

# Endurance®

## Datasheet

### Highlights

- 4 year warranty
- Wide temperature range:  
50 to 3200 °C (122 to 5792 °F)
- Sighting options:
  - Laser through the lens and Visible through the lens - Manual Variable focus
  - Video Camera through the lens and Visible through the lens - Manual Variable focus
  - LED through the lens and Visible through the lens - Manual Variable focus
- Superior optical resolution to 300:1
- LAN/Ethernet interface with PoE for communication with the sensor (ASCII, Video, and Webserver)
- Profinet Interface option
- Programmable relay output
- Fail safe alarm
- Isolated analog input/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, remote monitoring and field calibration
- Single color and two colors models



### Electrical Specifications

**Inputs** Contact input (peak/valley reset, Laser, LED), Analog input (emissivity, e-slope, background temperature) 0/4-20mA

**Outputs** Ethernet, Profinet 0/4-20 mA, max. load: 500 Ω RS485 (2-wire half duplex), networkable Relay, 48 V, 300 mA, response time < 2 ms

**Power Supply** 20 to 48 VDC, 500 mA Power over Ethernet (PoE)

### General Specifications

**Environmental Rating** IP65 (IEC529) / NEMA-4

**Ambient Temperature**

without cooling	0 to 65 °C (32 to 149 °F)
E2R without cooling	0 to 60 °C (32 to 140 °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)

**Storage Temperature** -20 to 70 °C (-4 to 158 °F)

**Relative Humidity** 10 to 95%, non-condensing

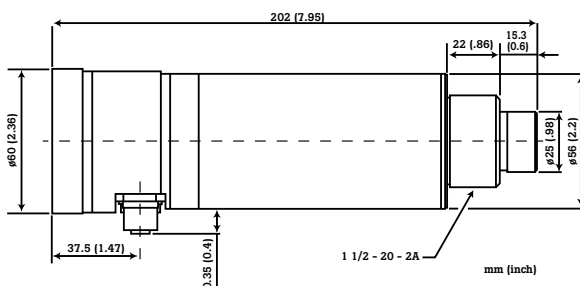
**Shock** IEC 68-2-27

**Vibration** IEC 68-2-6

**Weight**  
Optical head 1220 g (2.69 lbs)

Head with air/water cooled housing 2980 g (6.57 lbs)

### Dimensions

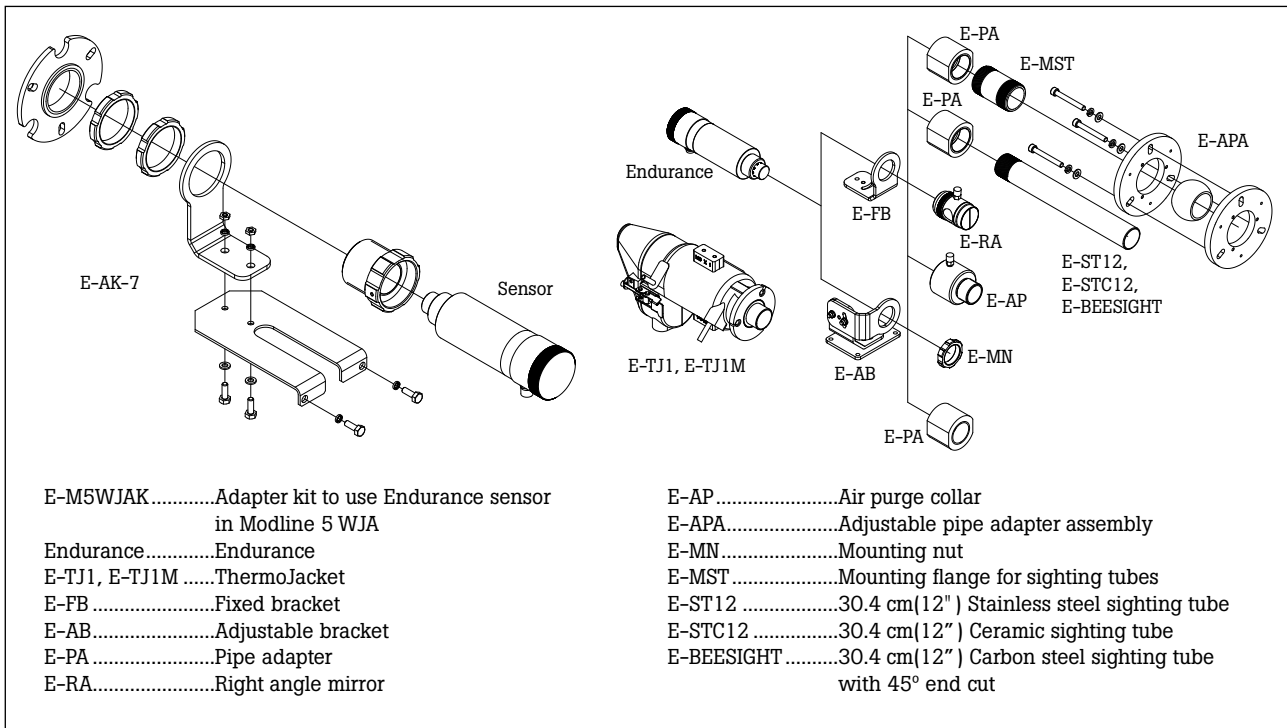


## User Interface



## Measurement Specifications

	<b>E1R</b>	<b>E2R</b>	<b>E1M</b>	<b>E2M</b>	<b>E3M</b>
<b>Temperature Range</b>	<b>E1RL</b> 600 to 1800 °C (1112 to 3272 °F) (2 color mode) 100 : 1	<b>E2RL</b> 250 to 1200 °C (482 to 2192 °F) 75 : 1	<b>E1ML</b> 400 to 1740 °C (752 to 3164 °F) 160 : 1	<b>E2ML</b> 250 to 1100 °C (482 to 2012 °F) 160 : 1	<b>E3ML</b> 50 to 1000 °C (122 to 1832 °F) 100 : 1
	550 to 1800 °C (1022 to 3272 °F) (single color mode) 100 : 1				
	<b>E1RH</b> 1000 to 3200 °C (1832 to 5792 °F) 150 : 1		<b>E1MH</b> 540 to 3000 °C (1004 to 5432 °F) 300 : 1	<b>E2MH</b> 450 to 2250 °C (842 to 4082 °F) 300 : 1	<b>E3MH</b> 150 to 1800 °C (302 to 3272 °F) 300 : 1
<b>Spectral Response</b>	1.0 μm nominal one/two color	1.6 μm nominal one/two color	1.0 μm nominal single color	1.6 μm nominal single color	2.4 μm nominal single color
<b>Lens Options</b>	600mm – ∞ (24" – ∞) (F2), 300 – 600mm (12 – 24") (F1), 190–300mm (7.5 – 12") (F0)				
<b>Sighting</b>	Visual/Laser, Visual/Camera, Visual/LED				
<b>Accuracy</b>	±(0.5% T <sub>meas.</sub> + 2°C) with no attenuation	±(0.5% T <sub>meas.</sub> + 2°C) with no attenuation	<b>E1ML</b> ±(0.3% T <sub>meas.</sub> + 1°C) > 450°C ±(2% T <sub>meas.</sub> + 2°C) < 450°C <b>E1MH</b> ±(0.3% T <sub>meas.</sub> + 1°C) > 650°C ±(2% T <sub>meas.</sub> + 2°C) < 650°C	<b>E2ML</b> ±(0.3% T <sub>meas.</sub> + 2°C) <b>E2MH</b> ±(0.3% T <sub>meas.</sub> + 1°C)	±(0.3% T <sub>meas.</sub> + 1°C) > 100°C ±(1% T <sub>meas.</sub> + 2°C) < 100°C
<b>Repeatability</b>	±(0.3% T <sub>meas.</sub> + 1°C) T <sub>meas.</sub> in °C with no attenuation	±(0.3% T <sub>meas.</sub> + 1°C) T <sub>meas.</sub> in °C with no attenuation	<b>E1ML</b> ±(0.1% T <sub>meas.</sub> + 1°C) > 450°C ±(1% T <sub>meas.</sub> + 1°C) < 450°C <b>E1MH</b> ±(0.1% T <sub>meas.</sub> + 1°C) > 650°C ±(1% T <sub>meas.</sub> + 1°C) < 650°C	(0.1% T <sub>meas.</sub> + 1°C)	±(0.1% T <sub>meas.</sub> + 1°C) > 100°C ±(1% T <sub>meas.</sub> + 1°C) < 100°C
<b>Temperature Resolution</b>	Digital Output 0.1°C, Current Output <0.03°C / 16 bit				
<b>Response Time</b>	10 ms (95%)	20 ms (95%)	2 ms (95%)	2 ms (95%)	20 ms (95%)
<b>Emissivity</b>	0.100 to 1.100				
<b>E-Slope</b>	0.850 to 1.150		N/A		
<b>Signal Processing</b>	Peak Hold, Valley Hold, Averaging				



**Options**

Options must be specified at time of order.

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

**Accessories**

The model includes a mounting nut, fixed bracket, end cap for display, operator’s manual and Endurance software. Additional accessories are available (refer to the Endurance Accessory datasheet).

- 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 block (**E-TB**)
- Switching power supply 24 VDC 1.3 A industrial power supply, DIN rail mount (**E-SYSPS**)
- Switching power supply in NEMA 4 enclosure 100 / 240 VAC 24 VDC, 1.1 A (**E-PS**)
- Power over Ethernet (**PoE**) Injector provides power and also acts as a single Ethernet hub (100/240 VAC input) (**E-PoE**)
- USB/RS485 Converter (**E-USB485**)
- Protective front window including O-ring (**E-PW**)

**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 countries and offices located in the U.S., Germany and China, we provide local service and support you can rely on time after time.

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