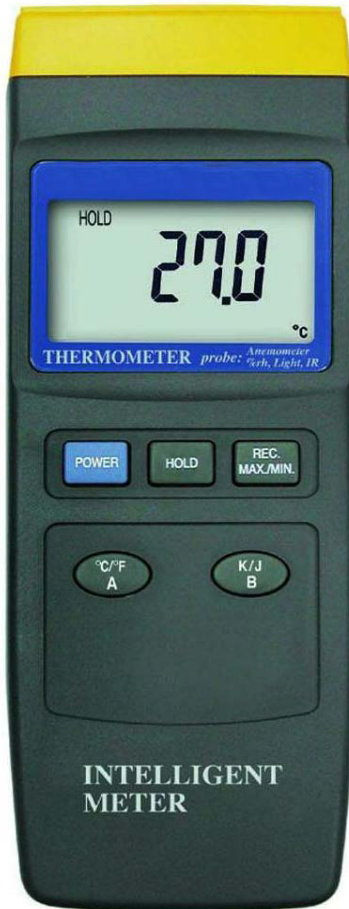


INTELLIGENT THERMOMETER

: = &&



Your purchase of this INTELLIGENT THERMOMETER marks a step forward for you into the field of precision measurement. Although this THERMOMETER is a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.



OPERATION MANUAL

TABLE OF CONTENTS

1. FEATURES.....	1
2. SPECIFICATIONS.....	2
3. FRONT PANEL DESCRIPTION.....	4
3-1 Display.....	4
3-2 Power Button.....	4
3-3 REC. Button.....	4
3-4 Hold Button.....	4
3-5 °C / °F Button (A Button).....	4
3-6 K/J Button (B Button).....	4
3-7 Battery Compartment/Cover.....	4
3-8 Temp. Input Socket	4
3-9 Lock Switch.....	4
3-10 Optional Probe Input Socket	4
3-11 RS-232 Out Terminal.....	4
3-12 Stand.....	4
4. MEASURING PROCEDURE.....	6
4-1 Type K, J thermometer measurement.....	6
4-2 Data Hold.....	6
4-3 Data Record (Max, Min reading).....	7
4-4 Anemometer, Light, IR thermometer, Humidity measurement.....	7
5. OFFSET TEMPERATURE ADJUSTMENT.....	8
6. AUTO POWER DISABLE.....	10
7. RS232 PC SERIAL INTERFACE.....	10
8. BATTERY REPLACEMENT.....	12
9. OPTIONAL PROBES & ACCESSORIES.....	12

1. FEATURES

- * Master meter is a professional Type K/J thermometer.
Type K range: -100.0 to 1300.0°C
Type J range: -100.0 to 1150.0°C
- * FI 22 can be plugged with the optional Anemometer probe (FI 22AN), Mini Vane Anemometer probe (FI 22MT), Light Meter probe, (FI 22LX), and Humidity probe (FI 22HR) to become a professional Anemometer, Mini Vane Anemometer, Light Meter, and Hygrometer. When change a new probe, no calibration procedures are required to be done.
** PLUG & PLAY FUNCTION**
- * Microprocessor circuit assures high accuracy and reliable performance.
- * 0.1 degree resolution for type K and type J thermometer.
- * Record maximum and minimum reading.
- * Instrument with high input impedance avoids measuring error.
- * Data Hold,
- * °C or °F conversion by push button on the front panel.
- * Auto power off saves battery life.
- * Large LCD, dual function display.
- * Powered by 006P DC 9V battery.
- * RS 232 computer serial interface.
- * Using the durable, long-lasting components and a strong lightweight ABS-plastic housing case.
- * The instrument is patented with it's intelligent design concept.
- * Patent pended in Taiwan, Germany, and China.
Patent pending in USA.

2. SPECIFICATIONS

2-1 General Specifications

Circuit	Exclusive microcomputer circuit, the software built-in linearity cooperation instead of the traditional hardware circuit.		
Display	LCD display, size : 51 mm x 31 mm. Dual function meter's display.		
Measurement	Type K	°C	-100.0 to 1300.0°C
		°F	-148.0 to 2372.0 °F
	Type J	°C	-100.0 to 1150.0°C
		°F	-148.0 to 2102.0 °F
Power off	Auto power off if no buttons are pressed within 10 minutes saves battery life or manual power off by push button.		
Data Output	RS232 PC serial interface.		
Over load indication	" ----" on the display.		
Sampling time	Approx. 0.8 second.		
Intelligent functions	FI 22 can be plugged with the optional Anemometer probe (FI 22AN), Mini Vane Anemometer probe (FI 22MT), Light Meter Probe (FI 22LX), and Humidity probe (FI 22HR) to become a professional Anemometer, Mini Vane Anemometer, Light Meter, and Hygrometer. When change a new probe, no calibration procedures are required to be done.		

Data hold	Hold the current reading value on the display.
Memory Recall	Maximum and Minimum reading values can be saved and retrieved by record function.
Operating Temperature	0 °C to 50 °C (32 °F to 122 °F).
Operating Humidity	Max. 80% RH.
Power Supply	006P DC 9V, MN1604 (PPS) battery or equivalent, Alkaline or heavy duty type.
Power Current	Approx. DC 7 mA.
Weight	250 g/0.55 LB (battery included).
Size (meter)	195 x 68 x 30 mm (7.6 x 2.6 x 1.2 inch).
Standard Accessories	Instruction manual.....1 PC.
Optional Accessories and Probes	<ul style="list-style-type: none"> * Anemometer Probe, FI 22AN * Mini Vane Anemometer, FI 22MT * Light probe, FI 22LX * Humidity probe, FI 22HR * Type K probe, TP-01, TP-02, TP-03, TP-04. * RS232 cable, UPCB-02 * Application Software, SW-U801-WIN Carrying case, CA-06

2-2 Electrical Specifications (23 ± °C)

Sensor Type	Reso- lution	Range	Accuracy
Type K	0.1 °C	-50.0 to 1300.0 °C	(0.2 % + 0.5 °C)
		-50.1 to -100.0 °C	(0.2 % + 1 °C)
	0.1 °F	-58.0 to 2372.0 °F	(0.2 % + 1 °F)
		-58.1 to -148.0 °F	(0.2 % + 1.8 °F)
Type J	0.1 °C	-5.0 to 1150.0 °C	(0.2 % + 0.5 °C)
		-50.1 to -100.0 °C	(0.2 % + 1 °C)
	0.1 °F	-58.0 to 2102.0 °F	(0.2 % + 1 °F)
		-58.1 to -148.0 °F	(0.2 % + 1.8 °F)

3. FRONT PANEL DESCRIPTION

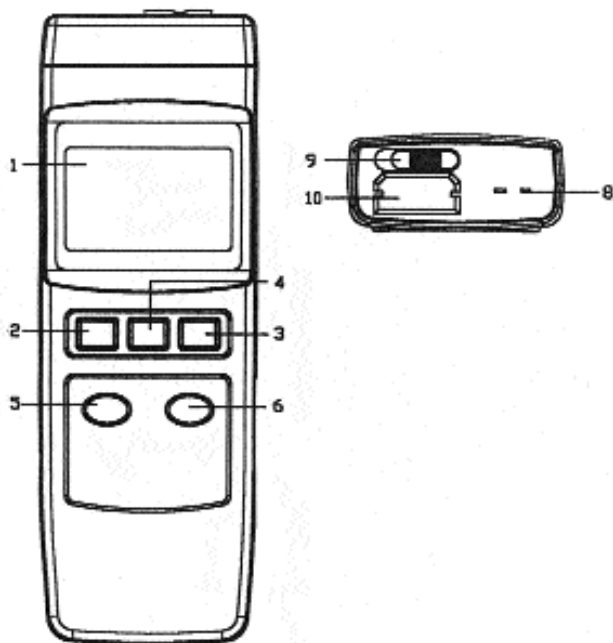


Fig. 1

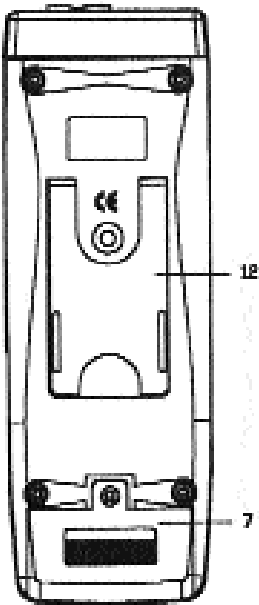


Fig. 2

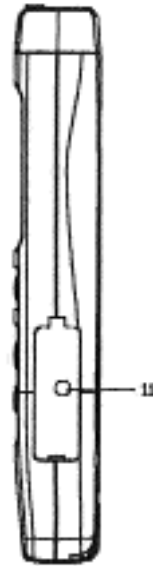




Fig. 3

- 3-1 Display
- 3-2 Power Button
- 3-3 REC. Button
- 3-4 Hold Button
- 3-5 °C, °F Button (A Button)
- 3-6 K/J Button (B Button)
- 3-7 Battery Compartment/Cover
- 3-8 Temp. Input Socket
- 3-9 Lock Switch
- 3-10 Optional Probe Input Socket
- 3-11 RS-232 Out Terminal
- 3-12 Stand

4. MEASURING PROCEDURE

4-1 Type K, J thermometer measurement

- 1) Plug Type K thermocouple probe in the Temp. Input Socket (3-8, Fig. 1).
- 2) Slide Lock Switch (3-9, Fig. 1) to the lock "  " position.

Please make sure the Lock Switch on the lock "  " position whenever before you power on the meter.

- 3) Power on the meter by pressing the Power Button (3-2, Fig.1), then you will see the measured value on the display.

Press the K/J Button (B Button) (3-6, Fig. 1) to select Type K mode or type J mode (the initial setup mode is Type K).

- * *Type K mode, the lower display will blank & not show any unit.*
- * *Type J mode, the lower display will show the unit of " J ".*

- 4) Press the " °C, °F Button " (3-5, Fig. 1) to select the temperature unit. You can see the current unit at the bottom-right position of the LCD display.

4-2 Data Hold

Press the " Hold Button " (3-4, Fig. 1) will hold the measured value & the LCD will indicate a " HOLD " symbol on the display during the measurement.

- * *Press the " Hold Button " again to release the data hold function.*

4-3 Data Record (Max., Min. reading)

- * The data record function records the maximum and minimum readings. Press the " REC. Button " (3-3, Fig. 1) to start the Data Record function and there will be a " REC " symbol on the display.
- * With the " REC " symbol on the display :
 - a) Press the " REC. Button " (3-3, Fig. 1) once, the " REC Max " symbol along with the maximum value will appear on the display.

If intend to delete the maximum value, just press the " Hold Button " (3-4, Fig. 1) for a while, then the display will show the " REC " symbol only & execute the memory function continuously.

- b) Press the " REC. Button " (3-3, Fig. 1) again, the " REC Min " symbol along with the minimum value will appear on the display.

If intend to delete the minimum value, just press the " Hold Button " (3-4, Fig. 1) for a while, then the display will show the " REC " symbol only & execute the memory function continuously.

- c) To exit the memory record function, just press the " REC " button for 2 seconds at least. The display will revert to the current reading.

4-4 Anemometer, Light, IR thermometer, Humidity measurement

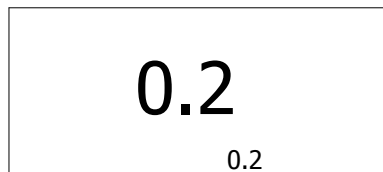
Please refer to the operation manual of Anemometer Probe/ FI 22AN, Mini Vane Anemometer/FI 22MT, Light probe/FI 22LX, Humidity probe/FI 22HR.

5. OFFSET TEMPERATURE ADJUSTMENT

The instrument is fully calibrated to assure the high quality measuring performance. Usually it is not necessary to execute the Offset Temperature Adjustment procedure, however the measured result could be influenced by using different type of temperature probes. Under such condition, customer can easily compensate the temperature value by push button on the front panel. However, in general conditions, customers are always not recommended to execute the Offset Temperature Adjustment Procedures without a reliable calibration equipment.

Offset Temp. Adjustment Procedure

- 1) Power on the instrument (Please make sure the Lock Switch is in the " " position).
- 2) Connect with a reliable temperature calibrator.
- 3) Adjust the calibrator and make it 0.0 output.
- 4) Press the " Hold Button " (3-4, Fig. 1) and " REC. Button " (3-3, Fig. 1) at the same time for around 1 seconds, the upper display and lower display will show the same value like



0.2
0.2

- 5) Under the " Hold Button " (3-4, Fig. 1) and " REC. Button " (3-3, Fig. 1) being pressed condition, press "°C,°F Button (A Button) " (3-5, Fig. 1) to add 0.1 or press " K/J Button (B Button) " (3-6, Fig. 1) to decrease 0.1 to the upper digits.



0.0
0.2

- 6) When desired value available, release the fingers from the " Hold Button " and " REC Button " to finish the Offset Temp. Adjustment Procedure.

CONSIDERATION

The calibration point is highly recommended at 0.0 or normal ambient temperature. Please never adjust the offset temperature over this range (0.0 to normal ambient temperature).

6. AUTO POWER OFF DISABLE

The instrument has " Auto Power Off " function in order to prolong battery life. If there are no buttons to be pressed for around 10 minutes, the meter will power off automatically.

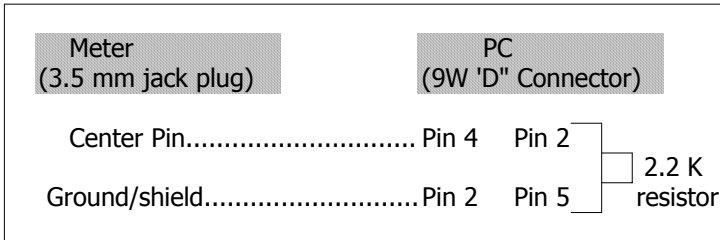
Disable auto power off function by pressing the " REC. Button " (3-3, Fig. 1) to get into the " Data Record " function with a " REC " symbol on the display for long period measurement.

7. RS232 PC SERIAL INTERFACE

The instrument has RS232 PC serial interface via a 3.5 mm terminal (3-11, Fig. 1).

The data output is a 16 digit stream which can be utilized for user's specific application.

A RS232 lead with the following connection will be required to link the instrument with the PC serial port.



The 16 digits data stream will be displayed in the following format :


D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0

Each digit indicates the following status :

D0	End Word
D1 & D8	Display reading, D1 = LSD, D8 = MSD <i>For example :</i> <i>If the display reading is 1234, then D8 to D1 is : 00001234</i>
D9	Decimal Point(DP), position from right to the left 0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP
D10	Polarity 0 = Positive 1 = Negative
D11 & D12	Annunciator for Display
	°C = 01 °F = 02 % RH = 04
	Lux = 15 Ft-cd = 16 m/s = 08
	Km/h = 10 ft/min = 11 mile/h = 12
	knot = 09
D13	When send the upper display data = 1 When send the lower display data = 2
D14	4
D15	Start Word

RS232 FORMAT : 9600, N, 8, 1

8. BATTERY REPLACEMENT

- 1) When the left corner of LCD display show "  ", it is necessary to replace the battery. However, in-spec. measurement may still be made for several hours after low battery indicator appears before the instrument become inaccurate.
- 2) Slide the " Battery Cover " (3-7, Fig. 2) away from the instrument and remove the battery.
- 3) Replace with 9V battery (Alkaline or Heavy duty type) and reinstate the cover.
- 4) Make sure the battery cover is secured after changing the battery.

9. OPTIONAL PROBES & ACCESSORIES

ANEMOMETER PROBE Model : FI 22AN	*FI 22AN plug into the FI 22 to become a professional Anemometer																
	<table border="1"> <thead> <tr> <th><i>Measurement</i></th> <th><i>Range</i></th> </tr> </thead> <tbody> <tr> <td>m/s</td> <td>0.4 to 25.0 m/s</td> </tr> <tr> <td>km/h</td> <td>1.4 to 90.0 km/h</td> </tr> <tr> <td>mile/h</td> <td>0.9 to 55.9 mile/h</td> </tr> <tr> <td>knots</td> <td>0.8 to 48.6 knots</td> </tr> <tr> <td>ft/min</td> <td>80 to 4930 ft/min</td> </tr> <tr> <td>°C</td> <td>0 °C to 50 °C</td> </tr> <tr> <td>°F</td> <td>32°F to 122 °F</td> </tr> </tbody> </table>	<i>Measurement</i>	<i>Range</i>	m/s	0.4 to 25.0 m/s	km/h	1.4 to 90.0 km/h	mile/h	0.9 to 55.9 mile/h	knots	0.8 to 48.6 knots	ft/min	80 to 4930 ft/min	°C	0 °C to 50 °C	°F	32°F to 122 °F
<i>Measurement</i>	<i>Range</i>																
m/s	0.4 to 25.0 m/s																
km/h	1.4 to 90.0 km/h																
mile/h	0.9 to 55.9 mile/h																
knots	0.8 to 48.6 knots																
ft/min	80 to 4930 ft/min																
°C	0 °C to 50 °C																
°F	32°F to 122 °F																

MINI VANE ANEMOMETER PROBE Model : FI 22MT	*FI 22MT plug into the FI 22 to become a professional Mini Vane Anemometer	
	<i>Measurement</i>	<i>Range</i>
	m/s	0.4 to 12.0 m/s
	km/h	1.4 to 42.0 km/h
	mile/h	0.9 to 27.0 mile/h
	knots	0.8 to 24.0 knots
	ft/min	80 to 2400 ft/min
	°C	0 °C to 50 °C
	°F	32°F to 122 °F

Light Meter PROBE Model : FI 22LX	*FI 22LX plug into the FI 22 to become a professional Light meter	
	<i>Measurement</i>	<i>Range</i>
	Lux	10 to 50,000 Lux 3 ranges
	Foot-candle	3.1 to 5,000 Fc 3 ranges

HUMIDITY PROBE Model : FI 22HR	*FI 22HR plug into the FI 22 to become a professional Humidity meter	
	<i>Measurement Range</i>	
	R.H.	10% to 95% R.H.
	°C	0 °C to 50 °C
	°F	32°F to 122 °F

Type K Thermocouple Probe Model: TP-01	* Measure Range : -40 °C to 250 °C, -40 °F to 482 °F. * Ultra fast response naked-bead thermocouple, general purpose application.
Type K Thermocouple Probe Model: TP-02A	* Measure Range : -50 °C to 900 °C, -50 °F to 1650 °F. * Dimension: 10 cm tube, 8 mm Dia.
Type K Thermocouple Probe Model: TP-03	* Measure Range : -50 °C to 1200 °C, -50 °F to 2200 °F. * Size: Temp. sensing head - 15 mm Dia. Probe length: 120 mm.
Type K Thermocouple Probe Model: TP-04	* Measure Range : -50 °C to 400 °C, -50 °F to 752 °F. * Dimension: 10 cm tube, 8 mm Dia.

CARRYING CASE CA-06	Hard carrying case
------------------------	--------------------

RS232 cable UPCB-02	RS232 cable for connecting between the meter & the computer.
SOFTWARE SW-U801-WIN	Windows version application software applies as the performance of data logging system & data recorder...