

## Highlights

- Wide temperature range: 550 to 3200 °C (1022 to 5792 °F)
- Sighting options:
  - o Laser through the lens and Visible through the lens - Manual Variable focus
  - o Video Camera through the lens and Visible through the lens - Manual Variable focus
  - o LED through the lens and Visible through the lens - Manual Variable focus
- Superior optical resolution to 150:1
- Ethernet interface option (Provides access to PoE ASCII, Ethernet, Video, and Webserver)
- Profinet Interface option
- Programmable relay output
- Fail safe alarm
- Isolated analog output
- Ambient temperatures to 315 °C (600 °F) with ThermoJacket enclosure
- Rugged stainless steel housing, IP65 (NEMA 4) rated
- Unique "dirty window" alarm
- Endurance software for remote configuration and monitoring
- Endurance field calibration software
- One or two color operation

## Electrical Specifications

|                |                                                                                                                                  |
|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Outputs</b> | Ethernet, Profinet<br>0/4-20 mA, max. load: 500 Ω<br>RS485 full duplex, networkable<br>Relay, 48 V, 300 mA, response time < 2 ms |
|----------------|----------------------------------------------------------------------------------------------------------------------------------|

|                     |                                                   |
|---------------------|---------------------------------------------------|
| <b>Power Supply</b> | 18 to 48 VDC, 500 mA<br>Power over Ethernet (PoE) |
|---------------------|---------------------------------------------------|

## General Specifications

|                             |                        |
|-----------------------------|------------------------|
| <b>Environmental Rating</b> | IP65 (IEC529) / NEMA-4 |
|-----------------------------|------------------------|

### Ambient Temperature

|                    |                            |
|--------------------|----------------------------|
| without cooling    | 0 to 65 °C (32 to 149 °F)  |
| with air cooling   | 0 to 120 °C (32 to 250 °F) |
| with water cooling | 0 to 175 °C (32 to 350 °F) |
| with ThermoJacket  | 0 to 315 °C (32 to 600 °F) |

|                            |                             |
|----------------------------|-----------------------------|
| <b>Storage Temperature</b> | -20 to 70 °C (68 to 158 °F) |
|----------------------------|-----------------------------|

|                          |                           |
|--------------------------|---------------------------|
| <b>Relative Humidity</b> | 10 to 95%, non-condensing |
|--------------------------|---------------------------|

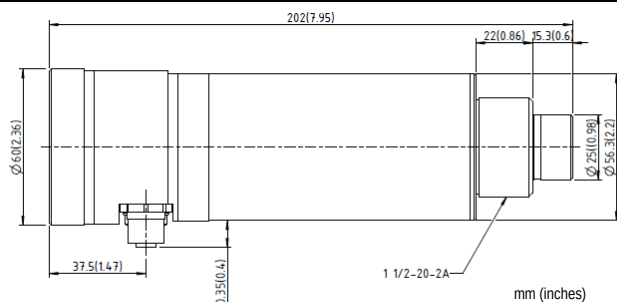
|              |             |
|--------------|-------------|
| <b>Shock</b> | IEC 68-2-27 |
|--------------|-------------|

|                  |            |
|------------------|------------|
| <b>Vibration</b> | IEC 68-2-6 |
|------------------|------------|

### Weight

|                               |                |
|-------------------------------|----------------|
| Optical head                  | 1200 g (42 oz) |
| With air/water cooled housing | 2460 g (87 oz) |

## Dimensions



**FLUKE®**

**Process  
Instruments**

# ENDURANCE™

## Datasheet



## Measurement Specifications

### Temperature Range

|      |                                                                                                         |
|------|---------------------------------------------------------------------------------------------------------|
| E1RL | 600 to 1800 °C (1112 to 3272 °F) (2 color mode)<br>550 to 1800 °C (1022 to 3272 °F) (single color mode) |
| E1RH | 1000 to 3200 °C (1832 to 5792 °F)                                                                       |

|                          |                                         |
|--------------------------|-----------------------------------------|
| <b>Spectral Response</b> | 1.0 μm nominal (Si/Si layered detector) |
|--------------------------|-----------------------------------------|

|                        |                                                               |
|------------------------|---------------------------------------------------------------|
| <b>System Accuracy</b> | ± (0.5% T <sub>measured</sub> + 2°C), T <sub>meas</sub> in °C |
|------------------------|---------------------------------------------------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Repeatability</b> | ±0.3% of temperature span |
|----------------------|---------------------------|

|                               |        |
|-------------------------------|--------|
| <b>Temperature Resolution</b> | 0.1 °C |
|-------------------------------|--------|

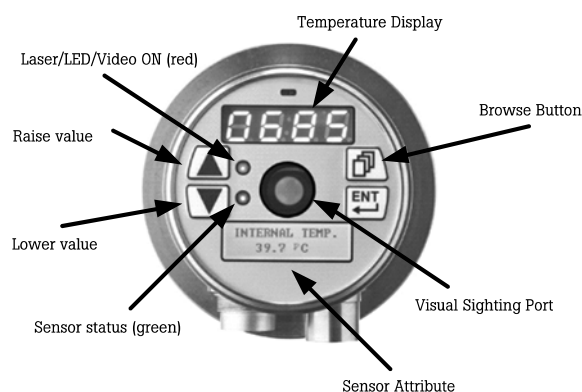
|                      |             |
|----------------------|-------------|
| <b>Response Time</b> | 10 ms (95%) |
|----------------------|-------------|

|                   |                                             |
|-------------------|---------------------------------------------|
| <b>Emissivity</b> | 0.10 to 1.10 in 0.01 increments (one-color) |
|-------------------|---------------------------------------------|

|              |                                                |
|--------------|------------------------------------------------|
| <b>Slope</b> | 0.850 to 1.150 in 0.001 increments (two-color) |
|--------------|------------------------------------------------|

|                          |                      |
|--------------------------|----------------------|
| <b>Signal Processing</b> | Peak hold, averaging |
|--------------------------|----------------------|

## User Interface



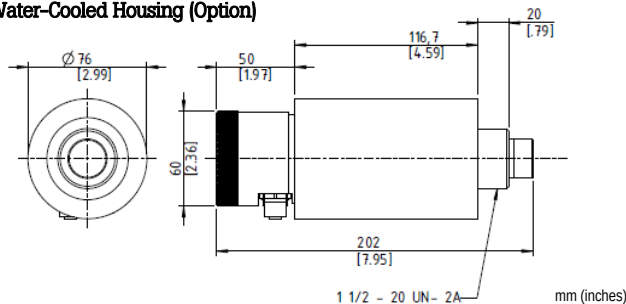
**! CAUTION !  
LASER LIGHT  
DO NOT STARE  
INTO BEAM  
1 mW at 650 nm  
CLASS II  
LASER PRODUCT**

## Accessories

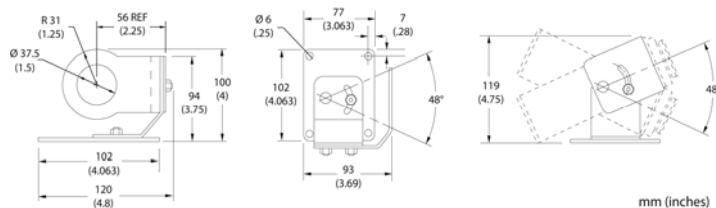
The model includes a mounting nut, fixed bracket, end cap for display, operator's manual and Endurance software. Additional accessories are available:

- Adjustable bracket (E-AB)
- Air purge collar (E-AP)
- SpotScan™ Accessory (SSA or SSB) to allow Endurance sensors to scan over a line
- ThermoJacket enclosure for ambient temperatures to 315 °C (600 °F) (E-TJ1M metric version), see ThermoJacket documentation
- Polarizing filter end cap (E-PFEC)
- Terminal strip (E-TS)
- Switching power supply 100 / 240 VAC to 24 VDC, 1.25 A (E-PS)
- Power over Ethernet (PoE) Injector provides power and also acts as a single Ethernet hub (1 10/220 VAC input) (E-PoE)
- USB/RS485 Converter (E-USB485)
- Focus adjustment tool when the sensor is installed in a ThermoJacket (E-2CFT)
- Replacement front window incl. O-ring (E-PW)

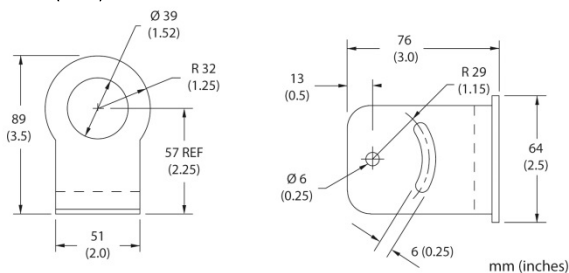
### Air/Water-Cooled Housing (Option)



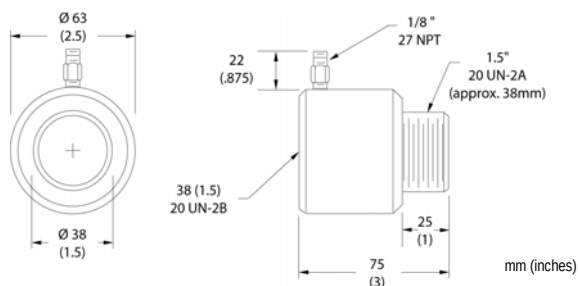
### Adjustable Bracket (E-AB)



### Fixed Bracket (E-FB)



### Air Purge Collar (E-AP)



## Optical Specifications

### Optical Resolution D : S<sup>1</sup>

|        |         |
|--------|---------|
| E1RLF1 | 100 : 1 |
| E1RHF1 | 150 : 1 |

### Focus Distance

|                   |                                                 |
|-------------------|-------------------------------------------------|
| Close Focus F1    | 300 – 600 mm (12 – 24") – Manual Variable Focus |
| Standard Focus F2 | 600 mm – ∞ (24" – ∞) Manual Variable Focus      |

### Smallest Spot Size<sup>2</sup>

|        |             |
|--------|-------------|
| E1RLF1 | 3 mm (.12") |
| E1RLF2 | 6 mm (.24") |
| E1RHF1 | 2 mm (.08") |
| E1RHF2 | 4 mm (.16") |

<sup>1</sup> at 95% energy, D: Distance between sensor and object, S: diameter of spot size

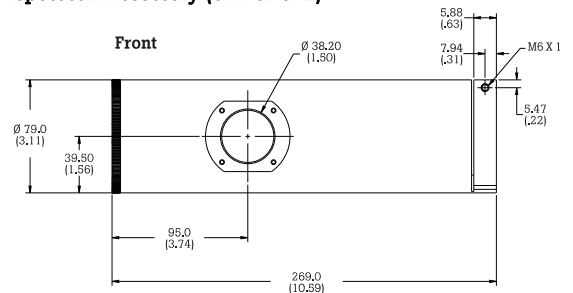
<sup>2</sup> typical values at minimum focus distance, SF = Standard Focus, CF = Close Focus

## Options

Options must be specified at time of order.

- Water-cooled housing, including air purge collar
- Profinet communications

### SpotScan Accessory (SPA or SPB)



## The Fluke Process Instruments Guarantee

The Endurance Series is supported by a 4 year warranty. With a network of trained representatives and agents in over one hundred (100) countries and offices located in the U.S., Germany and China, we provide local service and support you can rely on time after time.

## Fluke Process Instruments

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Specifications subject to change without notice.

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