EXTECH INSTRUMENTS
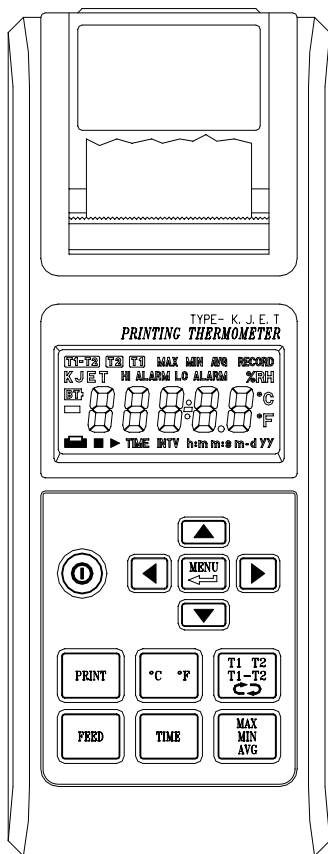
TYPE - K.J.E.T. PRINTING THERMOMETER

Model 422324

INSTRUCTION MANUAL

CONTENTS

I. SAFETY INFORMATION

- ❑ Read the following safety information carefully before attempting to operate or service the meter.
- ❑ Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.
- ❑ Use caution when working with voltages above $60V_{DC}$ or $24V_{AC}$ RMS. Such voltages pose a shock hazard.

Environment conditions
   ① Altitude up to 2000 meters
   ② Indoor use only
   ③ Relative humidity 90% max.
   ④ Operational Temperature $32 \sim 122^{o}F$ ($0 \sim 50^{o}C$)

Maintenance & Cleaning
   ① Repairs or servicing not covered in this manual should only be performed by qualified personnel.
   ② Periodically wipe the case with a dry cloth. Do not use abrasives or solvents to clean this instrument.

U.S. Pat. No. Des. 460,923

Safety symbols

🔲 Meter is protected throughout by double insulation or reinforced insulation.
   When servicing, use only specified replacement parts.

CE Complies with EMC

II. SPECIFICATIONS

2-1 General Information
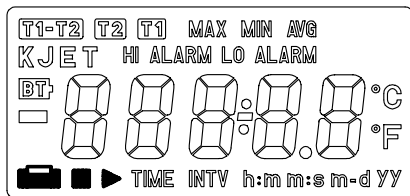Display: 4-1/2 digit LCD
LCD illustration (see below)

Fig-1

$\boxed{T1\text{-}T2}$, $\boxed{T2}$, $\boxed{T1}$	Reflects the selected temperature display configuration
MAX, MIN, AVG	Maximum, Minimum or Average reading display Avg = ½ (Previous reading + Current reading)
K , J , E , T	Thermocouple types
HI ALARM	Temperature exceeds high alarm limit (setpoint)
LO ALARM	Temperature exceeds low alarm limit (setpoint)
BT	Low battery symbol
▬	Negative polarity; positive polarity assumed
℃, ℉	Celsius and Fahrenheit temperature units
▭	Printer active
►, ▪	Interval printing Start /Stop symbol
TIME	Calendar time
INTV	Interval printing symbol
h:m	Hour : Minutes
m:s	Minute: Seconds
m-d	Month – Day
yy	Calendar year
8	Seven segment display digit

Over Range	OL or $\mathit{-OL}$ appears.
BT	Low battery indicator
Sampling Rate	1 reading per second (approx.)
Power	Six 1.5V 'AAA' cells or 9V (500mA) adaptor
Battery Life (typ.)	30 hours (interval print set to 60 mins. & beeper off) 70 hours (no printing or beeper)
Input protection	60Vdc/24Vrms

Operating Temperature and Humidity

32°F to 122°F (0°C to 50°C) below 90% RH

Storage Temperature and Humidity

14°F to 140°F (-10°C to 60°C) below 70% RH

Dimensions	7.6 (L) x 2.9 (W) x 1.5 (H)" (193 × 74 × 37 mm)
Weight	Approx. 12.8 oz. (365g) with batteries & paper.
Accessories	Carrying case, batteries, thermo-paper (2), Alarm DIN cable and temperature probe (type K)

Printer
  Thermo-printing type with 16 characters per line using 38mm width plain thermo-paper.

Instant printing: Print on demand (button press)

Interval printing: Print at desired interval from 00:00:03 to 23:59:59

2-2 Electrical Specifications

Accuracy (23℃ ±5℃, below 80%RH)

Type K:	±(0.1% rdg + 0.8℃) (0 ~ 1333℃)
	±(0.1% rdg + 1.4℉) (32 ~ 2431℉)
Type J :	±(0.1% rdg + 0.8℃) (0 ~ 760℃)
	±(0.1% rdg + 1.4℉) (32 ~ 1400℉)
Type E:	±(0.1% rdg + 0.8℃) (0 ~ 703℃)
	±(0.1% rdg + 1.4℉) (32 ~ 1297℉)
Type T:	±(0.1% rdg + 0.8℃) (0 ~ 400℃)
	±(0.1% rdg + 1.4℉) (32 ~ 752℉)
Type K/J/E/T:	±(0.5% rdg + 1.0℃) (-200 ~ 0℃)
	±(0.5% rdg + 1.8℉) (-328 ~ 32℉)

Resolution：0.1℃/0.1℉

Temperature Coefficient:

0.1 times the applicable accuracy specification per ℃ from 0℃ to 18℃ and 28℃ to 50℃ (32℉ to 64℉ and 82℉ to 122℉)

Measurement Range:

Type K: -200 ~ 1333℃ (-328 ~ 2431℉)

Type J: -200 ~ 760℃ (-328 ~ 1400℉)

Type E: -200 ~ 703℃ (-328 ~ 1297℉)

Type T: -200 ~ 400℃ (-328 ~ 752℉)
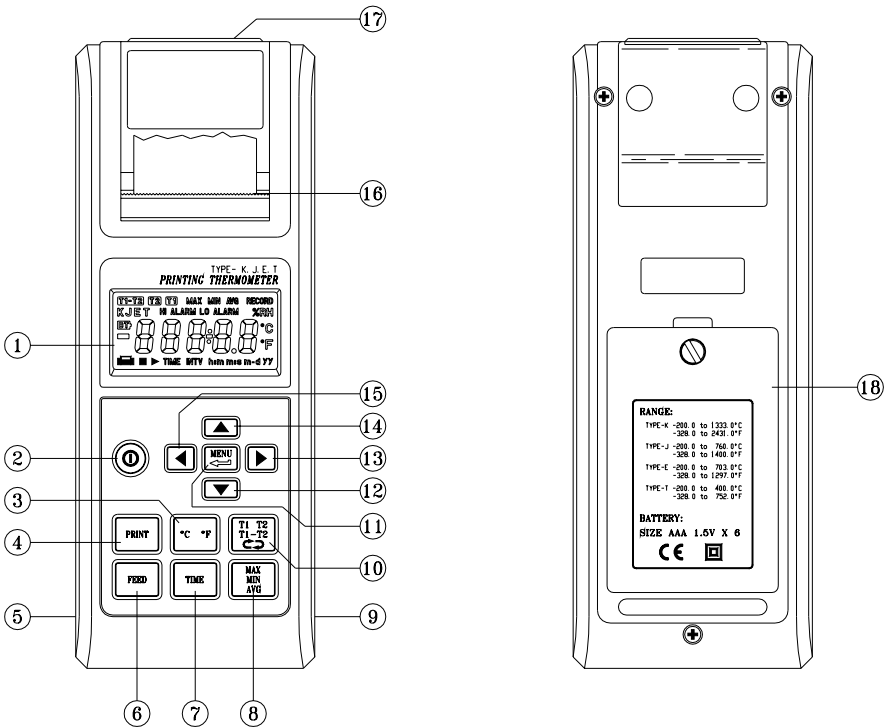
Fig-2

1. LCD
   Displays readings, units, symbols, and decimal points

2. POWER
   Powers the unit on/off

3. UNIT
   Selects the temperature units (℃ / ℉)

4. PRINT

   ① Prints current measurement (print format shown below):

LINE 1   1 0 : 5 1 : 1 2   1 1 - 0 2

LINE 2   T 1   K - 0 0 2 3 . 0   °C

Line 1: (Time) Hour: minute: second, month- day

Line 2: Measurement channel, thermocouple type, temp., and unit.

   ② Stops interval printing at any time and prints current reading.

   ③ Press for 2 seconds to enable interval printing. Unit will remain in
      the interval printing mode until this button is pressed again or the
      FEED button is pressed.

5. 9V-ADAPTOR SOCKET (3.5φ)

6. FEED PAPER (Fig-3) :
   ① Advances the thermo-paper one line.
   ② Cancels printing.

7. TIME：
   Calendar program button.

8. MAX / MIN / AVG：

   Press to scroll through maximum, minimum and
   average readings for channels T_1 / T_2 / T_1-T_2.
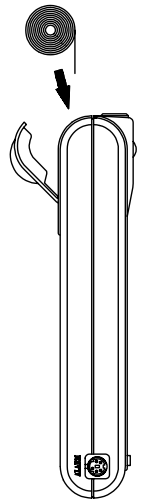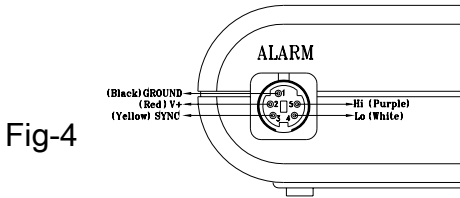

Fig-3

9. High / Low Alarm output connector

Fig-4

Pin 1: GND (external supply low voltage)

Pin 2: VCC (external supply high voltage)

Pin 3: SYNC (external trigger signal)
Pin4 (High Alarm) and pin5 (Low Alarm) signals must be synchronized with pin3. Pin5 and pin4 will not function (always low) unless SYNC (pin3) is high. If SYNC is low, then pin4 and pin5 will be low.

Pin4[1]: High Alarm
If the reading is higher than the high alarm setpoint, then (pin 4) will be high, otherwise, it will be low.

Pin 5[1]: Low Alarm
If the reading is less than or equal to the low alarm limit, (pin 5) will go high.

[1]The Pin 4 and 5 outputs may be delayed 0.4 seconds due to the datalogger's A/D scanning time.

Description of the DIN cable:
   ① Red wire   VCC (external supply high voltage)
   ② Black wire GND (external supply low voltage)
   ③ Yellow   SYNC (external trigger signal)
   ④ White   High Alarm
   ⑤ Purple   Low Alarm

Note: voltage VCC to GND is 16V Maximum, 5V Minimum.

GND≦ SYNC≦ VCC
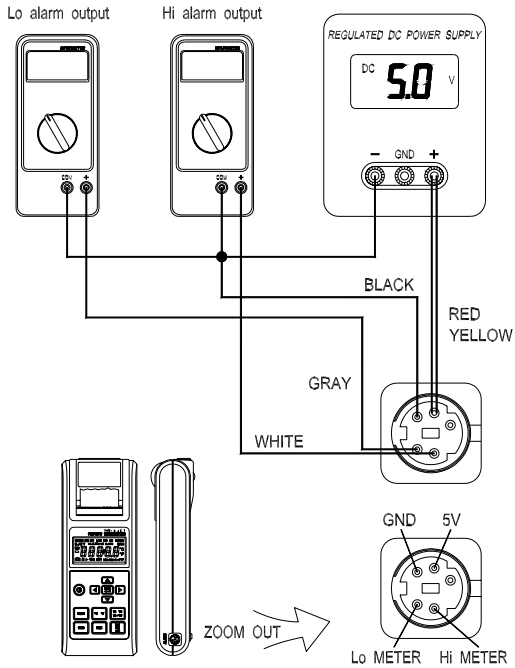
Example :

High Alarm= 1300.5℃ , Low Alarm= -50.5℃

If LCD reading ≧ 1300.5℃

Result : High Alarm output reading approx 5V
Low Alarm output reading approx 0V

If LCD reading ≦ -50.5℃

Result : Low Alarm output reading approx 5V
High Alarm output reading approx 0V

Example :

Hi alarm= 25.5℃ , Lo alarm= 25.5℃

If LCD reading = 25.5℃

Result : Hi Alarm output reading approx 5V
Lo Alarm output reading approx 5V

10. $T_1/T_2/T_1-T_2$ measurements :
   Press to select the display method, T_1, T_2, T_1-T_2.

11. MENU：
   Press to enter and step through the set-up mode. (Hold down the key to scroll quickly).

12. UP：Press to increase the value of a parameter.

13. RIGHT：Press to move to a desired parameter.

14. DOWN：Press to decrease a parameter's value.

15. LEFT：Press to move to a desired parameter.

   Parameters (in sequence):
   K/J/E/T (thermocouple types)
   00/01 Interval printing enable (01) and disable (00)

   ℃/℉ (Temperature units)
   High/Low Alarm (high and low alarm limits)

   > Ex: K Type (1333.3 ~ -200.0℃)
   >
   > J Type (760.5 ~ -200.0℃)

   INTV (printing interval range: 00h:00m:03s to 23h:59m:59s)
   Interval printing start / stop time (range: 00h:00m to 23h:59m)
   Calendar year (range up to 2999)
   Calendar month-day (ranges from 01-01 to 12-31)
   Calendar hour-minute (ranges from 00h:00m to 23h:59m)
   Calendar minute-second (ranges from 00m:00s to 59m:59s)

16. Out of Thermo-paper.

17. Temperature probe sockets.

18. Battery compartment and cover：Six 1.5V 'AAA' batteries

IV. PRECAUTIONS AND PREPARATIONS FOR MEASUREMENT

1. Before use, examine the device to ensure that no shipping damage has occurred.

2. Save all packing materials.

3. Ensure that the batteries are correctly placed in the case or that the 9V adaptor is correctly connected.

4. An unsecured battery cover can cause measurement error.

5. To avoid battery leakage, remove batteries if this meter will not be used for a long period of time.

6. Do not use or store this meter outside the operating or storage environmental specifications.

V.   OPERATIONAL GUIDE

A. This meter can be operated with batteries or 9V Adaptor, If using batteries, remove the rear cover and install the batteries (observe polarity). If using the 9V Adaptor, ensure that is connected firmly and correctly. Select the desired temperature probe for your application and insert it into the tempture probe socket.

B. Press the ⓞ button to power the meter. If "𝕆𝕝" appears, check that the probe is connected properly and that it is operational.

C. To enter the programming mode, press the "⬛" button, to exit, press it again. Use the left and right arrow buttons (◀ or ▶) to select a parameter for editing; Use the up and down buttons (▲ or ▼) to increase or decrease the value of a parameter. When modifing a parameter, the parameter's symbol will blink.

The available parameters in sequence:

1. INTERVAL PRINTING STATUS (01/ENABLE, 00/DISABLE): See LCD display example below in Fig-5
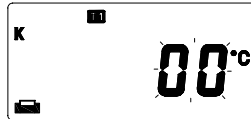

Fig-5

2. TYPE OF THERMOCOUPL (K/J/E/T) :
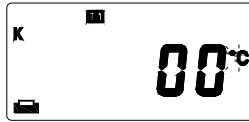

Fig-6

3. ALARM UNIT (℃/℉):

Fig-7

4. FIRST THREE DIGITS IN HI ALARM (-399 ~ 399):

Example :
Hi Alarm = 1234.5℃

Fig-8
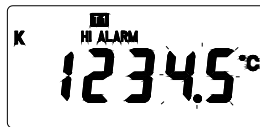
5. LAST TWO DIGITS IN HI ALARM (00 ~ 99):

Fig-9

6. FIRST THREE DIGITS IN LO ALARM (-399 ~ 399):

Example :
Lo Alarm = -50.8℃

Fig-10

7. LAST TWO DIGITS IN LO ALARM (00 ~ 99):

Fig-11

8. HOUR OF INTERVAL PRINTING (00 ~ 23):

Fig-12

9. MINUTE OF INTERVAL PRINTING (00 ~ 59):

Fig-13

10. SECOND OF INTERVAL PRINTING (00 ~ 59):

Fig-14

11. HOUR OF START INTERVAL PRINTING TIME (00 ~ 23):

Fig-15

12. MNUTE OF START INTERVAL PRINTING TIME(00 ~ 59):

Fig-16

※ NOTE : Print time START must be before print time STOP.

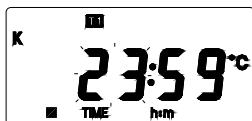13. HOUR OF STOP INTERVAL PRINTING TIME (00 ~ 23) :

Fig-17

14. MINUTE OF STOP INTERVAL PRINTING TIME (00 ~ 59):

Fig-18

15. FIRST TWO DIGITS OF CALENDAR YEAR (19 ~ 29):

Fig-19

16. LAST TWO DIGITS OF CALENDAR YEAR (00 ~ 99):

Fig-20

17. MONTH DIGITS OF CALENDAR MONTH-DAY (01 ~ 12):

Fig-21
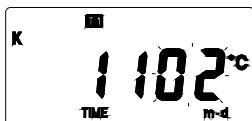
18. DAY DIGITS OF CALENDAR MONTH-DAY (01 ～ 31):

Fig-22

19. HOUR DIGITS OF CALENDAR HOUR-MINUTE (00 ～ 23):

Fig-23

20. MINUTE DIGITS OF CALENDAR HOUR-MINUTE (00 ～ 59):

Fig-24

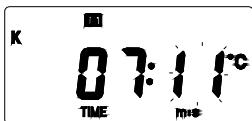21. SECOND DIGITS OF CALENDAR MINUTE-SECOND (00 ～ 59) :

Fig-25

If interval printing is enabled in the programming mode, the printer will print as in the examples below:

```
11 : 54 : 00    11-02
INTV : 00 : 00 : 10
```

First two lines:
    Line 1: hour:minute:second   month-day (start printing time)
    Line 2: interval printing time   hour:minute:second

Following two lines:
    Line 1: hour:minute:second   month-day (interval printing time)
    Line 2: measurement channel, thermocouple type, reading, and unit.

Last two lines:
    Line 1: hour:minute:second   month-day (stop pointing time)
    Line 2: interval printing time   hour:minute:second

※ NOTE : If the print button is pressed during this period the last two lines will not be printed.

If the print button is held for 2 seconds, the printer will print as follows:

```
12 : 58 : 18    11-02
INTV : 00 : 00 : 10


12 : 58 : 28    11-02
T1   K − 0039.5 ℃


12 : 58 : 38    11-02
T1   K −   0L. ℃


12 : 58 : 48    11-02
T1    K −   0L. ℃


12 : 58 : 58    11-02
T1    K − 0035.2 ℃


12 : 59 : 08    11-02
T1    K −   0L. ℃


12 : 59 : 18    11-02
T1   K − 0037.0 ℃


12 : 59 : 20    11-02
T1    K −   0L. ℃
```

First two lines:
   Line 1: hour:minute:second   month-day
   Line 2: interval printing time   hour:minute:second

Following lines:
   Line 1: hour:minute:second   month-day (interval printing time)
   Line 2: function test channel, type and reading with polarity,
      decimal point and unit.

To stop printing, press the Print or the Feed button.

VI. INTERVAL PRINTING SETUP

1. SETUP INTERVAL PRINT (with 24 hour maximum interval limit).

   ① Enter the Menu mode by pressing the MENU button.

   ② Enable interval printing as described on page 11 (fig-5) using the ▲ / ▼ buttons (01 is enable).

   ③ Use the ◀ / ▶ buttons to scroll through the available editing parameters as described on page 13 (fig-12).

   ④ Setup Interval/Start/Stop print time by pressing ▲ / ▼ buttons as described on pages 13, 14, (fig-12 to fig-18). Note that the START print time must be before the STOP time.

   ⑤ Press the MENU button to return to normal operating mode. The INTV symbol will be shown on LCD indicating that interval printing is active.

2. SETUP INTERVAL PRINT (without 24 hour limit)

   ① Enter the Menu mode by pressing the MENU button.

   ② Disable Interval Printing as described on page 11 (fig-5) using the ▲ / ▼ buttons (00 is disable).

   ③ Set Interval Print Time using the ▲ / ▼ button as shown on page 13, (fig-12 to fig-14).

   ④ Press MENU again to return to normal operation.

   ⑤ Press and hold the PRINT button for about 3 seconds, the INTV symbol will be shown on LCD indicating that interval printing is active.

3. During the Interval Print period, no buttons can be used except the PRINT and FEED button. When the PRINT button is pressed, one more line will be printed before the interval printing session is aborted. Pressing the FEED button aborts interval printing immediately.

VII. BATTERY REPLACEMENT

1. When battery power falls low, the **BT** will appear on the LCD. Replace the six 1.5V 'AAA' batteries

2. After the temperature probe(s) have been disconnected and the meter power turned off, remove the rear battery cover.

3. Remove batteries from the holder and replace with six 1.5V 'AAA' alkaline batteries.

4. Secure the battery cover.

VIII. Calibration and Repair Services

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification on most products or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to ensure calibration integrity.

☎

Support Hotline (781) 890-7440
Tech support: Ext. 200; Email: support@extech.com
Repair/Returns: Ext. 210; Email: repair@extech.com
Website: www.extech.com

Version 1.0 August 2002