# Technical Information

Digital Indicating Controllers
Replacement Guide

TI 05A03A01-01EN

## List of instruments to be replaced Be sure to see the reference page concerned.

| Model | Product Name | Discontinuation Date | Recommended Model | Reference Page |
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| UT14 | Digital indicating controller | June 1997 | UT320/UT321 | 3 |
| UT15 | Digital indicating controller | June 1997 | UT350/UT351 | 3 |
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| UT40 | Digital indicating controller | Sept. 1997 | UT750 | 8 |
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| UP25 | Program controller | Sept. 1997 | UP550 | 16 |
| UP27 | Program controller | Sept. 1997 | UP550 | 17 |
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| UP40 | Program controller | March 1997 | UP750 | 19 |
| UM04 | Digital indicating alarm unit | June 1997 | UM330/UM331 | 20 |
| UM05 | Digital indicating alarm unit | June 1997 | UM350/UM351 | 20 |

For other instruments, see the table below.

| Model | Product Name | Discontinuation Date | Recommended Model |
|---|---|---|---|
| EI108 | Indicating controller | Sept. 1991 | UT55A |
| ER181/182 | Recording controller (built-in type) | June 1994 | CX2000 |
| M500 | Temperature controller | Feb., 1993 | UT320/UT321/UT350/UT351<br>UM330/UM331/UM350/UM351 |
| M502 | Temperature controller without indication | June 1997 | UT350/UT351 |
| M1□4□ | Temperature indicating controller | Sept. 1985 | UT350/UT351 |
| M1□7□ | Temperature controller | Sept. 1985 | UT350/UT351 |
| M1□9□ | Temperature controller | June 1997 | UT350/UT351 |
| M2091 | Digital indicating controller | June 1997 | UT55A |
| M2092 | Digital indicating controller | June 1997 | UT55A |
| M2093 | Digital indicator | June 1997 | UM350/UM351 |
| M2094 | Digital indicator | June 1997 | UM330/UM331 |
| M2095 | Digital cryogenic temperature indicator | June 1997 | UT55A |
| OF120 | Controller without indication | Sept. 1988 | UT350/UT351 |
| OF121 | Full-scale indicating controller | June 1997 | UT350/UT351 |
| OF122 | Deviation indicating controller | July 1986 | UT350/UT351 |
| OF128 | Digital indicating controller | Sept. 1988 | UT55A |
| OF131 | Indicating controller | Sept. 1988 | UT350/UT351 |
| PC181 | Program setting unit/controller | Sept. 1992 | UP550 |
| PC182 | Program setting unit/controller | Sept. 1992 | UP750 |
| PG181/182 | Program setting unit | Sept. 1991 | UP550 |
| PC200 | Program setting unit/controller | Sept. 1988 | UP550 |
| PS200 | Program setting unit | Sept. 1988 | UP550 |
| PC300 | Program setting unit/controller | Sept. 1988 | UP550 |
| UT04 | Digital indicating controller | Jan. 2001 | UT150 |
| UT07J | Digital indicating controller | Jan. 2001 | UT150 |
| Y/40 | Indicating/recording controller | Dec. 1993 | UT55A |

* A Discontinuation Date in the future may be changed without notice.

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# UT10 ⇨ UT320/UT321

**UT10 Digital Indicating Controller**

External dimensions: 48×96×100 mm
Measurement accuracy: ±0.3%
Control period: 500 ms
Burn-out: specifiable
Anti-reset windup provided with auto tuning
Two alarm points available (with standby)
A/M switching function not provided

| Model | Suffix Code | | | | Description | Recommended Model |
|---|---|---|---|---|---|---|
| UT10 | | | | | Digital indicating controller | UT320-00<br>UT321-00 |
| Control action | -1 | | | | PID action | With auto tuning |
| | -2 | | | | PID action with auto tuning | |
| Input | | K | | | Thermocouple type K | Universal input<br>Note ① |
| | | J | | | Thermocouple type J | |
| | | R | | | Thermocouple type R | |
| | | S | | | Thermocouple type S | |
| | | B | | | Thermocouple type B | |
| | | E | | | Thermocouple type E | |
| | | N | | | Thermocouple type N | |
| | | T | | | Thermocouple type T | |
| | | D | | | RTD Pt100 | |
| | | P | | | RTD JPt100 | |
| | | V | | | DC voltage | |
| | | A | | | DC current: 4 – 20 mA DC | |
| Manipulated output | | | -1 | | Relay output | Universal output |
| | | | -2 | | Voltage pulse output: 0 – 12 V DC | |
| | | | -3 | | Current output: 4 – 20 mA DC | |
| Alarm output | | | | N | No alarm | Standard |
| | | | | 1 | High-limit deviation alarm | |
| | | | | 2 | Low-limit deviation alarm | |
| | | | | 3 | High- and low-limit deviation alarm | |
| Supply voltage | | | | -1 | 100/110 and 200/220 V AC | Free power supply |
| | | | | -2 | 110/120 and 220/240 V AC | |
| Style code | | | | *A | Style A | |

Note!
① For direct current input, use a 250-Ω shunt resistor (X010-250-2).

**Advantages of replacement**

1. Input/output not required to be specified (universal input/output)
2. Four sets of setpoints and PID are settable
3. A/M-switching dedicated key
4. Hunting-suppressing function
5. Three alarm points provided as standard
6. Transmission output provided as standard
7. RS-485 communication (optional installation)
8. High-speed and high precision (250 msec, ±0.1%)

# UT14 • UT15 ⇨ UT320/UT321 • UT350/UT351

**UT14 and UT15 Digital Indicating Controllers**

External dimensions: 48×96×100 mm (UT14)
96×96×100 mm (UT15)
Measurement accuracy: ±0.1%
Control period: 500 ms
Universal input/output
Auto tuning built in
A/M software switching function

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT14 | | | Digital indicating controller | UT320-00<br>UT321-00 |
| Style code | *A | | Style A | |
| Option code | ———— | | There are no optional specifications. | |

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT15 | | | Digital indicating controller | UT350-00<br>UT351-00 |
| Style code | *A | | Style A | |
| Option code | | /RET | Transmission output | Standard |
| | | /RS422 | RS-422A interface | UT350-01 Note ①<br>UT351-01 Note ① |

Note!
① RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires software (program) change on the equipment to which this model is connected.

**Advantages of replacement**

1. Four sets of setpoints and PID are settable
2. Hunting-suppressing function
3. A/M-switching dedicated key
4. Transmission output provided as standard
5. Output value can be displayed
6. Three alarm points provided as standard
7. Heater burn-out alarm (optional specifications)
8. Two external contact inputs provided as standard (such as setpoint switching and A/M switching)
9. RS-485 communication (optional specifications)
10. Heating/cooling control type can be specified
11. 24-V DC sensor power can be supplied (optional specifications)
12. Parameter setting tool
13. Active display (UT321/UT351)

# UT20 ⇨ UT55A

**UT20 Digital Indicating Controller**

External dimensions: 96×96×100 mm
Measurement accuracy: ±0.3%
Control period: 500 ms
Burn-out: specifiable
Anti-reset windup provided with auto tuning
Two alarm points available (with standby)
A/M switching function not provided
Remote setting input provided as standard

| Model | Suffix Code | Description | Recommended Model |
|---|---|---|---|
| UT20 | | Digital indicating controller | |
| Control action | -1 | PID action | UT55A-040-00-00 |
| | -2 | PID action with auto tuning | |
| | -3 | Heating/cooling PID action | UT55A-240-00-00 |
| | -4 | Heating/cooling PID action with auto tuning | |
| | -5 | Position proportional PID action (relay output) | UT55A-140-00-00 |
| | -6 | Position proportional PID action with auto tuning (relay output) | |
| Input | K | Thermocouple type K | Universal input |
| | J | Thermocouple type J | |
| | R | Thermocouple type R | |
| | S | Thermocouple type S | |
| | B | Thermocouple type B | |
| | E | Thermocouple type E | |
| | N | Thermocouple type N | |
| | T | Thermocouple type T | |
| | D | RTD Pt100 | |
| | P | RTD JPt100 | |
| | V | DC voltage | |
| | A | DC current: 4 – 20 mA DC | |
| Manipulated output (Heating side) | -1 | Relay output | Universal output: standard Note ① |
| | -2 | Voltage pulse output: 0 – 12 V DC | |
| | -3 | Current output: 4 – 20 mA DC | |
| | -4 | Continuous voltage output: 1 – 5 V DC | |
| Manipulated output (Cooling side) | N | No function | Universal output: standard Note ① |
| | 1 | Relay output | |
| | 2 | Voltage pulse output: 0 – 12 V DC | |
| | 3 | Current output: 4 – 20 mA DC | |
| | 4 | Continuous voltage output: 1 – 5 V DC | |
| Alarm output | N | No alarm | Standard |
| | 1 | High-limit deviation alarm | |
| | 2 | Low-limit deviation alarm | |
| | 3 | High- and low-limit deviation alarm | |
| Supply voltage | -1 | 100/110 and 200/220 V AC | Free power supply |
| | -2 | 110/120 and 220/240 V AC | |
| Style code | *A | Style A | |
| Option code | /RS422 | RS-422A communication function (unavailable if position proportional type is specified) | UT55A-□41-00-00, etc. Note ② |
| | /RET | Analog output (unavailable if heating/cooling type is specified) | Standard |
| | /RL | Remote/local switching (unavailable if position proportional type is specified or when in combination with /RS-422) | Standard |

Note!
① For continuous voltage output, use an external 250-Ω shunt resistor (X010-250-3).
② RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires a program change.
③ Screw terminals are from M3.5 to M3.

**Advantages of replacement**

1. 14-segment active color LCD
2. Simple operations using the Navigation key
3. Depth: 65 mm
4. Ladder sequence function provided as standard (Note that the LL50A Parameter Setting Software, separately sold, is required.)
5. Ethernet function (optional installation)
6. Quick setting function for easy setting of basic functions
7. Input/output not required to be specified (universal input/output)
8. Hunting-suppressing function
9. Eight groups of setpoint/PID are settable

# UT30 ⇨ UT55A

**UT30 Digital Indicating Controller**

External dimensions: 96×96×180 mm
Measurement accuracy: ±0.3%
Control period: 250 ms
Multi-gain built in
Remote input provided as standard (ratio bias available)
Input square root extraction
Output bar graph display
Auto tuning built in
A/M switching function
RS-422 communication

| Model | Suffix Code | | | Description | Recommended Model |
|---|---|---|---|---|---|
| UT30 | | | | Digital indicating controller | UT55A-040-00-00 Note ① |
| Input | -1 | | | Thermocouple, mV, and 4 – 20 mA DC input | Universal input |
| | -2 | | | RTD input | |
| Control action | 1 | | | Time proportional PID, relay output | Universal output Note ② |
| | 2 | | | Time proportional PID, voltage pulse output | |
| | 3 | | | Continuous output PID, 4 – 20 mA DC output | |
| | 4 | | | Continuous output PID, 1 – 5 V DC output | |
| | 5 | | | Position proportional PID action (relay output) | UT55A-140-00-00 |
| Supply voltage | -1 | | | 100 V system (90 – 132 V AC) | Free power supply |
| | -5 | | | 200 V system (180 – 250 V AC) | |
| Style code | *B | | | Style B | |
| Option code | | /DCV | | DC voltage input (0 to 1, -1 to 1, 0 to 5, 1 to 5, 0 to 10 V DC) | Universal inputNote ③ |
| | | /F□□□ | | Specify the input type. | N/A |
| | | /EX | | Remote/Local external switching | Standard |
| | | /RET | | Transmission output | Standard |
| | | /RS422 | | RS-422A communication interface | UT55A-010-00-00, etc. Note ④ |
| | | /RTSR | | Ratio, bias, and square root extraction | Standard |

Note!
① To use the multi-gain function, use the UT750's custom computation.
② For 1 – 5 V DC output, use an external 250-Ω shunt resistor (X010-250-3).
③ There is no range corresponding to -1 to 1 V DC. Use a signal converter.
④ RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires a program change.
⑤ Screw terminals are from M3.5 to M3.

**Advantages of replacement**

1. 14-segment active color LCD
2. Simple operations using the Navigation key
3. Depth: 65 mm
4. Ladder sequence function provided as standard (Note that the LL50A Parameter Setting Software, separately sold, is required.)
5. Ethernet function (optional installation)
6. Quick setting function for easy setting of basic functions
7. Input/output not required to be specified (universal input/output)
8. Hunting-suppressing function
9. Three DO points provided as standard

# UT35 ⇨ UT55A

## UT35 Digital Indicating Controller

External dimensions: 96×96×180 mm
Measurement accuracy: ±0.2%
Control period: 200 ms
Multi-range
Auto tuning built in

General type ⇨ UT55A-000-00-00
Position proportional ⇨ UT55A-100-00-00

| Model | Suffix Code | Description |
|---|---|---|
| UT35 | | Digital indicating controller |
| | -A | General type |
| Target setpoints that can be switched | 1 | 1 setting |
| | 4 | 4 settings |
| | 8 | 8 settings |
| Measurement input | 1 | Thermocouple, DC voltage (mV) |
| | 2 | RTD |
| | 3 | DC current, DC voltage (V) |
| Control action | 10 | Time proportional PID (relay output) |
| | 20 | Time proportional PID (voltage pulse output) |
| | 30 | Continuous output PID (4 – 20 mA DC) |
| | 40 | Continuous output PID (1 – 5 V DC) |
| | 50 | Position proportional PID (relay output) |
| | 60 | Three positions (relay output) |
| Alarm output | N | No alarm |
| | 1 | With alarms |
| Style code | *A | Style A |
| Option code / | / | Specify each option code. |

Notes ①, ③
Three positions → Note ②

Heating/cooling type ⇨ UT55A-200-00-00

| Model | Suffix Code | Description |
|---|---|---|
| UT35 | | Digital indicating controller |
| | -B | Heating/cooling type |
| Target setpoints that can be switched | 1 | 1 setting |
| | 4 | 4 settings |
| | 8 | 8 settings |
| Measurement input | 1 | Thermocouple, DC voltage (mV) |
| | 2 | RTD |
| | 3 | DC current, DC voltage (V) |
| Control action (Heating side) | 1 | Time proportional PID (relay output) |
| | 2 | Time proportional PID (voltage pulse) |
| | 3 | Continuous output PID (4 – 20 mA DC) |
| | 4 | Continuous output PID (1 – 5 V DC) |
| Control action (Cooling side) | 1 | Time proportional PID (relay output) |
| | 2 | Time proportional PID (voltage pulse) |
| | 3 | Continuous output PID (4 – 20 mA DC) |
| | 4 | Continuous output PID (1 – 5 V DC) |
| Alarm output | N | No alarm |
| | 1 | With alarms |
| Style code | *A | Style A |
| Option code / | / | Specify each option code. |

Notes ①, ③

Cryogenic type ⇨ UT55A-000-00-00

Use a cryogenic temperature converter. Note ⑧

| Model | Suffix Code | Description |
|---|---|---|
| UT35 | | Digital indicating controller |
| | -C | Cryogenic type |
| Target setpoints that can be switched | 1 | 1 setting |
| | 4 | 4 settings |
| | 8 | 8 settings |
| Measurement input | 4 | RTD (Pt-CO), (J263*B) |
| Control action | 10 | Time proportional PID (relay output) |
| | 20 | Time proportional PID (voltage pulse output) |
| | 30 | Continuous output PID (4 – 20 mA DC) |
| | 40 | Continuous output PID (1 – 5 V DC) |
| Alarm output | N | No alarm |
| | 1 | With alarms |
| Style code | *A | Style A |
| Option code / | / | Specify each option code. |

Notes ①, ③

Options

| Option Code | Description | Recommended Model (1 setting, 4/8 setting type) |
|---|---|---|
| /EX1 | Auto/Manual with external contact switching terminal | Standard |
| /EX2 | Run/Stop with external contact switching terminal | Standard |
| /RET1 | Transmission output signal: 4 – 20 mA DC | Standard |
| /RET2 | Transmission output signal: 1 – 5 VDC | Note ④ |
| /RSP | Remote setting input | UT55A-☐ 40-00-00, etc. Note ⑤ |
| /RMSR | Remote input ratio, bias, and square root extraction | UT55A-☐ 40-00-00, etc. Note ⑤ |
| /RLEX | Remote/Local with external switching terminal | UT55A-☐ 40-00-00, etc. Note ⑤ |
| /PVSR | PV input square root extraction | Standard |
| /SPEX | Target setpoint automatic switching | UP550-☐ 0 |
| /RS232C | Communication interface | UT55A-☐ 10-00-00, etc. Note ⑥ |
| /RS422 | Communication interface | UT55A-☐ 10-00-00, etc. Note ⑦ |
| /STC | Special thermocouple input | Standard |

Note!
① There is no range corresponding to DC voltage range code 021 (-1 to 1 V). Use a signal converter.
② For three-position output, control action is handled by ON/OFF control on both heating and cooling sides using the heating/cooling UT55A-200-00-00.
③ For DC voltage output, use an external 250-Ω shunt resistor (X010-250-3).
④ Because a 4 – 20 mA transmission output signal is provided as standard, each option code can be handled by purchasing a 250-Ω shunt resistor (X010-250-3) separately.
⑤ For DC current input, specify UT55A-☐ 00-00-00/DR.
⑥ Use RS-232C/RS-485 converter ML2.
⑦ RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires a program change.
⑧ Use the cryogenic temperature converter WRU☐.
⑨ Screw terminals are from M3.5 to M3.

**Advantages of replacement**

1. 14-segment active color LCD
2. Simple operations using the Navigation key
3. Depth: 65 mm
4. Ladder sequence function provided as standard (Note that the LL50A Parameter Setting Software, separately sold, is required.)
5. Ethernet function (optional installation)
6. Quick setting function for easy setting of basic functions
7. Input/output not required to be specified (universal input/output)
8. Hunting-suppressing function
9. Transmission output provided as standard

# UT37 • UT38 ⇨ UT55A

**UT37 and UT38 Digital Indicating Controllers**

External dimensions: 96×96×100 mm
Measurement accuracy: ±0.1%
Control period: 200 ms
Universal input/output
(For UT38, only input is universal)
Auto tuning "SUPER" built in

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT37 | | | Digital indicating controller | UT55A-1□0-00-00 |
| UT38 | | | Digital indicating controller<br>Universal input position proportional type | UT55A-1□0-00-00 |
| Option codes | | /RET | Transmission output<br>Selectable from among PV, SP, and MV | Standard |
| | | /LPS | Sensor supply power<br>21.6 to 28.0 V DC, 30 mA max<br>Not possible to be used in combination with /RSP or /RET | UT55A-□00-00-00/LP |
| | | /RS422 | RS-422A interface | UT55A-□10-00-00, etc. Note ① |
| | | /RSP | Remote setting input (1 – 5 V DC) | UT55A-□10-00-00, etc. |
| | | /ALM4 | Four alarm outputs<br>(Two open collector outputs can be added) | UT55A-□30-00-00, etc. |

Note!
① RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires a program change.
② Screw terminals are from M3.5 to M3.

**Advantages of replacement**

1. 14-segment active color LCD
2. Simple operations using the Navigation key
3. Depth: 65 mm
4. Ladder sequence function provided as standard (Note that the LL50A Parameter Setting Software, separately sold, is required.)
5. Ethernet function (optional installation)
6. Quick setting function for easy setting of basic functions
7. Transmission output provided as standard
8. Hunting-suppressing function
9. Eight groups of setpoints and PID are settable

# UT40 ⇨ UT750

**UT40 Digital Indicating Controller**

External dimensions: 96×96×180 mm
Measurement accuracy: ±0.1%
Control period: 100 ms
Multi-range in the same sensor
Auto tuning built in

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT40 | | | Digital indicating controller | UT750-01 Notes ①, ②, and ③ |
| Measurement input group | -1 | | Thermocouple, mV, and 4 – 20 mA DC input | |
| | -2 | | RTD input | |
| Control action | 1 | | Time proportional PID (relay output) | |
| | 2 | | Time proportional PID (voltage pulse output) | |
| | 3 | | Continuous output PID (4 – 20 mA DC output) | |
| | 4 | | Continuous output PID (1 – 5 V DC output) | |
| | 5 | | Position proportional PID (relay output) | UT750-11 |
| Power supply | 1 | | 100 V system (90 – 132 V AC) | Free power supply 100 – 240 V AC |
| | 5 | | 200 V system (180 – 250 V AC) | |
| Style code | *B | | Style B | ——— |
| Option code | | /DCV | DC voltage (V) input | Note ③ |
| | | /F□□□ | Specify the input type. | N/A |
| | | /EX | Remote/Local external switching | Standard |
| | | /RET | Transmission output | |
| | | /RTSR | Ratio, bias, and square root extraction | |
| | | /RS422 | RS-422 communication interface | UT750-□1 Note ④ |

Note!
① For continuous output PID 1 – 5 V DC, use a 250-Ω shunt resistor (X010-250-2).
② If no remote setting input is used, optional specifications are not required (UT750-□0).
③ There is no range corresponding to DC voltage range code 021 (-1 to 1 V). Use a signal converter.
④ RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires a software program change.
⑤ For current input, use a 250-Ω shunt resistor (X010-250-2).

**Advantages of replacement**

1. Transmission output provided as standard
2. Four alarm points/loop provided as standard
3. Eight sets of setpoints and PID are settable
4. Five-digit large LED display
5. One-touch control mode switching (maximum of 13 types of UT mode)
6. Hunting-suppressing function provided

# UT101 • UT102 ⇨ UM330/UM331

**UT101 Digital Temperature Indicator**
**UT102 Digital Temperature Indicating Alarm Unit**

| | |
|---|---|
| External dimensions: | 96×48×145 mm |
| Measurement accuracy: | ±0.25% (UT101)<br>±0.3% (UT102) |
| Sampling period: | 2 sec. |
| Alarm: | Two points (UT102) |

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT101 | | | Digital temperature indicator | UM-330-00<br>UM-331-00 |
| Input | -K | | Thermocouple type K | Standard (Universal input) |
| | -J | | Thermocouple type J | |
| | -R | | Thermocouple type R | |
| | -P | | RTD JPt100 | |
| Style code | | *A | Style A | |

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT102 | | | Digital temperature indicating alarm unit | UM-330-00<br>UM-331-00 |
| Alarm action | -11 | | High-limit setting | Standard (three points) |
| | -12 | | Low-limit setting | |
| | -14 | | High- and low-limit setting | |
| Input | | K | Thermocouple type K | Standard (Universal input) |
| | | J | Thermocouple type J | |
| | | R | Thermocouple type R | |
| | | P | RTD JPt100 | |
| Style code | | *A | Style A | |

**Advantages of replacement**

1. Input not required to be specified (universal input)
2. Alarm output provided as standard
3. Transmission output provided as standard
4. High precision ±0.1%
5. Large LED display
6. 24-V DC sensor power can be supplied (optional specifications)
7. Active display installed (UM331)

# UT103 ⇨ UM330/UM331

**UT103 Digital Indicating Controller**

External dimensions: 96×48×100 mm
Measurement accuracy: ±0.3%
Sampling period: 500 ms
Burn-out: Up for TC or RTD
Down for voltage or current
Two alarm points
Transmission output

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT103 | | | Digital temperature indicating alarm unit | UM330-00<br>UM331-00 |
| Alarm action | -N | | Indication only | 3 points provided as standard |
| | -1 | | High-limit setting | |
| | -2 | | Low-limit setting | |
| | -3 | | High- and low-limit setting | |
| Input | K | | Thermocouple type K | Universal input<br>Note ① |
| | J | | Thermocouple type J | |
| | R | | Thermocouple type R | |
| | S | | Thermocouple type S | |
| | B | | Thermocouple type B | |
| | E | | Thermocouple type E | |
| | N | | Thermocouple type N | |
| | T | | Thermocouple type T | |
| | D | | RTD Pt100 | |
| | P | | RTD JPt100 | |
| | V | | DC voltage | |
| | A | | DC current: 4 – 20 mA DC | |
| Supply voltage | 1 | | 100/110 and 200/220 V AC | Free power supply |
| | 2 | | 110/120 and 220/240 V AC | |
| Style code | *A | | Style A | |
| Option code | /RET | | Transmission output: 4 – 20 mA DC | Standard |

Note!
① For DC current input, use a 250-Ω shunt resistor (X010-250-2).

**Advantages of replacement**

1. Input not required to be specified (universal input)
2. Alarm output provided as standard
3. Transmission output provided as standard
4. High precision ±0.1%
5. Large LED display
6. 24-V DC sensor power can be supplied (optional specifications)
7. Active display (UM331)

# UT201 ⇨ UT55A

**UT201 Digital Indicating Controller**

External dimensions: 96×144×240 mm Note ①
Measurement accuracy: ±0.3%
Two alarm points
Remote input and Remote/Local selectable
Output bar graph display
A/M switching
Anti-reset windup provided

| Model | Suffix Code | | | Description | Recommended Model |
|---|---|---|---|---|---|
| UT201 | | | | Digital temperature indicating controller | UT55A-000-00-00 |
| Input | A | | | DC current: 4 – 20 mA DC | Universal input |
| | V | | | DC voltage: 1 – 5 V DC | |
| | M | | | DC voltage: 0 – 10 mV DC | |
| | K | | | Thermocouple type K | |
| | J | | | Thermocouple type J | |
| | E | | | Thermocouple type E | |
| | T | | | Thermocouple type T | |
| | R | | | Thermocouple type R | |
| | B | | | Thermocouple type B | |
| | P | | | RTD JPt100 | |
| | Q | | | RTD Pt50 | N/A |
| | D | | | RTD Pt100 | Universal input |
| Setting | | 1 | | Local setting | Standard |
| | | 2 | | Local/remote setting (4 – 20 mA DC) | UT55A-040-00-00/DR |
| | | 3 | | Local/remote setting (1 – 5 V DC) | UT55A-040-00-00 |
| Control action | | 4 | | PID action: time proportional ON-OFF | Universal output |
| | | 5 | | PID action: voltage output 24 V DC (isolated type) | N/A |
| | | 6 | | PID action: position proportional ON-OFF | UT55A-1□0-00-00 |
| | | 7 | | PID action: current output 4 – 20 mA DC | Universal output |
| Proportional band | | | 1 | Proportional band: 1 – 50% | Standard (Proportional band: 0.1 to 999.9% |
| | | | 2 | Proportional band: 6 – 300% | |
| Construction | | | | 0 | General type | ———— |

Note!
① Pay attention to the external dimensions.
② Screw terminals are from M3.5 to M3.

**Advantages of replacement**

1. 14-segment active color LCD
2. Simple operations using the Navigation key
3. Depth: 65 mm
4. Ladder sequence function provided as standard (Note that the LL50A Parameter Setting Software, separately sold, is required.)
5. Ethernet function (optional installation)
6. Quick setting function for easy setting of basic functions
7. Input/output not required to be specified (universal input/output)
8. Hunting-suppressing function
9. Transmission output provided as standard

# UT420 ⇨ UT52A

**UT420 Digital Indicating Controller**

External dimensions: 48×96×100 mm
Measurement accuracy: ±0.1%
Control period: 200 ms
Universal input/output
Auto tuning built in
5-digit display
Three alarm points provided as standard

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT420 | | | Digital indicating controller | UT52A-000-00-00 |
| Type | -0 | | General type | UT52A-000-00-00 |
| Optional function | | 0 | None | UT52A-000-00-00 |
| | | 7 | Communication, remote input, and two DI points to be added | UT52A-010-00-00 |
| | | 8 | Remote input and two DI points to be added | UT52A-020-00-00 |

Note!
① Screw terminals are from M3.5 to M3.

**Advantages of replacement**

1. 14-segment active color LCD
2. Simple operations using the Navigation key
3. Depth: 65 mm
4. Ladder sequence function provided as standard (Note that the LL50A Parameter Setting Software, separately sold, is required.)
5. Quick setting function for easy setting of basic functions

# UT450 ⇨ UT55A

**UT450 Digital Indicating Controller**


External dimensions: 96×96×100 mm
Measurement accuracy: ±0.1%
Control period: 200 ms
Universal input/output
Auto tuning built in
5-digit display
Three alarm points provided as standard

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT450 | | | Digital indicating controller | |
| Type | -0 | | General type | UT55A-0□0-00-00 |
| | -1 | | Position proportional type | UT55A-1□0-00-00 |
| | -2 | | Heating/cooling type | UT55A-2□0-00-00 |
| | -3 | | General type (provided with 24 V DC sensor supply power) | UT55A-0□0-00-00/LP |
| | -4 | | Position proportional type (provided with 24 V DC sensor supply power) | UT55A-1□0-00-00/LP |
| Optional function | | 0 | None | UT55A-□00-00-00 |
| | | 1 | Communication, remote input, five DI points, and one alarm point to be added | UT55A-□10-00-00 |
| | | 2 | Communication, remote input, and one DI point to be added | UT55A-□20-00-00 |
| | | 3 | Four DI points and one alarm point to be added | UT55A-□30-00-00 |
| | | 4 | Remote input and one DI point to be added | UT55A-□40-00-00 |

Note!
① Screw terminals are from M3.5 to M3.

**Advantages of replacement**

1. 14-segment active color LCD
2. Simple operations using the Navigation key
3. Depth: 65 mm
4. Ladder sequence function provided as standard (Note that the LL50A Parameter Setting Software, separately sold, is required.)
5. Ethernet function (optional installation)
6. Quick setting function for easy setting of basic functions

# UT520 ⇨ UT52A

**UT520 Digital Indicating Controller**

External dimensions: 48×96×100 mm
Measurement accuracy: ±0.1%
Control period: 50 ms or greater
Universal input/output
Auto tuning built in
5-digit display
Three alarm points provided as standard

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT520 | | | Digital indicating controller | UT52A-000-00-00 |
| Type | -0 | | General type | UT52A-000-00-00 |
| Optional function | | 0 | None | UT52A-000-00-00 |
| | | 7 | Communication, auxiliary analog (remote) input, and two DI points to be added | UT52A-010-00-00 |
| | | 8 | Auxiliary analog (remote) input and two DI points to be added | UT52A-020-00-00 |

Note!
① Screw terminals are from M3.5 to M3.

**Advantages of replacement**

1. 14-segment active color LCD
2. Simple operations using the Navigation key
3. Depth: 65 mm
4. Ladder sequence function provided as standard (Note that the LL50A Parameter Setting Software, separately sold, is required.)
5. Quick setting function for easy setting of basic functions

# UT550/UT551 ⇨ UT55A

**UT550/UT551 Digital Indicating Controllers**

External dimensions: 96×96×100 mm
Measurement accuracy: ±0.1%
Control period: 50 ms or greater
Universal input/output
Auto tuning built in
5-digit display
Active display (UT551 only)
Ethernet communication (UT551-□A to D only)

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT550 /UT551 | | | Digital indicating controller | ———— |
| Type | -0 | | General type | UT55A-0□0-00-00 |
| | -1 | | Position proportional type | UT55A-1□0-00-00 |
| | -2 | | Heating/cooling type | UT55A-2□0-00-00 |
| | -3 | | General type (provided with 24 V DC sensor supply power) | UT55A-0□0-00-00/LP |
| | -4 | | Position proportional type (provided with 24 V DC sensor supply power) | UT55A-1□0-00-00/LP |
| Optional function | | 0 | None | UT55A-□00-00-00 |
| | | 1 | Communication, auxiliary (remote) input, six DI points, and four DO points to be added | UT55A-□10-00-00 |
| | | 2 | Communication, auxiliary analog (remote) input, and one DI point to be added | UT55A-□20-00-00 |
| | | 3 | Five DI points and four DO points to be added | UT55A-□30-00-00 |
| | | 4 | Auxiliary analog (remote) input and one DI point to be added | UT55A-□40-00-00 |

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UT551 | | | Digital indicating controller | |
| Type | -0 | | General type | UT55A-0□2-00-00 |
| | -1 | | Position proportional type | UT55A-1□2-00-00 |
| Optional function | | A | Provided with Ethernet communication | UT55A-□02-00-00 |
| | | B | Provided with Ethernet communication, and auxiliary (remote) input and one DI point to be added | UT55A-□42-00-00 |
| | | C | Provided with Ethernet communication, and five DI points and four DO points to be added | UT55A-□32-00-00 |
| | | D | Provided with Ethernet communication, and auxiliary analog (remote) input, six DI points, and four DO points to be added | UT55A-□52-00-00 |

Note!
① Screw terminals are from M3.5 to M3.

**Advantages of replacement**

1. 14-segment active color LCD
2. Simple operations using the Navigation key
3. Depth: 65 mm
4. Ladder sequence function provided as standard (Note that the LL50A Parameter Setting Software, separately sold, is required.)
5. Quick setting function for easy setting of basic functions

# UP25 ⇨ UP550

## UP25 Program Controller

External dimensions: 96×96×180 mm
Measurement accuracy: ±0.2%
Control period: 200 ms
Multi-range in the same sensor
Auto tuning "SUPER" built in
Maximum of eight patterns/118 segments
Two PV events and four time events
Eight sets of zone PID

General type ⇨ UT550-0□
Position proportional ÞUP550-1□

| Model | Suffix Code | Description |
|---|---|---|
| UP25 | | Program controller |
| | -A | General type |
| Number of patterns | 4 | 4 patterns |
| | 8 | 8 patterns |
| Measurement input group | 1 | Thermocouple, DC voltage (mV) |
| | 2 | RTD |
| | 3 | DC current, DC voltage (V) |
| Control action | 10 | Time proportional PID (relay output) |
| | 20 | Time proportional PID (voltage pulse output) |
| | 30 | Continuous output PID (4 – 20 mA DC) |
| | 40 | Continuous output PID (1 – 5 V DC) |
| | 50 | Position proportional PID (relay output) |
| | 60 | Three positions (relay output) |
| Alarm output | N | No alarm |
| | 1 | With alarms (PV event) |
| Style code | *A | Style A |
| Option code / □ / □ | | Specify each option code. |

Note ①
Current input → Note ②
Continuous PID 1 – 5 V → Note ③
Three-position output → Note ⑤

Heating/cooling type ⇨ UP550-2□

| Model | Suffix Code | Description |
|---|---|---|
| UP25 | | Program controller |
| | -B | Heating/cooling type |
| Number of patterns | 4 | 4 patterns |
| | 8 | 8 patterns |
| Measurement input group | 1 | Thermocouple, DC voltage (mV) |
| | 2 | RTD |
| | 3 | DC current, DC voltage (V) |
| Control action (Heating side) | 1 | Time proportional PID (relay output) |
| | 2 | Time proportional PID (voltage pulse output) |
| | 3 | Continuous output PID (4 – 20 mA DC) |
| | 4 | Continuous output PID (1 – 5 V DC) |
| Control action (Cooling side) | 1 | Time proportional PID (relay output) |
| | 2 | Time proportional PID (voltage pulse output) |
| | 3 | Continuous output PID (4 – 20 mA DC) |
| | 4 | Continuous output PID (1 – 5 V DC) |
| Alarm output | N | No alarm |
| | 1 | With alarms (PV event) |
| Style code | *A | Style A |
| Option code / □ / □ | | Specify each option code. |

Note ①
Current input → Note ②
Continuous PID 1 – 5 V → Note ③

Cryogenic type ⇨ UP550-0□

Use a cryogenic temperature converter.
Note ⑨

| Model | Suffix Code | Description |
|---|---|---|
| UP25 | | Program controller |
| | -C | Cryogenic type |
| Number of patterns | 4 | 4 patterns |
| | 8 | 8 patterns |
| Measurement input | 4 | RTD (Pt-CO), (J263*B) |
| Control action | 10 | Time proportional PID (relay output) |
| | 20 | Time proportional PID (voltage pulse output) |
| | 30 | Continuous output PID (4 – 20 mA DC) |
| | 40 | Continuous output PID (1 – 5 V DC) |
| Alarm output | N | No alarm |
| | 1 | With alarms (PV event) |
| Style code | *A | Style A |
| Option code / □ / □ | | Specify each option code. |

Continuous PID 1 – 5 V → Note ③

## Options

| Option Code | Description | Recommended Model |
|---|---|---|
| /EX | Operation mode with external contact switching terminal | UP550-□0 Note ⑥ |
| /RET1 | Transmission output signal: 4 – 20 mA DC | Standard |
| /RET2 | Transmission output signal: 1 – 5 VDC | Note ④ |
| /PTNEX | Program patterns with external contact switching terminal | Standard, Note ⑥ |
| /RS232C | Communication interface | UP550-□1, Note ⑦ |
| /RS422 | Communication interface | UP550-□1, Note ⑧ |
| /STC | Special thermocouple input | Standard |

Note!
① There is no range corresponding to DC voltage range code 021 (-1 to 1 V). Use a signal converter.
② For DC current input, use a 250-Ω shunt resistor (X010-250-2).
③ For DC voltage output, use an external 250-Ω shunt resistor (X010-250-2).
④ Because a 4 – 20 mA transmission output signal is provided as standard, this option code can be handled by purchasing a 250-Ω shunt resistor (X010-250-2) separately.
⑤ For three-position output, control action is handled by ON/OFF control on both the heating and cooling sides using the heating/cooling UP550-2□.
⑥ If /EX and /PTNEX are both specified, the option code (-□1) is required.
⑦ Use RS-232C/RS-485 converter ML2.
⑧ RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires a software program change.
⑨ Use the cryogenic temperature converter WRU□.

**Advantages of replacement**

1. 30 patterns/300 segments
2. Contact input/output: Up to eight points each (7 points each are provided as standard).
3. Eight PV events/16 time events are settable (Up to eight contact outputs)
4. Transmission output provided as standard
5. Hunting-suppressing function
6. Eight sets of zone PID/segment PID are settable
7. Five-digit large LED display

# UP27 ⇨ UP550

**UP27 Program Controller**

External dimensions: 96×96×100 mm
Measurement accuracy: ±0.1%
Control period: 200 ms
Universal input/output
Auto tuning "SUPER" built in
15 patterns/192 segments
Two PV events and four time events
Pattern end signal (1 point)
Zone PID/300 segments
Eight sets of PIDs settable

| Model | Suffix Code | Description | Recommended Model |
|---|---|---|---|
| UP27 | | Program controller | UP550-01 Note ① |
| Option code | /RET | Transmission output<br>Selectable from among PV, SP, and MV | Standard<br>Notes ② and ③ |
| | /LPS | Sensor supply power<br>21.6 – 28.0 V DC, 30 mA DC max<br>Not available in mixed use with /RSP or /RET | |
| | /RS422 | RS-422A interface<br>Provided with a coordinated operation function | UT550-01<br>Note ④ |

Note!
① Eight contact inputs and 15 patterns selectable. If one of PRG, RST, ADVANCE, and HOLD functions is not used, UP550-00 (provided with seven contact inputs as standard) can be used.
② Either transmission output or sensor supply power is available as standard.
③ Sensor supply power is 14.5 to 18.0 V DC at 21 mA DC maximum.
For 21.6 – 28.0 V power supply, provide an external power supply separately.
④ RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires a software program change.

**Advantages of replacement**

1. 30 patterns/300 segments
2. Contact inputs and outputs: Up to eight points each (7 points each are provided as standard).
3. Eight PV events/16 time events are settable (Up to eight contact outputs)
4. Transmission output provided as standard
5. Hunting-suppressing function
6. Five-digit large LED display

# UP30 ⇨ UP550

**UP30 Program Controller**

External dimensions: 96×96×180 mm
Measurement accuracy: ±0.1%
Control period: 100 ms
Universal input/output
Auto tuning "SUPER" built in
19 patterns/200 segments
Two PV events and four time events
Pattern end signal (1 point)
Zone PID switching and eight sets of PIDs are settable

| Model | Suffix Code | Description | Recommended Model |
|---|---|---|---|
| UP30 | | Program controller | UP550-00 Notes ①, ④, and ⑤ |
| Measurement input group | -1 | Thermocouple, mV, and 4 – 20 mA DC input | |
| | -2 | RTD input | |
| Control action | 1 | Time proportional PID (relay output) | |
| | 2 | Time proportional PID (voltage pulse output) | |
| | 3 | Continuous output PID (4 – 20 mA DC) | |
| | 4 | Continuous output PID (1 – 5 V DC) | |
| Power supply | 1 | 100 V system (90 – 132 V AC) | Free power supply 100 – 240 V AC |
| | 5 | 200 V system (180 – 250 V AC) | |
| Style code | *B | Style B | ———— |
| Option code | /DCV | DC voltage (V) input | Standard Note ② |
| | /F□□□ | Specify the input type. | N/A |
| | /RET | Transmission output | Standard |
| | /RS422 | RS-422 communication interface | UP550-□1 Note ③ |

Note!
① For continuous output PID (1 – 5 V DC), use a 250-Ω shunt resistor (X010-250-2).
② There is no range corresponding to DC voltage range code 021 (-1 to 1 V). Use a signal converter.
③ RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires a software program change.
④ There is no range corresponding to DC voltage range code 021 (-1 to 1 V). Use a signal converter.
⑤ For DC current input, use a 250-Ω shunt resistor (X010-250-2).

**Advantages of replacement**

1. 30 patterns/300 segments
2. Contact inputs and outputs: 7 points each as standard
3. Eight PV events/16 time events are settable
   (Up to eight contact outputs)
4. Transmission output is provided as standard. A maximum of two transmission outputs
5. Hunting-suppressing function
6. Five-digit large LED display

# UP40 ⇨ UP750

**UP40 Program Controller**

External dimensions: 96×144×180 mm Note ①
Measurement accuracy: ±0.1%
Control period: 100 ms
Multi-range in the same sensor
Auto tuning built in
99 patterns/400 segments
Four PV events and eight time events
Zone PID switching, and eight sets of PIDs are settable

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UP40 | | | Program controller | UP750-00 Notes ②, ③, and ④ |
| Measurement input group | -1 | | Thermocouple, mV, and 4 – 20 mA DC input | |
| | -2 | | RTD input | |
| Control action | 1 | | Time proportional PID (relay output) | |
| | 2 | | Time proportional PID (voltage pulse output) | |
| | 3 | | Continuous output PID (4 – 20 mA DC) | |
| | 4 | | Continuous output PID (1 – 5 V DC) | |
| Power supply | 1 | | 100 V system (90 – 132 V AC) | Free power supply 100 – 240 V AC |
| | 5 | | 200 V system (180 – 250 V AC) | |
| Style code | *B | | Style B | ———— |
| Option code | | /DCV | DC voltage (V) input | Standard Note ③ |
| | | /F□□□ | Specify the input type. | N/A |
| | | /RET | Transmission output | Standard |
| | | /RS422 | RS-422 communication interface | UP750-□1 Note ⑤ |

Note!
① Pay attention to the external dimensions.
② For continuous output PID (1 – 5 V DC), use a 250-Ω shunt resistor (X010-250-2).
③ There is no range corresponding to DC voltage range code 021 (-1 to 1 V). Use a signal converter.
④ For DC current input, use a 250-Ω shunt resistor (X010-250-2).
⑤ RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires a software program change.
⑥ If a sequence is organized using an ANS signal for contact output, this option is handled as custom computation of UP750-10.
⑦ An expansion module is required depending on the number of contact inputs/outputs. See the connection diagram in the general outline.

**Advantages of replacement**

1. 300 patterns/3000 segments
2. Contact inputs and outputs: Up to 23 points each (7 points each are provided as standard).
3. Eight PV events/16 time events are settable
4. Transmission output provided as standard
5. Hunting-suppressing function
6. Five-digit large LED display

# UM04 • UM05 ⇨ UM330/UM331 • UM350/UM351

**UM04 and UM05 Digital Indicating Alarm Units**

External dimensions: 96×48×100 mm (UM04)
96×96×100 mm (UM05)
Measurement accuracy: ±0.1%
Sampling period: 500 ms
Universal inputs
Two alarm points provided as standard
Transmission output

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UM04 | | | Digital indicating alarm unit | UM330-00<br>UM331-00 |
| Style code | *A | | Style A | |
| Option code | | /RET | Measured-value transmission output:<br>4 – 20 mA DC | |

| Model | Suffix Code | | Description | Recommended Model |
|---|---|---|---|---|
| UM05 | | | Digital indicating alarm unit | UM350-00<br>UM351-00 |
| Style code | *A | | Style A | |
| Option code | | /RET | Measured-value transmission output:<br>4 – 20 mA DC | |
| | | /RS422 | RS-422 communication interface | UM-350-01 Note ①<br>UM-351-01 Note ① |
| | | /ALM4 | Four alarm outputs<br>(two outputs to be added) | UM350-02<br>UM351-02 |

Note!
① RS-485 is electrically upward compatible to RS-422. However, the communication protocol is changed to PC link communication, which requires a software program change.

**Advantages of replacement**

1. Four alarm points are possible (3 points provided as standard)
2. Transmission output provided as standard
3. Large LED display
4. RS-485 communication available (optional specifications)
5. 24-V DC sensor power can be supplied.
6. Active display (UM331/UM351)