General Specifications

UT35A/UT32A
Digital Indicating Controllers

UTAdvanced

GS 05P01D31-01EN

[Style: S5]

■ 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 separatly) 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.

UT35A **UT32A**

Table of Number of Inputs and Outputs

Model and suffix code (See the model code)	Number of analog input points	Number of analog output points (*1)	Number of contact input points	Number of contact output points (*3)
UT35A				
-×0×	1	1	2	3
-×1×	1	1	4	5
-×2×	1	1 (*2)	7	8
UT32A				
-×0×	1	1	2	3
-×1×	1	1	2	3
-×2×	1	1 (*2)	4	5

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

■ 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

YOKOGAWA
Yokogawa Electric Corporation
2-9-32, Nakacho, Musashino-shi, Tokyo, 180-8750 Japan
Tel.: 81-422-52-7179 Fax.: 81-422-52-6619

GS 05P01D31-01EN
1st Edition Nov.30, 2009 (KP)
4th Edition Mar. 11, 2011 (KP)

(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

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

(5) Ladder computation period

Ladder computation period is the same as control period.

Alarm Functions

- Types of Alarm

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

- Alarm Functions

Alarm output action	Alarm stand-by action Alarm latch (forced reset) function Alarm hysteresis Alarm ON/OFF delay timer
Number of alarm settings	4
Number of alarm output points	Up to 8 (differs by model code)

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

Ladder Sequence Function

(1) Number of I/O Points

	UT35A	UT32A
Number of digital input points	Up to 7	Up to 4
Number of digital output points	Up to 8	Up to 5

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

(2) Types of Command

	Number of commands	Remark
Number of basic command types	13	Load, AND, OR, Timer, Counter, etc.
Number of application command types	73	Comparison, reverse, addition/subtraction/multiplication/division, logic operation, high/low limiter, etc.

(3) Sequence Device

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

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

	Function	Method	Interface	Targets	Max connection	Communication Data
Modbus/TCP	A standard industry protocol allowing communications between the controller and devices such as PCs, PLCs, and DCSs.	Server	Ethernet	PLC and others	2 connections	PV, SP, OUT, ALM etc
		Gateway	Ethernet +RS-485	RS-485: UT55A/UT52A/ UT35A/UT32A/ UP55A/UP35A/ UM33A (*1)	31 units	
Modbus (RTU/ASCII)		Slave	RS-485	PLC and others, UT55A/UT52A/ UT35A/UT32A/ UP55A/UP35A/ UM33A (*2)	31 units	
PROFIBUS-DP	Used for communication between PLCs and remote I/O, enabling high-speed data transmission.	Slave	RS-485	PLC and others	Number of nodes: 126	
		Modbus master function	RS-485	UT55A/UT52A/ UT35A/UT32A/ UP55A/UP35A	31 Units (Main Controller is included.)	
CC-Link		Slave	RS-485	PLC and others	Number of nodes: 42 (Remote device)	
		Modbus master function	RS-485	UT55A/UT52A/ UT35A/UT32A/ UP55A/UP35A	31 Units (Main Controller is included.)	
DeviceNet		Slave	RS-485	PLC and others	Number of nodes: 64	
		Modbus master function	RS-485	UT55A/UT52A/ UT35A/UT32A/ UP55A/UP35A	31 Units (Main Controller is included.)	
Peer to peer	A protocol allowing multiple controllers to send and receive data between one another. The Ladder Program is used.	Multi-drop	RS-485 (2 wire only)	UT55A/UT52A/ UT35A/UT32A/ UP55A/UP35A	Read/Write: 4 units Read only : 28 units	
Coordinated Communication	A protocol to coordinate the operation of two or more instruments controlling the same process.	Master/Slave	RS-485	UT55A/UT52A/ UT35A/UT32A/ UP55A/UP35A(*2)	Master : 1 unit Slave : 31 units	
PC link	The proprietary Yokogawa protocol allowing communications to PCs, PLCs and touch panels.	Slave	RS-485	PC and others, UT55A/UT52A / UT35A/UT32A/ UP55A/UP35A/ UM33A(*2)	31units	
Ladder	A protocol to communicate to PLCs.					

*1: UT digital indicating controller, Signal conditioner JUXTA, Power monitor POWERCERT can be connected.
*2: UT digital indication controllers can be connected.

Physical interface

Ethernet
Standard : IEEE802.3 (10BASE-T, 100BASE-TX)
Max segment length : 100m
Max. Connecting Configguration : Cascade Max. 4 level (10BASE-T), Max. 2 level (100BASE-TX)

RS-485
Standard : EIA RS-485
Communication method : Two-wire harf-duplex or four-wire harf-duplex, start-stop synchoronization, and non-procedural
Baud rate : 600,1200,2400,4800,9600,19200 or 38400bps Peer to peer communication is only 19200bps
Maximum communication distance : 1200m
Terminating resistor : 220Ω (External)

PROFIBUS-DP
Standard : Field bus (IEC61158)
Corresponding version : DP V0
Baud rate : 9.6k, 19.2k, 45.45k, 93.75k, 187.5k, 0.5M, 1.5M, 3M, 6M, 12M, AUTO (*3)
Communication distance : 1200m (9.6k to 93.75k) 1000m (187.5k)
400m (0.5M) 200m (1.5M)
100m (3M to 12M)

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

CC-Link
Supported on version : Remote device (Ver.1.10, Ver.2.00)
Baud rate : 156k, 625k, 2.5M, 5M, 10M bps
Transmission distance : 1.2km (156k bps), 600m (625k bps), 200m (2.5M bps), 150m (5M bps), 100m (10M bps)
When used optical repeater : 7.6 km (156k) to 4.3 km (10M)

DeviceNet
Field bus (IEC61158)
Baud rate 125k, 250k, 500k bps
Transmission distance 500m (125k bps), 250m (250k bps), 100m (500k bps)

■ 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)

Types of input		Instrument range °C	Instrument range °F	Accuracy
Thermocouple	K	-270.0 to 1370.0°C	-450.0 to 2500.0°F	±0.1% of instrument range ±1 digit for 0°C or more ±0.2% of instrument range ±1 digit for less than 0°C However, ±2% of instrument range ±1 digit for less than -200°C of thermocouple K ±1% of instrument range ±1 digit for less than -200°C of thermocouple T
		-270.0 to 1000.0°C	-450.0 to 2300.0°F	
		-200.0 to 500.0°C	-200.0 to 1000.0°F	
	J	-200.0 to 1200.0°C	-300.0 to 2300.0°F	
	T	-270.0 to 400.0°C	-450.0 to 750.0°F	
		0.0 to 400.0°C	-200.0 to 750.0°F	
	B	0.0 to 1800.0°C	32 to 3300°F	±0.15% of instrument range ±1 digit for 400°C or more ±5% of instrument range ±1 digit for less than 400°C
	S	0.0 to 1700.0°C	32 to 3100°F	±0.15% of instrument range ±1 digit
	R	0.0 to 1700.0°C	32 to 3100°F	
	N	-200.0 to 1300.0°C	-300.0 to 2400.0°F	±0.1% of instrument range ±1 digit ±0.25% of instrument range ±1 digit for less than 0°C
	E	-270.0 to 1000.0°C	-450.0 to 1800.0°F	±0.1% of instrument range ±1 digit for 0°C or more ±0.2% of instrument range ±1 digit for less than 0°C However, ±1.5% of instrument range ±1 digit for less than -200.0°C of thermocouple E
	L	-200.0 to 900.0°C	-300.0 to 1600.0°F	
	U	-200.0 to 400.0°C	-300.0 to 750.0°F	
		0.0 to 400.0°C	-200.0 to 1000.0°F	
	W (*2)	0.0 to 2300.0°C	32 to 4200°F	±0.2% of instrument range ±1 digit
	Platinel 2	0.0 to 1390.0°C	32.0 to 2500.0°F	±0.1% of instrument range ±1 digit
	PR20-40	0.0 to 1900.0°C	32 to 3400°F	±0.5% of instrument range ±1 digit for 800°C or more Accuracy not guaranteed for less than 800°C
	W97 Re3-W75 Re25	0.0 to 2000.0°C	32 to 3600°F	±0.2% of instrument range ±1 digit
Resistance-temperature detector (RTD) 3-wire	JPt100	-200.0 to 500.0°C	-300.0 to 1000.0°F	±0.1% of instrument range ±1 digit (*1)
		-150.00 to 150.00°C	-200.0 to 300.0°F	±0.1% of instrument range ±1 digit
	Pt100	-200.0 to 850.0°C	-300.0 to 1560.0°F	±0.1% of instrument range ±1 digit (*1)
		-200.0 to 500.0°C	-300.0 to 1000.0°F	
		-150.00 to 150.00°C	-200.0 to 300.0°F	±0.1% of instrument range ±1 digit
Standard signal		0.400 to 2.0000 V	-	±0.1% of instrument range ±1 digit
		1.000 to 5.000 V	-	
		4.00 to 20.00 mA	-	
DC voltage		0.000 to 2.000 V	-	
		0.00 to 10.00 V	-	
		-10.00 to 20.00 mV	-	
DC current		0.00 to 20.00 mA	-	

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
±0.5°C ±1 digit in the range between -100 and 200°C

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

- 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)

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 μ A 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
  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)

24 V DC Loop Power Supply Specifications (for /LP Option)

- 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/EN61010-1 (CE), approved by CAN/CSA C22.2 No. 61010-1 (CSA), approved by 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 (*)
  *: 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.
- 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

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
  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 V AC/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

PV (universal) input terminal	Internal circuits	Power supply
Control and transmission (analog) output terminal (not isolated between the analog output terminals) Valve position (feedback) input terminal		
Control relay (c-contact or 2 a-contact) output terminal		
Alarm-1 relay (a-contact) output terminal		
Alarm-2 relay (a-contact) output terminal		
Alarm-3 relay (a-contact) output terminal		
Position proportional relay output terminal		
Contact input terminal (All) RS485 communication terminal (2 ports)		
24 V DC loop power supply terminal		
Contact output (transistor) terminal		
Ethernet/PROFIBUS-DP/CC-Link/DeviceNet communication terminal		
Current transformer input terminal		

The circuits divided by lines are insulated mutually.

Environmental Conditions

Normal operating conditions

- Ambient temperature: -10 to 50°C (-10 to 40°C for side-by-side mounting of controllers)
  For the CC-Link option, 0 to 50 ºC (0 to 40 ºC for side-by-side close 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
  (at 9 to 150 Hz) 4.9 m/s^2 or less, 1 oct/min for 90 minutes each in the three axis directions
- Rapid vibration: 14.7 m/s^2, 15 s or less
- Impact: 98 m/s^2 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

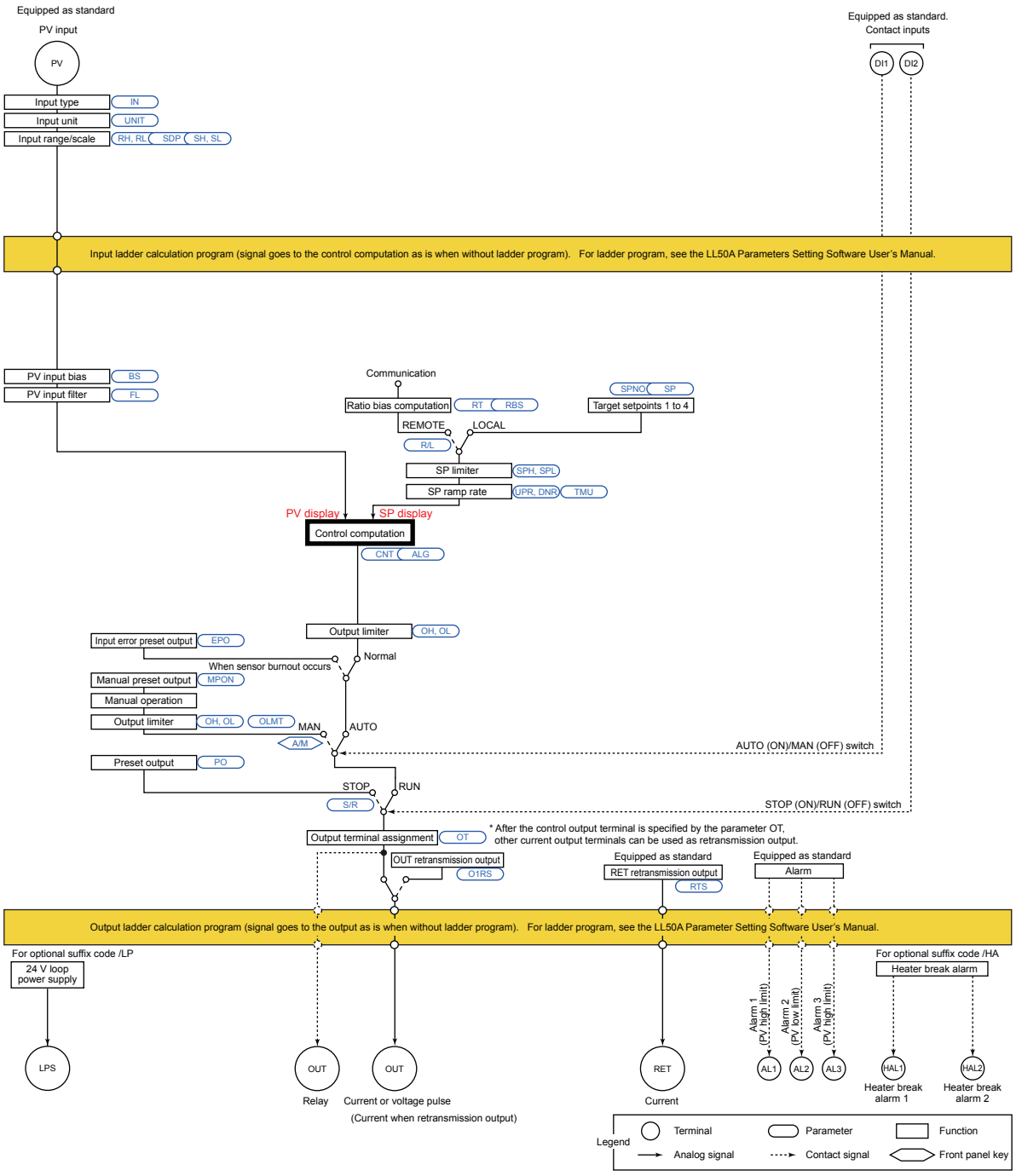
- Temperature: -25 to 70°C
- Temperature change rate: 20°C per hour or less
- Humidity: 5 to 95%RH (no condensation)

Effects of Operating Conditions

- Effect of ambient temperature
  For voltage or TC input:
  ±1 μ V/°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)

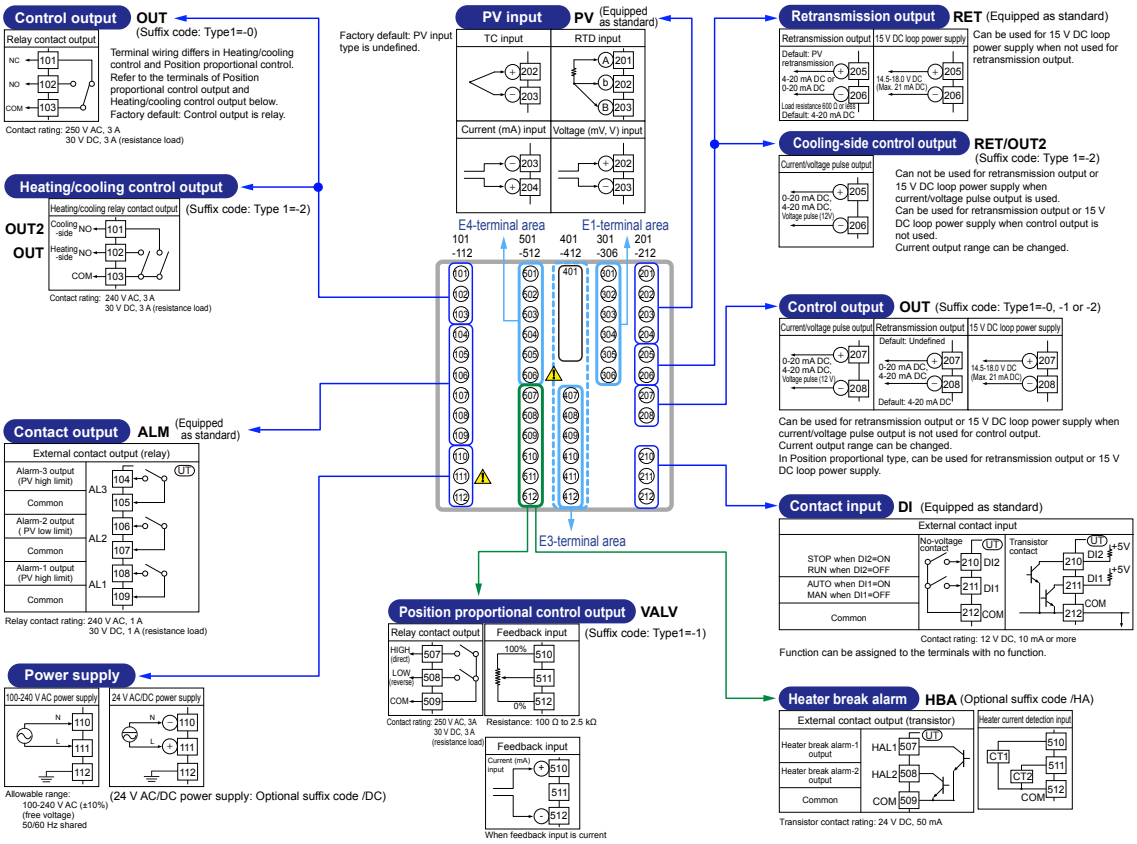
■ Block Diagram

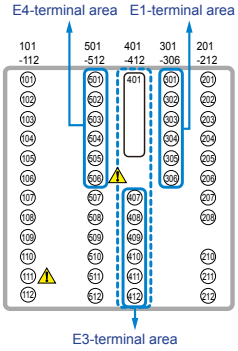
Single Loop Control



■ Terminal Arrangement

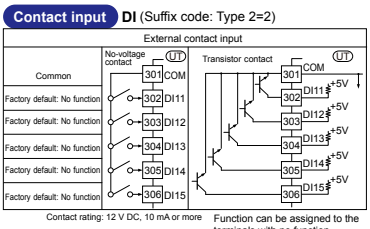
Terminal Arrangement for UT35A Single Loop Control





301-306 E1-Terminal Area

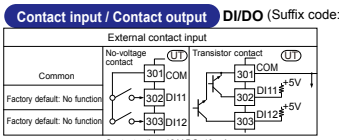
Contact input DI (Suffix code: Type 2=2)



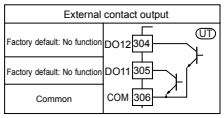
Contact rating: 12 V DC, 10 mA or more

Function can be assigned to the terminals with no function.

Contact input / Contact output DI/DO (Suffix code: Type 2=1)



Contact rating: 12 V DC, 10 mA or more

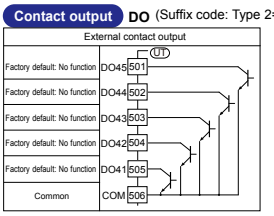


Function can be assigned to the terminals with no function.

Transistor contact rating: 24 V DC, 50 mA

501-506 E4-Terminal Area

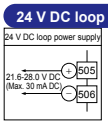
Contact output DO (Suffix code: Type 2=2)



Transistor contact rating: 24 V DC, 50 mA

Function can be assigned to the terminals with no function.

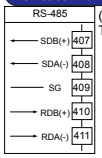
24 V DC loop power supply



LPS24
(Optional suffix code /LP)

401-412 E3-Terminal Area

RS-485 communication RS485



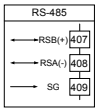
(Suffix code: Type 3=1)

Ethernet communication (with gateway function)

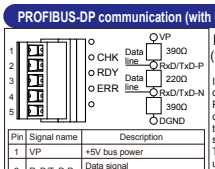
10BASE-T/100BASE-TX RJ45 connector

ETHR
(Suffix code: Type 3=2)

Upper side LED (baud rate)	
Color	Amber
Lit	100M bps
Unlit	10M bps
Lower side LED (link activity)	
Color	Green
Lit	Linked
Blink	Active
Unlit	Link failure



PROFIBUS-DP communication (with Modbus master)

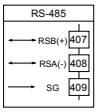


PROF
(Suffix code: Type 3=4)

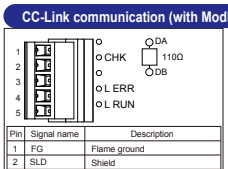
If the UT is located at the end of a segment for the PROFIBUS communication wiring, terminating resistors are separately needed. These are to be prepared by users. (390 Ω: 2 pcs. 220 Ω: 1 pc., or an active terminator.)

Pin	Signal name	Description
1	VP	+5V bus power
2	RxD/TxD-P	Data signal (positive data receive/transmit)
3	RxD/TxD-N	Data signal (negative data recive/transmit)
4	DGND	Signal ground
5	SHIELD	Shield ground

LED	Lit	Unlit
CHK (red)	User profile error	Normal
RDY (green)	Normal Communicating successfully	No power, or Communication failure
ERR (red)	Not connected, or communication failure (flashing)	Normal



CC-Link communication (with Modbus master)

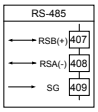


CC-L
(Suffix code: Type 3=3)

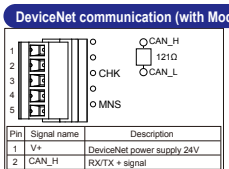
If the UT is located at the end of a segment for the CC-Link communication wiring, terminating resistors are separately needed. These are to be prepared by users. (110 Ω: 1 pc.)

Pin	Signal name	Description
1	FG	Flame ground
2	SLD	Shield
3	DG	RX/TX signal ground
4	DB	RX/TX - signal
5	DA	RX/TX + signal

LED	Lit	Unlit
CHK (red)	User profile error/ Address error	Normal
L ERR (red)	Communication failure (CRC error)	Normal
L RUN (green)	Normal Communicating successfully	No carrier detected/ Communication timeout



DeviceNet communication (with Modbus master)

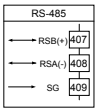


DNET
(Suffix code: Type 3=5)

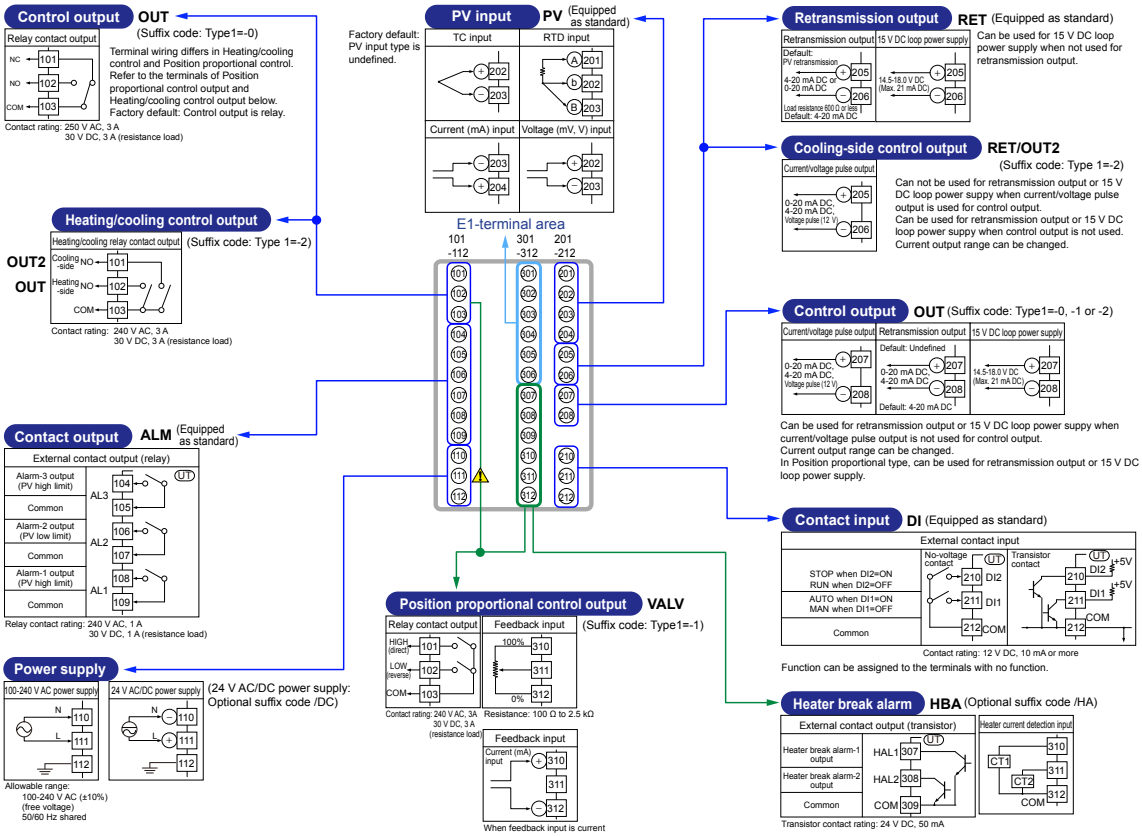
If the UT is located at the end of a segment for the DeviceNet communication wiring, terminating resistors are separately needed. These are to be prepared by users. (121 Ω: 1 pc.)

Pin	Signal name	Description
1	V+	DeviceNet power supply 24V
2	CAN_H	RX/TX + signal
3	DRAIN	Shield/Drain wire
4	CAN_L	RX/TX - signal
5	V-	DeviceNet power supply common

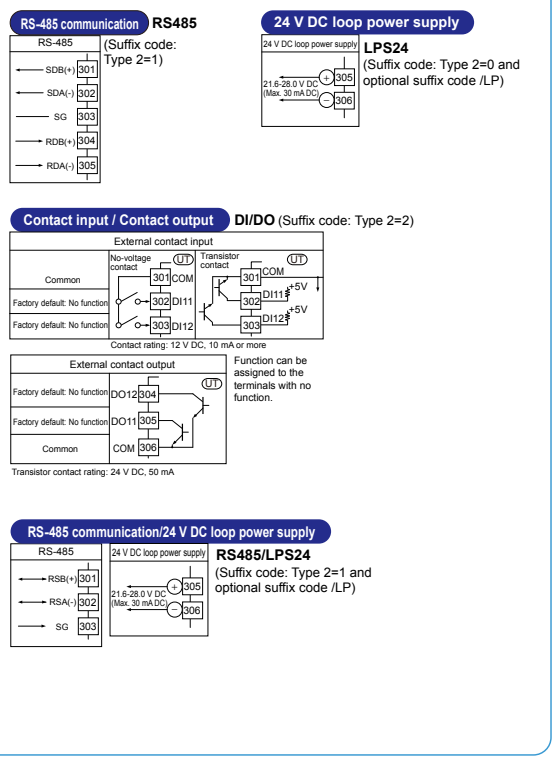
LED	Lit/flashing	Unlit
CHK (red)	User profile error	Normal
MNS (green /red)	Normal, communicating successfully (green, lit). Not connected (green, flashing).	No electricity
	Critical link failure (red, lit). Connection timeout (red, flashing)	
	At power-on/Communication faulted (green/red, flashing)	



Terminal Arrangement for UT32A Single Loop Control



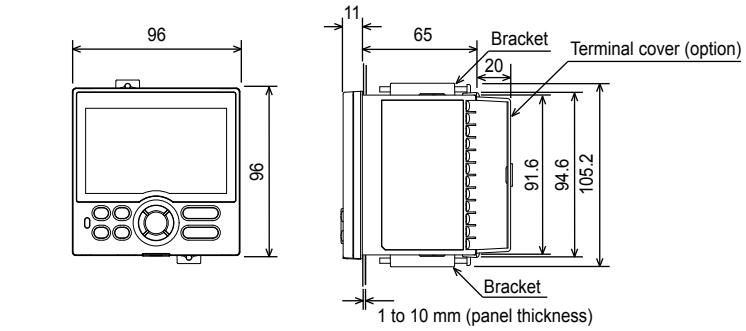
301-306 E1-Terminal Area



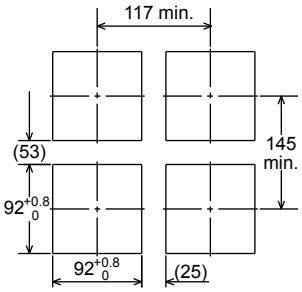
■ External Dimensions and Panel Cutout Dimensions

UT35A

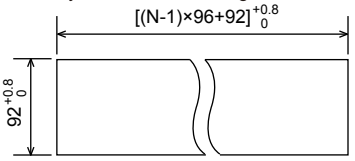
Unit: mm



• General mounting



• Side-by-side close mounting

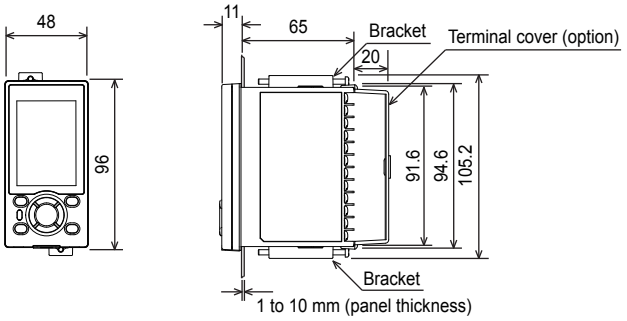


"N" stands for the number of controllers to be installed.
However, the measured value applies if N≥5.

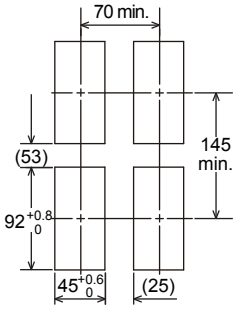
Normal tolerance:
±(value of JIS B 0401-1998 tolerance class IT18)/2

UT32A

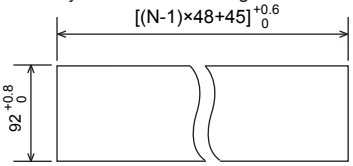
Unit: mm



• General mounting



• Side-by-side close mounting



"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 titling allowed.
- Wiring: M3 screw terminal with square washer (signal wiring and power)

■ Model and Suffix Code

Model	Suffix code						Optional suffix code	Description
UT35A								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)
Type 1: Basic control	-0							Standard type
	-1							Position proportional type
	-2							Heating/cooling type
Type 2: Functions		0						None
		1						2 additional DIs, 2 additional DOs
		2						5 additional DIs, 5 additional DOs
Type 3: Open networks			0					None
			1					RS-485 communication (Max.38.4 kbps, 2-wire/4-wire)
			2					Ethernet communication (with serial gateway function)
			3					CC-Link communication (with Modbus master function)
			4					PROFIBUS-DP communication (with Modbus master function)
			5					DeviceNet communication (with Modbus master function)
Display language (*1)				-1				English
				-2				German
				-3				French
				-4				Spanish
Case color					0			White (Light gray)
					1			Black (Light charcoal gray)
Fixed code						-00		Always "-00"
Optional suffix codes							/LP	24 V DC loop power supply (*2)
							/HA	Heater break alarm (*3)
							/DC	Power supply 24 V AC/DC
							/CT	Coating (*4)

*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.

Model	Suffix code						Optional suffix code	Description
UT32A								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)
Type 1: Basic control	-0							Standard type
	-1							Position proportional type
	-2							Heating/cooling type
Type 2: Functions		0						None
		1						RS-485 communication (Max. 38.4 kbps, 2-wire/4-wire) (*2)
		2						2 additional DIs and 2 additional DOs
Type 3: Open networks			0					None
Display language (*1)				-1				English
				-2				German
				-3				French
				-4				Spanish
Case color					0			White (Light gray)
					1			Black (Light charcoal gray)
Fixed code						-00		Always "-00"
Optional suffix codes							/LP	24 V DC loop power supply (*2)
							/HA	Heater break alarm (*3)
							/DC	Power supply 24 V AC/DC
							/CT	Coating (*4)

*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 1 code (any of "-0" or "-1") and Type 2 code (any of "0" or "1.") Additionally, when the Type 2 code is "1", the RS-485 communication is 2-wire system.
*3: The /HA option can be specified when the Type 1 code is "-0" or "-2."
*4: When the /CT option is specified, the UT32A 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

Model code	Suffix code	Description
LL50A	-00	Parameter Setting Software

■ Standard accessories

Brackets (mounting hardware), Unit label, Operation Guide

■ Accessory

Name	Model	Description
Terminal cover	UTAP001	For UT35A
	UTAP002	For UT32A
User's Manual (CD-ROM)	UTAP003	