COMARK
A Fluke Company

Precision instrumentation
and monitoring solutions
for industrial, technical and
scientific applications.

Why Comark?

Comark is a leading international manufacturer of precision measuring and monitoring instruments.

This brochure covers thermometers and temperature probes, data loggers, humidity meters and pressure meters for a range of applications which include scientific research, pharmaceuticals, public health, horticulture, building management, industrial, H & V and refrigeration.

Whatever your requirement, it's likely that Comark can supply the most appropriate solution. The range of products is comprehensive and extends from hand-held instruments and data loggers through to sophisticated wireless monitoring systems which employ ground-breaking technology to achieve unprecedented performance levels in almost any industry or application.

All Comark instruments come with a minimum 1 year warranty unless otherwise stated and all comply with appropriate industry standards.

All components are produced from high grade materials and many products now have BioCote® antimicrobial impregnated into their surfaces to provide an extra line of defence where cross-contamination is a potential hazard – see page 15 for more details.

Comark is certified to ISO 9001 and operates appropriate internal quality management systems. Many instruments are IP rated to classify the degree of protection against dust and water and the CE Mark (usually printed on the back of the instrument) certifies that the product meets European Health and Safety Regulations. If required, a certificate of calibration can be supplied by Comark's own UKAS accredited temperature and humidity calibration laboratory.

All of this, plus first class technical service and support, knowledgeable qualified staff, and some forty plus years' experience delivering the best solutions – that's why you should specify Comark.

A separate brochure detailing Comark products for food applications is also available.

Contents

Professional Thermometers

Reliable performance, rugged design and useful features make these instruments the choice of professional users.

These instruments are built to withstand rough treatment and feature easy-to-clean dust and waterproof cases with sealed soft touch keypads and BioCote® antimicrobial for increased protection when used in areas where cross-contamination could be an issue – for more information on BioCote® see page 15.

Each instrument is compatible with a wide range of Comark probes, covering both general and specialist applications, depending on the sensor type. **Please see pages 20 to 23.**

C28
Single sensor

This Type K thermocouple thermometer has an easy-to-use keypad and a large, clear LCD display with a permanent clock. A cell-phone style menu allows the auto switch-off to be changed to 3, 10 or 30 minutes and the countdown timer to be set – the timer can also be stopped during countdown. The case incorporates a built-in protective boot and is waterproof to IP67 standard.

• –200°C to +600°C range
• Countdown timer with audible bleep
• Permanent clock display
• Selectable alarm
• Auto switch-off
• Data hold
• Sub-miniature probe connector
• Scales °C, °F

Order code: C28

WATERPROOF **IP67** DUSTPROOF BioCote

2 YEAR WARRANTY

N9005
Dual sensor

This Type T/K thermocouple thermometer is housed in Comark's well proven, IP67 premium case and provides exceptional instrument accuracy (0.1% ±0.2°C) across the full measurement range. A cell-phone style menu allows selection of scales, clock adjustment, setting of countdown timer – which can be stopped during countdown – and setting of high and low temperature alarms. Auto switch-off can also be changed to 3, 10 or 30 minutes.

- –200°C to +1372°C range, depending on sensor
- Countdown timer with selectable audible alarms
- Permanent clock display
- Selectable auto switch-off
- Data hold
- Sub-miniature probe connector
- Scales °C, °F

Order code: N9005

WATERPROOF **IP67** DUSTPROOF BioCote

2 YEAR WARRANTY

N9002
Differential thermometer with multi-sensor compatibility

The N9002 is compatible with 8 thermocouple types – K, N, T, J, R, S, E and B. As well as an overall temperature measurement capability ranging from –200°C to +1820°C, it allows users to select the best thermocouple for the application. Twin sub-miniature probe connectors also allow differential temperatures to be measured, with readings displayed in °C, °F or K. It can also be used as a conventional thermometer when a single probe is connected. Comark's IP67 rated premium case adds to the instrument's versatility.

- –200°C to thermocouple limit
- Single and dual differential inputs
- Maximum and minimum temperature memory
- Data hold
- Selectable 3, 10 or 30 minute auto switch-off
- Sub-miniature probe connector
- Scales °C, °F and K
- Certificate of conformity included
- Calibration – BS EN 60584 thermocouples (ITS90)

Order code: N9002

WATERPROOF **IP67** DUSTPROOF BioCote

2 YEAR WARRANTY

Technical Selector

	Displayed Resolution	Sensor Type	Measurement Range	Instrument Accuracy at 23°C	Battery Life
C28	>–100°C: 0.1°, <–100°C: 1.0°	Type K Thermocouple	–200°C to +600°C	0.1% ±0.2°C	Up to 7000 hrs
N9005	>–100°C <+1000°C: 0.1°C	Type T Thermocouple	–200°C to +400°C	0.1% ±0.2°C full range (Type T or K)	Up to 10 yrs
	<–100°C, >+1000°C: 1.0°C	Type K Thermocouple	–200°C to +1372°C		
N9002	<+1000°C: 0.1°C, >+1000°C: 1.0°C	Types K, N, T, J, R, S, E and B	–200°C to +1820°C depending on sensor	Type K only: <0.1% of reading ±0.2°C	200 hrs

See Pages 6 and 7 for other thermometers in our range.

Specialist Thermometers

A range of instruments with features designed to satisfy application specific needs.

These instruments are built to the same high design standards and deliver similar levels of reliability and accuracy as others in the Comark range, but they generally address core needs and exclude some of the more sophisticated 'add-ons'.

Each instrument is compatible with a wide range of Comark probes, covering both general and specialist applications, depending on the sensor type. **Please see pages 23 and 24.**

C26
With Type T sensor

The C26 is economically priced, gives a fast response, and is suitable for a wide range of applications over the mid temperature range up to 400°C. It is housed in a robust IP67 rated case with a built-in protective rubber boot.

• –50°C to +400°C range
• Fast response
• Sub-miniature probe connector
• Large LCD display
• Countdown timer
• Permanent clock
• Scales °C, °F
• Data hold
• Auto switch-off

Order code: C26

WATERPROOF IP67 DUSTPROOF

BioCote

2 YEAR WARRANTY

KM330
With Type K sensor

An economically priced thermometer with a Type K sensor, which extends the upper measurement range to 1300°C. It incorporates a useful maximum temperature memory function and comes complete with a slip-on rubber boot.

• –50°C to +1300°C range
• Sub-miniature probe connector
• Selectable 0.1°/1° resolution
• Max temperature memory
• Data hold
• Scales °C, °F

Order code: KM330

KM340
Differential thermometer with Type K sensor

This is a differential measurement version of the KM330 and is ideal for HVAC applications, particularly for flow and return measurements and radiator output checks. It measures two temperature inputs and calculates the difference between them. It can also be used as a conventional single probe thermometer.

• –50°C to +1300°C range
• Two sub-miniature probe connectors
• Max/min temperature memory
• Data hold
• Scales °C or °F

Order code: KM340

C9006IS
Atex compliant Intrinsically Safe thermometer

Certified to ⟨Ex⟩II 1 G EEx ia IIC T4 Baseefa 03 ATEX0056, the C9006IS is housed in a robust IP67 rated case and is approved for use in hazardous environments such as refineries, petrochemical plants and gas distribution facilities.

• –200°C to +1767°C depending on thermocouple
• Compatible with thermocouple types K, N, T, J, R and S
• Sub-miniature probe connection
• Calibration – BS EN 60584 thermocouples (ITS90)
• Max/min temperature memory
• Data hold
• Selectable auto switch-off

Order code: C9006IS

WATERPROOF **IP67** DUSTPROOF   **2** YEAR WARRANTY

Technical Selector

	Displayed Resolution	Sensor Type	Measurement Range	Instrument Accuracy at 23°C between 0°C and +70°C	Battery Life
C26	>–100°C: 0.1°, ≤–100°C: 1.0°	Type T Thermocouple	–50°C to +400°C	<±0.5°C	Up to 5 yrs
KM330	0.1°/1° selectable	Type K Thermocouple	–50°C to +1300°C	–50°C to 0°C: +2, –1°C 0°C to +1100°C: ± (0.2% of reading +1°C)	200 hrs
KM340	1.0°				
C9006IS	<1000°C: 0.1°, >+1000°C: 1.0° (autoranging)	Types K,N,T,J,R and S	–200°C to +1767°C depending on sensor	<±0.1%±0.2°C	80 hrs

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Thermometer Kits

These handy kits include the thermometer and probe selection most appropriate to the application.

KM330/P/Kit

- KM330 thermometer
- 1 x PRO2 surface probe
- 1 x PRO4 flexible air probe
- Carrying pouch

Order code: KM330/P/KIT

KM330/Legionella Kit (not illustrated)

- KM330 thermometer
- 1 x PRO1 chisel probe
- 1 x PRO2 surface probe
- Carrying pouch

Order code: KM330/P12/KIT

N9002 HVAC Kit

- N9002 differential thermometer
- 1 x LC98 case
- 2 x SK29M pipe probes
- 1 x SK21M surface probe
- 1 x AK21M air probe

Order code: N9002/HVKIT

Useful temperature conversions

°C	°F
1820	3308
1767	3213
1372	2502
1300	2372
1200	2192
1100	2012
1000	1832
850	1562
800	1472
760	1400
700	1292
650	1202
600	1112
545	1013
500	932
450	842
400	752
260	500
250	482
200	392
190	374
150	302
140	284
125	257
120	248
110	230
100	**212**
90	194
88	190
85	185
80	176
75	167
70	158
65	149
63	145
60	140
50	122
40	104
28	82
23	73
20	68
8	46
5	41
3	37
2	36
1	34
0	**32**
−1	30
−5	23
−10	14
−18	**0**
−20	−4
−25	−13
−30	−22
−32	−26
−40	−40
−50	−58
−55	−67
−80	−112
−100	−148
−200	−328

Temperature conversion formulae

°C to °F = x 1.8 + 32
°F to °C = −32 ÷ 1.8

Diligence EVG Graphic Display Monitor

Provides continuous data logging with the benefit of a large LCD to display complex data instantly.

N3014
Graphic display monitor

This versatile, stand-alone instrument can be programmed from its own keypad to provide continuous temperature monitoring of up to eight events or processes via sub-miniature connections. Collected data can be viewed at any time on the large integral display.

The data can then be stored on a PC and printed out in graphical, tabular or summary form. The unit comes complete with a stand, wall fixings and carrying case and provides a neat and compact solution wherever it's used.

- Range: –200°C to thermocouple limit
- Compatible with thermocouple types
  K, N, T, J, R, S, B, and E
- Instrument accuracy with type K Thermocouple:
  ±0.1% of reading, ±0.2°C
- Scales °C, °F or K
- Logging frequency: 10 seconds to 99 hours
- 8 monitoring channels
- 64,000 readings memory capacity
- Green/Red LEDs indicate active and alarm conditions
- 8 sub-miniature sensor connections
- Rechargeable batteries or mains operation
  – adaptor/charger included
- Compact dimensions: 190 x 138 x 45mm

Order code: N3014

Integral software

The N3014 uses Comark's proven Evolution software and keypad initiated options include:

- Start/stop recording and pre-set times for each channel
- Selection of wraparound or 'one shot' memory
- Description of logging run and channel names
- Sensor configuration
- Setting of max/min temperatures and alarms for the different channels
- Password set
- Clock set
- Tabular data presentations
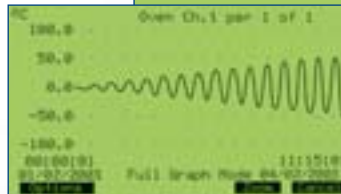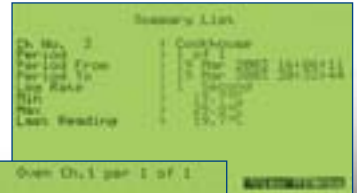
2 YEAR WARRANTY
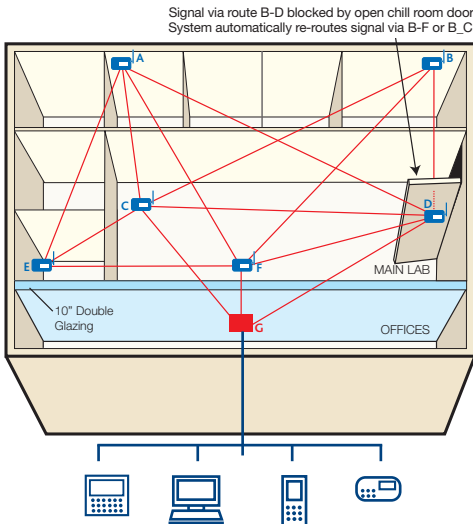
RF500 Wireless Monitoring

Delivers exceptional data integrity and satisfies regulatory requirements such as 21 CFR Part 11.

2 YEAR WARRANTY

The RF500 system provides 24/7 monitoring of temperature, humidity and door events and achieves unprecedented levels of efficiency and reliability through its use of the latest RF technology with built-in mesh networking, and its use of transmitters with bi-directional communications. Key benefits include:

- **Accurate records without compromise**
- **Secure multi-user access to data via the Internet at any time**
- **Alarm notification via email, phone or pager**
- **Transmitters that are accurate and have a long battery life**
- **Aids compliance with legislative and regulatory requirements**
- **Plus, it's easy to install, use and maintain**

A network of remote sensors and probes collect the information and transmit it to a Gateway Unit which manages the system and stores the data. The result is efficient and versatile round-the-clock monitoring.

Signal via route B-D blocked by open chill room door. System automatically re-routes signal via B-F or B_C.

Instant alarm notification is via screens, SMS, voice or email to your PC, PDA, mobile or pager.

Manual checks on temperature and humidity are a thing of the past.

RF500 does it automatically and, in the event of readings falling outside pre-set limits, alarm notification via screens, SMS, email or voice allows immediate corrective action to be taken. RF500 answers market demands for a reliable system which is easy to understand and operate, but can just as easily be reconfigured or expanded in line with changing needs.

Transmitters include an LCD and LEDs for alarm conditions.

> **For full product details or an on-site demonstration contact the Comark Sales Office on 0844 (+44 844) 815 6599**

The powerful Gateway Unit requires no specialist PC software.

It connects directly to the local area network, permitting 24/7 single or multi-user access via the Internet. The system also provides a full audit trail, electronic signatures and data protection to meet the requirements of 21 CFR Part 11.

It is ideal for applications where protection of your products or services and your good name are paramount.

• Up to 512 channels
• Up to 128 transmitters
• Up to 10 years' storage capacity

Stop, start etc.

High alarm limit shown in red

Low alarm limit shown in blue

Export function

Mean Kinetic Temperature value

Transmitter Options

RF512 with an integral temperature sensor plus connectors for two external thermistor probes and an external door sensor.

RF513 with integral temperature and humidity sensors and a connector for an external door sensor.

RF515 can be connected to a control loop and programmed to measure an extensive range of parameters such as pressure, gas, flow, level, dissolved oxygen, CO_2 and many more.

RF516 with a precision temperature transmitter with an integral temperature sensor plus connectors for one external PT100 probe and an external door sensor.

Diligence EV Data Loggers

Stand-alone temperature and humidity loggers that remove the risk of human error.

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These high specification time and data loggers are lightweight and small enough to be used almost anywhere.

They can be permanently located or used to monitor goods in transit and various models are available for measuring temperature humidity and different process parameters. A long battery life and a large memory allow logging over extended periods.

Comark EV software is required to program logger tasks, download and analyse data and keep permanent records to aid compliance with 21CFR Part 11. Two software versions are available, see Diligence EV Accessories panel opposite.

- LCD display for local readings
- Green/red LEDs to show active and alarm conditions
- Tough, dust and waterproof case to IP67 standard
- Up to 5 years' battery life
- Ability to log over multiple periods
- Large 32k memory with wraparound so no lost data:
  1 channel: 16,000 samples
  2 channels: 8,000 samples
  3 channels: 5,300 samples
  4 channels: 4,000 samples
  5 channels: 3,200 samples
- Infrared interface for programming and downloading data
- Logging frequency from 1 second to 99 hours (2 seconds/minute for N2014)

Technical Selector

	Displayed Resolution	Sensor Type	Measurement Range	Accuracy
N2011	0.1°	Thermistor	−40°C to +70°C	System Accuracy at: (Temperature) −25°C to +50°C: ±0.5°C −40°C to +80°C: ±1.0°C −40°C to +150°C: ±2.0°C (typical) (Humidity N2013 only) −20°C to +60°C: ±3%
N2012	0.1°	Thermistor	Internal sensor: −40°C to +70°C External/sensors: −40°C to +150°C	
N2013	Temperature: 0.1° Humidity: 0.1% RH	Thermistor	Temperature: −20°C to +60°C Humidity: 0 to 97% RH non-condensing	
N2014	0.2° up to and including +300°C	Type K Thermocouple	−200°C to +1372°C	Instrument Accuracy at 20°C: ±5°C + 0.5% of reading
		Type T Thermocouple	−200°C to +400°C	
		Thermistor	−50°C to +150°C	
N2015	4 digits, 1 decimal place	–	4 to 20mA	Instrument Accuracy at 20°C: ±0.3% of full scale
EVt1*	0.1°	Thermistor	−20°C to +70°C	±0.5°C
EVt2*			−30°C to +70°C	

N2011
Temperature logger

Single internal sensor for temperature logging only. This logger is certified to meet transport standard EN12830:1999.

N2012
Multi sensor temperature logger

Single internal temperature sensor and up to 4 external thermistor temperature sensors, connected via a multi-link box (sold separately). Used in conjunction with Comark probes, the N2012 can be used to monitor local temperature via the internal sensor, plus up to 4 adjacent temperatures.

N2014
Multi sensor high temperature logger

Monitors temperatures from up to three external Type K or Type T sensors via an adaptor cable (sold separately). Use of these sensors allows a much wider range of temperatures to be monitored. The N2014 can also be used in conjunction with a single Thermistor probe if high accuracy over a core temperature range is required.

N2013
Combined temperature and humidity logger

Single fixed external temperature and humidity sensors.

N2015 mA Logger

The N2015 is designed for connection into the control loop of various automated processes via an ADP50 adaptor cable and can be programmed to monitor a wide range of parameters, typically pressure, pH and airflow.

EV Software

EVSW Software – General use logger software.
Order Code: EVSW

EVSWPRO Software – Professional version of logger software with security options to aid compliance with 21CFR Part 11.
Order Code: EVSWPRO

Accessories

EVTCRU USB computer interface for EVt loggers.
Order Code: EVTCRU

N2000CRU USB computer interface
Order Code: N2000CRU

N2000BOX Multi-link box to connect up to four thermistor external sensors to data logger model N2012.
Order Code: N2000BOX

N2000ADP/K Adaptor cable to connect up to three Type K probes to data logger model N2014.
Order Code: N2000ADP/K

N2000ADP/T Adaptor cable to connect up to three Type T probes to data logger model N2014.
Order Code: N2000ADP/T

ADP50 Adaptor cable to connect N2015 loggers to a sensor transmitter.
Order Code: ADP50

A17476 Lithium battery with case seal.
Order Code: A17476

SSF2 Stainless steel filter N2013.
Order Code: SSF2

EVt Transport Loggers

When you need to keep a temperature eye on goods in transit or storage.

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EVt loggers are robust, low cost and easy to use, and provide a highly efficient method of logging. Using Comark EV software, EVt loggers can be programmed to record the temperature at various stages of a journey and the results later downloaded to a PC for immediate analysis and permanent records. Shared features include:

- Single button operation
- LCD which shows essential data without the need for downloading
- 1 second to 99 hours logging frequency
- 3,000 readings memory capacity
- LEDs for active and alarm indication
- Display resolution: 0.1°
- System accuracy: ±0.5°C

See pages 12 & 13 for specifications and EV Software

EVt1 Single use logger

Supplied pre-programmed but can be re-programmed.
- Temperature range: –20°C to +70°C
- Battery life: 12 months

Order code: EVT1

EVt2 Multi-use logger

Can be reused after each trip then re-programmed. This logger is certified to meet transport standard EN12830:1999.
- Temperature range: –30°C to +70°C
- Battery life: 24 months

Order code: EVT2

Logger Starter Kits

These expandable kits contain all you need to start logging.

EVt1 Starter Kit
- EVt1 Logger
- 1 x EVSW Software
- 1 x EVTCRU USB Computer Interface

Order code: EVT1STARTERKIT

EVt2 Starter Kit
- EVt2 Logger
- 1 x EVSW Software
- 1 x EVTCRU USB Computer Interface

Order code: EVT2STARTERKIT

N2011 Starter Kit
- N2011 Logger
- 1 x EVSW Software
- 1 x N2000CRU USB Computer Interface

Order code: N2011STARTERKIT

N2012 Starter Kit
- N2012 Logger
- 1 x EVSW Software
- 1 x N2000CRU USB Computer Interface

Order code: N2012STARTERKIT

N2013 Starter Kit
- N2013 Logger
- 1 x EVSW Software
- 1 x N2000CRU USB Computer Interface

Order code: N2013STARTERKIT

N2014 Starter Kit
- N2014 Logger
- 1 x EVSW Software
- 1 x N2000CRU USB Computer Interface

Order code: N2014STARTERKIT

N2015 Starter Kit
- N2015 Logger
- 1 x EVSW Software
- 1 x N2000CRU USB Computer Interface

Order code: N2015STARTERKIT

BIG SAVINGS when you order a starter kit

Stop!

## Think how you could benefit from BioCote® protected instruments.

To help guard against the risk of cross-contamination in almost any environment, the latest Comark instruments come with BioCote® antimicrobial impregnated into instrument surfaces, keypads and probe handles. The process uses silver, a natural antimicrobial, and lasts for the life of the instrument. When micro-organisms come into contact with the silver, their ability to reproduce is inhibited and they die.

Recent trials conducted by BioCote® and The University of Wolverhampton science park canteen compared BioCote® treated and untreated Comark thermometers. The result was a massive 92.73% reduction in microbe levels on the treated instrument.

BioCote® treated instruments from Comark provide users in sensitive areas like laboratories, pharmaceutical and public health with an important extra line of defence against cross-contamination.

Tests showed a massive 92.73% reduction in microbe levels!
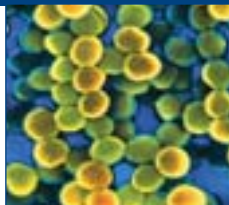
Only Comark offers thermometers with Biocote® antimicrobial

Infrared Thermometers

For safe, non-contact surface temperature measurement.

Infrared thermometers allow temperatures to be measured without physical contact with the subject – just point the instrument and read off the temperature. They are ideal where access to the subject is difficult or dangerous or where quick checks are required to identify potential problems.

KM814
Lightweight, compact and pocket sized for quick checks

• -18°C to +260°C range
• Backlit LCD
• Hold function
• Scales °C, °F

Order code: KM814

KM842
Robust design for tougher applications

• -32°C to +400°C range
• Displays current and maximum temperatures
• Data hold
• Switchable backlit LCD
• Scales °C, °F

Order code: KM842

KM846

Similar to KM842 but allows the connection of a contact probe for more accurate temperature checks when a problem is identified, plus additional features:

• Extended range –32°C to +600°C
• 12 point data logging capability
• Max, min, differential and average temperature functions
• Display recall
• Audible and visible high/low alarm indication

Order code: KM846

KM848

Similar specification and features to the KM 846 plus:

• Extended range -32°C to +760°C

Order code: KM848

Emissivity: 0.95 emissivity is a good general compromise for non-metallic target materials. Adjustable instruments allow more accurate matching to the emissivity of the material.

Distance to spot size ratio: The smaller the distance to spot size ratio, the better for close-up work. The larger ratio is more effective over longer distances.

Technical Selector

	Displayed Resolution	Measurement Range	Distance to spot size ratio	Emissivity Level†	Accuracy for targets at:
KM814	0.2ºC	−18°C to +260°C	6:1	0.95 preset	−1°C to +260ºC: ±2°C or ±2%
KM842	0.2ºC	−32°C to +400°C	12:1	0.95 preset	+23°C to full range: ±1°C or ±1%
KM846	0.1ºC	−32°C to +600°C	30:1	0.1 to 1.0 adjustable	+23°C to full range: ±1°C or ±1%
KM848	0.1ºC	−32°C to +760°C	50:1	0.1 to 1.0 adjustable	+23°C to full range: ±1°C or ±1%

Humidity Meters

These IP67 rated dust and waterproof instruments measure both temperature and humidity.

These instruments are suitable for applications as diverse as heating and ventilating, the storage of sensitive materials such as paper and fabric, or art galleries and museums where acceptable humidity levels need to be maintained.

The N8004 and N8006 share a number of features including:

• IP67 rated dust and waterproof case with a soft touch keypad

• Simultaneous reading of either RH or calculated dewpoint and ambient temperatures

• Dewpoint calculation from measured values

• Data hold of current, maximum and minimum readings

N8006
With integral temperature and humidity sensor

Same specifications as the N8004 but with integral sensors. This makes this instrument particularly suitable where quick checks are required.

Order code: N8006

WATERPROOF
IP67
DUSTPROOF

N8004
With 'plug in' temperature and humidity sensor

• 0 to 100% humidity range
• –20°C to 60°C temperature range
• Capacitive humidity sensor for fast response
• Thermistor temperature sensor for accuracy
• RH, °C, °F and DP scales
• Accuracy at 0-90%RH: ±2%
• Lumberg connector

Order code: N8004

WATERPROOF
IP67
DUSTPROOF

DTH880
For measuring room temperature and humidity levels

• 25% to 95% humidity range
• 0°C to 50°C temperature range
• Comfort zone indicator and min/max temperature
• Data hold
• Wall bracket and stand

Order code: DTH880

N2013
Temperature and humidity logger

• See page 13 for details.

Pressure Meters

Accuracy and speed of response, plus ATEX certified Intrinsically Safe options are the factors which define Comark pressure meters.

Comark twin input pressure meters

The C9550 range of pressure meters is suitable for gauge or differential pressure and positive or negative (vacuum) pressure measurement. These instruments are ideal for applications like H & V, process pressures, laboratories and clean rooms, through to service and maintenance and the calibration of other instruments.

The C9500 range is identical to the above in terms of specifications but all instruments are ATEX certified Intrinsically Safe (I.S.) for working in hazardous environments. Certified to ⟨Ex⟩ II 1 G EEx ia IIC T4 Baseefa 03 ATEX 0079. All C9500 models also have average reading function and over-range indication.

Both the C9550 and C9500 ranges offer silicone protection as an option. This allows liquid pressures to be measured without the risk of sensor corrosion. Simply order the version with 'SIL' in the order code.

Four models are offered in each range with measurement parameters 0 to 2PSI, 0 to 5PSI, 0 to 30PSI and 0 to 100PSI. Readings can be displayed in up to 11 different scales depending on the model. **See table for options.**

Standard instruments
Order codes: C9551, C9553, C9555, C9557

Standard instruments with Silicone Protection
Order codes: C9551/SIL, C9553/SIL, C9555/SIL, C9557/SIL

Instrinsically Safe Instruments
Order codes: C9501/IS, C9503/IS, C9505/IS, C9507/IS

Instrinsically Safe Instruments with Silicone Protection
Order codes:
C9501/IS/SIL, C9503/IS/SIL, C9505/IS/SIL, C9507/IS/SIL

TK2
Pressure test kit

For checking the calibration of pressure installations. The kit comprises hand pump, tubing and connectors, all contained in a robust carrying case.

Order code: TK2

C9500 Series Specifications

| SCALE | Standard | C9551 | C9553 | C9555 | C9557 |
	Intrinsically Safe	C9501/IS	C9503/IS	C9505/IS	C9507/IS
PSI	Range	0 to ±2.031	0 to ±5.076	0 to ±30.46	0 to ±101.05
	Resolution	0.001	0.001	0.001	0.01
mbar	Range	0 to ±140	0 to ±350	0 to ±2100	0 to ±7000
	Resolution	0.1	0.1	0.1	1
Bar	Range	–	–	0 to ±2.100	0 to ±7000
	Resolution	–	–	0.001	0.001
inH$_2$O	Range	0 to ±56.2	0 to ±140.5	0 to ±843.1	0 to ±2810
	Resolution	0.01	0.01	0.1	0.1
inHg	Range	0 to ±4.134	0 to ±10.34	0 to ±62.01	0 to ±206.7
	Resolution	0.001	0.001	0.01	0.01
mmHg	Range	0 to ±105.0	0 to ±262.5	0 to ±1575	0 to ±5250
	Resolution	0.01	0.01	0.1	1
Torr	Range	0 to ±105.0	0 to ±262.5	0 to ±1575	0 to ±5250
	Resolution	0.01	0.01	0.1	1
Pa	Range	0 to ±14000	–	–	–
	Resolution	1	–	–	–
KPa	Range	0 to 14.00	0 to ±35.00	0 to ±210.0	0 to ±700.0
	Resolution	0.001	0.01	0.01	0.1
mmH$_2$O	Range	0 to ±1428	0 to ±3569	–	–
	Resolution	0.1	1	–	–
cmH$_2$O	Range	0 to ±142.8	–	0 to ±2141	0 to ±7138
	Resolution	0.01	–	0.1	1
Kgcm^{-2}	Range	0 to ±143	0 to ±0.357	0 to ±2.141	0 to ±7.138
	Resolution	0.001	0.001	0.001	0.001

Temperature Probes

Comark's range of temperature probes is one of the biggest available, and covers virtually every temperature measurement application.

Comark produces one of the largest available ranges of temperature probes, with a probe for almost every application.

There is a special probe design and build facility so if you can't find what you need within the standard range, Comark can either modify an existing probe or supply probes to customer designs.

Probe Categories

Comark standard probes fall into four main categories and each includes probes with different sensor types:

Penetration probes are used for measuring the internal, or core temperatures, of solid and semi-solid materials.

Surface probes are designed for maximum contact with the surface to be measured.

Air probes are for measuring air and gas temperatures and damped sensor probes.

Immersion probes measure the temperature of liquids and semi-solids.

Where required, UKAS certificates of calibration can be provided for probe and thermometer combinations.

Choosing the right sensor

The choice of sensor will determine the measurement range, the accuracy and the response time. The sensor type must also be compatible with the thermometer you use. Comark standard probes use two basic sensor types:

1. Thermocouples. These consist of two wires made of dissimilar materials joined together at the measurement tip (the hot junction) and connected at the other end to the instrument (the cold junction). The two main thermocouples used in Comark thermometers are Types K and T. See opposite for thermocouple limits.

The **Type K** Thermocouple has a wide measurement range and responds quickly to temperature changes.

The **Type T** Thermocouple also responds quickly to temperature changes and generally provides greater accuracy, but it is effective over a narrower temperature range.

2. Thermistor (PST) is a semi-conductor sensor and provides exceptional accuracy but over a much narrower temperature range.
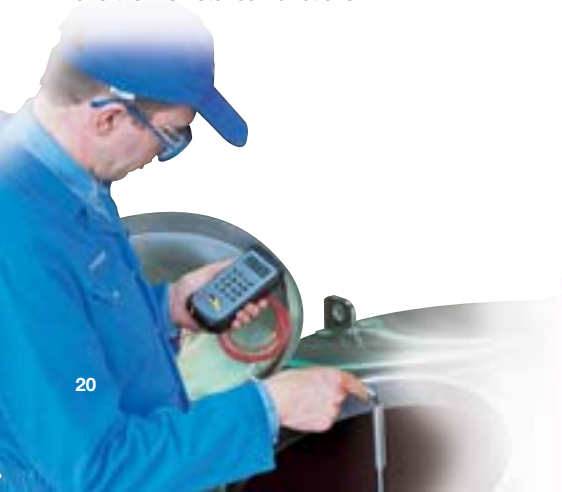
Choosing the right probe

Within the Comark standard probe range you'll find probes for general duties as well as ones for more specialist applications. Try to match the probe to the job. For example, a low mass flexible air probe is better suited to accurate air temperature measurement than a penetration probe which will take too long to stabilise.

For solid and semi-solid materials use surface probes for surface measurements. Options include probes with a bent stem for easier access and specialist probes for pipe temperatures.

Use penetration or immersion probes to check internal temperatures. Where holes need to be drilled in solids, use a thermocouple or thermistor probe and make sure it's inserted to at least 6 times

its diameter. You can also use a thermal transfer compound for improved accuracy.

For liquids use an immersion probe or you can use certain penetration probes, but check for possible corrosive effects on the sensor first and agitate the liquid for a faster response.

For air and other gasses use an air probe. Response times are affected by heat transfer around the sensor and the smaller the sensor, the faster the response time. Response is also affected by air movement. Damped sensor probes have a large mass around the sensor to slow response times so they don't trigger alarms when fridge or freezer doors are opened or during defrost cycles.

Understanding the Comark probe order code

Category Type
P: Penetration
S: Surface
A: Air
I: Immersion

Sensor Type
K: Type K thermocouple
T: Type T thermocouple
X: Thermistor (PST)
P: PT100

Sequential Code Number

Connector Type
M: Sub-miniature
L: Lumberg
L8: Lumberg 8-pin, for N5001 HACCP Auditor
B: Bipole

P K 24 M

Connector Types

M: Sub-miniature

L: Lumberg
L8: 8-pin Lumberg

B: Bipole
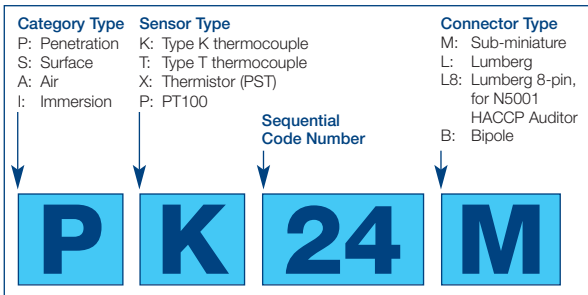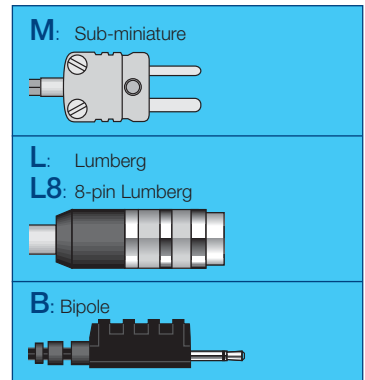
Probe Leads

Comark probe leads are matched to the intended applications for the probe. The materials used are:

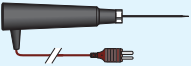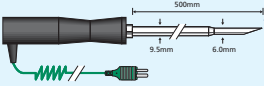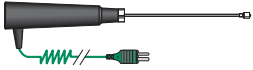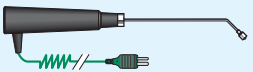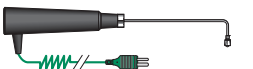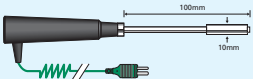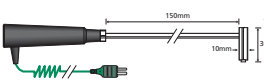**PVC** – PVC coiled leads provide ease of use in ambient temperatures of up to +70°C.
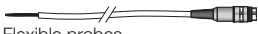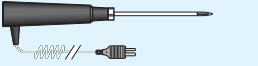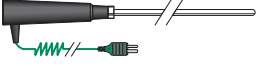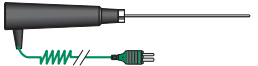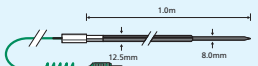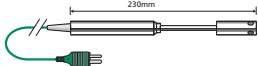
FEP and PTFE – These materials are especially suited to food probes and can be used in sub-zero temperatures. Steel braided PTFE leads provide greater strength.

Fibreglass (FG) – Fibreglass insulated leads are used for special application probes where the lead could be subjected to very high ambient temperatures of up to +400°C.

Thermocouple Limits

Type	Temperature Range
K	−200°C to +1372°C
N	−200°C to +1300°C
T	−200°C to +400°C
J	−200°C to +1200°C
R, S	−50°C to +1767°C
E	−200°C to +1000°C
B	0°C to +1820°C

	Sensor	Connector	Temp Range °C	Response Time (secs)†	Stem Length (mm)	Stem Dia (mm)	Lead Length (m)	Lead Material	Order Code

Penetration Probes

	Sensor	Connector	Temp Range °C	Response Time (secs)†	Stem Length (mm)	Stem Dia (mm)	Lead Length (m)	Lead Material	Order Code
	T	M	−100°C to +250°C	0.5	50	1.6	1.0	PVC	**PT21M**
	K	M	−50°C to +250°C	0.5	50	1.6	1.0	PVC	**PK21M**
Short Stem Probe for very fast response.									
	K	M	−50°C to +250°C	2.0	100	3.3	1.0	PVC	**PK24M**
General purpose probe.									
	K	M	−50°C to +250°C	10.0	500	9.5/6.0	2.0	PVC	**PK32M**
Heavy duty tarmac probe.									

Surface Probes

	Sensor	Connector	Temp Range °C	Response Time (secs)†	Stem Length (mm)	Stem Dia (mm)	Lead Length (m)	Lead Material	Order Code
	K	M	−50°C to +250°C	0.2	100	7.5	1.0	PVC	**SK21M**
Fast response general purpose probe.									
	K	M	−50°C to +250°C	0.2	70/30	7.5	1.0	PVC	**SK22M**
Fast response general purpose probe.									
	K	M	−50°C to +250°C	0.2	70/30	7.5	1.0	PVC	**SK23M**
Fast response general purpose probe.									
	K	M	−50°C to +650°C	0.4	100	10.0	1.0	PVC	**SK24M**
Heavy duty general purpose probe – suitable for high temperatures.									
	K	M	−50°C to +650°C	0.4	150/36	10.0	1.0	PVC	**SK25M**
Heavy duty general purpose probe – suitable for high temperatures.									
	K	M	−50°C to +100°C	10.0	–	–	2.5	PVC	**SK29M**↓
Pipe probe for heating, ventilating and air-conditioning applications with 500mm Velcro strip.									
	K	M	−50°C to +100°C	5.0	–	–	1.0	PVC	**SK35M**↓
Pipe clamp probe for use in heating, ventilating and air-conditioning applications for pipes 15 to 38mm diameter.									

Air Probes

	Sensor	Connector	Temp Range °C	Response Time (secs)†	Stem Length (mm)	Stem Dia (mm)	Lead Length (m)	Lead Material	Order Code
	K	M	−100°C to +250°C	0.5	–	–	1.0	PTFE	**AK28M**
	T	M	−100°C to +250°C	2.0	–	–	1.0	PTFE	**AT26M**
	T	M	−100°C to +400°C	2.0	–	–	1.0	FG	**AT27M**
Flexible thermocouples.	K	M	−100°C to +250°C	0.5	–	–	5.0	PTFE	**AK29M**
	K	M	−100°C to +250°C	0.5	–	–	10.0	PTFE	**AK31M**
	K	M	−100°C to +250°C	0.5	–	–	25.0	PTFE	**AK32M**
	K	M	−100°C to +400°C	0.5	–	–	1.0	FG	**AK33M**
Flexible thermocouple.	T	L	−100°C to +250°C	2.0	–	–	1.0	PTFE	**AT26L**

	Sensor	Connector	Temp Range °C	Response Time (secs)†	Stem Length (mm)	Stem Dia (mm)	Lead Length (m)	Lead Material	Order Code
Air Probes									
	T	L	−100°C to +250°C	2.0	–	–	1.0	PTFE	**AT22L⌡**
Fast response flexible probe with steel braided lead.									
	PST	L	−40°C to +70°C	10.0	–	–	1.0	FEP	**AX24L⌡**
Flexible probes.	PST	L	−40°C to +70°C	10.0	–	–	3.0	FEP	**AX25L⌡**
	K	M	−100°C to +850°C	0.5	100	3.3	1.0	PVC	**AK21M**
	K	M	−100°C to +250°C	0.4	100	3.3	1.0	PVC	**AK27M**
General purpose air probes. AT21M with steel braided lead.									
	K	M	−100°C to +1100°C	3.0	700	6.0	1.0	PVC	**AK24M**
	K	M	−100°C to +1100°C	3.0	1000	6.0	1.0	PVC	**AK25M**
Semi-flexible high temperature air probes.									
Immersion Probes									
	K	M	−100°C to +850°C	0.4	100	1.5	1.0	PVC	**IK21M**
	K	M	−100°C to +850°C	0.4	300	1.5	1.0	PVC	**IK23M**
	K	M	−100°C to +1100°C	0.4	300	3.0	1.0	PVC	**IK24M**
	K	M	−100°C to +1100°C	1.0	100	3.0	1.0	PVC	**IK22M**
	T	M	−200°C to +400°C	1.0	300	3.0	1.0	PVC	**IT22M**
	T	M	−200°C to +400°C	0.4	300	1.5	1.0	PVC	**IT24M**
Semi-flexible high temperature air probes.									
	K	M	−100°C to +1100°C	12.0	1000	12.5/8.0	1.0	PVC	**IK25M⌡**
Heavy-duty melt probe.									
	K	M	−100°C to +150°C	2.0	120	–	20.0	PTFE	**IK26M**
Weighted sinker probe for deep tanks and containers.									

†The time constant is the time taken for the probe to reach 63% of the value of the temperature change.
Multiply x 3 for the time taken to achieve 95% and by 5 for 99%.

⌡Not suitable for Intrinsically Safe applications. Thermocouples: Tolerances relate to BS EN60584−2 (1993), Class A.

Probe Accessories

EK22M Type K 10m extension lead.
Order Code: EK22M

Probe Wipes

Probes must be kept clean and this task is easily handled using Comark antibacterial probe wipes. Available in a tub of 200 wipes (PW200T), or alternatively a handy pocket size pack of 70 wipes (PW70T).

Order Code: PW200T
Order Code: PW70T

For full details of the Comark probe range check www.comarkltd.com or contact the Comark Sales Office.

Calibration Equipment

Allows you to check the accuracy of the thermometers you are using.

C9040
Temperature simulators

The C9040 comes complete with a UKAS Certificate of Calibration. A rotating switch allows the accuracy of a thermometer to be checked at five preset temperature simulation points. Three models cover different thermocouple and connector requirements.

• Auto switch-off
• Battery test facility
• Accuracy at 23°C ±0.2°C

KM20REF
Reference thermometer

This accurate Pt100 reference thermometer is ideal for regular accuracy checks on the thermometers you are using.

• Auto/manual switch-off
• Range -100°C to +199.9°C
• 5 point UKAS Certificate of Calibration supplied at -18°C, 0°C, +8°C, +70°C and +100°C*
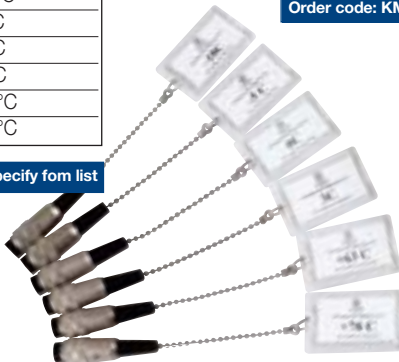
Order code: KM20REF

*Different points are available if requested at the time of ordering. This may incur a small additional charge.

C9040K
Type K Thermocouple

• Sub-miniature connector
• Simulated temperature points: -20°C, 0°C, +50°C, +100°C, +500°C

Order code: C9040K

C9040TM
Type T Thermocouple

• Sub-miniature connector
• Simulated temperature points: -18°C, 0°C, +5°C, +70°C, +100°C

Order code: C9040TM

C9040TL
Type T Thermocouple

• Lumberg connector
• Simulated temperature points: -18°C, 0°C, +5°C, +70°C, +100°C

Order code: C9040TL

KM820/VAL
Validator calibration check unit

Specifically designed for checking the accuracy of infrared and other contact thermometers. It needs to be used in conjunction with a digital probe thermometer.

Order code: KM820/VAL

Alternatively, the unit is available within a kit, complete with a KM20REF thermometer and carrying case.

Order code: KM820/VKIT

Test Caps

Each cap simulates a specific temperature to check your thermistor thermometers. Each cap has a UKAS Certificate of Calibration.

Test Cap Order Code	Temperature Point
TX21L	−18°C
TX22L	−5°C
TX23L	0°C
TX24L	+3°C
TX25L	+63°C
TX26L	+70°C

Order code: Please specify fom list

Calibration & Service

Comark offers full instrument service and UKAS accredited temperature and humidity calibration from its own in-house laboratory.

Comark offers full instrument service and UKAS accredited temperature and humidity calibration from its own in-house laboratory. Ensure that your instruments are kept within their calibration limits by having them checked regularly.

Certificates of Calibration

Certificates of Calibration, often essential as part of quality assurance systems, can be supplied when calibration checks are carried out or with new instruments. These can be provided from the Comark UKAS (United Kingdom Accreditation Service) accredited temperature and humidity calibration laboratory. NPL traceable certification also available.

On-site Service

Comark provides confidence and convenience with on-site UKAS accreditation, particularly suited to RF Wireless Systems and portable temperature instruments where down-time could be an issue.

- Accreditation in accordance with the recognised International Standard ISO/IEC 17025:2005

- Certify your instruments over the range –40°C to +150°C

- National coverage provided by our team of specialist engineers

Other services include:

- RF swop-out service where on-site calibration is impractical

- Thermal mapping for storage, handling and distribution to ensure optimum performance and assist with meeting regulatory requirements

For full details contact the Comark Service Department or email: **service@comarkltd.com**

Ensure that your instruments are kept within their calibration limits by having them checked regularly.

How to buy from Comark.

Order Direct

Simply call, email or fax the Comark Sales Office and pay by Visa, MasterCard, Switch card or cheque. If you intend to place regular orders, please ask about opening a credit account. If you already have a credit account, please quote your account number on all orders.

Order On-line

You can order directly from our website at www.comarkltd.com. Simply make your product selections, click on the 'Add' icon to place in your shopping basket and follow the on screen directions.

Product Warranty.

All Comark instruments have a minimum one year warranty unless otherwise stated. The warranty period for temperature probes is for six months and all other probes and electrodes are unwarranted because the conditions of use are beyond our control.

The Comark warranty covers manufacturing defects and component failures on all products returned to Comark premises and applies worldwide. The warranty does not affect your statutory rights. In line with our policy of continuous development we reserve the right to alter any product specifications without notice.

All products are covered by our Quality Management System which is compliant with BS EN ISO9001:2000 for the design, manufacture, supply, service, repair and recalibration of electronic measuring instruments and equipment.

Delivery and Charges

Prices exclude VAT at the current rate and all orders are subject to a delivery charge. Delivery is charged at £8.00 within the UK mainland (excludes Northern Ireland and Highlands and Islands). Prices for other delivery options and destinations are available on request. We reserve the right to change prices without prior notification. Discounts are available for bulk orders.

To Contact Us

For Sales and Admin.

Telephone: **0844 (+44 844) 815 6599**

The Sales Office phones are open from 8.45am to 5.00pm weekdays. Call us for help and advice to find the right solution. Alternatively, you can arrange a site visit from one of our experienced Field Sales Team.

Or you can email:
salesuk@comarkltd.com - UK and Ireland
salesint@comarkltd.com - International
or Fax: **0844 (+44 844) 815 6598**

Or click on **www.comarkltd.com** for full product details or to buy on-line.

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Telephone: **01603 (+44 1603) 256 647**

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A Fluke Company