Instruction manual

和文は裏面をご覧ください。

Temperature Sensor PC□ -700 series for Hand-Held Digital Indicator DFT-700

No.PCE71JE14 2022.02

Thank you for purchasing our temperature sensor PC□-700. This manual contains instructions for using temperature sensor PC□-700. Please read this instruction manual carefully before using the PC□-700. To prevent accidents arising from the misuse of temperature sensor PC□-700, please ensure the operator receives this manual.

Notes

- Please follow and observe Warnings and Cautions written in this manual, otherwise it may lead to serious injury or death.
- The contents written in this manual are subject to change without notice.
- Care has been taken to ensure that the contents of this instruction manual are correct, but if there are any doubts, mistakes or questions, please inform our sales department.
- Any unauthorized transfer or copying of this document, in part or in whole, is prohibited.
- SHINKO TECHNOS CO., LTD is not liable for any damage or secondary damage(s) incurred as a result of using this product, including any indirect damage.

SAFETY PRECAUTIONS

(Be sure to read these precautions before using our products)

⚠ Warning

Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.

⚠ Caution

Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product, if not carried out properly.

⚠ Warning

- Temperature sensor (hereinafter sensor) for the DFT-700 is designed to measure the temperature. Never use the sensor other than for measuring temperature.
- Never use sensors on the human body such as taking temperature.
- Adjust the DFT-700-M input specification to its sensor type. If it is not adjusted, a correct measurement value cannot be obtained. [The sensor type is written on the code terminal (e.g. K, Pt100) with its maximum measurable temperature.]
- Do not use the temperature sensor for measuring the surface of objects, liquids and the inside of objects, still or rotating objects or as the sensor for the surface of moving or rotating objects. It may lead not only to the malfunction and damage of the sensor, but it is also hazardous.
- When measuring an object through which current is running, a correct measurement value cannot be obtained, since the temperature sensing section is grounded.
- Do not touch the temperature sensing section or protective tube just after measuring, because it may lead to burns, frost bite or other injuries.

⚠ Caution

- The temperature indicated on the code terminal is the high limit temperature of the sensing section. Use the grip, cord, etc. in normal atmospheres (0 to 60℃) with the exception of the sensing part. Using them in high temperature atmospheres may lead to malfunction or ignition of the sensor.
- The grip of the sensor is not waterproof.
- When measuring under -50℃, sensors become less flexible and may easily break.
- Do not use the sensor at a location where there is electric noise such as strong magnetic field or high frequencies. The DFT-700-M and sensor may be damaged.
- Do not use the sensor in an atmosphere where there are corrosive substances such as acid or alkali, as they may degrade or cause malfunction.
- Do not cool rapidly by soaking the sensing section in water right after measuring high temperature. Otherwise, the sensor will malfunction.

⚠ SAFETY PRECAUTIONS

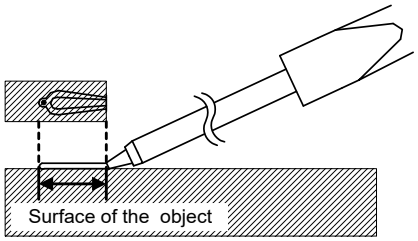
- To ensure safe and correct use, thoroughly read and understand this manual before using this instrument.
- This instrument is intended to be used for industrial machinery, machine tools and measuring equipment. Verify correct usage after consulting purpose of use with our agency or main office. (Never use this instrument for medical purposes with which human lives are involved.)
- Proper periodic maintenance is required as malfunction of this product could result in serious damage to the system or injury to personnel.
- This instrument must be used under the conditions and environment described in this manual. Shinko Technos Co., Ltd. does not accept liability for any injury, loss of life or damage occurring due to the instrument being used under conditions not otherwise stated in this manual.

⚠ Caution with Respect to Export Trade Control Ordinance

To avoid this instrument from being used as a component in, or as being utilized in the manufacture of weapons of mass destruction (i.e. military applications, military equipment, etc.), please investigate the end users and the final use of this instrument. In the case of resale, ensure that this instrument is not illegally exported.

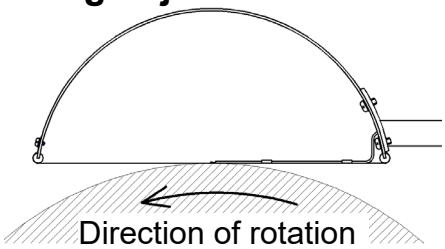
■ Using the temperature sensor on the surface of an object: PCE-701

- **Error through incorrect positioning**
  If the sensor is not used in the correct position, a correct measurement value cannot be obtained.
  Contact the temperature sensing section to the surface of the measured object so as not to leave a gap between them.



- **Condition of the surface of the object**
  When the surface of the object is not clean, measurement errors may occur. Clean the surface before measurement.
  (Make sure to clean the surface when its temperature is safe.)
  When the surface is not flat, measurement errors may occur.
  Measurement errors differ depending on the characteristics of the surface of the object.
  In order to decrease measurement errors, measure as flat a surface as possible.
- **Contact pressure to the surface of object**
  When contact pressure to the surface is sufficient, heat transition from the surface to the temperature sensing section is smooth and measurement errors tend to be small.
  But when excessive pressure is given to the surface, it may scratch the surface, deform or break the temperature sensing section of sensor.
  (Do not apply excessive tension beyond the capacity of the spring-like temperature sensing section of the sensor.)

■ Using the temperature sensor for the surface of a rotating object: PCE-702



• Error through incorrect positioning

If this sensor is not used in the correct position, correct measurement values cannot be obtained. Contact the temperature sensing section to the surface of the measured object so as not to leave a gap between them.
When the surface of object is rotating, errors may occur as a result of frictional heat.

• Condition of the surface of the object

When the surface of object is not clean, measurement errors may occur.
Clean the surface before measurement. (Make sure to clean the surface when its temperature is safe.)
When the surface is not flat, measurement errors may occur.
Measurement errors differ depending on the characteristics of the surface material of the object.
In order to decrease measurement errors, measure as flat a surface area as possible.
When measuring the surface of a cylindrical object, the contact area of the temperature sensing plate differs depending on its radius. The smaller the radius is, the larger the measurement errors tend to be, because the contact area is small.
When measuring the surface of a rotating object, do as the above graphic indicates.
Do not measure the temperature of an object when the direction of rotation is opposite, slant or vertical. This is dangerous, and the sensor may malfunction or break.

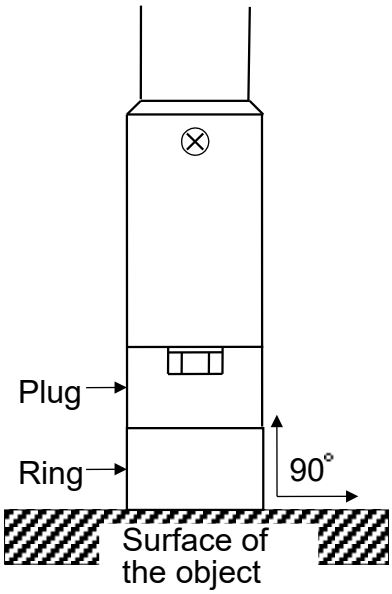
• Contact pressure to the surface of measured object

When contact pressure on the measuring surface is sufficient, heat transition from the surface to the temperature sensing section is smooth and measurement errors tend to be small.
But when excessive pressure is given to the surface, it may scratch the surface, deform or break the temperature sensing contact plate of the sensor.

■ Using the temperature sensor on the surface of a still object: PCE-707, 707L, 700M

• Error through incorrect positioning

If the sensor is not used in a correct position, a correct measurement value cannot be obtained.
Measure the temperature of the object by placing the sensor on the surface vertically. A slight slant affects the measurement value and causes error.
Do not move the sensor while it is pressed and touching the object surface. The temperature sensing section (Ribbon) might be defaced or damaged.



• Condition of the surface of the object

When the surface of the object is not clean, measurement errors may occur. Clean the surface before measurement.
(Make sure to clean the surface when its temperature is safe.)
When the surface is not flat, measurement errors may occur.
Measurement errors differ depending on the characteristics of the surface of measured object. In order to decrease measurement errors, measure as flat a surface as possible.
As this sensor is used for the surface of still object, it cannot measure the surface temperature of moving or rotating object.
Never measure the surface of moving or rotating object because it is hazardous and may damage the sensor.

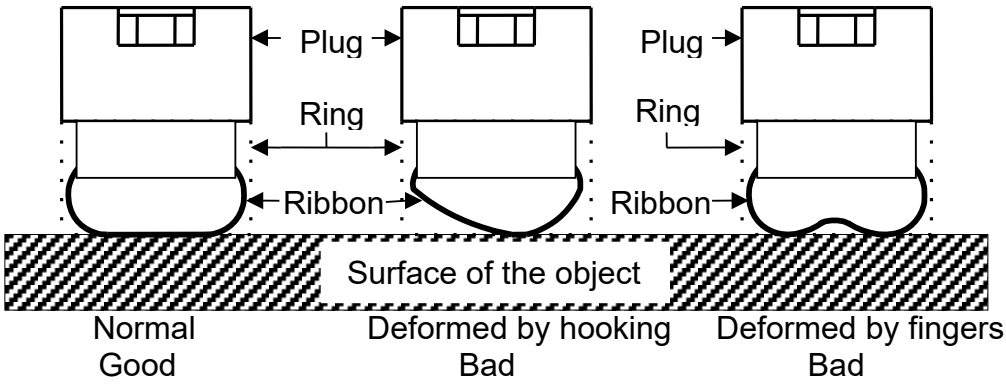
• Contact pressure to the surface

This sensor is designed to prevent its temperature sensing section (Ribbon) from excessive contact pressure by attaching a ring which acts as protection against deformation and damage to the temperature sensing section (Ribbon).
Such being the case, be sure to measure the temperature of objects that are bigger than the ring. Otherwise, the surface may be scratched, or the temperature sensing section (Ribbon) may deform or break.

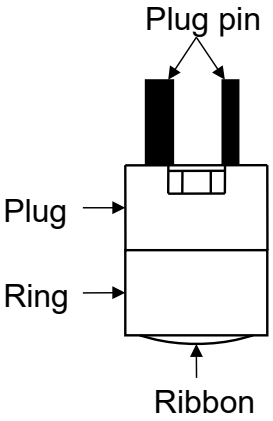
• Temperature sensing section (Ribbon)

While this sensor excels in responsiveness with an exposed temperature sensing section (Ribbon), it is a delicate instrument.
Responsiveness becomes worse and measurement errors occur as a result of the temperature sensing section (Ribbon) deformation caused by long term or inappropriate use of the sensor, dropping, hooking, or pressing the measured part with fingers.

Once the temperature sensing section (Ribbon) is deformed, it is impossible to repair. So be careful when handling.



■ Thermocouple for replacement (sold separately): PCE-H7



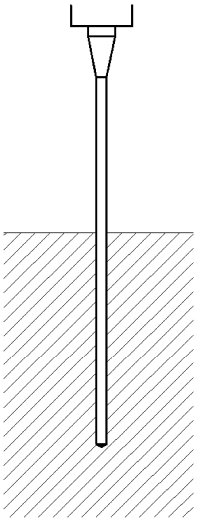
Thermocouple for replacement (hereinafter PCE-H7) is exclusively for the use of the PCE-707 and PCE-707L.

- **How to exchange PCE-H7 for a new one**

When replacing PCE-H7 with a new one, pull the PCE-H7 out from the sensor holding the ring and plug. Then insert the Plug pin into the socket of the sensor holding the Ring and Plug of the new PCE-H7. (**Never touch the Plug pin or Ribbon.**)

- **Refer to the Temperature sensor for the surface of still objects, for the explanation of "Error through incorrect positioning", "Condition of the surface of the object", "Contact pressure to the surface" and "Temperature sensing section (Ribbon)".**

■ Using the temperature sensor for liquids and the inside of an object: PCE-704, PCE-706, PCE-709, PCR-701



- **Insertion error**

The sensors include a temperature sensing element in a protective tube.
In order to measure temperature with less error, insert it into the object to the depth 10 times or more longer than the protective tube diameter.
When the insertion depth is not sufficient, measurement errors become large.
Apart from the above, when RTD (PCR-701) is used as a temperature sensing element, secure a 50mm length or longer for insertion.

- **Protective tube**

Among the sensors, some of them have a protective tube with a sharp tip, so care should be taken when handling.
Do not use excessive force to the protective tube, and do not bend, as the temperature sensing element will be damaged.

Guarantee and limitation of liability

Since the temperature sensor is a consumable, it is not subject to guarantee.
If any defect in manufacturing or malfunction by damage in transit is found, please contact a registered Shinko Technos agent or the retailer from which the unit was purchased.
SHINKO TECHNOS CO., LTD is not liable for any damage as a result of using this sensor.

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