



## Comark C20 Series Handheld Thermometers

Models C21, C22, C26 and C28

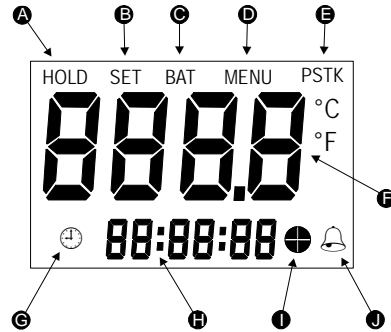
### Operator Manual

#### Description

The C20 series handheld thermometers represent a leap forward in case design and specification combining a number of innovative features with an advanced performance.

C20 series thermometers all have a high strength, polycarbonate case with rubber over moulding. This offers a very high level of strength, durability and protection against dust and water ingress. The C20 range is certified to meet IP67. All models incorporate a clock, countdown timer and data hold feature. For the full range of features please refer to Appendix 1, Page 7.

#### Overview of Display Symbols



- A – Indicates that HOLD has been selected.
- B – Setting menu item to ON/OFF
- C – Indicates Low Battery.
- D – The Set Up menu is active.
- E – Indicates probe type.
- F – Main Display for Temperature
- G – Clock Indicator.
- H – Display for time and countdown timer.
- I – Indicates countdown active.
- J – Alarm indication

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#### Connecting Probes to the Thermometers

C20 series thermometers have either sub-miniature or Lumberg sockets for probe connection and offer a class leading choice between Comark thermistor, type T thermocouple or type K thermocouple probes.

The polarity of the connector must always be checked before connecting thermocouple probes to C20 series thermometers. A probe of the correct thermocouple type must also be selected to match the specific thermometer. C20 series thermometers with Lumberg sockets will automatically detect the sensor type of the probe connected. The LCD will then indicate thermistor probes as "PST", and type T thermocouple probes as "T". Models with Sub-Min connector are of fixed thermocouple type, see specifications for details.

#### Switching On and Off

##### Display Test/Mode

The 'ON/OFF' button on the keypad is used to switch on the thermometer. After a short pause the display will show the current model of the instrument and will then revert to normal temperature display. The current time is also permanently displayed on the LCD.

##### Data Hold

All C20 series thermometers have a data hold facility. If the 'H' button is pressed at any time during normal temperature mode, the current temperature will be held on the display. To release press 'H'.

##### Countdown Timer

All C20 series thermometers have a countdown timer. This function is activated from the Set Up Menu – see section below, and can be calibrated in seconds/minutes or hours. Pressing the countdown timer button will start this function. Pressing the button again during the countdown period will stop the count. The instrument will beep for 30 seconds at the end of a countdown period to indicate to the user that it has been completed.

#### Auto Switch Off/Power Saving Mode

C20 series thermometers have a selectable auto-switch off feature. This is set to 3 minutes from the factory. Please refer to Set Up Menu for instructions on changing this setting.

#### Set Up Menu

C20 series thermometers have a hidden menu structure that is used to set up a number of parameters within the instrument. See Appendix 1 on Page 7 – C20 Series Model Range Options, to see which options are available on each model.

The set up menu can be entered when the instrument is switched on.

To enter the set up menu first ensure the instrument is off, then press the Count Down button and keep this held down while pressing the On button to switch the instrument on. After the thermometer has completed its self-checks, it will enter the menu.

N.B. After each menu item use the ON/OFF button to save and move to the next menu item.

Clock selection is the first item in the menu:

##### Clock – the display will show 'CLOC'

Use the countdown timer button and the hold button to adjust the clock time up or down.

##### Countdown Timer – the display will show 'Cd'

Use the countdown timer button and the hold button to select timer on or off. Use the Hold and Countdown timer buttons to scroll up and down in seconds up to 5 minutes then in 1 minute intervals up to 24 Hours.

##### Scale – the display will show 'SCAL'

After entering the SCALE menu, use the Countdown Timer button and the Hold button to scroll between the available scales.

##### High Alarm – the display will show 'HIAL'

Use the countdown timer and hold buttons to select or de-select high alarms, then select the required high alarm value.

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### Low Alarm – the display will show 'LOAL'

Use the countdown timer and hold buttons to select or de-select low alarm, then select the required low alarm value.

### Auto Power OFF – the display will show 'AOFF'

Use the countdown timer button and the hold button to scroll between the available options of 3, 10, 30 minutes or none.

### Clock Alarms – the display will show AL 1, followed by AL 2 and AL 3

Three Clock Timer Alarms can be set. Use the countdown and hold buttons to select or deselect Clock Alarm, and then to select the required time. Note that on instruments with no AM or PM indicator it will show the change by the way the time changes over midnight or noon. At midnight the display will change from 11:59 to 0:00, indicating AM, and at noon the display will change from 11:59 to 12:00, indicating PM. Repeat for AL 2 and AL 3.

### Resolution – the display will show 'HRES'

Use the countdown and hold buttons to select or de-select temperature display in high resolution 0.1° or low resolution 1°.

### Care of the Thermometer

C20 series thermometers are dust and waterproof as stated in the specifications and will withstand harsh environments. Use a damp cloth or warm soapy water to remove deposits and prevent them from hardening or becoming sticky. Do not use solvent-based cleaners or methylated spirit, etc.

Caution: Do not place any C20 series thermometers in a dishwasher.

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### Changing the Batteries

The symbol BAT appears on the display when the battery voltage has reduced. Battery replacement is recommended at this time.

To replace the battery, remove the battery cover retaining screw on the rear of the instrument, using the correct size screwdriver. Remove the two cells, and replace with alkaline cells only. Be careful to observe the correct polarity. Take care not to over-tighten the screw when refitting the cover.

Note: The C20 series thermometers will not work if the battery compartment is incorrectly fitted or missing. In this instance the display will show 'OPEN'. Please note the small pip on the inside of the battery cover, which must fit into the hole provided in the back of the case.

### Specifications for C20 Series Thermometers

Measurement	Thermistor 10 K Ohms univariate Thermocouple type T and K 6-pin Lumberg and Sub-Min Connectors
Measurement Range	-50°C(-58°F) to +150°C(302°F) Thermistor -200°C(-328°F) to 400°C(752°F) Type T -200°C(-328°F) to 600°C(1112°F) Type K
Scales	°C and °F
Displayed Resolution	0.1° > -100° 1° ≤ -100°
Instrument Accuracy	
Thermocouple	0.1% ± 0.2°C(0.4°F) full range @ 23°C Ambient
Thermistor	±0.3°C (±0.6°F)
System Accuracy	0°C (32°F) to 70°C (158°F) ±0.5°C (±0.9°F) -25°C (-13°F) to 100°C (212°F) @ 23°C Ambient
Temperature Coefficient	
Thermistor	less than 0.005°C/°C (0.01°F per °F)
Thermocouple	less than ± 0.01 % of reading ±0.02 °C per °C (±0.04°F per °F) change from 23°C

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### Specifications Continued

Ambient Temperature Range	-20°C (-4°F) to +50°C (122°F) operating
Display	4 digit, 12.5 mm LCD
Battery	Two Type I.E.C. LR6 Size AA
Battery Life (continuous)	Up to 14000 hours with thermistor probes Up to 7000 hours with thermocouple probes
Environmental Protection	IP67, BS 60529, IEC 529
EMC Emission	Tested to EN61326-1 Criteria B Performance
Dimensions	
Length	152mm/6 inches
Width	58mm/2.3 inches
Depth	22/27mm/09./1.1 inches
Weight	178g/6.3 ozs

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### Appendix 1 – C20 Series Model Range Options

Models	C21	C22	C22 T Type	C26	C28 K Type
Part No.	C21	C22	C22F	C26	C28F
Options					
Countdown Timer	✓	✓	✓	✓	✓
Data Hold	✓	✓	✓	✓	✓
Real Time Clock	✓	✓	✓	✓	✓
Clock Alarms	-	-	-	-	✓
Scale Selection	✓	✓	✓	✓	✓
High Alarm	-	-	✓	-	✓
Low Alarm	-	-	✓	-	✓
High Resolution	✓	✓	✓	✓	✓
Type T	-	✓	✓	✓	-
Type K	-	-	-	-	✓
Thermistor	✓	✓	✓	-	-
Connector*	L	L	L	S	S
Auto Off	✓	✓	✓	✓	✓
IP67	✓	✓	✓	✓	✓

\* L – Lumberg  
S – Sub-Miniature

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