HAND-HELD DIGITAL THERMO-HYGROMETER DFT-700-M

To prevent accidents arising from the misuse of this product, please ensure the operator receives this manual.

Notes

- This instruction manual should be used in accordance with the specifications described in the manual.
  If it is not used in accordance with the specifications, it may malfunction or breakdown.
- Be sure to follow all of the warnings and cautions. If they are not observed, serious injury or accidents may occur.
- The specifications of the DFT-700-M and the contents of this instruction 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.)

The safety precautions are classified into 2 categories: "Warning" and "Caution".
Depending on the circumstances, procedures indicated by ⚠ Caution may result in serious consequences, so be sure to follow the directions for usage.

⚠ **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

- To prevent an electrical shock or fire, only Shinko or other qualified service personnel may handle the inner assembly.
- To prevent an electrical shock, fire or damage to the instrument, parts replacement may only be undertaken by Shinko or other qualified service personnel.

⚠ 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 measuring equipment. Verify correct usage after purpose-of-use consultation with our agency or main office. (Never use this instrument for medical purposes with which human lives are involved.)
- External protection devices such as protective equipment against excessive temperature rise, etc. must be installed, as malfunction of this product could result in serious damage to the system or injury to personnel. Proper periodic maintenance is also required.
- 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.

⚠ Warning

- Do not use the DFT-700-M (hereafter DFT) and sensors on the human body.
- Do not direct sensors connected to the DFT toward the human body. If a sensor pierces the body, it may cause death or serious injury.
- The consequences of swallowing the AA alkaline batteries attached to the DFT are very dangerous.
  Keep the DFT, sensors and batteries away from children.

⚠ Caution

This instrument is intended to be used under the following environmental conditions.
- A minimum of dust, and an absence of corrosive substances or gases such as acid, alkali
- No flammable, explosive gases
- No mechanical vibrations or shocks
- No electric noise such as strong magnetic fields and high frequencies
- No exposure to direct sunlight, an ambient temperature of 0 to 50℃ (32 to 122℉) that does not
  change rapidly, and no icing
- No water, oil or chemicals or the vapors of these substances can come into direct contact with the unit.

Precautions for Use

⚠ Caution

- When inserting batteries to the DFT, do not confuse polarity (+, -) of the batteries.
  If they are inserted incorrectly, the DFT may breakdown.
- Be sure to remove the batteries from the DFT, if it is not used for a long time.
  Otherwise the batteries may leak and result in a breakdown or malfunction of the DFT.
- Never disassemble, modify or repair the DFT and sensors yourself.
  Doing so will void the guarantee for the DFT and sensors.
- Do not drop the DFT and sensors, strike them with hard objects, press hard on them, as this may lead
  to breakdown or malfunction.
- The heat resistance of the DFT, sensor knob and cable section is low, unlike the measuring part of the
  sensor (metal section), so use them in temperatures ranging from 0 to 50℃.
  Do not use them in or near water, as this may cause breakdown or malfunction.
- Do not use this instrument near flammable material since the case of this instrument is made of resin.
  Avoid setting this instrument directly on flammable material.
- Do not touch the sensor measuring part (metal section, etc.) and protection tube after measuring the
  temperature of hot or cold objects, as this may cause burning or frost burn.

About DFT-700 Sensor

⚠ Warning

- Sensors for the DFT-700 is for temperature measurement: Use it only for this purpose.
- Never use the sensor on the human body. (e.g. Taking body temperature, etc.)
- Be sure to turn power to the DFT-700-M OFF before attaching or detaching the hygrothermo transmitter
  (hereafter THD-700-P) to/from the DFT-700-M.
- Do not attach or detach the THD-700-P in a wet place or with wet hands because it may cause an
  electrical shock.

⚠ Caution

- Please adjust the sensor type to the DFT-700-M input. If the sensor type does not match the input type,
  reliable measured values cannot be obtained. The sensor type is written on the cord end along with its
  high limit measuring temperature. (e.g.) "K, Pt100"
- Reliable measured values cannot be obtained when measuring temperature in a place with an active current.
- The maximum measuring temperature written in the table is the limit temperature of the measuring part.
  Use a grip, cord, etc. at ambient temperature (0 to 50℃) except for the measuring part.
  Using them in a high temperature atmosphere may cause breakdown or ignition.
- Do not use this in a place with electric noise such as strong magnetic fields, high frequencies:
  The DFT-700-M and sensor may breakdown or be damaged.
- Do not use sensors in a place with a corrosive atmosphere such as acid, alkali, because it may hasten
  the sensor degradation and be responsible for breakdowns.
- Do not cool down the measuring part quickly by soaking it in water after measuring. That may cause a breakdown.
- Do not drop the sensors or the THD-700-P, strike them with hard objects or press hard on them, as this
  may lead to the breakdown or malfunction.
- Use THD-700-P under the conditions specified (for temperature, humidity, atmosphere, etc.).

DFT-700 Sensor Guarantee and Liability Limit

Since the sensors for temperature or humidity measurement are consumable, they are not guaranteed.
Contact our shop or sales office if there are any flaws caused during manufacturing or malfunctioning due to
accidents during shipment or transportation.
Shinko Technos Co., Ltd. is not liable for any damages incurred as a result of using these sensors.

1. Model

1.1 Model

DFT-700-<u>M</u>

Multi-range input: 4 types of thermocouple (K, R, B, S), RTD (Pt100) and Hygrothermo transmitter (THD-700-P) can be designated by front keypad.

Option: Square type connector for connecting sensors:
KC (K) for thermocouple K (Must be specified when ordering.)
KC (R) for thermocouple R (Must be specified when ordering.)
Only connectors for thermocouple K, R are optional.

1.2 Rated Input

• Thermocouple input

Input Type	Input Range		Resolution
K	-199.9 to 1370℃	-199.9 to 2500℉	0.1℃ (℉) *
R	0.0 to 1760℃	32.0 to 3200℉	0.1℃ (℉) *
B	0.0 to 1820℃	32.0 to 3300℉	0.1℃ (℉) *
S	0.0 to 1760℃	32.0 to 3200℉	0.1℃ (℉) *

* When indication is -199.9 to 999.9℃ (℉): Resolution 0.1℃ (℉)
When indication is 1000℃ (℉) or more: Resolution 1℃ (℉)

• RTD input

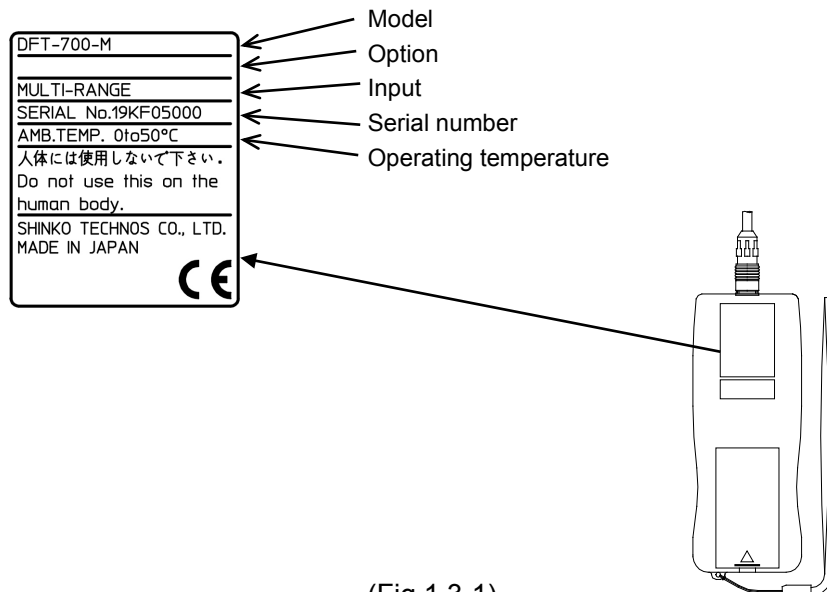| Input Type	Input Range		Resolution
Pt100	-199.9 to 850.0℃	-199.9 to 1500℉	0.1℃ (℉) *

* When indication is 1000℉ or more: Resolution 1℉

• Hygrothermo transmitter THD-700-P input

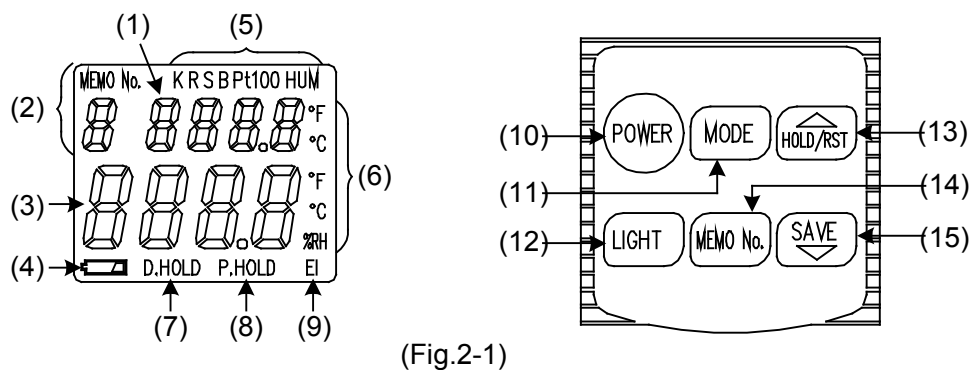| Input Type	Input Range	Resolution
Temperature sensor	-20.0 to 60.0℃	0.1℃
	-4.0 to 140.0℉	0.1℉
Humidity sensor	0.0 to100.0 %RH	0.1 %RH

1.3 How to Read Model Label

A model label is attached to the back of the case.

(Fig.1.3-1)

2. Names and Functions

(Fig.2-1)

(1) Data Display: Indicates the data memorized.
Indicates temperature data when the hygrothermo transmitter is connected.

(2) Memory No. Display: Indicates the memory number.
Indicates the memory number every 1.5 seconds when the hygrothermo transmitter is connected.

(3) PV Display: Indicates the PV (process variable).
Indicates the humidity data when the hygrothermo transmitter is connected.

(4) Battery life indication: Flashes when the battery voltage goes down.

(5) Sensor input indication: Indicates the sensor type being used.

(6) Unit indication: Indicates the current temperature, humidity unit.

(7) D. HOLD indication: Indicates when the Data HOLD function is set.

(8) P. HOLD indication: Indicates when the Peak HOLD function is set.

(9) Immersion type thermocouple: Indicates when the immersion type thermocouple is selected.

(10) POWER key: Pressing the POWER key turns the power ON, Displays light, and the unit enters Measuring mode. Pressing the POWER key again turns off the power and Displays.

(11) MODE key: Pressing the MODE key for 1 second turns the Measuring mode to the Peak HOLD (P.HOLD) measuring mode, and "P.HOLD" is indicated.
Pressing the MODE key again for 1 second reverts to the Measuring mode, resets the held data, and "P.HOLD" turns off.

(12) LIGHT key: Pressing the LIGHT key turns on the backlight, which turns off automatically after 10 seconds.

(13) HOLD/RST/▲key: If the HOLD/RST/▲ key (hereafter ▲ key) is pressed in Measuring mode, the data when the ▲ key is pressed is held, and the "D.HOLD" is indicated.
Regardless of the input burnout, the held data is still indicated until Data HOLD is cancelled. Pressing the ▲ key again makes the D.HOLD turn off, resets the held data, and reverts to Measuring mode.

In the Peak HOLD (P.HOLD) measuring mode, the held data is cleared by pressing the ▲ key, and the measured data when the ▲ key is pressed is indicated.

In Immersion type thermocouple measuring mode, pressing the ▲ key while holding data (flashing) changes it to the Measuring mode.

(14) MEMO No. key: By pressing the MEMO No. key, the unit enters the Data memory mode, and the MEMO No. and its data [A maximum of 10 (0 to 9) can be memorized] are indicated on the Displays.
By pressing the MEMO No. key again, the next MEMO No. and its data are indicated.

When hygrothermo transmitter is connected, current values (temperature and humidity) and memory data are alternately indicated every 1.5 seconds.
If the MEMO No. key is held down for 2 seconds, Data memory mode is cancelled, and the unit reverts to Measuring mode.

4

(15) SAVE/▼key: When the "MEMO No." is lit on the Display, the values indicated on the PV, DATA
Displays or each held value are memorized by pressing the SAVE/▼ key (hereafter ▼ key).
When the hygrothermo transmitter is connected, the current value (temperature and humidity)
and memory data are alternately indicated every 1.5 seconds.

3. External Dimensions

(Scale: mm)

(Fig. 3-1)

4. Preparation for the Measurement
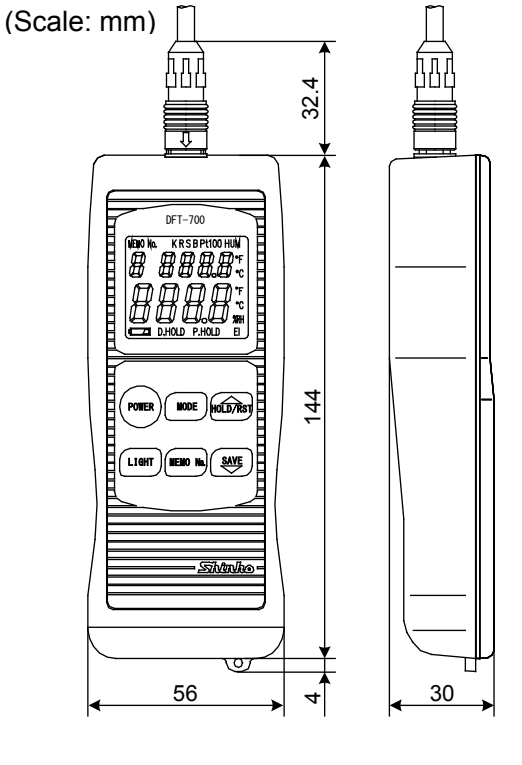
4.1 How to Insert and Remove the Batteries

The explanation written below is based on the condition
that the power supply to the DFT is OFF. Therefore, if the
power supply to the DFT is ON, turn the power OFF by
pressing the POWER key.

(1) Push the battery case cover up in the direction indicated
by arrow ①, then swing the cover open in the direction
indicated by arrow ②.
The battery case cover will come off. (Fig.4.1-1)

(2) **When inserting the batteries**
Insert the batteries in the direction as shown in the
battery case. Insert as indicated by ③, and then swing
them in ④ (Fig.4.1-2). If batteries are inserted correctly,
"DFT-700" is indicated on the LCD Display for 5 seconds,
and then the power switches OFF.

When removing the batteries
After making sure that power is OFF, push the positive
(+) side of the batteries up in the direction indicated by
⑤, then swing them in the direction indicated by ⑥,
and remove them. (Fig.4.1-3)

(3) After setting batteries in the battery case, insert the case cover in the direction indicated by ⑦, then
swing it closed ⑧. Press the battery case cover until a "Click" is heard. (Fig.4.1-4)

Even if batteries are changed, the set values and memory data are not erased.
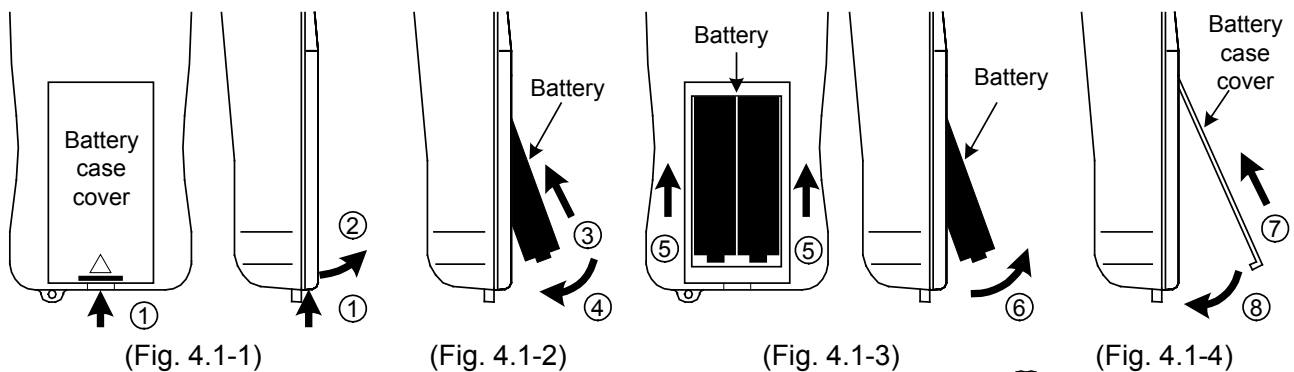
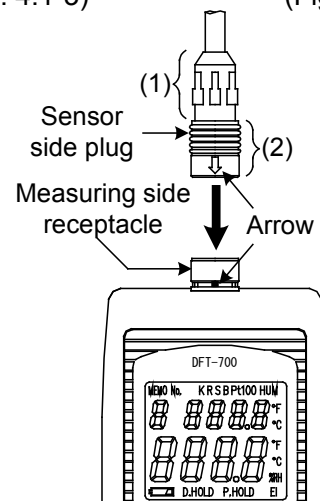(Fig. 4.1-1)   (Fig. 4.1-2)   (Fig. 4.1-3)   (Fig. 4.1-4)

4.2 How to Connect Sensors

Insert the sensor side plug (hereafter plug) to the measuring
side receptacle (hereafter receptacle) matching the arrow
on the plug with the one on the receptacle.
When inserting the plug, hold section (1) of the plug.

When pulling out the plug from the receptacle, hold section (2)
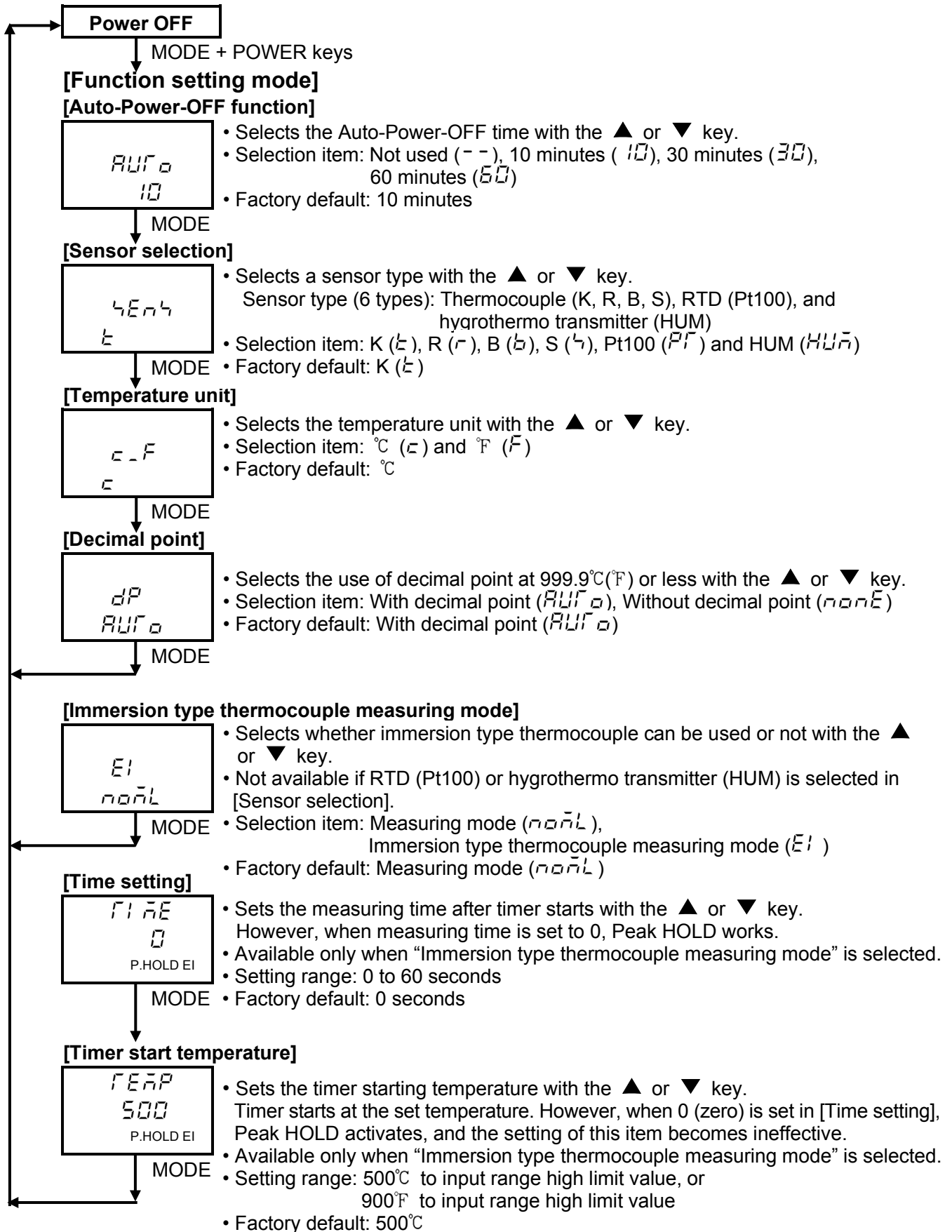of the plug.

(Fig. 4.2-1)

4.3 Setup

Press the MODE and POWER keys (in that order) together when power to the instrument is OFF.
As Function setting mode items are indicated, set up the DFT-700-M.
However, if user's specifications are the same as the default value of the DFT-700-M, it is not necessary to set up the DFT-700-M.
After setup of the DFT-700-M is complete, power is automatically turned off.

Power OFF

↓ MODE + POWER keys

[Function setting mode]

[Auto-Power-OFF function]

AUTo
10

- Selects the Auto-Power-OFF time with the ▲ or ▼ key.
- Selection item: Not used (− −), 10 minutes (*10*), 30 minutes (*30*), 60 minutes (*60*)
- Factory default: 10 minutes

↓ MODE

[Sensor selection]

SEnS
t

- Selects a sensor type with the ▲ or ▼ key.
  Sensor type (6 types): Thermocouple (K, R, B, S), RTD (Pt100), and hygrothermo transmitter (HUM)
- Selection item: K (*t*), R (*r*), B (*b*), S (*S*), Pt100 (*Pt*) and HUM (*HUM*)
- Factory default: K (*t*)

↓ MODE

[Temperature unit]

c_F
c

- Selects the temperature unit with the ▲ or ▼ key.
- Selection item: ℃ (*c*) and ℉ (*F*)
- Factory default: ℃

↓ MODE

[Decimal point]

dP
AUTo

- Selects the use of decimal point at 999.9℃(℉) or less with the ▲ or ▼ key.
- Selection item: With decimal point (*AUTo*), Without decimal point (*nonE*)
- Factory default: With decimal point (*AUTo*)

↓ MODE

[Immersion type thermocouple measuring mode]

EI
noriL

- Selects whether immersion type thermocouple can be used or not with the ▲ or ▼ key.
- Not available if RTD (Pt100) or hygrothermo transmitter (HUM) is selected in [Sensor selection].
- Selection item: Measuring mode (*noriL*), Immersion type thermocouple measuring mode (*EI*)
- Factory default: Measuring mode (*noriL*)

↓ MODE

[Time setting]

TIriE
0
P.HOLD EI

- Sets the measuring time after timer starts with the ▲ or ▼ key.
  However, when measuring time is set to 0, Peak HOLD works.
- Available only when "Immersion type thermocouple measuring mode" is selected.
- Setting range: 0 to 60 seconds
- Factory default: 0 seconds

↓ MODE

[Timer start temperature]

tEriP
500
P.HOLD EI

- Sets the timer starting temperature with the ▲ or ▼ key.
  Timer starts at the set temperature. However, when 0 (zero) is set in [Time setting], Peak HOLD activates, and the setting of this item becomes ineffective.
- Available only when "Immersion type thermocouple measuring mode" is selected.
- Setting range: 500℃ to input range high limit value, or 900℉ to input range high limit value
- Factory default: 500℃

↓ MODE

4.4 Site Selection for Measurement

This instrument is intended to be used under the following environmental conditions.

• A minimum of dust, and an absence of corrosive substances or gases such as acid, alkali
• No flammable, explosive gases
• No mechanical vibrations or shocks
• No electric noise such as strong magnetic fields and high frequencies
• No exposure to direct sunlight, an ambient temperature of 0 to 50℃ (32 to 122℉) that does not change rapidly, and no icing
• No water, oil or chemicals or the vapors of these substances can come into direct contact with the unit.

5. Measurement

5.1 Measuring Mode

(1) Turn the power ON by pressing the POWER key.

(2) To measure temperature, let the temperature sensor for the DFT-700 (hereafter sensor) contact the object to be measured or insert the sensor into the object.
To measure both temperature and humidity, put the hygrothermo transmitter (THD-700-P) in the place where the measurement is desired.

(3) Data HOLD function
While the sensor is measuring temperature, if the ▲ key is pressed, "D.HOLD" is indicated, and temperature data currently indicated on the Display is held.

While the hygrothermo transmitter (THD-700-P) is measuring temperature and humidity, if the ▲ key is pressed, "D.HOLD" is indicated, and the temperature and humidity data currently indicated is held. (Temperature is indicated on the Data Display and humidity on the PV Display.)

To cancel the Data HOLD, press the ▲ key again. "D.HOLD" will turn off, and the unit reverts to Measuring mode.

(4) Peak HOLD function
While the sensor is measuring temperature, if the MODE key is pressed for 1 second, "P.HOLD" is indicated, and the maximum value of the temperature data currently indicated is held.
While the hygrothermo transmitter (THD-700-P) is measuring temperature and humidity, if the MODE key is pressed for 1 second, "P.HOLD" is indicated, and the maximum value of humidity data currently indicated and temperature data when humidity data is at maximum are held.
(Temperature is indicated on the Data Display and humidity on the PV Display.)
If this function is selected, the indicated values will not be updated as long as temperature and humidity do not exceed the currently indicated values.

To cancel the Peak HOLD function, press the MODE key again for 1 second.
"P.HOLD" will turn off, and the unit will revert to Measuring mode.

(5) Memory function
A maximum of 10 (0 to 9) pieces of data can be memorized and indicated again.

• Memorizing and retrieving the indicated data
① Press the MEMO No. key.
While the sensor is measuring temperature, "MEMO No. 0", memory data and the data currently measured are indicated on the Displays, and the mode switches to Data memory mode.
While the hygrothermo transmitter (THD-700-P) is measuring temperature and humidity, "MEMO No. 0" and memory data are indicated on the Displays for 1.5 seconds.
After 1.5 seconds "MEMO No. 0" and memory data disappear, then the current temperature and humidity data are indicated. (These indications repeat every 1.5 seconds.)
Data which has not been memorized is represented as [‐ ‐ ‐ ‐].
② Press the ▼ key while the data is indicated.
The data when the ▼ key is pressed is memorized at "MEMO No. 0" currently indicated.
③ The next memory number "MEMO No. 1" is indicated by pressing the MEMO No. key again.
To retrieve the memorized data, keep pressing the MEMO No. key until the desired memory number appears.

• Canceling Data memory mode
Press the MEMO No. key for 2 seconds or more to cancel Data memory mode.
"MEMO No. " on the Display will turn off, and Data memory mode will be cancelled.

• Clearing the memorized data
① Press the POWER key in Measuring mode to turn the power to the DFT OFF.
② Press the MEMO No. key and POWER key (in that order) together.
(Keep pressing the MEMO No. key until Measuring mode appears.)
All data memorized by the memory function will be cleared.

(6) Backlight function
When it is too dark to see the LCD Display, press the LIGHT key.
A backlight lights up. (The backlight automatically turns off in 10 seconds.)

5.2 Immersion Type Thermocouple Measuring Mode
(1) Turn the power ON by pressing the POWER key.

(2) If the unit is in Measuring mode, change the mode to Immersion type thermocouple measuring mode referring to Section "4.3 Setup". "EI" is indicated at the bottom right of the display if Immersion type thermocouple measuring mode is selected.
However, even if Immersion type thermocouple measuring mode is selected, if the time is set to 0 (zero) in [Time setting], the mode switches to the Peak HOLD measuring mode, and "P.HOLD EI" is indicated at the bottom right of the display.

(3) Temperature measurement starts.
• When "EI" is indicated at the bottom right of the display:
If temperature exceeds the value which was preset in [Timer start temperature], the timer starts.
After it starts, when the preset time has passed, the temperature data is held and flashes.
(When Auto-Power-OFF is set, at this moment Auto-Power-OFF time counting starts.
Unless the DFT is operated within a preset time, the power is automatically turned off.)
To cancel the flashing indication, press the ▲ key. The flashing indication will be cancelled, and the current temperature will be indicated.
However, even if flashing is cancelled, when the indicated temperature is higher than the value that was set in [Timer start temperature], the EI function does not work.
To start the EI function again, be sure to let the indicated temperature be [Timer start temperature – 5℃ (10℉)] or less.

• When "P.HOLD EI" is indicated at the bottom right of the display:
This is Peak HOLD (P.HOLD) measuring mode. (When Auto-Power-OFF is set, the power is automatically turned off unless the DFT is operated within a preset time.)
To cancel Peak HOLD (P. HOLD), press the ▲ key.
The held data will be cleared by pressing the ▲ key, and the measured value when the ▲ key is pressed will be indicated.

(4) Memory function
A maximum of 10 (0 to 9) pieces of data can be memorized and re-indicated.

• Memorizing and retrieving the indicated data
① Press the MEMO No. key.
While temperature is being measured, MEMO No. 0, memory data and the data being measured are indicated on the Displays, and the mode switches to Data memory mode.
Data which has not been memorized is represented as [– – – –].
② Press the ▼ key while the data is indicated.
The data when the ▼ key was pressed is memorized at "MEMO No. 0" which is currently indicated.
③ The next memory number "MEMO No. 1" is indicated by pressing the MEMO No. key again.
To indicate the desired memory number, keep pressing the MEMO No. key until it appears.

• Canceling Data memory mode
Press MEMO No. key for 2 seconds or more to cancel Data memory mode.
The "MEMO No." will disappear, and Data memory mode will be cancelled.

• Clearing the memorized data
① Press the POWER key in Measuring mode, then the power to the DFT is turned OFF.
② Press the MEMO No. key and the POWER key (in that order) together.
(Press the MEMO No. key until the mode turns to Measuring mode.)
All data memorized by the memory function will be erased.

(5) Backlight function
When it is too dark to see the LCD Display, press the LIGHT key.
A backlight lights up. (A backlight automatically turns off in 10 seconds.)

Note
In the case of immersion type thermocouple measuring mode, the Data HOLD (D.HOLD) function does not work.

6. Other Functions

- **Automatic cold junction temperature compensation (Only thermocouple input)**
  This detects the temperature at the connecting terminal between the thermocouple and the DFT, and constantly maintains it at the same status as if the reference junction location temperature were at 0℃ (32℉).

- **Auto-Power-OFF**
  In order to prevent battery power consumption, DFT power is automatically turned off unless the DFT is operated within the preset time. (Default value: 10 minutes)
  However, when measuring in Immersion type thermocouple measuring mode (when timer is active), power to the DFT is automatically turned off after timer action is over (Data on the PV Display flashes) unless the DFT is operated within the preset time.

- **Auto-range**
  When the PV indication changes from 999.9 to 1000℃ (℉), the resolution automatically changes from 0.1℃ (℉) to 1℃ (℉).

- **Immersion type thermocouple measuring mode (EI)**
  In the case of Immersion type thermocouple measuring mode, if temperature exceeds the preset timer start temperature, the timer starts a countdown, and the data on the PV Display is held after the end of the timer, and the indication flashes.
  (Held value indicates the value when the time is up regardless of sensor burnout.)
  However, after flashing is cancelled or power is turned on, if the indicated temperature is higher than the value preset in [Timer start temperature], the EI function does not work.
  To start the EI function again, be sure to set the indication temperature to [Timer start temperature – 5℃ (10℉)] or less.

- **Decimal point place indication**
  It is possible to set the decimal point to 999.9℃(℉) or less.
  However, if the decimal point is set not to be used, the resolution turns from 0.1℃ (℉) to 1℃ (℉).

- **Battery life indication**
  When the battery voltage wanes, the Battery life indication flashes to indicate that it is time to change batteries.

- **Input burnout indication**
  [Overscale]
  For thermocouple and RTD input, [‾ ‾ ‾ ‾] flashes on the PV Display if the sensor is burnt out or if the value exceeds the input range high limit value.
  [Immersion type thermocouple measuring mode (EI) does not have this function.]
  However, during Data HOLD, the held value is indicated by priority.

  Hygrothermo transmitter (THD-700-P) input:
  For the temperature sensor (TD-S), if the sensor is burnt out or if the value exceeds the input range high limit value, [‾ ‾ ‾ ‾] flashes on the Data Display.
  For the humidity sensor (HD-S2), if the value exceeds the input range high limit value, [‾ ‾ ‾ ‾] flashes on the PV Display.
  If the humidity sensor (HD-S2) is burnt out, [‾ ‾ ‾ ‾] flashes or "0.0" is indicated on the PV Display.
  However, during Data HOLD (D.HOLD), the held value is indicated by priority.

  [Underscale]
  For thermocouple and RTD inputs, if the value drops below the input range low limit value, [_ _ _ _] flashes on the PV Display.
  However, during Data HOLD (D.HOLD), the held value is indicated by priority.

  Hygrothermo transmitter (THD-700-P) input:
  For the temperature sensor (TD-S), if the value drops below the input range low limit value, [_ _ _ _] flashes on the Data Display.
  For the humidity sensor (HD-S2), if the value drops below the input range low limit value, "0.0" is indicated on the PV Display.
  However, during Data HOLD (D.HOLD), the held value is indicated by priority.
  If sensor is burnt out in Immersion type thermocouple measuring mode (EI), [_ _ _ _] flashes on the Data Display.

- **Temperature unit selection**
  Temperature unit ℃ or ℉ can be selected. (Factory default: ℃)

- **Memory backup**
  Backs up the memory data when changing batteries.

- **Memory data clearing**
  If the power is turned on by the POWER key while holding down the MEMO No. key, all memorized data reverts to the factory default value [‾ ‾ ‾ ‾].
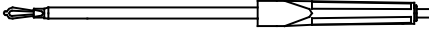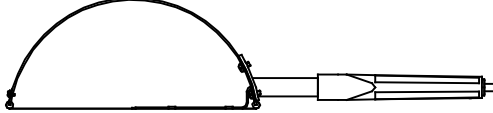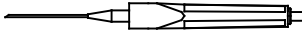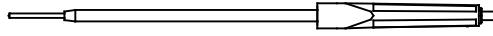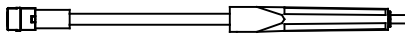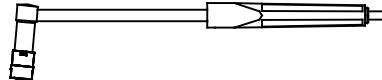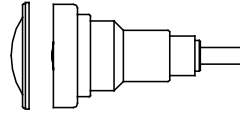
7. Sensors

Use the specific sensors for the DFT-700-M (Sold separately) below.
We are ready to manufacture the sensors other than the ones described below to customize to your needs, so please consult the agency or the shop where you purchased this instrument.

7.1 Thermocouple (K)   (Abbreviation: Temp.: Temperature)

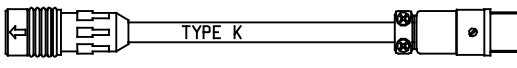| Model	Drawing	Main objects	Measuring temp. range
PCE-701		For measuring general surface temperature	0 to 400℃
PCE-702		For measuring curved surface temperatures	0 to 400℃
PCE-704		For measuring temperature of interiors of objects and liquids	0 to 400℃
PCE-706		For measuring temperature of interiors of objects and liquids	0 to 400℃
PCE-707		For measuring general surface temperature	0 to 400℃
PCE-707L		For measuring general surface temperature	0 to 400℃
PCE-H7		Exclusive use tip for PCE-707, 707L (for exchange)	0 to 400℃
PCE-709		For measuring temperature of interiors of objects and liquids (Direct mounting to the DFT)	0 to 400℃
PCE-700-M		For measuring molded surface temperature, etc. (Magnetic type)	0 to 300℃

7.2 RTD (Pt100)

Model	Drawing	Main objects	Measuring temp. range
PCR-701		For measuring temperature of interiors of objects and liquids	0 to 400℃

7.3 Hygrothermo Transmitter

Model	Drawing	Measuring range
THD-700-P		Temperature: 0 to 50℃ Humidity: 20 to 90 %RH

7.4 Conversion Plug

Model	Drawing	Note
PCE-CP7	TYPE K	Temperature sensors for the DFT-600 (thermocouple K) can be connected to the DFT-700, by using this plug.

7.5 Sensor Lead Wire   Standard wire length: 1 m

8. Specifications

8.1 Standard Specifications

Name: Hand-held digital thermo-hygrometer

Model: DFT-700-M

External dimensions: 56 x 144 x 30 mm (W x H x D) [excluding protruding portion]

Display: Electric field effect type liquid crystal (with backlight)

Input: Thermocouple: K, R, S (100 Ω max.), B (40 Ω max.)
RTD: Pt100, 3-wire type
Hygrothermo transmitter THD-700-P: RTD: Pt100 3-wire type
　　　　　　　　　　　　　　　　　　Humidity sensor: 0 to 1 V DC
　　　　　　　　　　　　　　　　　　(Corresponding to 0 to 100 %RH)

Indicating accuracy: Thermocouple input: Within ±0.2% of FS ±1 digit, however,
　　R, S: 0.0 to 100.0℃ (0.0 to 200.0℉): Within ±6.0℃ (±12.0℉)
　　B: 0.0 to 300.0℃ (0.0 to 600.0℉): Accuracy is not guaranteed.
RTD input: Within ±0.1% of FS ±1 digit
Hygrothermo transmitter input:
　　Temperature: Within ±0.3℃ (excluding sensor error)
　　Humidity: Within ±0.3 %RH (excluding sensor error)

Input sampling period: 400 ms

Standard functions: Automatic cold junction temperature compensation (Only thermocouple input),
Auto-Power-OFF, Auto-range, Immersion type thermocouple measuring
mode (EI), Decimal point indication switching, Battery life indication,
Input burnout (Overscale, Underscale), Temperature unit selection,
Multi-range input, Memory backup, Memory data clearing,
Drip-proof/Dust-proof [IP65: Excluded if KC (K) or KC (R) option is applied.]

Power supply voltage: 3 V DC　Size AA alkaline batteries (LR6): 2 pieces
Continuous use: Approx. 200 hours at room temperature
　　　　　　　　　　　(Without using the backlight)

Operating temperature: 0 to 50℃

Storing temperature: -20 to 60℃

Material: Case: Resin

Color: Case: Dark gray

Panel: Membrane sheet

Weight: Approx. 90 g (Accessories are excluded.)

Accessories included: Instruction manual: 1 copy, Alkaline battery (LR6) AA size: 2 pieces,
Wrist strap: 1 piece
Vinyl cover: 1 piece [Vinyl cover is not provided if KC (K) or KC (R) option
　　　　　　　　is applied.]

Accessories sold separately: Various sensors for the DFT-700-M

8.2 Optional Specifications

Square type connector: Option code KC (K): Thermocouple K (Must be specified when ordering.)
　　　　　　　　　　　　　　Option code KC (R): Thermocouple R (Must be specified when ordering.)

9. Troubleshooting

If any malfunction occurs, refer to the following items after checking that power is being supplied to the DFT.

Problem	Possible Cause	Solution
Thermocouple and RTD inputs: • [¯ ¯ ¯ ¯] is flashing on the PV Display. **Hygrothermo transmitter input:** • [¯ ¯ ¯ ¯] is flashing on the Data Display. • [¯ ¯ ¯ ¯] is flashing or [0.0] keeps indicating on the PV Display.	Temperature sensor of thermocouple or RTD is burnt out.	Replace the old sensor with a new one.
	Temperature sensor (TD-S) is burnt out.	Replace the Temperature sensor (TD-S) with a new one.
	Humidity sensor (HD-S2) is burnt out.	Replace the Humidity sensor (HD-S2) with a new one.
	Sensor plug connection to the measuring receptacle is imperfect.	Connect the sensor plug to the receptacle securely.
Indication of the PV Display or Data Display does not change.	Data HOLD (D.HOLD) or Peak HOLD (P.HOLD) is set.	Cancel the Data HOLD (D.HOLD) or Peak HOLD (P.HOLD).
	Humidity sensor (HD-S2) of the hygrothermo transmitter (THD-700-P) is out of order.	Replace the humidity sensor (HD-S2) or the transmitter with a new one.
Indication of the PV Display or Data Display is irregular or unstable.	Sensor type is incorrect.	Select the correct sensor type.
	℃/℉ unit is incorrect.	Select the correct temperature unit.
	AC is leaking from the measured object into thermocouple or RTD.	Stop AC leakage.
[Er r1] is indicated on the PV Display.	Internal memory is defective.	Please contact our main office or dealers.
Unable to set the unit to Immersion type thermocouple measuring mode (EI).	RTD (Pt100) or hygrothermo transmitter (HUM) is selected in [Sensor selection].	Select thermocouple (K, R, B, S) in [Sensor selection].
The Auto-Power-OFF function does not work.	In Auto-Power-OFF mode, Auto-Power-OFF [¯ ¯] (Not used) is selected.	Set the time (10, 30, 60 minutes) in Auto-Power-OFF mode.

For all other malfunctions, please contact our main office or dealers.