit alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviation alarm</td>
<td>Deviation high/low limit alarm</td>
</tr>
<tr>
<td>Rate-of-change alarm</td>
<td>Deviation high and low limits alarm</td>
</tr>
<tr>
<td></td>
<td>Deviation within high and low limits alarm</td>
</tr>
<tr>
<td></td>
<td>Analog input PV high/low limit alarm</td>
</tr>
<tr>
<td></td>
<td>Feedback input high/low limit alarm</td>
</tr>
<tr>
<td></td>
<td>PV rate-of-change alarm</td>
</tr>
<tr>
<td>Setpoint alarm</td>
<td>SP (setpoint) high/low limit alarm</td>
</tr>
<tr>
<td></td>
<td>Target SP high/low limit alarm</td>
</tr>
<tr>
<td></td>
<td>Target SP deviation high/low limit alarm</td>
</tr>
<tr>
<td></td>
<td>Target SP deviation high and low limits alarm</td>
</tr>
<tr>
<td></td>
<td>Target SP deviation within high and low limits alarm</td>
</tr>
<tr>
<td>Output alarm</td>
<td>Control output high/low limit alarm</td>
</tr>
<tr>
<td></td>
<td>Cooling control output high/low limit alarm</td>
</tr>
<tr>
<td>Other alarms</td>
<td>Heater disconnection alarm (for /HA option)</td>
</tr>
<tr>
<td></td>
<td>Self-diagnosis alarm</td>
</tr>
<tr>
<td></td>
<td>FAIL</td>
</tr>
</tbody>
</table>

• Alarm Functions

<table>
<thead>
<tr>
<th>Alarm output action</th>
<th>Alarm stand-by action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alarm latch (forced reset) function</td>
</tr>
<tr>
<td></td>
<td>Alarm hysteresis</td>
</tr>
<tr>
<td></td>
<td>Alarm ON/OFF delay timer</td>
</tr>
<tr>
<td>Number of alarm settings</td>
<td>4</td>
</tr>
<tr>
<td>Number of alarm output points</td>
<td>Up to 8 (differs by model code)</td>
</tr>
</tbody>
</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.

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

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>Load, AND, OR, Timer, Counter, etc.</td>
<td>13</td>
</tr>
<tr>
<td>Comparison, reverse, addition/subtraction/multiplication/division, logic operation, high/low limiter, etc.</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.

(4) Program capacity

Max Program capacity: 300 steps *

*: Available number of steps differs according to the parameters and using command.

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>A standard industry protocol allowing communications between the controller and devices such as PCs, PLCs, and DCSs.</td>
<td>Server</td>
<td>Ethernet</td>
<td>PLC and others</td>
<td>2 connections</td>
</tr>
<tr>
<td>Modbus (RTU/ASCII)</td>
<td>Used for communication between PLCs and remote I/O, enabling high-speed data transmission.</td>
<td>Gateway</td>
<td>Ethernet + RS-485</td>
<td>UT55A/UT52A, UT35A/UT32A (*)</td>
<td>31 units</td>
</tr>
<tr>
<td>PROFIBUS-DP</td>
<td>Used for communication between PLCs and remote I/O, enabling high-speed data transmission.</td>
<td>Slave</td>
<td>RS-485</td>
<td>PLC and others, UT55A/UT52A, UT35A/UT32A (*2)</td>
<td>Number of nodes: 126</td>
</tr>
<tr>
<td>CC-Link</td>
<td>A protocol allowing multiple controllers to send and receive data between one another. The Ladder Program is used.</td>
<td>Slave</td>
<td>RS-485</td>
<td>PLC and others</td>
<td>31 units (Main Controller is included.)</td>
</tr>
<tr>
<td>Peer to peer</td>
<td>A protocol allowing multiple controllers to send and receive data between one another. The Ladder Program is used.</td>
<td>Multi-drop</td>
<td>RS-485 (2 wire only)</td>
<td>UT55A/UT52A, UT35A/UT32A</td>
<td>Read/Write: 4 units, Read only: 28 units</td>
</tr>
<tr>
<td>Coordinated Communication</td>
<td>A protocol to coordinate the operation of two or more instruments controlling the same process.</td>
<td>Master/Slave</td>
<td>RS-485</td>
<td>UT55A/UT52A, UT35A/UT32A (*2)</td>
<td>Master: 1 unit, Slave: 31 units</td>
</tr>
<tr>
<td>PC link</td>
<td>The proprietary Yokogawa protocol allowing communications to PCs, PLCs and touch panels.</td>
<td>Slave</td>
<td>RS-485</td>
<td>PC and others, UT55A/UT52A, UT35A/UT32A (*2)</td>
<td>31 units</td>
</tr>
<tr>
<td>Ladder</td>
<td>A protocol to communicate to PLCs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Physical Interface

<table>
<thead>
<tr>
<th>Interface</th>
<th>Standard</th>
<th>Max. Connecting Configuration</th>
<th>Baud rate</th>
<th>Communication distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>IEEE802.3 (10BASE-T, 100BASE-TX)</td>
<td>Cascade Max. 4 level (10BASE-T), Max. 2 level (100BASE-TX)</td>
<td>600,1200,2400,4800,9600,19200 or 38400 bps</td>
<td>1200m (9.6k to 9.75k)</td>
</tr>
<tr>
<td></td>
<td>RS-485</td>
<td>EIA RS-485</td>
<td>600,1200,2400,4800,9600,19200 or 38400 bps</td>
<td>1200m</td>
</tr>
<tr>
<td></td>
<td>PROFIBUS-DP</td>
<td>Field bus (IEC61158)</td>
<td>V0</td>
<td>600,1200,2400,4800,9600,19200 or 38400 bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1200m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terminating resistor: 220Ω (External)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31 units</td>
</tr>
<tr>
<td>CC-Link</td>
<td>Supported on version: 4.5 or higher</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: 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>E</td>
<td>-270.0 to 1200.0 °C</td>
<td>±0.1% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>F</td>
<td>-270.0 to 1200.0 °C</td>
<td>±0.2% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>G</td>
<td>0.0 to 1800.0 °C</td>
<td>±0.15% of instrument range ±1 digit</td>
</tr>
<tr>
<td>H</td>
<td>0.0 to 1800.0 °C</td>
<td>±0.25% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>I</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>J</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>K</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>L</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>M</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>N</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>O</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>P</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>Q</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>R</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>S</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>T</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>U</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>V</td>
<td>0.0 to 1700.0 °C</td>
<td>±0.5% of instrument range ±1 digit for less than 0°C</td>
</tr>
<tr>
<td>W</td>
<td>0.0 to 2300.0 °C</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
<tr>
<td>W*2</td>
<td>0.0 to 2300.0 °C</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
<tr>
<td>W*3/R3/Rw25</td>
<td>0.0 to 2300.0 °C</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
<tr>
<td>X</td>
<td>0.0 to 2300.0 °C</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
<tr>
<td>Y</td>
<td>0.0 to 2300.0 °C</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
<tr>
<td>Z</td>
<td>0.0 to 2300.0 °C</td>
<td>±0.2% of instrument range ±1 digit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resistance-temperature detector (RTD)</th>
<th>Standard signal</th>
<th>DC voltage</th>
<th>DC current</th>
</tr>
</thead>
<tbody>
<tr>
<td>JH100</td>
<td>0.000 to 2.000 V</td>
<td>0.000 to 10.000 mA</td>
<td>0.000 to 20.00 mA</td>
</tr>
<tr>
<td>JH500</td>
<td>0.000 to 5.000 V</td>
<td>0.000 to 20.000 mA</td>
<td>0.000 to 10.000 mA</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

*1: W-5% ReW-26% Re (Hoskins Mfg. Co.), ASTM E988
*2: 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 downsacle 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)
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

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)

*: This cannot be used for a small load of 10 mA or less.

• Application: time proportional output, alarm output, FAIL output, etc.

• Time resolution for control output: 10 ms or 0.1% of output value, whichever is larger

Step Response Time Specifications

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)

Position Proportional Output Specifications

• Position signal input
  Slide 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)

• 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 3A at 30 V DC (resistance load)
  UT32A: Two 1a-contact points, 3 A at 240 V AC or 3A at 30 V DC (resistance load)

*: This cannot be used for a small load of 10 mA or less.

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: ±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

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)

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 more

• 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
    Leak 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

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
Heater Break Alarm Specifications (for /HA Option)

- **Function:** Measures the heater current using an external current transformer (CT) and generates a heater break alarm when the measured value is less than the disconnection detection value.
- **Number of input points:** 2 points
- **Number of output points:** 2 points (transistor contract output)
- **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
- **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 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
  - 300 V AC for 1 minute between primary terminals
  - 24 V DC for 1 minute between secondary terminals
- **Pollution degree:** 2
- **Measurement category:** I (CAT. I)
- **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 IEC/EN/CSA/UL61010-1. This value is not necessarily a guarantee of instrument performance.

**Safety and EMC Standards**

- **Safety:**
  - Compliant with IEC/EN61010-1 (CE), approved by CAN/CSA C22.2 No. 61010-1 (CSA), UL61010-1.
  - Installation category: CAT. II
  - Pollution degree: 2
  - Measurement category: I (CAT. I)
- **Rated measurement input voltage:** Max. 10 V DC
- **Rated transient overvoltage:** 1500 V (°)
- **EMC standards:**
  - Compliant with CE marking
  - EN 61326-1 Class A, Table 2 (For use in industrial locations), EN 61326-2-3
  - EN 55011 Class A, Group 1
  - EN 61000-3-2 Class A
  - EN 61000-3-3
  - C-tick mark
  - EN 55011 Class A, Group 1
  - The instrument continues to operate at a measurement accuracy of within ±20% of the range during testing.
- **RoHS regulation:** Compliant

**Environmental Conditions**

- **Normal operating conditions**
  - Ambient temperature: -10 to 50°C (-10 to 40°C for side-by-side mounting of controllers)
  - 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
  - (at 9 to 150 Hz) 4.9 m/s² or less, 1 oct/min for 90 minutes each in the three axis directions
  - 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
- 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

- Effect of power supply fluctuation:
  For analog input: ±0.05% of F.S. or less
  For analog output: ±0.05% of F.S. or less
  Each within rated voltage range

Block Diagram

Single Loop Control
# Terminal Arrangement

## Terminal Arrangement for UT35A Single Loop Control

- **Control output** (Suffix code: Type 1=-5)
  - Terminal wiring differs in Heating/cooling control and Proportional control output.
  - Refer to the terminals of Proportional control output and Heating/cooling control output. Factory default: Control output is relay output.

- **Heating/cooling control output** (Suffix code: Type 1=-2)
  - Relay contact output

- **Contact output**
  - Relay contact output
  - Alarm-1 output
  - Alarm-2 output
  - Alarm-3 output

- **Power supply**
  - HV/AC power supply: Optional suffix code /DC

- **PV input**
  - Current (mA) input
  - Voltage (mV, V) input

- **E4-terminal area**
  - 30 V DC, 3 A (resistance load)

- **E3-terminal area**
  - 30 V DC, 1 A (resistance load)

- **E1-terminal area**
  - 15 V DC loop power supply:
    - Can be used for retransmission output or 15 V DC loop power supply.
    - Can be used for retransmission output or 15 V DC loop power supply when not used for control output.
    - Can be used for retransmission output or 15 V DC loop power supply.

- **Position proportional control output** (Suffix code: Type 1=-1)
  - Current/voltage pulse output
  - Voltage pulse (12 V)

- **Retransmission output** (Suffix code: Type 1=-3)
  - Can be used for 15 V DC loop power supply.
  - Can be used for 15 V DC loop power supply.

- **Contact input**
  - DI1=ON AUTO
  - DI1=OFF MAN
  - DI2=ON STOP
  - DI2=OFF RUN

- **Valve**
  - Control output

- **Heater break alarm**
  - HBA

- **GS 05P01D31-01EN**

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Terminal Arrangement for UT32A Single Loop Control

Control output
- OUT
  - (Suffix code: Type 1=0)
  - Function can be assigned to the terminals with no function.
- ALM
  - (Suffix code: Type 1=0)
- External contact output (relay)
  - COM
  - OUT
  - (Suffix code: Type 1=2)

Heating/cooling control output
- OUT2
  - (Suffix code: Type 1=2)

Contact output
- ALM
  - (Suffix code: Type 1=0)
- ALM
  - (Suffix code: Type 1=0)
- Contact output
  - ALM
  - (Suffix code: Type 1=0)
- Power supply
  - RS-485 communication
    - (Suffix code: Type 1=0)
  - 24 V DC loop power supply
  - (Suffix code: Type 1=0)

PV input
- PV
  - (Suffix code: Type 1=0)
- Factory default: PV input type is undefined.

Position proportional control output
- (Suffix code: Type 1=0)
- Control output
  - OUT:
    - (Suffix code: Type 1=0)
    - Factory default: No function
    - Control output is relay.
  - COM
  - OUT:
    - (Suffix code: Type 1=0)
    - Factory default: No function
    - Control output is relay.

Retransmission output
- RET: (Equipped as standard)
- Can be used for 15 V DC loop power supply when not used for retransmission output.

Cooling-side control output
- RET/OUT2:
  - (Suffix code: Type 1=2)
  - Can be used for retransmission output or 15 V DC loop power supply when current/voltage pulse output is used.

Contact input
- DI:
  - (Suffix code: Type 1=0)
  - Function can be assigned to the terminals with no function.

Heater break alarm
- HBA
  - (Suffix code: Type 1=0)

201-306 E1-Terminal Area

24 V AC/DC power supply
- Optional suffix code: (Type 1=-0)

Additional notes:
- Contact input / Contact output
  - DI/DO
    - (Suffix code: Type 2=2)

Related diagrams and specifications:
- RS-485 communication
  - RS485/LPS24
    - (Suffix code: Type 2=1 and optional suffix code: LP)

- 24 V DC loop power supply
  - LP524
    - (Suffix code: Type 2=0 and optional suffix code: LP)

- 24 V DC loop power supply
  - RS485
    - (Suffix code: Type 2=1)

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## External Dimensions and Panel Cutout Dimensions

**UT35A**

![Diagram of UT35A with dimensions and cutout details.]

- **General mounting**
  - External Dimensions: 96 (width) x 96 (height) x 65 (depth from the panel surface)

- **Side-by-side close mounting**
  - External Dimensions: 96 (width) x 96 (height) x 65 (depth from the panel surface)

* “N” stands for the number of controllers to be installed. However, the measured value applies if N ≥ 5.

**Normal tolerance:**
- ±(value of JIS B 0401-1998 tolerance class IT18)/2

**UT32A**

![Diagram of UT32A with dimensions and cutout details.]

- **General mounting**
  - External Dimensions: 48 (width) x 96 (height) x 65 (depth from the panel surface)

- **Side-by-side close mounting**
  - External Dimensions: 48 (width) x 96 (height) x 65 (depth from the panel surface)

* “N” stands for the number of controllers to be installed. However, the measured value applies if N ≥ 5.

**Normal tolerance:**
- ±(value of JIS B 0401-1998 tolerance class IT18)/2

### Construction, Mounting, and Wiring

- Dust-proof and drip-proof: IP56 (Front panel) (Except for side-by-side close mounting)/NEMA4 *
  - Hose down test only
- Material: Polycarbonate resin (Flame retardancy: UL94 V-0)
- Case color: Light gray
- Weight: 0.5 kg or less
- External dimensions (mm):
  - UT35A: 96 (width) x 96 (height) x 65 (depth from the panel surface)
  - UT32A: 48 (width) x 96 (height) x 65 (depth from the panel surface)
- Mounting: Direct panel mounting; mounting bracket, one each for upper and lower mounting
- Panel cutout dimensions (mm):
  - UT35A: 92+0.8/0 (width) x 92+0.8/0 (height)
  - UT32A: 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>Optional suffix code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT35A</td>
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<td>Digital Indicating Controller (provided with retransmission output or 15 V DC loop power supply, 2 DIs, and 3 DOs) (Power supply: 100-240 V AC)</td>
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<tr>
<td>Type 1: Basic control</td>
<td>-0</td>
<td>Standard type</td>
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<td>-1</td>
<td>Position proportional type</td>
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<tr>
<td></td>
<td>-2</td>
<td>Heating/cooling type</td>
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<td>2 additional DIs, 2 additional DOs</td>
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<td>6 additional DIs, 6 additional DOs</td>
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<tr>
<td>Type 3: Open networks</td>
<td>0</td>
<td>None</td>
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<tr>
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<td>RS-485 communication (Max. 38.4 kbps, 2-wire/4-wire)</td>
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<tr>
<td></td>
<td>2</td>
<td>Ethernet communication (with serial gateway function)</td>
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<tr>
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<td>3</td>
<td>CC-Link communication</td>
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<td>4</td>
<td>PROFIBUS-DP communication</td>
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<td>Always &quot;00&quot;</td>
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<td>Optional suffix codes</td>
<td>/LP</td>
<td>24 V DC loop power supply (*2)</td>
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<td></td>
<td>/HA</td>
<td>Heater break alarm (*3)</td>
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<tr>
<td></td>
<td>/DC</td>
<td>Power supply 24 V AC/DC</td>
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<tr>
<td></td>
<td>/CT</td>
<td>Coating (*4)</td>
<td></td>
</tr>
</tbody>
</table>

*1: English, German, French, and Spanish can be displayed as the guide display.

*2: 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").

*3: The /HA option can be specified when the Type 1 code is "-0" or "-2."

*4: When the /CT option is specified, the UT35A does not conform to the safety standards (UL and CSA) and CE marking.

## Items to be specified when ordering

Model and suffix codes, whether User’s Manual and QIC required.

## 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>
</tbody>
</table>

## Standard accessories

Brackets (mounting hardware), Unit label, Operation Guide

## Accessory

<table>
<thead>
<tr>
<th>Name</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal cover</td>
<td>UTAP001</td>
<td>For UT35A</td>
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<tr>
<td></td>
<td>UTAP002</td>
<td>For UT32A</td>
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<tr>
<td>User’s Manual</td>
<td>UTAP003</td>
<td>(CD-ROM)</td>
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