YOKOGAWA

Ideal for temperature measurement, monitoring and management of temperature data records

Thermometers

TM10,20 / TX10

■ The TM Series offers excellent data management functions

- Collect up to 5000 data items with time-stamp, tag name and inspector name.
- Save 2 weeks continuous data logging with 1 minute interval, (up to 20000 data items, measuring interval is 1sec. to 24 houres.)
  Information on when , by whom and what is measured is saved along with the data.

■ The simplicity of the TX10 Series allows for ease of use.

- For K, E, J, and T type thermocouples
- Easy display switching between channels A and B

CE

Improved data management with inclusion of information on **when**, **by whom** and **what** is measured

TM Series of Thermo-Collectors

TM10 for Food & HACCEP use
TM20 for Industrial use

TM10 Thermistor model

Effective for HACCP program implementation

External probes (-30°C to 200°C)

There are three types available: a needle probe for mid-point temperature, a rounded end probe for liquid temperature, and a surface probe for surface temperature.

Built-in sensor (-20°C to 50°C)

Measures ambient temperature, and allows for continuous measurement inside a warehouse or during transportation.

Full Size

Light Weight: 170 g

Drip-proof construction (TM10/TM20)

Conforming to IP54 standards, the TM10/TM20 can still function even if it becomes wet to some degree. In addition, the optional waterproof cover increases waterproofing and protects the instrument against possible dirt contamination.

IP54
- 5: Drip-proof: Immune to any harmful effects from liquid splashes from any direction.
- 4: Dust-proof: Prevents dust from entering the instrument.

TM10/TM20 Common Features

Memory key

Each press of this key saves the measured data, along with 3 other monitoring items: the name of the object being measured, operator's name, and date and time of measurement.

Selection of registered tag name

Select from the list of up to 50 registered tag names (objects to be measured).

Input selection key

Collector/Logging mode selector key

Switches between the collector mode (saves measured data when necessary) and logging mode (saves measured data continuously).
- **When used in the collector mode only, saves up to 5000 data items.***
- **When used in the logging mode only, saves up to 20000 data items.***

Measuring interval: 1 second to 24 hours (Under simultaneous 2-channel measurement with the TM20, 2 seconds is the minimum.)
Start-of-measurement time: timer can be set.

*** Under simultaneous 2-channel measurement, the TM20 saves 2 data items for one measurement.**

User-friendly FUNC key

You can select setup items in the same way as you choose options from the built-in menu of a cellular phone.

Selection of operator name

With the (1) key, you can recall a list of up to 10 operator names and can also change any of these names.

Record-keeping on measurement failure handling

By pre-registering a list of up to 32 comments on how to handle particular measurement failures, you can keep records of how the measurement failure was dealt with by selecting the desired comment from the list using the (4) key.

(The TM10 supports this feature with TM10 Version 1.10 when used with application software version 1.30 or later.)

Setup keys

Register tag names, set alarm points, and define measuring conditions, such as the measuring interval for the logging mode. These setting tasks can also be carried out from a PC.

RS-232C I/O terminals

Used to exchange data with a PC or send data to a dedicated printer.

TM20 Universal dual inputs model

Simultaneous 2-channel measurement with thermocouple probes

You can select from types K, E, J, and T to change probes according to sensor type.

Full Size

Light Weight: 180 g

Thermocouple probes (-200°C to 1372°C)

Type K : -200°C to 1372°C
Type E : -200°C to 700°C
Type J : -200°C to 1000°C
Type T : -200°C to 400°C
(Possible temperature ranges with the TM20)

Analog signal input

The TM20 can accept inputs from a sensor that outputs voltage signals ranging ±100 mV or ±1 V.
* A U-shaped Miniature connector is required.

● Products that can be connected to the TM20

- Connecting the TM20 to various analog output sensors allows for data storage and management.
- The TM20 also has a scaling function that shows computed values on its display.

Clamp-on Testers (CL Series)

Digital illuminance meters (510 Series)

● Waterproof Cover and Soft Carrying Case

Waterproof cover
Model 93011 (for TM10/TM20)

With the waterproof cover, you can keep the TM10 clean and increase its waterproofing qualities.

Soft Case
Model 93010 (for TM10)
Model 93012 (for TM10/TM20)

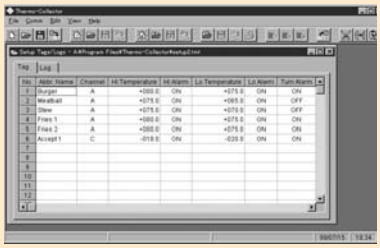
Can be attached to your belt.

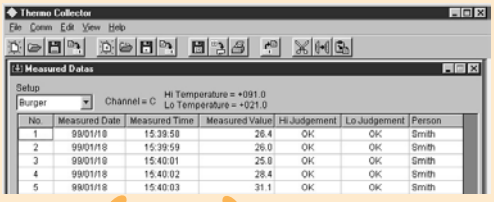
Data management is made easy because the TM10/TM20 records data items that tell you when, by whom, and what along with the temperature data.

Easy data management using a PC (data management software included)

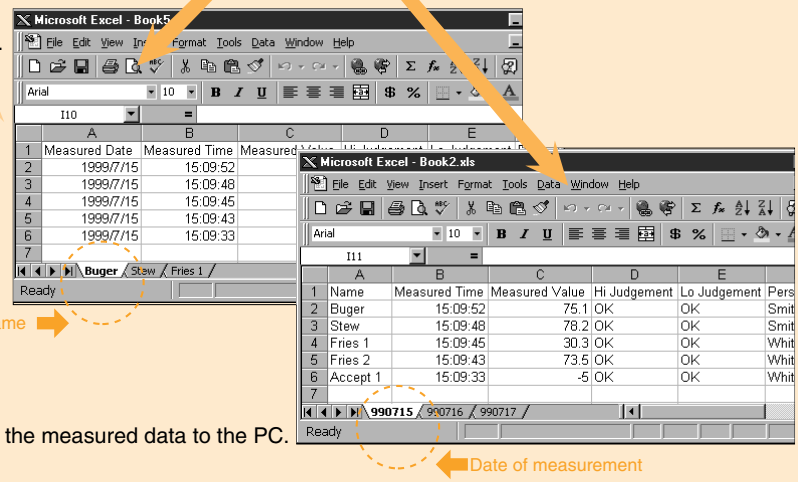
Setting measurement conditions from the PC.

(1) Download the measurement conditions to the TM10/TM20.





(2) Carry out measurement.

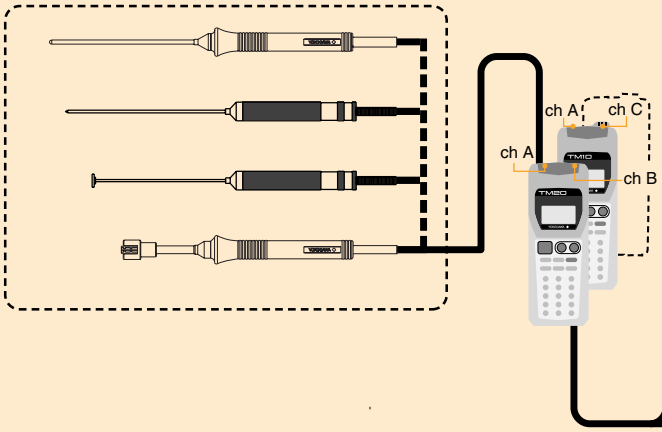


(3) Upload the measured data to the PC.

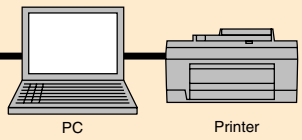
●Microsoft Excel spreadsheets are automatically generated for each object being measured (tag name) and each date of measurement. Data collected later can also be added to these spreadsheets.
The TM10 supports this feature with TM10 Version 1.10 when used with application software version 1.30 or later.

Configuration of a system based on the TM10/TM20 Thermo-collector

● **Probes for contact thermometry**



● **Data management based on easy-to-use application software**
(The software is supplied together with the TM10/TM20.)

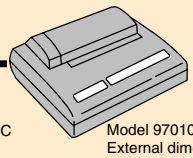


Real-time transmission is possible.*
The measured data can be transmitted to the PC in real-time during measurement.

* When performing real-time transmission, always use the non-contact probe.

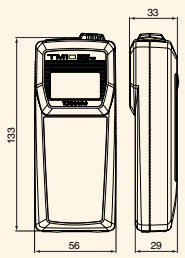
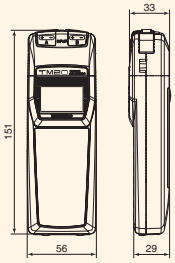
RS-232C interface cables:
Model 91011 (with 8-pin barrel and 9-pin D-sub connectors)

● **Data management through direct printing**



Model 91010 RS-232C interface cable (with 8-pin barrel and 9-pin D-sub connectors)

Model 97010 dedicated printer
External dimensions:
160 × 170 × 66.5 mm

Product name (Model)	**TM10 Thermo-collector Thermistor model (54051)**	**TM20 Thermo-collector Thermocouple model (54011)**
Number of measuring channels	1 (Selectable from 2 channels) One channel is provided for each of the external thermistor probe, and built-in thermistor sensor.	2 (when A and B channels are used for thermocouple or voltage input)
Measuring range (only the main unit)	External thermistor -30°C to 200°C Built-in thermistor -20°C to 50°C	Thermocouple Type K : -200°C to 1372°C Type J : -200°C to 1000°C Type E : -200°C to 700°C Type T : -200°C to 400°C Voltage input ±100 mV, ±1 V
Resolution	External thermistor: 0.1°C Built-in thermistor: 0.1°C	Thermocouple: 0.1°C Voltage input: 0.1 mV or 0.001 V
Accuracy (only the main unit)	External thermistor Temperature range (T) / Accuracy -30.0 to -19.9°C ±1.0°C -20.0 to -0.0°C ±0.4°C 0.1 to 99.9°C ±0.3°C 100.0 to 149.9°C ±0.4°C 150.0 to 200.0°C ±0.7°C Built-in thermistor Temperature range (T) / Accuracy -20.0 to 0.0°C ±1.0°C 0.1 to 39.9°C ±0.8°C 40.0 to 50.0°C ±1.0°C	Thermocouple -200.0 to 100.1°C : ±(0.1% of rdg + 0.7°C) -100.0°C or above : ±(0.1% of rdg + 1.0°C) *Accuracy of reference junction compensation is included ±0.4°C when the temperature of the input terminal is in equilibrium. Voltage input ±(0.1% of rdg + 0.2% of range)
Measuring mode	Collector mode or Logging mode	
Measuring interval	Collector mode: 1 second or longer Logging mode: 1 second to 24 hours	Collector mode: 0.5 seconds or longer when 1 channel is used. 1 second or longer when 2 channels are used. Logging mode: 1 second to 24 hours when 1 channel is used. 2 seconds to 24 hours when 2 channels are used.
Data capacity	5000 data items when used in collector mode only. 20000 data items when used in logging mode only. Measurement data obtained in collector mode and logging mode can coexist.	5000 data items when used in collector mode only. 20000 data items when used in logging mode only. Measurement data obtained in collector mode and logging mode can coexist. Under simultaneous 2-channel measurement, 2 data items are recorded at the same time.
Drip-proof construction	Conforms to IP54 standards (dust-proof and drip-proof requirements of IEC529)	
Display	LCD with backlight	
Operating temperature and humidity	-20°C to 50°C, 20 to 80% RH (no condensation)	0°C to 50°C, 20 to 80% RH (no condensation)
Power requirements	Two AA-size alkaline dry batteries (LR6)	
Battery life	Approx. 3 months when operated in logging mode at 10-minute intervals; Approx. 1 month when operated in logging mode at 1-minute intervals; Approx. 2 weeks when operated in collector mode 8 hours a day.	Approx. 1.5 months when operated in logging mode at 10-minute intervals; Approx. 1 month when operated in logging mode at 1-minute intervals; Approx. 5 days when operated in collector mode 8 hours a day including 30 minutes of communication.
Registration of tag names	A maximum of 50, each comprising up to 8 alphanumeric characters	
Registration of operator names	A maximum of 10, each comprising up to 8 alphanumeric characters	
Registration of comments	A maximum of 32, each comprising up to 8 alphanumeric characters	
Alarm function	Upper- and lower-limit alarms	
Computing function	Maximum, minimum, and average	Maximum, minimum, and average Reading of difference between the 2 channels is possible.
Communication function	Conforms to EIA RS-232C standard.	
Simplified correction function	None	Corrects the measured data from thermocouple input within the range of ±20.0°C.
Scaling function	None	Scales the voltage input x according to the formula “Ax + B,” which is defined from the thermo-collector software.
Other functions	Chime, function lock, clock display, auto power-off, and battery alarm	
Thermo-collector software system requirements	CPU: i486DX or higher OS: Windows 2000/Windows XP FDD: 3.5", 1.44 MB-formatted Required space on the HDD: 10 MB or greater Recommended memory capacity: 16 MB or greater Serial I/O capability: A serial port conforming to RS-232C standard should be available. Software: Microsoft Excel 95, Microsoft Excel 97	
Compliance with standards	EMC standards EMI (interference signal): EN55011;1998, EN61326-1;1998+A1 (Class B, Group 1) EMS (immunity): EN50082-1;1997, EN61326;1998+A1	
External dimensions	 Approx. 133(H) × 56(W) × 33(D) mm (excluding protrusions) Weight: Approx. 170 g (including batteries)	 Approx. 151(H) × 56(W) × 33(D) mm (excluding protrusions) Weight: Approx. 180 g (including batteries)
Supplied accessories	Software, two AA-size alkaline dry batteries (LR6), a waterproof cover, and an instruction manual	
Optional accessories	Standard needle probe (90010) High-speed needle probe (90011) Surface probe (90012) Rounded end probe (for liquid) (90013) Soft case (93010)	Temperature probes (for K type thermocouple): Rounded end probe (90020, 90021, 90022) Needle probe (90023, 90024) Surface probe (90030, 90031, 90032, 90033) Bead TC (245907) Extension cable 5 m (245921) /10 m (245922) Soft case (93012)
	●RS-232C cable for PC connection:9-pin (91011) ●AC adapter for printer:Europe (94006) / USA (94007) ●Printer (97010) ●RS-232C cable for printer connection (91010) ●Thermal paper for printer (10 rolls) (97080)●Waterproof cover (5 per package) (93011)	

Simplicity Allows for Ease of Use

TX10 Series of Digital Thermometers

TX10 Series offers thermocouple thermometers that support K, J, E and T type thermocouples. There are three models available: 1-channel single-function, 1-channel multi-function, and 2-channel multi-function models.

TX1001

1-channel Single-function Model (TX1001)

TC TYPE

Select the thermocouple type (K, J, E, and T) for the initial setting.
(The type K is factory-set at shipment)

Operation

Press and hold down the TC TYPE key while pressing the POWER key.
The TX10 enters the thermocouple type selection mode, and each press of the TC TYPE key switches between the thermocouple types.
Then accept the setting with the POWER key.
(Make sure that the characters in the display have changed.)

DATA HOLD

Press this key to hold the measured value.

Multi-function Models (TX1002/03)

- **Memory-in Function**
  Up to ten data items can be stored. When recalled, the stored data value is displayed with its memory number.
- **User calibration function**
  Calibration and adjustment can be mode easily by operating the panel keys on instrument and a measurement-standard.

TX1002 TX1003

TC TYPE

Thermocouple type (K, J, E, and T) select key
(Operation is the same as TX1001)

CH
(TX1003 only)

Input channel select key
With each press, the channel switches through the sequence of “chA,” “chB,” and then “chA-chB.”

DATA HOLD

Data hold key
A held measured value, can be stored in the memory of an optional memory number, which is selected with the ▲, ▼ keys.

RECORD

· Maximum and minimum record key
Stores the maximum and minimum values from the time the RECORD key is pressed.

· Data record key
Stores the held measured value in memory. (Up to ten)

RANGE

Resolution select key
With each press, resolution alternates between 0.1°C and 1°C.
(Within the range of -200.0°C to 199.9°C)

READ

Maximum and minimum values, and stored data read key
Every time this key is pressed, the maximum and minimum values, stored data, and the current measured data are displayed in sequence.

REL/ADJ

· Relative display select key
Displays measured values with reference to the value obtained immediately before this key was pressed (relative value). Each press of this key can select or release the relative display.

· Simplified correction mode key
Sets the correction value, and selects active/inactive of the simplified correction function.

▲, ▼ Data call-up key
Used to select a memory number when calling up stored data. Also used to adjust the correction value for simplified correction mode.

Light Weight: 180 g

(Shown above is the TX1003. The TX1002 has no CH key.)

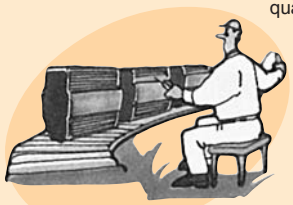
Can Be Used in Wide Variety of Applications

●Temperature management in a refrigerated warehouse

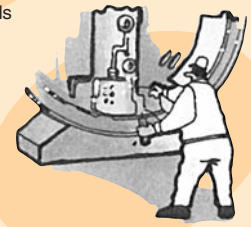
●Frozen food products quality control

●Perishable foods quality control

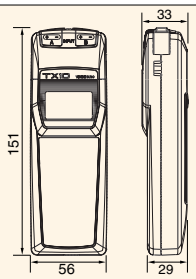
●Temperature management in production processes



●Product temperature measurement test



●Temperature checks in equipment maintenance
●Temperature management for research and development

Product name	Digital Thermometer		
	Single-function, 1 channel	Multi-function, 1 channel	Multi-function, 2 channels
Model	TX1001	TX1002	TX1003
Number of input channels	1		2
Measuring range (only the main unit)	Thermocouple type Type K: -200°C to 1372°C Type J: -200°C to 1000°C Type E: -200°C to 700°C Type T: -200°C to 400°C		
Resolution	-200.0°C to 199.9°C: 0.1°C 200°C or above: 1°C	-200.0°C to 199.9°C: 0.1°C or 1°C (when 1°C resolution is set) +200°C or above: 1°C	
Accuracy (only the main unit)	-200.0°C to -100.1°C: ±(0.1% of rdg + 1.0°C) -100.0°C to 199.9°C: ±(0.1% of rdg + 0.7°C) +200°C or above, or when 1°C resolution is set: ±(0.2% of rdg + 1°C) *Accuracy of reference junction compensation is included ±0.4°C when the temperature of the input terminal is in equilibrium.		
Temperature coefficient	± (0.015% of rdg +0.06°C)/°C		
Measurement interval	Approx. 1 sec.		Approx. 1 sec. (1 channel measurement) Approx. 2 sec. (2 channel measurement)
Data storage	None	Capable of storing up to 10 measured data items	
Simplified correction	None	Correction range: ±20°C of measured value	
Display items	HOLD,°C, ch A, TC type K, J, E, T, Battery alarm	HOLD, RCD, REL, ADJ, MAX, MIN, MEM, °C chA, TC type K, J, E, T Battery alarm	HOLD, RCD, REL, ADJ, MAX, MIN, MEM, °C chA, chB, chA-chB TC type K, J, E, T Battery alarm
Other functions	Auto power-off, battery alarm		
Display	LCD		
Operating temperature and humidity	0°C to 50°C, 20 to 80% RH (no condensation)		
Power requirements	Two AA-size alkaline dry batteries (LR6)		
Battery life	About 450 hours		
Drip-proof construction	Conforms to IP54 (dust-proof and drip-proof requirements of IEC529)		
Compliance with standards	EMC standards EMI (interference signal): EN55011;1998, EN61326-1;1998+A1 (Class B, Group 1) EMS (immunity): EN50082-1;1997, EN61326;1998+A1		
External dimensions	 Approx. 151(H) × 56(W) × 33(D) mm (excluding protrusions) Weight: Approx. 180 g (including batteries)		
Supplied accessories	Two AA-size alkaline dry batteries (LR6) and instruction manual		
Optional accessories	Temperature probes (for K type thermocouple) Rounded end probe (90020, 90021, 90022) Needle probe (90023, 90024) Surface probe (90030, 90031, 90032, 90033) Bead TC (245907) Extension cable 5 m (245921) /10 m (245922) Soft case (93012) Waterproof cover (5·per package) (93011)		

Specifications of Accessories

Probes for TM10

90010 Standard Needle Probe
90013 Rounded end Probe (for Liquid)

● Measuring range: -30°C to 200°C

Temperature range (T)	Accuracy	
-30°C ≤ T < -20°C	±1.0°C	(Typical)
-20 ≤ °C ≤ 0	±0.5°C	(Typical)
0 < °C < 100	±0.5°C	
100 ≤ °C < 150	±1.0°C	(Typical)
150 ≤ °C ≤ 200	±2.0°C	(Typical)

● Response: Approx. 6 seconds for 90% of final value

90011 High-speed Needle Probe
90012 Surface Probe

● Measuring range: -30°C to 200°C

Temperature range (T)	Accuracy	
-30°C ≤ T < -20°C	±2.0°C	(Typical)
-20 ≤ °C ≤ 0	±1.5°C	(Typical)
0 < °C < 100	±1.5°C	(Typical)
100 ≤ °C < 150	±1.5°C	(Typical)
150 ≤ °C ≤ 200	±2.5°C	(Typical)

● Response: Approx. 2 seconds for 90% of final value (90011)
Approx. 6 seconds for 90% of final value (90012)

Note: The accuracy ratings above were obtained with the measurement of liquids being agitated.

Probes for TM20/TX10

Temperature Probe (for type K)

Model	Probe type	Measuring range	Accuracy	Response time (second)	Sensor Dimenter / Length (m/m)	Cord length
90020	rounded end	-50 to 600°C	0.4% or ±1.5°C	1.4	φ3.2 / 200	1.2 m
90021	rounded end	-50 to 600°C	0.4% or ±1.5°C	0.4	φ1.6 / 150	1.2 m
90022	rounded end	-50 to 600°C	0.4% or ±1.5°C	1.4	φ3.2 / 500	1.2 m
90023	needle	-50 to 500°C	0.4% or ±1.5°C	0.4	φ1.6 / 100	1.2 m
90024	needle	-50 to 500°C	0.4% or ±1.5°C	1	φ2.1 / 100	1.2 m
90030	Surface straight	-20 to 250°C	0.75% or ±2.5°C	2	φ15 (temp. sensing portion)	1.2 m
90031	Surface angled	-20 to 250°C	0.75% or ±2.5°C	2	φ15 (temp. sensing portion)	1.2 m
90032	Surface straight	-20 to 500°C	0.75% or ±2.5°C	2	φ15 (temp. sensing portion)	1.2 m
90033	Surface angled	-20 to 500°C	0.75% or ±2.5°C	2	φ15 (temp. sensing portion)	1.2 m
245907	Bead TC	-40 to 260°C	0.75% or ±2.5°C		1200 (included cord)	

(90% response)

NOTE: 90030 is using polyimide to insulate from objects to be measured.
Manufacturers of polyimide are announcing not to apply polyimide directly for food, internal and body fluid.

Optional Accessories for TM10

Product name	Model
Standard needle probe	90010
High-speed needle probe	90011
Surface probe	90012
Rounded end probe (for liquid)	90013
Soft case	93010

Optional Accessories for TM10/TM20

Product name	Model
RS-232C cable for PC connection (9-pin)	91011
Printer	97010
AC adapter for printer (Europe)	94006
AC adapter for printer (USA)	94007
Thermal paper for printer (10 rolls)	97080
RS-232C cable for printer connection	91010

Optional Accessories for TM20/TX10

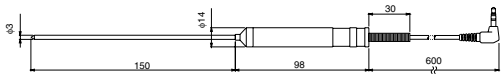
Product name	Model
Temperature probe (for type K)	90020/21/22/23/24/30/31/32/33
Bead TC (for type K)	245907
K-shape connector	99009
U-shape connector (for input voltage) (for TM20 only)	99008
Extension cable (5 m)	245921
Extension cable (10 m)	245922
Soft case	93012
Waterproof cover (5 per package) (for TM10, TM20, TX10)	93011

NOTE: Please purchase commercially available thermocouples (Type-E/J/T), connectors and extention cables.

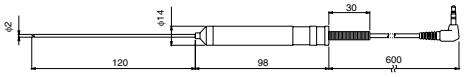
External Dimensions

TM10

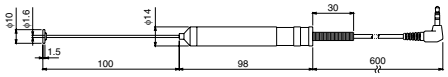
Standard needle probe (90010) / Rounded end probe (90013) / Material: SUS316



High-speed needle probe (90011) / Material: SUS316

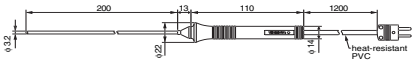


Surface probe (90012) / Material: SUS316

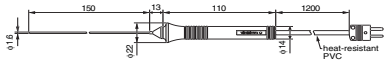


TM20 TX10

90020
Material:
SUS316



90021
Material:
SUS316



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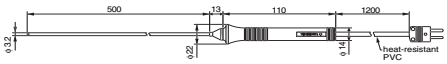

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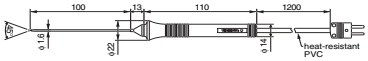

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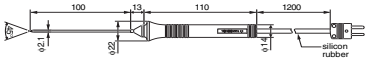

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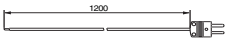

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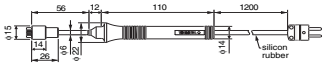

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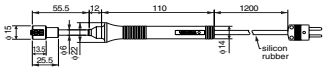

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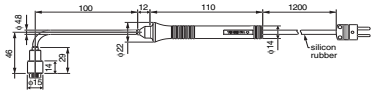

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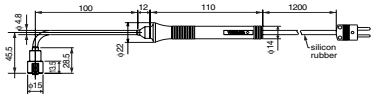

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⚠NOTICE
● Before using the product, read the instruction manual carefully to ensure proper and safe operation.

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[Ed: 06/b]
Printed in Japan: Jun. 2007(C)/1,000(KP)