multicomp PRO

Infrared Thermometer

Model: MP780004

IMPORTANT SAFETY INFORMATION

Please read these instructions carefully before use and retain for future reference.

- Please operate according to this manual, otherwise the protection provided by the device will be impaired or fail.
- Do not point laser directly in your eyes or indirectly off reflective surfaces.
- Check the condition before using. If you find any cracking, breakage, damage or abnormality, or you consider the device broken, stop using the device immediately
- Do not use the thermometer if it operates abnormally. Protection may be impaired. When in doubt, have the thermometer serviced.
- Do not operate the thermometer around explosive gas, vapour, or dust.
- To avoid a burn hazard, remember that highly reflective objects will often result in lower than actual temperature measurements.
- To avoid damaging the thermometer or the equipment under test protect them from the following:
  - EMF (electro-magnetic fields) from arc welders, induction heaters, etc.
  - Static electricity.
  - Thermal shock (caused by large or abrupt ambient temperature changes – allow 30 minutes for the thermometer to stabilize before use).
- Do not leave the thermometer on or near objects of high temperature.
- Replace the batteries as soon as the low battery indicator appears on the display.
- Remove dead batteries from the thermometer or if it is not going to be used for a long time.
- Never mix old and new batteries together, or different types of batteries.
- Never dispose of batteries in a fire, or attempt to recharge ordinary batteries.
- Before replacing the battery, turn off the thermometer and disconnect all the test probes.
- To prolong battery life turn off the thermometer after use.

WHAT'S INCLUDED

- Infrared thermometer with laser sighting.
- 9V 6F22 Alkaline battery (included)
- Instruction manual

FEATURES

- Single-spot laser sighting.
- White backlight.
- Synchronous display of the measured maximum and minimum value.
- Celsius and Fahrenheit temperature measurement.
- Dynamic battery capacity monitoring.
- Low voltage indication.
- Display screen.
- Adjustable emissivity.
- Alarm sounder for upper and lower limit.
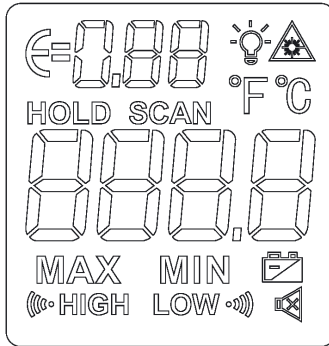
Display

- The primary temperature display reports the current or last IR temperature read until the 8-second hold time elapses.
- The secondary temperature display reports a choice of maximum, minimum, difference between maximum and minimum temperature.
- You can display the maximum and minimum temperature anytime the display is on.
- The MAX, MIN temperatures are constantly calculated and updated while the trigger is pressed.
- After the trigger is released, all readings are held for 8 seconds.

⋶	Emissivity setting display.
☀	Laser on symbol.
SCAN	Active SCAN.
HOLD	Display Hold.
MAX MIN	Maximum or Minimum Value.
🔋	Low Battery symbol. Appears when the battery charge is <4.5V.
ۼ	Backlight indication.
°C / °F	Celsius / Fahrenheit.
⟨⟨•HIGH LOW•⟩⟩ ⤬	Sound alarm for the upper and lower temperature limit.

Button operation.

Press **SET** to enter set up mode stepping through **Emissivity**, **°C/°F**, **High & Low** limit set up.

Press **MAX/MIN** to display these measurements on the LCD. When thermometer enters user set up mode use ▼ to select a further option.

Press ☼ to turn on the display backlight. Press again to switch on laser target function. When thermometer enters user set up mode use ▲ to select a further option.

OPERATION FUNCTION

- Infrared thermometers measure the surface temperature of an opaque object. The thermometer's optics sense infrared energy, which is collected and focused onto a detector. The thermometer's electronics then translate the information into a displayed temperature reading which appears on the display. The laser is used for aiming purposes only.
- The thermometer turns on when you press the trigger. The thermometer turns off when no activity is detected for 8 seconds.
- To measure temperature, aim the thermometer at the target, pull and hold the trigger. Release the trigger to hold a temperature reading.
- To find a hot or cold spot, aim the thermometer outside the target area. Then, slowly scan across the area with an up and down motion until you locate the hot or cold spot.

Distance and target spot size

- As the distance (D) from the target being measured increases, the spot size (S) of the area measured by the unit becomes larger. The spot size indicates 90% encircled energy. The maximum D:S is obtained when the thermometer is 600mm (23.62in) from the target resulting in a spot size of 50mm (2in).
- Make sure that the target is larger than the spot size.
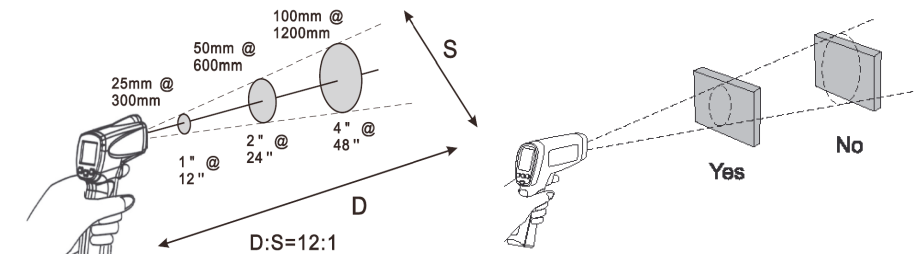
Emissivity adjustment setting
- Emissivity describes the energy-emitting characteristics of materials. Most organic materials and painted or oxidized surfaces have an emissivity of about 0.95.
- If possible, to compensate for inaccurate readings that may result from measuring shiny metal surfaces, cover the surface to be measured with masking tape or flat black paint (<150 $^{\circ}$C / 302 $^{\circ}$F) and use the high emissivity setting. Allow time for the tape or paint to reach the same temperatures as the surface beneath it. Measure the temperature of the tape or painted surface.
- If you cannot use paint or tape, then you could improve the accuracy of your measurements with the emissivity selector. Even with emissivity selector, it can be difficult to get a completely accurate infrared measurement of a target with a shiny or metallic surface.
- The thermometer allows you to adjust the unit's emissivity for the type of surface.

To adjust values for emissivity (see table below):
1. Press SET to select emissivity set up, icon E on the display will flash. The Thermometer steps through emissivity set up, $^{\circ}$C / $^{\circ}$F & high / low limit setting.
2. Press ▲ to increase the value by 0.01. The maximum value is 1.00.
3. Press ▼ to decrease the value by 0.01. The minimum value is 0.10.

Measure Surface (metals)	Switch Setting
Aluminium oxidised	0.2-0.4
Alloy A3003 oxidised	0.3
Alloy A3003 roughened	0.1-0.3
Burnished Brass	0.3
Oxidised Brass	0.5
Copper oxidised	0.4-0.8
Electrical terminal blocks	0.6
Haynes alloy	0.3-0.8
Inconel oxidised	0.7-0.95
Inconel sandblasted	0.3-0.6
Inconel electropolished	0.15
Cast Iron oxydised	0.6-0.95
Cast Iron clean	0.2
Cast Iron molten	0.2-0.3
Wrought Iron dull	0.9
Lead rough cast	0.4
Lead oxidised	0.2-0.6
Molydbenum oxidised	0.2-0.6
Nickel oxidised	0.2-0.5
Platinum black	0.9
Steel cold rolled	0.7-0.9
Steel ground sheet	0.4-0.6
Steel polished sheet	0.1
Iron oxidised	0.5-0.9
Iron rusted	0.5-0.7
Zinc oxidised	0.1

Measure Surface (non-metals)	Switch Setting
Asbestos	0.95
Asphalt	0.95
Basalt	0.7
Carbon clean	0.8-0.9
Graphite	0.7-0.8
Carborundum	0.9
Ceramic	0.95
Clay	0.95
Concrete	0.95
Cloth	0.95
Plate glass	0.85
Gravel	0.95
Gypsum	0.8-0.95
Ice	0.98
Limestone	0.98
Paper (any colour)	0.95
Opaque plastic	0.95
Soil	0.9-0.98
Water	0.93
Wood (natural)	0.9-0.95

Temperature units
- Press SET to enter the setting mode of Centigrade or Fahrenheit then select ▼ to set the default.

Temperature Limit Value setting
- Press SET to enter the high limit setting. MAX will flash on the display. Select ▼ or ▲ to adjust in 0.1 degree increments. Hold the adjustment button for a rapid incremental change.
- The sounder indicator ⌷ will start flashing to allow you to allow or disable the high limit audible warning.
- Press SET to enter the low setting. MIN will flash on the display. Select ▼ or ▲ to adjust in 0.1 degree increments. Hold the adjustment button for a rapid incremental change.
- The sounder indicator ⌷ will start flashing to allow you to allow or disable the low limit audible warning.
- When the sounder is active, an intermittent sound is emitted when the recorded temperature is above or below the set max/min values set.

OPERATION EXAMPLES

Testing Contactors
- Press SET to select emissivity. Press ▲/▼ to select relatively low emissivity for bright contacts, or 0.7 mid level for darkened contacts.
- Press MODE to select MAX.
- Measure line and load side of one pole without releasing trigger.
- A temperature difference between the line and load sides of a pole indicate increased resistance of one point and a contactor may be failing.

Testing Enclosed Relays
- Press SET and then press ▲/▼ to set emissivity to relatively low for uninsulated connectors or relatively high for plastic encased relays or for bakelite enclosed relays or insulated connectors.
- Press MODE to select MAX. Start to scan.
- Measure the relay casing, looking for hot spots.

Testing Fuses and Bus Connectors
- Press SET and then press ▲/▼ to set emissivity to relatively high for paper covered fuse body or insulated connections.
- Press MODE to select MAX.
- Scan the paper covered length of fuse.
- Without releasing the trigger, scan each fuse. Unequal temperatures between fuses may indicate voltage or amperage imbalance.
- Press SET and then press ▲/▼ to set emissivity to relatively low, for metal fuses and caps and insulated bus connections.

Testing Electrical Connections
- Press SET and then press ▲/▼ to set emissivity to relatively low for uninsulated connectors or bus connections or relatively high for insulated connections.
- Scan the conductor, moving toward direction of electrical connector.

Note: conductors are typically smaller than the thermometers spot size. If the spot size is bigger than the connector the reading is the average within the spot.

Scanning walls for air leaks or insulation deficiencies
- Turn off heating, cooling, and blower.
- Press SET to select emissivity. Use ▲/▼ to select emissivity relatively high for painted surfaces or window surfaces.
- Measure an interior partition wall surface temperature. Do not release the trigger.
- Record this temperature as your baseline (or benchmark) for a "perfectly" insulated wall.
- Face the wall to be scanned. Stand 1.5m away to scan a 5cm spot on the wall. Scan horizontal rows of wall from top to bottom, or horizontal rows of ceiling from wall to wall.
  Look for greatest deviations from baseline temperature to identify problems.
- This completes the insulation test scan.

Checking Hydronic radiant heat applications
- Radiant heat tubes in the floor will normally run parallel to the outside walls. Starting at the floor wall juncture, scan parallel to the wall while moving into the room away from the wall. Parallel to the outside wall you should find parallel isothermal rows indicating the location of heat tubes below the surface. Perpendicular to the outside wall, you should find rising and falling temperatures at equal distances. High temperatures indicate you are scanning a heat tube beneath the floor surface, low falling temperatures indicate a space between the heat tubes.

Measuring Grille or Diffuser Discharge Temperature
- Press SET and then press / to select relatively high emissivity.
- Aim the thermometer at the discharge air grille, register, or diffuser.
- Measure discharge temperature.
- Release trigger to freeze the temperature reading for 8 seconds and record this temperature. Grille, register, or diffuser temperature should be equivalent to discharge temperature at the air handler.

MAINTENANCE

Changing the battery
• To install or change the 9V battery, open the battery compartment. Replace only with the same type of battery.

Cleaning the lens
Blow off loose particles using clean compressed air. Carefully wipe the surface with a moist cotton swab. The swab may be moistened with water.

Cleaning the casing
• Wipe using a damp cloth or sponge. Do not use solvents as these may damage the casing. Do not immerse in water.

SPECIFICATIONS

Measurement Range	-32° to 400°C (-25° to 752°F)
Resolution	0.1°C/F
Accuracy	$\pm$2°C or 2% (ambient temp: 23°C$\pm$2°C/73.4°F-35.6°F)
Repeatability	$\pm$0.5% of reading or $\pm$0.5°C
Response time (95%)	500ms
Distance to spot	12:1
Emissivity adjustment	0.10~1.00
Laser	
Sighting	Single point laser
Power	Class 1 Output <1mW, wavelength 630 to 670mm
Power Supply	6F22 9V Battery
Power consumption	Over 30hrs (alkaline) or over 10hrs (gp)
Weight	325g

INFORMATION ON WASTE DISPOSAL FOR CONSUMERS OF ELECTRICAL & ELECTRONIC EQUIPMENT
These symbols indicate that separate collection of Waste Electrical and Electronic Equipment (WEEE) or waste batteries is required. Do not dispose of these items with general household waste. Separate for the treatment, recovery and recycling of the materials used. Waste batteries can be returned to any waste battery recycling point which are provided by most battery retailers. Contact your local authority for details of the battery and WEEE recycling schemes available in your area.

Made in China. LS12 2QQ

Man Rev 2.0