UNO is a new range of industrial radiation thermometers from the market leaders Land Infrared. UNO has been developed utilizing experience gained from fifty years of providing temperature measurement solutions to a wide range of industries throughout the world.

The UNO range of thermometers is designed to satisfy all OEM requirements and has a wide selection of infrared radiation thermometers available.

Each series of thermometers offers a choice of built-in time functions - peak picker or averager; and a range of temperature spans and operating wavebands to ensure optimum accuracy of measurement for the chosen industry and application.

The standard range of UNO thermometers feature precision through-the-lens sighting with focusable optics, which guarantees exact viewing and measurement of the smallest of target areas.

**SYSTEM FEATURES**

UNO is a new range of high precision stand-alone non contact temperature measurement systems which benefit from a rugged and versatile design, extensive range of optional accessories, and traceable calibration coupled with exceptional accuracy and reliability.

- Range of standard through-the-lens sighting thermometers
- Range of fibroptic thermometers with optional laser targeting system
- Comprehensive range of thermometer mountings and accessories for complete environmental protection
- DIN-rail mounted power supply unit - DPU (optional)
- LANDMARK Indicator LMi - digital panel meter (optional)

No other method of temperature measurement offers the benefits of infrared radiation thermometry.

UNO non contact thermometer systems measure continuously the temperature of hot, moving or inaccessible materials accurately and safely at a distance. The thermometers do not require contact with the target object, so they cannot interfere with, damage, or contaminate the product or process.

UNO thermometers do not remove heat or disturb the process being monitored and offer the only solution when the product is small, fragile, or in a vacuum or controlled atmosphere.
APPLICATIONS

UNO thermometer systems are designed for OEM installation where continuous operation, quality control and process monitoring are plant management requirements. The rugged and versatile design satisfies end users in a wide range of industries including:

- Hot rolling
- Heat treatment furnaces
- Glass manufacture and processing
- Electrical and electronics
- Induction heating
- Foundry and forging
- Mineral processing
- Petrochemicals

The photograph below shows heat treatment of automotive components on an induction heating machine.

CONTACT TEMPERATURE MEASUREMENT
AL PROCESS MONITORING AND CONTROL

THERMOMETERS

- Industry standard 4 to 20 mA linear output
- Choice of standard or fibroptic thermometers
- Accurate, reliable, drift-free measurement
- Traceable calibration, built within ISO 9001 QMS approval

Simple trimpot controls are used to suit the application:

- To set emissivity/non-greyness for the material being measured
- To set the time function - peak or averager
- To set the averager time constant or peak picker decay rate

MOUNTINGS AND ACCESSORIES

A complete range of protection and mounting accessories is available which provides full mechanical and thermal protection for the thermometer to ensure continuous service with minimal maintenance in almost any environment.

For further details request brochures S4MA and S4FA.

APPLICATIONS

UNO thermometer systems are designed for OEM installation where continuous operation, quality control and process monitoring are plant management requirements. The rugged and versatile design satisfies end users in a wide range of industries including:

- Hot rolling
- Heat treatment furnaces
- Glass manufacture and processing
- Electrical and electronics
- Induction heating
- Foundry and forging
- Mineral processing
- Petrochemicals

The photograph below shows heat treatment of automotive components on an induction heating machine.
Thermometers offer exceptional flexibility with a choice of single wavelength, ratio, fibroptic and fibroptic ratio models.

Thermometer type, temperature range, spectral response and optical characteristics are chosen to suit the particular application.

**RADIATION THERMOMETERS**

The thermometers utilize proven reliable electronics combined with a high quality optical system to provide accurate, dependable temperature measurement.

They are housed in a rugged die cast body with a high quality electrical connector to provide reliable performance.

The single wavelength and ratio thermometers all feature through-the-lens sighting with a 6° field of view. Adjustable focus with a circular graticule gives precise alignment on to the smallest of targets.

Two optical variants are available: Standard and Short-focus. Close focus lenses are also available permitting measurement of targets as small as 0.45mm/0.017in. Ask for separate leaflet for full information.

**FIBROPTIC THERMOMETERS**

Fibroptic thermometers utilize a flexible fibre optics light guide enabling the detector and electronics enclosure to be located in a less hostile environment.

The fibroptic thermometers are available with an optional built-in laser targeting system which defines the target spot for accurate sighting.

The use of fibre optics permits viewing of normally inaccessible targets, where there are high magnetic fields or in high ambient temperatures up to 200°C/400°F without cooling of the optic head. There is a choice of three optic heads and three light guide lengths.

**PEAK PICKER**

The peak picker function is used when measuring the temperature of intermittent targets or where the hot target surface is obscured by cool areas such as scale on rolled steel.

The peak picker decay rate is adjustable from 1.5 to 30% of span per second.

The peak picker function can be reset from a remote switch connected to the DPU.

**AVERAGER**

The averager function is used to smooth unwanted variations or rapidly fluctuating changes in the thermometer signal to maintain a valid temperature reading.

The averager time constant can be adjusted from 5ms (U1 and U2 thermometers) to 5 seconds to give a smooth temperature display.

---

**U1 Thermometers**

U1 thermometers are intended for general purpose use in high temperature applications. They utilize a silicon cell detector, and operate at short wavelengths around 1.0µm where emissivity errors are minimized. They have a fast response time of 5ms.

**U2 Thermometers**

U2 thermometers use the latest germanium detectors, and operate at a wavelength of 1.6µm. They extend the measurement range of short wavelength thermometers down to 300°C/600°F and have a fast response time of 5ms.

**U4 Thermometers**

U4 thermometers are used on low temperature, low or uncertain emissivity surfaces such as bright or unoxidized metals. They use a lead sulphide detector and operate at a wavelength of 2.4µm. They have a response time of 100ms.

**U5 Thermometers**

U5 thermometers are specifically designed for glass surface temperature measurement. Fast speed of response, coupled with small target size and accurate sighting facility make it ideal for all flat glass, glass toughening and optical fibre preform applications.

**V1 Ratio Thermometers**

V1 ratio thermometers use dual silicon cell detectors operating at 0.85 to 1.1µm. They are intended for difficult, high temperature applications where the field of view is not fully filled or where the sight path is obscured. They can accurately measure temperature of targets with up to 95% obscuration.

**Fibroptic U1 Thermometers**

Fibroptic U1 thermometers combine the flexibility of fibre optics with short wavelength operation. They can be used in high temperature applications such as metals, glass, coke ovens and induction heating.

**Fibroptic U2 Thermometers**

Fibroptic U2 thermometers can be used in applications such as glass mold temperatures where access to the target is restricted, or limited to a few milliseconds.

**Fibroptic V1 Ratio Thermometers**

Fibroptic V1 ratio thermometers provide accurate high temperature measurement of small intermittent targets such as rod and wire, and tube welding. Other typical applications include kilns and vacuum furnaces.
To calculate the target size at the focused distance from the datum, use the simple equation: \( d = \frac{D}{\text{FOV}} \).
STANDARD BODIED THERMOMETER SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>U1 600/1600C U1 1100/2900F</th>
<th>U1 800/2600C U1 1500/4700F</th>
<th>U2 300/1100C U2 600/2000F</th>
<th>U4 50/250C U4 150/3000</th>
<th>U4 150/550C U4 300/1000F</th>
<th>U5 400/1300C U5 750/2400F</th>
<th>U5 1000/2500C U5 1800/4500F</th>
<th>U1 600/1600C U1 1100/2900F</th>
<th>U1 1500/4700F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. range:</td>
<td>600 to 1600°C</td>
<td>1100 to 2900°F</td>
<td>800 to 2600°C</td>
<td>1500 to 4700°F</td>
<td>300 to 1100°C</td>
<td>600 to 2000°F</td>
<td>50 to 250°C</td>
<td>150 to 550°C</td>
<td>300 to 1000°F</td>
</tr>
<tr>
<td>Wavelength:</td>
<td>1µm</td>
<td>1.6µm</td>
<td>2.4µm</td>
<td>4.8 to 5.2µm</td>
<td>0.85 to 1.1µm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Averager response time:</td>
<td>Adjustable 5ms to 5s (0 to 95%)</td>
<td>Adjustable 100ms to 5s (0 to 95%)</td>
<td>Adjustable 100ms to 5s (0 to 95%)</td>
<td>Adjustable 15ms to 5s (0 to 95%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Peak Picker: Adjustable 1.5 to 30s decay

Emissivity/NG: Emissivity adjustable 0.10 to 1.00
Non-greyness adjustable 0.8 to 1.199

Output: 4 to 20mA

Sighting: 6°, through the lens

Target size: >98% of energy within graticule image

Magnification: 1.8x

Eye relief: 30mm/1.2in

Field of view*: 100:1 200:1 100:1 30:1 100:1 100:1 50:1 200:1

Focus range: 0.5mm/19.7mm to infinity variable focus (standard) 0.35mm/13.6mm to 1mm/39.3mm (Short variable focus)

Min target dia: 3.5mm/0.13in 1.8mm/0.07in 3.5mm/0.13in 11.7mm/0.46in 3.5mm/0.13in 3.5mm/0.13in 7mm/0.27in 1.8mm/0.07in

FIBROPTIC THERMOMETER SPECIFICATIONS

**Nominal**

**Y denotes optional laser targeting system fitted**

<table>
<thead>
<tr>
<th>Model</th>
<th>U1 600/1600C CYL U1 1100/2900F YL</th>
<th>U1 800/2600C CYL U1 1500/4700F YL</th>
<th>U2 300/1100C CYL U2 600/2000F YL</th>
<th>U4 50/250C CYL U4 150/3000 YL</th>
<th>U4 150/550C CYL U4 300/1000F YL</th>
<th>U5 400/1300C CYL U5 750/2400F YL</th>
<th>U5 1000/2500C CYL U5 1800/4500F YL</th>
<th>U1 600/1600C CYL U1 1100/2900F YL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. range:</td>
<td>600 to 1600°C</td>
<td>1100 to 2900°F</td>
<td>800 to 2600°C</td>
<td>1500 to 4700°F</td>
<td>300 to 1100°C</td>
<td>600 to 2000°F</td>
<td>50 to 250°C</td>
<td>150 to 550°C</td>
</tr>
<tr>
<td>Wavelength:</td>
<td>1µm</td>
<td>1.6µm</td>
<td>0.85 to 1.1µm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Averager response time:</td>
<td>0.2%/amb 0.3%/amb 0.2%/amb 0.1%/amb 0.2%/amb 0.3%/amb 0.2%/amb 0.1%/amb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability Temperature:</td>
<td>2°C/4°F/year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply:</td>
<td>23 to 48V d.c., ≤200mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration:</td>
<td>3g, any axis, 10 to 300Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity:</td>
<td>0 to 99% non-condensing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sealing:</td>
<td>To IP54 requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ambient temp.:

- Specified: 0 to 70°C (amb) 0.2°C/2°C F 0.75%K 0.6%K 0.6%K 1%K 0.6%K 0.75%K 1.25%K
- Operating: 2°C/4°F/year

SPECIFICATIONS:

- C 800 to 2600°C
- C 300 to 1100°C
- C 50 to 250°C
- C 1000 to 2500°F
- C 150 to 550°F
- C 600 to 1600°F
- C 1100 to 2900°F
- C 1800 to 4700°F
- STAN 0.3°C/2°C
- START 0.1°C/2°C
- STAND 0.2°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
- STAND 1°C/2°C
- STAND 2°C/2°C
- STAND 0.3°C/2°C
- STAND 0.5°C/2°C
UNO thermometers have a unique part number to suit the particular combination of features which make up the model.

The model number, consisting of the various options available, describes the exact UNO thermometer type required.

This model number can be used for selection and ordering purposes.

For example: U1 600/1600°C V describes a single wavelength thermometer, operating at 1.0µm, with a measurement span of 600 to 1600°C, celsius version, with standard variable focus optics.

### Ordering Information

#### Detector and Wavelength

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Silicon (1µm)</td>
</tr>
<tr>
<td>2</td>
<td>Germanium (1.6µm)</td>
</tr>
<tr>
<td>4</td>
<td>Lead Sulphide (2.4µm)</td>
</tr>
<tr>
<td>5</td>
<td>Thermopile (4.8µm to 5.2µm)</td>
</tr>
</tbody>
</table>

#### Laser Options

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>Variable Focus (Standard)</td>
</tr>
<tr>
<td>S</td>
<td>Short Variable Focus</td>
</tr>
<tr>
<td>L</td>
<td>Fibre optics</td>
</tr>
</tbody>
</table>

#### Fibre Optics Lightguide

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L10</td>
<td>1m/3ft long</td>
</tr>
<tr>
<td>L20</td>
<td>2m/6ft long</td>
</tr>
<tr>
<td>L35</td>
<td>3.5m/10ft long</td>
</tr>
</tbody>
</table>

#### Optic Head

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A10</td>
<td>100mm/3.9in Focus</td>
</tr>
<tr>
<td>A25</td>
<td>250mm/9.8in Focus</td>
</tr>
<tr>
<td>A50</td>
<td>500mm/19.6in Focus</td>
</tr>
</tbody>
</table>

#### Type No. | Power Requirement | Part No. |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LMi</td>
<td>110 to 240V a.c., 50 to 60Hz, 5VA</td>
<td>091.988</td>
</tr>
</tbody>
</table>

#### Type No. | Power Requirement | Part No. |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DPU 105</td>
<td>100 to 115V a.c., 50 to 60Hz, 10VA</td>
<td>092.426</td>
</tr>
<tr>
<td>DPU 115</td>
<td>113 to 127V a.c., 50 to 60Hz, 10VA</td>
<td>092.427</td>
</tr>
<tr>
<td>DPU 210</td>
<td>200 to 230V a.c., 50 to 60Hz, 10VA</td>
<td>092.428</td>
</tr>
<tr>
<td>DPU 230</td>
<td>225 to 254V a.c., 50 to 60Hz, 10VA</td>
<td>092.429</td>
</tr>
</tbody>
</table>
For fifty years LAND have supplied temperature measuring systems and instruments to many different industries all over the world. Now the world leader in non contact thermometry, our expert advice and support is never far away.

For further information or free advice on specific temperature measurement problems within these or any other industry, contact your nearest Land office.

PRODUCT ASSURANCE
When you specify LAND products you are assured of receiving a completely pretested, calibrated working product. Each instrument is carefully checked to ensure complete compliance with specification and is fully guaranteed. LAND was the first manufacturer of infrared instruments to successfully obtain ISO 9001 Quality Management System Approval for both design and manufacture of non contact infrared temperature measuring equipment.

UNO complies with current European directives relating to electromagnetic compatibility and safety (EMC directive 89/336/EEC; Low voltage directive 73/23/EEC).