Warning and Disclaimer

(1) YOKOGAWA makes no warranties regarding the product except those stated in the WARRANTY that is provided separately.

(2) The product is provided on an “as is” basis. YOKOGAWA assumes no liability to any person or entity for any loss or damage, direct or indirect, arising from the use of the product or from any unpredictable defect of the product.

Safety, Protection, and Modification of the Product

(1) In order to protect the system controlled by this product and the product itself, and to ensure safe operation, observe the safety precautions described in the operation guide. Use of the instrument in a manner not prescribed herein may compromise the product’s functions and the protection features inherent in this device. We assume no liability for, or responsibility of the product’s quality, performance or functionality should users fail to read the instruction manual when operating the product.

(2) Installation of protection and/or safety circuits with respect to a lightning protector; protective equipment for the system controlled by the product and the product itself; fault-proof or fail-safe design of a process or line using the system controlled by the product or the product itself; and/or the design and installation of other protective and safety circuits are to be appropriately implemented as the customer deems necessary.

(3) Be sure to use spare parts approved by YOKOGAWA when replacing parts or consumables.

(4) This product was designed or manufactured to be used in critical applications that directly affect or threaten human lives. Such applications include nuclear power equipment, devices using radioactivity, railway facilities, aviation equipment, air navigation facilities, aviation facilities, and medical equipment. If not used, it is the user’s responsibility to include in the system all additional equipment and devices that ensure personnel safety.

(5) Modification of the product is strictly prohibited.

(6) This product is intended to be handled by skilled personnel for electronic devices.

This instrument is an EMC class A product. In a domestic environment this product may cause radio interference in which case the user needs to take adequate measures.

Power Supply

Ensure that the instrument’s supply voltage matches the voltage range for the input power supply before turning ON the power.

Do Not Use in an Explosive Atmosphere

Do not open input terminals in locations with combustible or explosive gases or steam. Operation in such environments constitutes an extreme safety hazard. Use of the instrument in environments where there are concentrations of corrosive (PLS, SO₂) etc. for extended periods of time may cause a failure.

Do Not Remove Internals

The internal unit should not be removed by anyone other than YOKOGAWA’s service personnel. There are dangerous high voltage parts inside. Additionally, do not replace the fuse by yourself.

Damage to the Protective Construction

Operation of the instrument in a manner not specified in the operation guide may damage its protective construction.

Protection of Environmental

Waste Electrical and Electronic Equipment (WEEE), Directive

This is an explanation of how to dispose of the product based on Waste Electrical and Electronic Equipment (WEEE) Directive. This directive is only valid in the E.U.

Marking

This product complies with the WEEE Directive marking requirement. This marking indicates that you must not discard the electronic/electrical product in domestic household waste.

Product Category

With reference to the equipment types in the WEEE directive, this product is classified as a “Small electrical product”.

Do not dispose in domestic household waste. When disposing products in the EU, contact your local YOKOGAWA Europe B.V. office.

Customized Product

For customized product, the product is identified by the option code or SR/W (where W is a number).

Contact your supplier in case your instrument has option SR, and you are not in the possession of FT1-Model code) SR or IM (Model code) SR (where [Model code] means, for example, UT52A-01011000/MDL).

Accessories (sold separately)

The following is an accessory sold separately.


Refer to the website for additional selling conditions and warranty.

Note

Be sure to turn OFF the power supply to the controller before installing the instrument to avoid an electric shock.

Note

If the instrument is moved from a location with low temperature and low humidity to a place with high temperature and high humidity, or if the temperature changes rapidly, condensation will result. Moreover, in the case of thermocouple inputs, measurement errors will result. To avoid such a situation, leave the instrument in the new environment under ambient conditions for more than 1 hour prior to using it.
4. Hardware Specifications

This instrument is for Measurement Category No.1.

Do not use it for measurements in locations falling under Measurement Categories No.2, No.3, and No.4.

■ Input Specifications

Universal Input (Equipped as standard)

- Number of inputs: 1
- Input type, instrument range, and measurement accuracy: See the table below.

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Instrument Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-wire RTD</td>
<td>±1.0% of span</td>
<td>±0.05% of span + 0.1°C</td>
</tr>
<tr>
<td>2-wire RTD</td>
<td>±2.0% of span</td>
<td>±0.9% of span + 0.2°C</td>
</tr>
<tr>
<td>DC voltage</td>
<td>0.0 to ±20.0</td>
<td>±0.01% of rated range ±1 digit</td>
</tr>
</tbody>
</table>

■ External Dimensions

- UT55A/MDL, UT55A/MDL 1
- UT52A/MDL

■ Removing from the DIN Rail

Insert a flat-blade screwdriver (guide hole: 10 mm shaft length, 6 mm blade width, 0.8 mm blade thickness) into the bottom slide lock hole and pull down to release the slide lock. On the UT55A/MDL, there are two slide locks. Release the other slide lock after you release the first slide lock. When both slide locks are unlocked, the instrument can be removed from the DIN rail.

■ Mounting on a DIN Rail

Insert the DIN rail into the top area of DIN rail groove (at two locations) on the rear panel, and secure in place with the slide locks.

■ Input Sampling (control) period: Same as universal input
- Input sampling (control) period: Same as universal input
- Burnout detection: Same as universal input
- Burnout detection: Same as universal input
- Remote output with Direct Input

■ Contact Input Specifications

- Number of inputs: See the tables of Model and Suffix Codes.
- Input type: No-voltage contact input or transistor contact input
- Current contact rating: 12 V DC, 10 mA or more
- Use with a contact that has a minimum on-current of 1 mA or less.
- ON/OFF detection
- No-voltage contact input
- Contact resistance of 1 Ω or less is determined as "ON" and contact resistance of 50 kΩ or more as "OFF"
- Transition contact input
- Input voltage of 2 V or less is determined as "OFF" and leakage current must not exceed 100 μA when "OFF"
- Minimum status detection hold time: Control period >50 ms
- User SP switch, operation mode switch, and event input

■ Analog Output Specifications

- Number of outputs: 1
- Output type: Current type
- Output range: 4 to 20 mA DC or 0 to 20 mA DC/DC
- Current output accuracy: ±0.05% of rated range + 0.1 mA/m or less
- Output voltage accuracy: ±0.01% of span (25% of span for 1 mA/m or less)
- The accuracy is in the standard operating conditions: 23°C, 55±10%, ±1°C/10°C offset, and 100 V AC supply.
- Output voltage: ±0.1 V DC or less
- Time resolution: 10 ms or 0.1% of output, whichever is larger

■ Retransmission Output Specifications

- Number of outputs: Retransmission output, 1, with 15 V DC loop power supply
- Current output: 4 to 20 mA DC or 0 to 20 mA DC/DC
- Current output accuracy: ±0.05% of span (25% of span for 1 mA/m or less)
- The accuracy is in the standard operating conditions: 23°C, 55±10%, ±1°C/10°C offset, and 100 V AC supply.

This is not a conversion accuracy through input and output but the performance of transmission output itself.

■ Specifications

- Allowing for orientation resistance: RTD input: Max. 150 Ohm (The conductor resistance between the three wires shall be equal.)
- Wiring resistance effect: ±0.1°C/10°C
- Allowing for input ventilation: TC, mv, mA and RTD input: ±10 DC
- V input: ±20 DC, mA input: ±40 mA
- Noise rejection ratio: Normal model: 40 dB or more (at 50/60 Hz)
- Common model: 120 dB or more (at 50/60 Hz)
- For 100-240 V AC, the power frequency can be set manually. Automatic detection is also available.
- For 24 V AC/DC, the power frequency can be set manually.
- Reference junction compensation error: ±1°C (±2°C at 35°C) ±1°C/10°C (±1°C at 35°C and ±2°C at 50°C)
- Applicable standards: JIS/IEC/EN (ITS-90) for TC and RTD

■ Auxiliary Analog Input

- Use as separate setting, external compensating input, auxiliary input for computation, etc.
- Number of inputs: See the Table of Model and Suffix Codes.
- Input type, instrument range, and measurement accuracy: See the table below.

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Instrument Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-wire RTD</td>
<td>±1.0% of span</td>
<td>±0.05% of span + 0.1°C</td>
</tr>
<tr>
<td>2-wire RTD</td>
<td>±2.0% of span</td>
<td>±0.9% of span + 0.2°C</td>
</tr>
<tr>
<td>DC voltage</td>
<td>0.0 to ±20.0</td>
<td>±0.01% of rated range ±1 digit</td>
</tr>
</tbody>
</table>

■ Specifications

- Allowing for orientation resistance: RTD input: Max. 150 Ohm (The conductor resistance between the three wires shall be equal.)
- Wiring resistance effect: ±0.1°C/10°C
- Allowing for input ventilation: TC, mv, mA and RTD input: ±10 DC
- V input: ±20 DC, mA input: ±40 mA
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- Reference junction compensation error: ±1°C (±2°C at 35°C) ±1°C/10°C (±1°C at 35°C and ±2°C at 50°C)
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- Input type, instrument range, and measurement accuracy: Same as universal input except for the table below.

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- Input type, instrument range, and measurement accuracy: Same as universal input except for the table below.

■ Contact Input Specifications

- Number of inputs: See the tables of Model and Suffix Codes.
- Input type: No-voltage contact input or transistor contact input
- Current contact rating: 12 V DC, 10 mA or more
- Use with a contact that has a minimum on-current of 1 mA or less.
- ON/OFF detection
- No-voltage contact input
- Contact resistance of 1 Ω or less is determined as "ON" and contact resistance of 50 kΩ or more as "OFF"
- Transition contact input
- Input voltage of 2 V or less is determined as "OFF" and leakage current must not exceed 100 μA when "OFF"
- Minimum status detection hold time: Control period >50 ms
- User SP switch, operation mode switch, and event input

- Number of outputs: 1
- Output type: Current type
- Output range: 4 to 20 mA DC or 0 to 20 mA DC/DC
- Current output accuracy: ±0.05% of rated range + 0.1 mA/m or less
- Output voltage accuracy: ±0.01% of span (25% of span for 1 mA/m or less)
- The accuracy is in the standard operating conditions: 23°C, 55±10%, ±1°C/10°C offset, and 100 V AC supply.
- Output voltage: ±0.1 V DC or less
- Time resolution: 10 ms or 0.1% of output, whichever is larger

- Number of outputs: Retransmission output, 1, with 15 V DC loop power supply
- Current output: 4 to 20 mA DC or 0 to 20 mA DC/DC
- Current output accuracy: ±0.05% of span (25% of span for 1 mA/m or less)
- The accuracy is in the standard operating conditions: 23°C, 55±10%, ±1°C/10°C offset, and 100 V AC supply.

This is not a conversion accuracy through input and output but the performance of transmission output itself.

Note: The accuracy is in the standard operating conditions: 23°C, 55±10%, ±1°C/10°C offset, ±1.0ºC in the range between -200°C and 850.0°C is 0.01% of span + 0.3°C.

For input sampling (control) period: Select from 50, 100, and 200 ms
Burst detection: Functions at standard signal
Burnout detection: Determined to have occurred if it is 0.1 V or less.
Remote output with Direct Input
- Number of inputs: See the Table of Model and Suffix Codes.
- Input type, instrument range, and measurement accuracy: Same as universal input except for the table below.

- Number of inputs: See the Table of Model and Suffix Codes.
- Input type, instrument range, and measurement accuracy: Same as universal input except for the table below.

- Number of inputs: See the Table of Model and Suffix Codes.
- Input type, instrument range, and measurement accuracy: Same as universal input except for the table below.

- Number of outputs: 1
- Output type: Current type
- Output range: 4 to 20 mA DC or 0 to 20 mA DC/DC
- Current output accuracy: ±0.05% of rated range + 0.1 mA/m or less
- Output voltage accuracy: ±0.01% of span (25% of span for 1 mA/m or less)
- The accuracy is in the standard operating conditions: 23°C, 55±10%, ±1°C/10°C offset, and 100 V AC supply.
- Output voltage: ±0.1 V DC or less
- Time resolution: 10 ms or 0.1% of output, whichever is larger

- Number of outputs: Retransmission output, 1, with 15 V DC loop power supply
- Current output: 4 to 20 mA DC or 0 to 20 mA DC/DC
- Current output accuracy: ±0.05% of span (25% of span for 1 mA/m or less)
- The accuracy is in the standard operating conditions: 23°C, 55±10%, ±1°C/10°C offset, and 100 V AC supply.

This is not a conversion accuracy through input and output but the performance of transmission output itself.
**5. How to Connect Wires**

- Wiring work must be carried out by a person with basic electrical knowledge and practical experience.
- Be sure to turn off the power supply to the controller before wiring to avoid an electric shock. Use a Lester or similar device to ensure that no power is being supplied to a cable to be connected.
- For the wiring connection, the short-circuit protection rating is 75 V at 240 V (AC). As a safety measure, always install a circuit breaker (an IEC 60898-compliant breaker, or a 5 A, 180 V or 220 V DC in an easily accessible location near the instrument. Moreover, provide indication that the switch is a device for turning off the power to the instrument.
- Install the power cable keeping a distance of more than 1 cm from other signal wires.
- The power cable is required to meet the IEC standards concerning the requirements of the area in which the instrument is being installed.
- Wiring should be installed to conform to NEC (National Electrical Code: ANSI/NFPA-70) or the wiring construction standards in countries or regions where wiring will be installed.
- If the shielding is provided to each relay output terminal is Functional insulation, provide Reinforced insulation to the external of the device as necessary. (Refer to the drawing before)

**Recommended Crimp-on Terminal Lug**

- **DC Relay Wiring**
  - Use one with a relay coil rating less than the PT's contact rating.
  - **AC Relay Wiring**
    - Use one with a relay coil rating less than the PT's contact rating.

**Transistor Output Wiring**

- Provide electricity from a single-phase power supply. If the power is noisy, install an isolator transformer on the primary side, and take a line filter on the secondary side. When measured against noise are taken, do not install the primary and secondary power cables close to each other.
- If there is a risk of external lighting surge, use a lightning arrester etc.
- For TC input, use shielded compensating lead wire for wiring. For RTD input, use shielded wires that have low conductor resistance and cause no significant differences in resistance between the three wires.
- Since the control output relay arm is a relay (resistance load of 100,000 times), use the auxiliary relay to perform ON/OFF control.
- The use of induction coil (LS) such as auxiliary relay coil, solenoid and solenoid valves causes malfunction or relay failure; always insert a CR filter for use with alternating current or a diode for use with direct current, as a spark-arrestor surge suppression circuit, into the line parallel with the load.
- After completing the wiring, the terminal cover is recommended to use for the instrument.

**How to Connect Wires**

- Wiring work must be carried out by a person with basic electrical knowledge and practical experience.
- Be sure to turn off the power supply to the controller before wiring to avoid an electric shock. Use a Lester or similar device to ensure that no power is being supplied to a cable to be connected.
- For the wiring connection, the short-circuit protection rating is 75 V at 240 V (AC). As a safety measure, always install a circuit breaker (an IEC 60898-compliant breaker, or a 5 A, 180 V or 220 V DC in an easily accessible location near the instrument. Moreover, provide indication that the switch is a device for turning off the power to the instrument.
- Install the power cable keeping a distance of more than 1 cm from other signal wires.
- The power cable is required to meet the IEC standards concerning the requirements of the area in which the instrument is being installed.
- Wiring should be installed to conform to NEC (National Electrical Code: ANSI/NFPA-70) or the wiring construction standards in countries or regions where wiring will be installed.
- If the shielding is provided to each relay output terminal is Functional insulation, provide Reinforced insulation to the external of the device as necessary. (Refer to the drawing before)
Do not use an unassigned terminal as the relay terminal.

Contact rating: 12 V DC, 10 mA or more

Contact output

Alarm-2 output

Alarm-3 output

(PV high limit)

4-20 mA DC, 5-20 mA DC or retransmission

Default: PV

Can be used for current/voltage pulse output and for control output. Current output range can be changed.

DI1

DI2

DI3

+5V

DI1 failure

DI1 No power

DI1 Communication timeout

DI1 Communication failure

Aux. analog input / Contact input

Remote input

Remote input / Contact input

Voltage (mV, V) input

4-20 mA DC,

0-20 mA DC,

0-2 V DC,

0-10 V DC

Remote input

4-20 mA DC

Current/voltage pulse output

Default: 4-20 mA DC

-212

210

208

206

205

15 V DC loop power supply

14.5-18.0 V DC

14.5-18.0 V DC

Can be used for 15 V DC loop power supply when not used for retransmission output.

DI1

DI2

DI3

+5V

DI1 failure

DI1 No power

DI1 Communication timeout

DI1 Communication failure

Aux. analog input / Contact input

Remote input

Remote input / Contact input

Voltage (mV, V) input

4-20 mA DC,

0-20 mA DC,

0-2 V DC,

0-10 V DC

Remote input

4-20 mA DC

Current/voltage pulse output

Default: 4-20 mA DC

-212

210

208

206

205

15 V DC loop power supply

14.5-18.0 V DC

14.5-18.0 V DC

Can be used for 15 V DC loop power supply when not used for retransmission output.

DI1

DI2

DI3

+5V

DI1 failure

DI1 No power

DI1 Communication timeout

DI1 Communication failure

Aux. analog input / Contact input

Remote input

Remote input / Contact input

Voltage (mV, V) input

4-20 mA DC,

0-20 mA DC,

0-2 V DC,

0-10 V DC

Remote input

4-20 mA DC

Current/voltage pulse output

Default: 4-20 mA DC

-212

210

208

206

205

15 V DC loop power supply

14.5-18.0 V DC

14.5-18.0 V DC

Can be used for 15 V DC loop power supply when not used for retransmission output.

DI1

DI2

DI3

+5V

DI1 failure

DI1 No power

DI1 Communication timeout

DI1 Communication failure

Aux. analog input / Contact input

Remote input

Remote input / Contact input

Voltage (mV, V) input

4-20 mA DC,

0-20 mA DC,

0-2 V DC,

0-10 V DC

Remote input

4-20 mA DC

Current/voltage pulse output

Default: 4-20 mA DC

-212

210

208

206

205

15 V DC loop power supply

14.5-18.0 V DC

14.5-18.0 V DC

Can be used for 15 V DC loop power supply when not used for retransmission output.

DI1

DI2

DI3

+5V

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DI1 No power

DI1 Communication timeout

DI1 Communication failure

Aux. analog input / Contact input

Remote input

Remote input / Contact input

Voltage (mV, V) input

4-20 mA DC,

0-20 mA DC,

0-2 V DC,

0-10 V DC

Remote input

4-20 mA DC

Current/voltage pulse output

Default: 4-20 mA DC

-212

210

208

206

205

15 V DC loop power supply

14.5-18.0 V DC

14.5-18.0 V DC

Can be used for 15 V DC loop power supply when not used for retransmission output.
7. Setup Procedure

The following flowchart shows the setup procedure for UT55A/MDL and UT52A/MDL.

Perform setup through communication or the LL50A Parameter Setting Software (sold separately).

For details, see the LL55A/MDL User’s Manual (IM OP IS501-01C1). For details, see the UT52A/MDL User’s Manual (IM OP IS505A-01C1). For details, see the UT55A/MDL User’s Manual (IM OP IS501C1). For details, see the UT52A/MDL User’s Manual (IM OP IS505A-01C1).

8. Operations

The controller status can be verified with the LED.

Check the operating status (run/stop, auto/manual, remote/local, etc.) of the controller through communication or the LL50A Parameter Setting Software (sold separately).

For details, see the (1) UT55A/MDL User’s Manual (IM OP IS501C1), (2) UT52A/MDL User’s Manual (IM OP IS505A-01C1), and (3) UT55A/MDL Parameter Setting Software User’s Manual (IM OP IS501-01C1).

9. Troubleshooting

If a problem appears to be complicated, contact our sales representatives.

For problems that can be confirmed by the user exclusively, refer to the text below.

For problems that need to be confirmed using the problem diagnosis table, refer to page 65.

For problems that need to be confirmed using the communication error table, refer to page 66.

For faults that need to be confirmed using the power function fault table, refer to page 67.

Get in touch with our sales representatives if you have any questions.

[Flowchart]

LED lamp

UT55A/MDL Front (with terminal cover)

UT52A/MDL Front (with terminal cover)

Check the operating status (run/stop, auto/manual, remote/local, etc.) of the controller through communication or the LL50A Parameter Setting Software (sold separately).

For details, see the (1) UT55A/MDL User’s Manual (IM OP IS501C1), (2) UT52A/MDL User’s Manual (IM OP IS505A-01C1), and (3) UT55A/MDL Parameter Setting Software User’s Manual (IM OP IS501-01C1).

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The following flowchart shows the setup procedure for UT55A/MDL and UT52A/MDL.

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For details, see the UT55A/MDL User’s Manual (IM OP IS501C1). For details, see the UT52A/MDL User’s Manual (IM OP IS505A-01C1).