

User’s Manual

TX1002, TX1003
Digital Thermometer
[Operation Manual]

Store this manual in an easily accessible place for quick reference.

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Yokogawa Test & Measurement Corporation

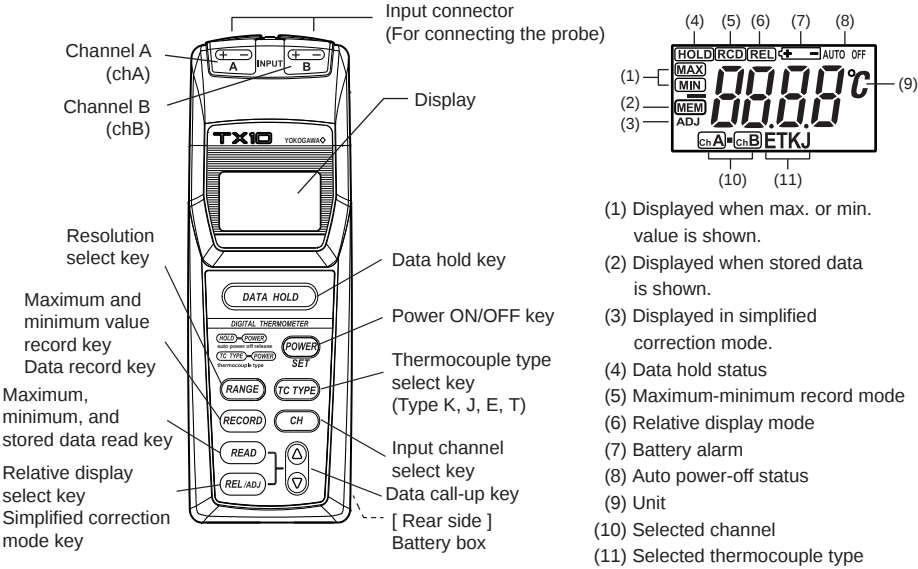
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IM TX10-02-02EN
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This user's manual describes the TX1003, which has more functions than the TX1002. However, with the exception of the **CH** key, operation of the TX1002 is performed in the same way.

7. Components and Functional Description

7.1 Components



7.2 Functional Description

To turn the power on and off

Key	Operation and description	Display
Power on POWER SET	- Press the POWER key to turn on the power. - The auto power-off function turns off the power automatically about 10 minutes after the last key operation of any key other than the POWER/SET key. - To disable the auto power-off function, turn off the power first if the power is already turned on. Then simultaneously press the POWER/SET and DATA HOLD key. This will keep the instrument turned on continuously. (If the instrument is used with the auto power-off function disabled, pay attention to the battery consumption.)	After the power has been turned on, all the elements of the display light up. AUTO OFF
Power off POWER SET	To turn off the power, press this key for 1 second or longer.	

To select the thermocouple type

TC TYPE + POWER SET ↓ TC TYPE ↓ POWER SET	To select a thermocouple type from K, J, E, and T: If the power is already turned on, turn it off. - Press and hold down the TC TYPE key while pressing the POWER/SET key to turn on the power. The thermocouple type and unit on the display flash, indicating that the instrument is ready for changing thermocouple type. - Every time the TC TYPE key is pressed the thermocouple type. - Press the POWER/SET key to accept the setting. TIP The factory-set default is type K.	K, J, E, T
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To select the input channel

CH (TX1003 only)	To select the input channel from channel A, B, or A-B: - Press the CH key. With each press, the display changes between A, B, and A-B, allowing you to select the input channel for measurement. NOTE - Channel switching is disabled during the RCD mode. - By switching the channels when data is being read, you can display the data of each channel: maximum and minimum values and measured data saved using the Memory-in function.	ChA ChB ChA - ChB
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To hold data

Hold DATA HOLD	Use this key to hold the measured value on LCD. To hold, press the DATA HOLD key.	HOLD
Release hold DATA HOLD	To cancel holding, press the DATA HOLD key again.	

This manual describes the specifications and handling precautions of the digital thermometer.
Before using this product, thoroughly read this manual to understand how to use it properly.

IM TX10-02E Safety Precautions, Specifications etc.
IM TX10-02-02EN: Operation Manual (This manual)

Contact information of Yokogawa offices worldwide is provided on the following sheet.

PIM 113-01Z2 Inquiries List of worldwide contacts

To select the resolution

RANGE	To select a display resolution: - Press the RANGE key. Every time this key is pressed, the display resolution alternates between 0.1°C and 1°C (within the range of -200.0°C to 199.9°C). If 0.1°C is selected, a resolution of 0.1°C is achieved when the display value is 199.9°C or below; when it goes over 200°C, the resolution changes to 1°C, and the number of display digits is switched automatically. When “chA-B” is selected, the display is switched to the input value of channel A or B, whichever is greater. TIP - The resolution setting is maintained even after the power is turned off. The next time the power is turned on, the instrument starts up with the setting that was set before the power was turned off. - Factory-set default is 0.1°C.	
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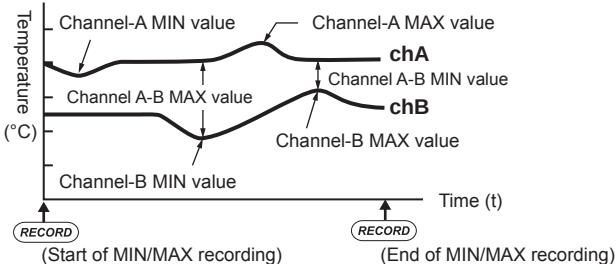
To turn relative display on and off

Relative display REL/ADJ	To select relative display: Press the REL key to select a relative display. The display shows the difference (relative value) of a subsequent measured value (Dx) from the reading given as a reference value (D1) when this key was pressed. Relative display value = Dx–D1	REL
Cancel relative display REL/ADJ	The reference value affects measurements on all channels (channel A, channel B and channel A-B). Any value among MAX, MIN and MEM can also be used as the reference value. To cancel relative display, press the REL key again.	

To turn simplified correction on and off

REL/ADJ ▲ ▼ POWER SET	To set the correction value for simplified correction: The current temperature reading can be corrected to a value based on the reference thermometer. By thus eliminating probe-specific errors, you can take precision measurements over a frequently used temperature range. NOTE When you change the measurement probe, the correction value must be set again regardless of the thermocouple type. - Press and hold the REL key about 3 seconds. The ADJ on the display flashes, indicating that the instrument is ready for setting. - Carry out the correction. While measuring the reference temperature, correct the display value to an optional value using the [▲] and [▼] keys. (The correction range is ±20°C of the measured value. Resolution of the correction value is determined according to the resolution setting.) TIP Holding down the [▲] or [▼] key increases the speed with which the display value changes. (a value continues to change) - Press the POWER/SET key to accept the setting.	ADJ flashes.
Simplified correction mode REL/ADJ Cancel simplified correction mode REL/ADJ	Use this key to enter and exit the simplified correction mode: - To enter, press the REL key for 1 to 2 seconds. - To exit, press the REL key for 1 to 2 seconds again.	ADJ

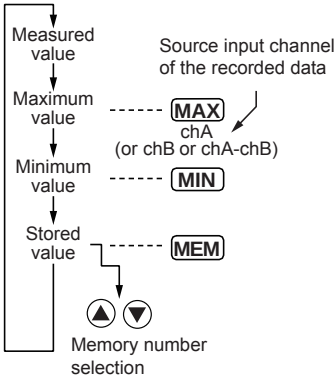
To record maximum and minimum values

Recording RECORD Cancel recording RECORD	Recording of the maximum and minimum values: Detection and recording of the max./min. values starts when the RECORD key is pressed and continues until this key is pressed again or the power is turned off. ■ To start recording, press the RECORD key. NOTE Enable the RCD mode after selecting the channel. ■ To stop the recording, press the RECORD key again. Measurement on channel A-B is done as described below. Press the READ key to read the minimum and maximum values. With the CH key, select channel A or B. The display shows the MIN and MAX values for each channel.  NOTE - The maximum and minimum values are stored in internal memory even after recording is cancelled. The data will be updated when the RCD mode is enabled again. - If you enable the RCD mode when the REL mode is active, the reading changes to a relative value. Nevertheless, the minimum and maximum of measured values (Dx) are stored in internal memory. - Recorded maximum and minimum values can be referenced even after the power is turned off and on again because they are stored in memory until the RCD mode is enabled next time. - Auto power-off is cancelled during the RCD mode.	RCD
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To store data in memory

DATA HOLD RECORD ▲ ▼ RECORD	To store data in internal memory (maximum of 10 data items): ■ Press the DATA HOLD key to hold the measured value. ■ Press the RECORD key. The display automatically shows the smallest memory number under which no data has been recorded. At this point, the MEM symbol turns on to indicate that the thermometer is in the “Memory-in” mode. ■ Select a memory number. Use the [▲] and [▼] keys to select a desired memory number under which you want to record data. In this step, you can also check the existing data value. TIP Pressing the DATA HOLD key while a memory number is being displayed cancels the memory-in function (returns to measurement mode). ■ Press the RECORD key to store the data. TIP The “HOLD” and “MEM” symbols indicate that the value recorded with the memory-in function is being held and shown. Press the DATA HOLD key to return to normal measurement mode.	HOLD MEM
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To read maximum and minimum values and stored data values

READ READ ▲ ▼	To read maximum and minimum values and stored data values from memory: ■ When the READ key is pressed, the display changes in the sequence shown in the figure on the right. ■ Select the memory number. For stored data, select the memory number using the [▲] or [▼] key. After the memory number has been displayed for a few seconds, the value stored in that memory is displayed. NOTE - This data reading is disabled during thermocouple type selecting or correction value setting. - If you press the READ key when the REL mode is active, each of the MIN, MAX and MEM values is shown as a relative value based on the reference value (D1). - The number of display digits of maximum and minimum/stored data depends on the current resolution setting, not the number of display digits at the time when the data was measured. Channel switching and display when data is being read (TX1003 only): ■ Single channel (either channel A or B) Using the CH key, display the channel used when the data was measured. All of the maximum, minimum, and stored data values can be displayed. ■ Two channels (channel A and B measurement) - Pressing the CH key to select channel A or B shows the minimum and maximum values, as well as the memory value, measured on that channel. - Pressing the CH key to select ‘chA-chB’ displays the stored values of the difference between channels A and B as well as the maximum or minimum difference values. 	
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Burnout indication

••••	- When the probe is not connected to the input connector (or the sensor opens), a burnout mark is displayed. - For the 2-channel mode, the burnout mark is displayed when the probe is not connected to the selected channel (channel A and B, or channel A-B)	
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To clear the memory

READ ▲ ▼ RECORD	To clear the recording memory: ■ Press the READ key to display stored data. ■ Select the memory number you wish to clear. Use the [▲] and [▼] keys to select a desired memory number. ■ Press the RECORD key to clear the data. To clear all the stored data in the memory at one time, press and hold the RECORD key for 1 to 2 seconds. TIP This operation does not affect the maximum and minimum values.	
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8. Measurement

This instrument can connect any of the 4 types of thermocouples: Type K, J, E, or T (it is set to Type K at shipment from the factory). Use an omega-type connector corresponding to the TC type for the probe.
[Procedure]

- (1) Load the batteries (see section "9. Battery Replacement").
- (2) Press the POWER/SET key to turn on the power.
When the power has been turned on, all indications on the display light up for about 2 seconds, then the measured value appears.

When the probe is not connected to the input connector, a burnout mark is displayed.

Burnout indication: - - - - °C
- (3) Check the thermocouple type.
If you wish to change the current setting, see "To select a thermocouple type" of section "6.2 Functional Description."
- (4) Select the input channel. (TX1003 only)
Press the CH key and select one channel from channel A, B, and A-B. (see "To select the input channel.")
- (5) Connect the probe to the input connector.
If you are using the 2-channel model (TX1003), connect the probe(s) to the channel(s) you are using. (The measured value appears.)
- (6) When you have finished measurement, turn off the power by pressing the POWER/SET key.
 - The power may be turned off by the auto power-off function during measurement. In this case, press the POWER/SET key to restart the instrument and continue measurement.
 - If the power is turned off and then on again, the instrument restarts with the same settings of the resolution (0.1°C or 1°C), input channel (channel A, B or A-B) and thermocouple type (K, J, E or T) as before it was turned off.

For other operations such as display hold, relative display, and maximum and minimum record/readout, see section "7.2 Functional Description."

NOTE

Key operation of this instrument is comparatively easy. However, it is necessary to make sure that the instrument is not mistakenly set to a state other than that intended. Note that, under normal measurement, “HOLD,” “RCD,” “REL,” “MAX,” “MIN,” and “MEM” are not displayed.

9. Battery Replacement

CAUTION

- When inserting batteries, be careful not to mistake the polarity as this can damage the instrument.
- When the instrument is to be stored for a long period of time, remove the batteries.
- Do not leave dead batteries in the instrument as doing so may result in a failure or malfunction of the instrument due to a leakage in battery liquid.
- Both batteries should be replaced with new ones at the same time as replacing only one of the batteries may result in the charge leaking from the new battery to the old.

Attention

- Lors de l'insertion des piles, faire en sorte de ne pas confondre de polarité, car cela risquerait d'endommager l'instrument.
- Si l'instrument doit être stocké pendant une longue période, retirer les piles.
- Ne pas laisser de vieilles piles usagées dans l'instrument, car cela risquerait sinon d'entraîner une défaillance ou un dysfonctionnement de l'instrument dû(e) à une fuite du liquide des piles.
- Les deux piles doivent être remplacées par des nouvelles en même moment, car le fait de n'en remplacer qu'une seule risque d'entraîner un transfert de charge de la nouvelle pile vers l'ancienne.

When the batteries approach the end of their lives, the  mark appears on the display. If this mark is displayed, replace the batteries.

To replace the batteries:

- (1) Remove the battery box cover from the back (rear) of the instrument.
Then replace the two AA alkaline dry batteries (LR6).
- (2) Refit the cover to the battery box.