

Endurance®

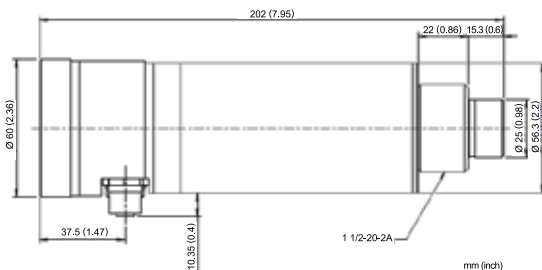
Datasheet

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 and EtherNet/IP interface options
- 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



Dimensions



Electrical Specifications

Inputs	Contact input (peak/valley reset, Laser, LED), Analog input (emissivity, e-slope, background temperature) 0/4-20 mA
Outputs	Ethernet, Profinet, EtherNet/IP, 0/4-20 mA, max. load: 500 Ω RS485 (2-wire half duplex), networkable Relay, 48 V, 300 mA, response time < 2 m
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
E2R without cooling	0 to 60 °C
with air cooling	0 to 120 °C
with water cooling	0 to 175 °C
with ThermoJacket	0 to 315 °C

Storage Temperature -20 to 70 °C

Relative Humidity 10 to 95 %, non-condensing

Shock IEC 68-2-27

Vibration IEC 68-2-6

Weight

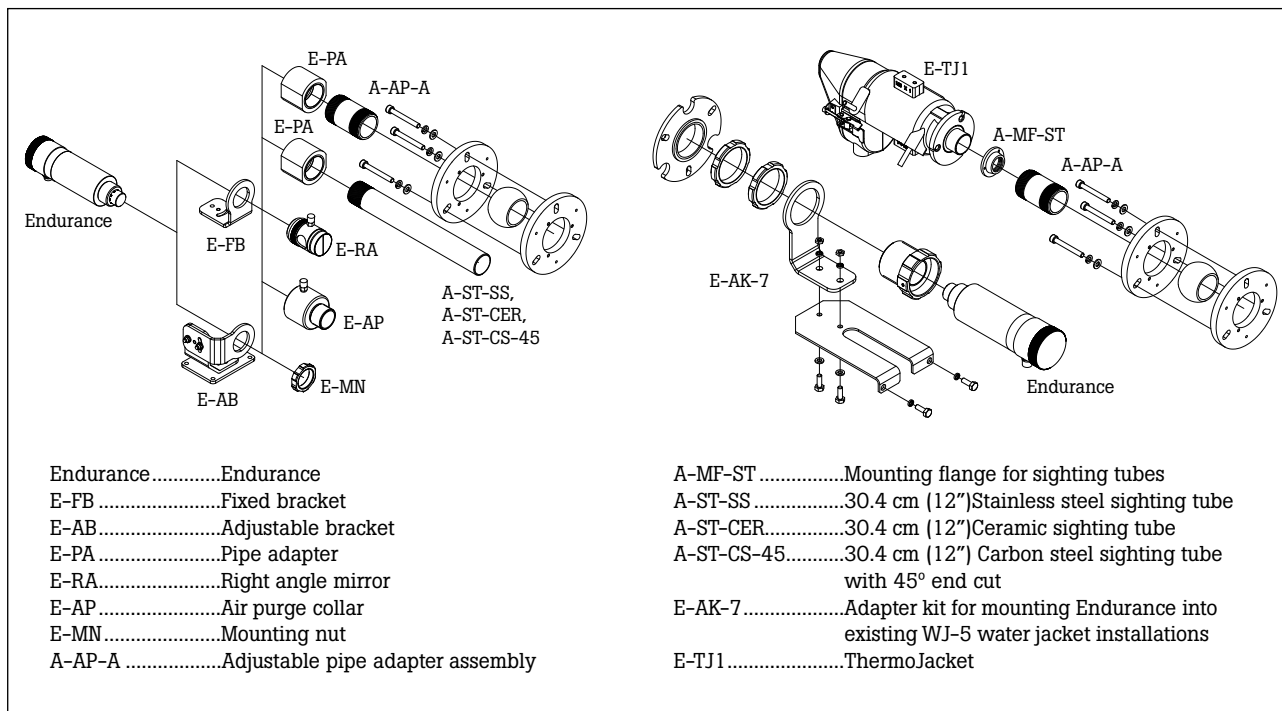
Optical head	1220 g
With air/water cooled housing	2980 g

User Interface



Measurement Specifications

	E1R	E2R	E1M	E2M	E3M
Temperaturbereich	E1RL 600 to 1800 °C (2 color mode) 550 to 1800 °C (single color mode) 100 : 1 E1RH 1000 to 3200 °C 150 : 1	E2RL 250 to 1200 °C 75 : 1	E1ML 400 to 1740 °C 160 : 1	E2ML 250 to 1100 °C 160 : 1	E3ML 50 to 1000 °C 100 : 1
Spectral Response	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
Lens Options	600 mm – ∞ (F2), 300 - 600 mm (F1), 190-300 mm (F0)				
Sighting	Visual/Laser, Visual/Camera, Visual/LED				
Accuracy	±(0.5% T _{meas} + 2 °C) T _{meas} in °C with no attenuation	±(0.5% T _{meas} + 2 °C) T _{meas} in °C with no attenuation	E1ML ±(0.3% T _{meas} + 1 °C) > 450°C ±(2% T _{meas} + 2 °C) < 450°C E1MH ±(0.3% T _{meas} + 1 °C) > 650°C ±(2% T _{meas} + 2 °C) < 650°C	E2ML ±(0.3% T _{meas} + 2 °C) E2MH ±(0.3% T _{meas} + 1 °C)	±(0.3% T _{meas} + 1 °C) > 100°C ±(1% T _{meas} + 2 °C) < 100°C
Repeatability	±(0.3% T _{meas} + 1 °C) T _{meas} in °C with no attenuation	±(0.3% T _{meas} + 1 °C) T _{meas} in °C with no attenuation	E1ML ±(0.1% T _{meas} + 1 °C) > 450°C ±(1% T _{meas} + 1 °C) < 450°C E1MH ±(0.1% T _{meas} + 1 °C) > 650°C ±(1% T _{meas} + 1 °C) < 650°C	(0.1% T _{meas} + 1 °C)	±(0.1% T _{meas} + 1 °C) > 100°C ±(1% T _{meas} + 1 °C) < 100°C
Temperature Resolution	Digital Output 0.1°C, Current Output <0.03°C / 16 bit				
Response Time	10 ms (95%)	20 ms (95%)	2 ms (95%)	2 ms (95%)	20 ms (95%)
Emissivity	0.100 to 1.150				
E-Slope	0.850 to 1.150		N/A		
Signal Processing	Peak Hold, Valley Hold, Averaging				



Options

Options must be specified at time of order.

- Water-cooled housing, including air purge collar
- Profinet, EtherNet/IP 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-TJ1**) – see *ThermoJacket documentation*.
- Polarizing filter end cap (**E-PFEC**)
- Terminal strip (**E-TB**)
- Switching power supply 24 VDC 1.2 A industrial power supply, DIN rail mount (**E-SYSPS**)
- Switching power supply in NEMA 4 enclosure 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 (110/220 VAC input) (**E-PoE**)
- USB/RS485 Converter (**E-USB485**)
- Replacement 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 (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.

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Worldwide Service

Fluke Process Instruments offers services, including repair and calibration. For more information, contact your local office.

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