# KM20REF
# REFERENCE
# THERMOMETER

Kane-May

# GENERAL INFORMATION

It is recommended that you read the safety and operation instructions before using this instrument.

**WARNING**

**TO AVOID DAMAGE OR BURNS, DO NOT MAKE TEMPERATURE MEASUREMENTS IN MICROWAVE OVENS.**

**CAUTION**

**Temperature Measurement Probes**
**This precision instrument has been designed for use with the extensive range of Comark temperature probes. The use of other probes may impair the performance and accuracy of the instrument. Full details of Comark probes and sensors can be obtained from Comark Customer Support department or your local distributor.**

**Repeated sharp flexing can break thermocouple probe leads. To prolong lead life, avoid sharp bends or kinks in the leads, especially near the connector.**

*ISO 9001*
*FM 26700*

This instrument is manufactured in accordance with the Company's ISO 9001 Quality Approved System.

This instrument complies with the Electromagnetic Compatibility Directive EN 61326-1.

Declarations of Conformity available. Contact Comark Customer Support or your local Distributor.

In line with its policy of continuous development, Comark Instruments reserves the right to alter the instrument specification without prior notice. Further information is available from Comark Instruments or your distributor.

# CALIBRATION, CERTIFICATION AND SERVICE


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**Certification**
Comark can provide certificates of calibration for its whole product range, to suit ISO 9000 and other quality assurance procedures, food hygiene regulations, HACCPs and environmental regulations. Comark certificates are produced by independent quality controlled processes which compare product performance against agreed National Standards. For peace of mind and best practice Comark recommend annual certification/recalibration.

Two levels of certification are available for infra-red temperature and non temperature instruments, excluding humidity:- UKAS certificates via an external accredited laboratory and NPL traceable certificates from the Comark calibration laboratory.

Three levels of certification are available for contact temperature and humidity products and these are detailed here:

**a) UKAS Temperature Certification**
The Comark UKAS (United Kingdom Accreditation Service) accredited temperature calibration laboratory is one of the finest in the UK. Comark UKAS certificates can offer the lowest uncertainty of 0.01°C and provide independent proof of correct calibration using equipment and procedures audited by UKAS inspectors. The equipment used is fully traceable to the National Physical Laboratory.

**b) UKAS Humidity Certification**
In addition to the Comark temperature laboratory, the humidity laboratory continues the tradition of high accuracy certification and a wide range (25% to 90%RH) with uncertainties of 2.8% of reading. This range also includes Dew point measurements.

**c) NPL Traceable Certification**
Comark NPL certificates are traceable to the National Physical Laboratory and can offer uncertainty as low as 0.3°C.

**Conformance**
Certificates of conformance can be supplied for new, serviced and recalibrated instruments. These confirm that instruments are within their original manufactured specification.

**Service/Repairs**
Regular servicing and any required repairs, under warranty or after, are available from the Comark Service Department.

For more information on all Comark certification, calibration and service facilities please call Comark Customer Support or contact your local distributor.

# CHECKING THE ACCURACY OF FOOD TEMPERATURE MEASURING SYSTEMS USING THE KM20REF REFERENCE THERMOMETER

The KM20REF thermometer has been specially configured and calibrated to provide an accurate and convenient method of checking the calibration of food temperature measuring systems. Each KM20REF is provided with a UKAS Certificate of Calibration from the Comark UKAS accredited calibration laboratory, which is traceable to NPL reference standards. This certificate defines the accuracy of the KM20REF at designated points.

To maximise the stability of readings from the KM20REF or indeed any other reference thermometer it is recommended that:-

a) it is only used as a reference thermometer

b) it is only used in ambient temperatures of +20°C ±5°C

c) it is protected from extreme temperature changes, shock and vibration

d) that only an alkaline battery is used and that this is replaced after 25 hours of use.

Food temperature measuring systems comprise two parts: the hand-held meter and the sensor (probe). It is important that the accuracy of the complete system (meter and probe) is regularly checked against the reading from a reference thermometer. To maintain traceable records both the meter and probe should be given unique serial numbers.

To compare the reading from a food thermometer with the reference thermometer the following procedure may be applied:

**Note:** A separate procedure has been devised for National Health Service catering operations, copies of which are available from Comark Ltd - Part Number 12442.

Make sure that both the food thermometer and your KM20REF have both been at ambient temperature (between +15°C and +25°C) for at least one hour.

Take a glass or plastic beaker that can safely hold at least 0.5 litres of fluid.

Mix cold water and if needed ice cubes made from tap water to achieve a mixture of water and/or ice (crushed ice is best) at a degree or so

below your desired comparison temperature, say +4°C or +7°C as appropriate. You can use your reference thermometer for this.

(0.5 litres of water in a plastic beaker at +7°C with an ambient temperature of 20°C exhibits a temperature rise of less than 0.1°C per minute.)

Switch on both thermometers and insert both the probes into the water to a depth of at least 50mm (2 inches). Hold the probes so that their tips are very close together and use the probes to stir the water. The water should be stirred in the centre of the beaker away from the sides. The agitation rate should be approximately one rotation per second.

Once the KM20REF is displaying the required temperature of comparison and this reading has been stable for 30 secs the reading of the food thermometer can be taken and recorded.

If the reading from the food thermometer differs from the traceable reading of the KM20REF by ±0.5°C or more, the food thermometer and probe should be returned to the manufacturer for recalibration.

**Note:** The traceable KM20REF reading is obtained by adding the appropriate adjustment. This adjustment is obtained by taking the applied temperature and subtracting the corresponding measured value. See the example below:

| Applied Temperature | Measured | Adjustment |
|---|---|---|
| –18.0°C | –18.2°C | +0.2 |
| 0.0°C | –0.1°C | +0.1 |
| +5.0°C | +5.1°C | –0.1 |
| +8.0°C | +8.1°C | –0.1 |
| +20.0°C | +20.2°C | –0.2 |

**Note:** In an ideal world your tests should be conducted at exactly the same points as those indicated in the “Measured” column of your KM20REF Certificate. For all practical purposes it is acceptable to apply the adjustment factor provided the readings are ±1.0°C of the “Measured” value.

If then when conducting the test the following results were achieved

| | |
|---|---|
| KM20REF reading | +8.1°C |
| Food thermometer reading | +8.5°C |

your results sheet would be filled in as follows:

# EXAMPLE

## CALIBRATION CHECK RESULTS SHEET

DATE: **2nd May 2001**

TIME: **0930**

AMBIENT TEMPERATURE: **21.3°C**

KM20REF SERIAL NUMBER: **1234**

FOOD THERMOMETER SERIAL NUMBERS:

INSTRUMENT: **0675**

PROBE: **0231**

KM20REF READING: **+8.1°C**

ADJUSTMENT **–0.1°C**

**TRACEABLE TEMPERATURE: +8.0°C**

**FOOD THERMOMETER READING: +8.5°C**

DEVIATION **+0.5°C**

**ACCEPT/REJECT**

**TESTED BY:**

**CHECKED BY:**

## CALIBRATION CHECK RESULTS SHEET

DATE:

TIME:

AMBIENT TEMPERATURE:

KM20REF SERIAL NUMBER:

FOOD THERMOMETER SERIAL NUMBERS:

INSTRUMENT:

PROBE:

KM20REF READING: **°C**

ADJUSTMENT **°C**

**TRACEABLE TEMPERATURE:** **°C**

**FOOD THERMOMETER READING:** **°C**

DEVIATION **°C**

**ACCEPT/REJECT**

**TESTED BY:**

**CHECKED BY:**

**Auto Switch Off**
The KM20REF has an auto switch off function to conserve battery life. The instrument will automatically switch off after approximately 3 minutes use. Press the ON/OFF button again to continue using the instrument.

# SPECIFICATION

| | |
|---|---|
| **SCALE** | °C |
| **MEASUREMENT RANGE Pt100** | –100°C to +199.9°C |
| **RESOLUTION** | 0.1°C |
| **ACCURACY** | ±0.2°C |
| **OPERATING RANGE** | 0 to +40°C |
| **CERTIFICATE OF CALIBRATION DESIGNATED POINTS FOR ACCURACY** | –18°C, 0°C, +5°C, +8°C, +20°C |
| **EMC** | Tested to EN 61326-1<br>Criteria B performance |

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