

**OMRON**

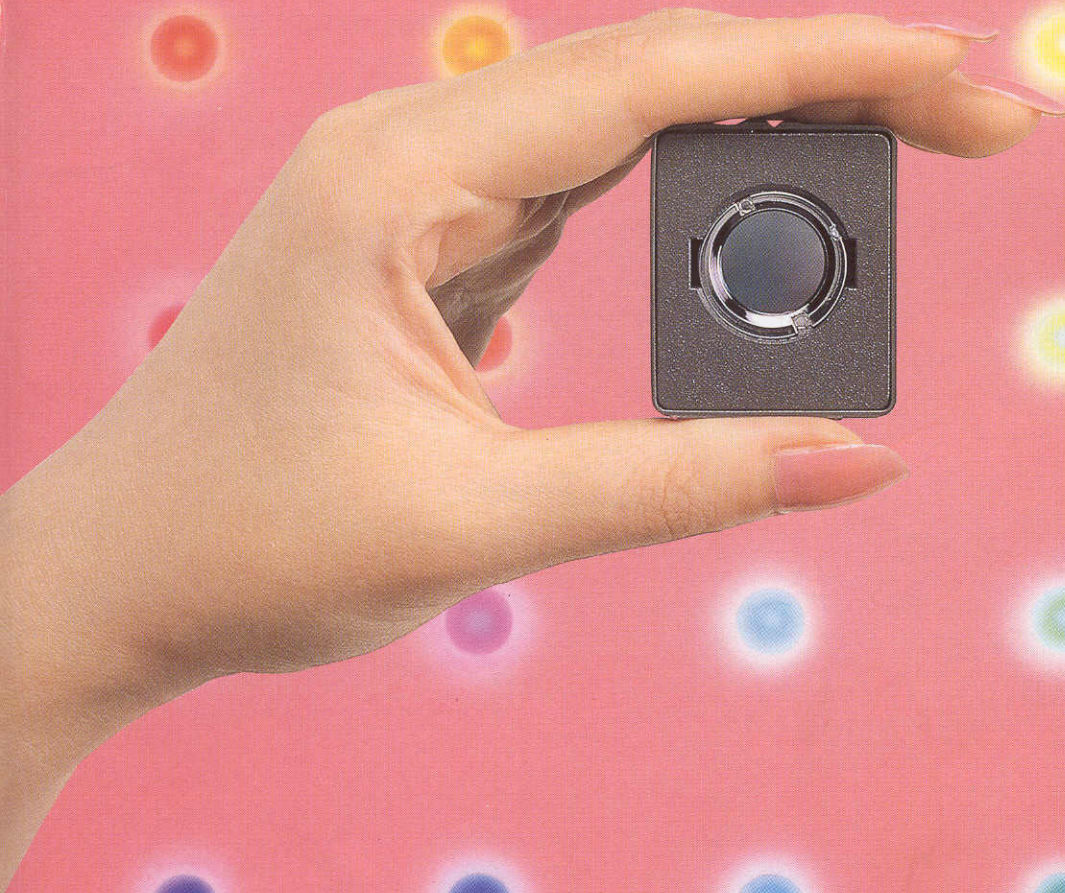
# **ES1-LP3/ES1-LP10**

## **Infrared Thermosensors**

*Only 1/3 the Size of Previous Models*

*Spot Sizes Reduced to 3- and 8-mm Diameters*

*The Super-miniature Sensors for Modern Temperature Monitoring and Control*



**SUPER-MINIATURE**



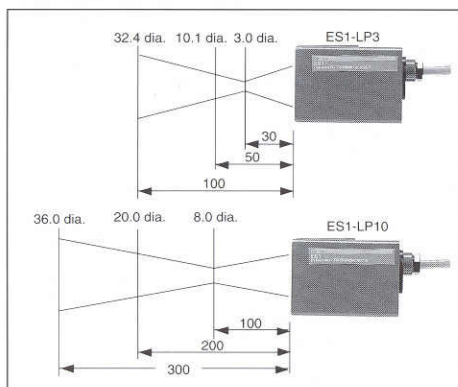
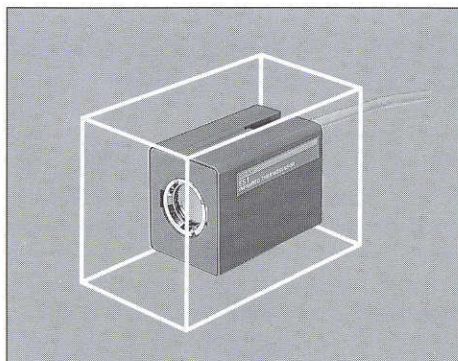
# ES1-LP3/ES1-LP10 *Infrared Thermosensors*

## **Super-miniature: Only 1/3 the Size of Previous Models**

These Thermosensors combine sensor and converter into a Super-miniature package only 32 x 53 x 38-mm large (WxDxH) to enable easy installation and mounting in a wide variety of assembly lines. These sensors are also light enough for installation almost anywhere.

## **Two Spot Diameters Available: 3 mm and 8 mm**

Select from a 3-mm spot at 30 mm or a 8-mm spot at 100 mm. Either way, you get a narrow visual field that lets you dependably measure electronic components and other small workpieces that previously were nearly impossible to deal with.



## **Analog Output (4 to 20 mA) for Better Control with Temperature Controllers**

The Thermosensors can be combined with OMRON Temperature Controllers, Intelligent Signal Processors, Digital Controllers, and many other devices to easily construct complete temperature control systems.

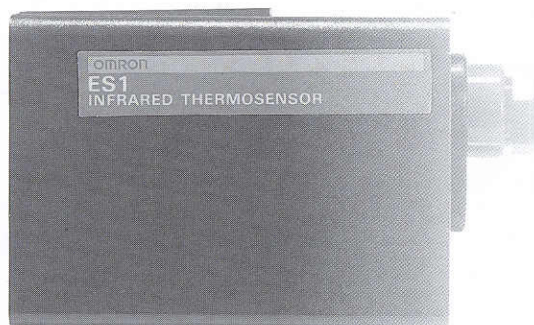
## **Wide Measurement Range: 0 to 500 °C**

This temperature range provides what is needed for a wide range of temperature measurement applications: food products, electrical devices, electronics, plastics, machine conveyors, textiles, and much more.

## **Speed and Accuracy for Real-time Use**

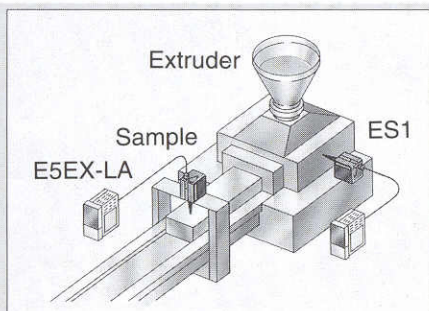
High accuracy (repeatability:  $\pm 0.5^{\circ}\text{C}$ ) and speed (response time: 0.4 s at 95%) provide real-time speed to meet modern production line needs.

## Application Examples



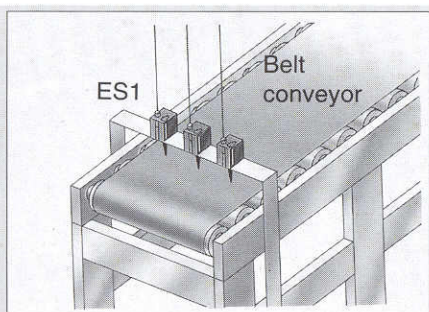
### **Forming Machines**

Measure extruded resin and resin nozzle temperatures and monitor cooling temperatures in forming machines and extruders.



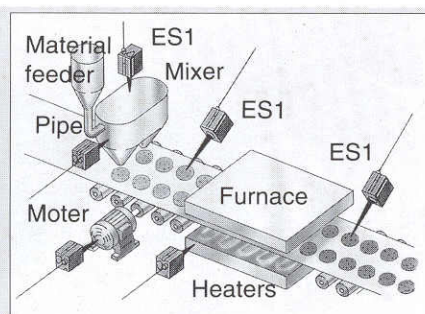
### **Rubber and Resin Production**

Monitor conveyor temperatures to control heating and detect abnormal temperatures.



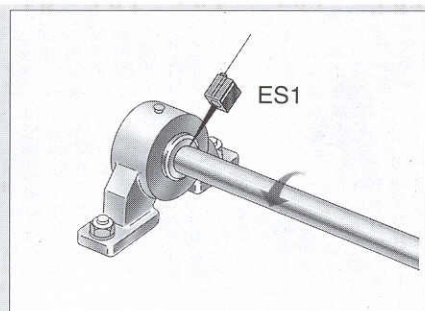
### **Cookies/Bisques**

Monitor temperature from the low-temperature roller stage to the high-temperature furnace stage without damaging the product, ensuring efficiency and cleanliness.



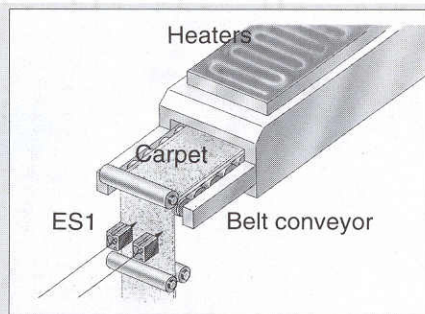
### **Ball Bearings**

Prevent accidents caused by dry bearings or bearing damage by monitoring bearing temperatures for abnormal increases.



### **Carpet Production**

Monitor heat processing temperature during carpet production.





# Select from A Range of Options

## ES1-PRO Programmer

Used to display process temperature values and to change settings (emissivity, upper-limit and lower-limit output scale, moving average data) and to test current output (zero and full scale).

68 x 21 x 90 (WxDxH)  
Display resolution: 1 °C  
Display range: -50 to 500 °C  
Display refresh: Twice/s  
2-m cable



## ES1-T Black Tape

Used to measure objects with low reflectivity or objects with unknown reflectivity and to set the emissivity.

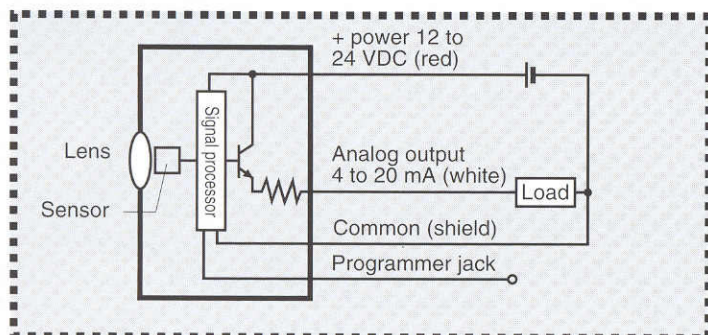
Black tape:  $\epsilon = 0.95$   
Width: 50 mm; Length: 10 m  
Heat resistance: 180 °C

## ES1-BAF2 (BaF2 Lens)

For use with food conveyors or with furnace/vacuum device windows.

40 mm-dia. x 4t = 0.91  
(t = transmissivity factor)  
Heat resistance: 500 °C

## I/O Circuits



## Total Temperature Control Systems

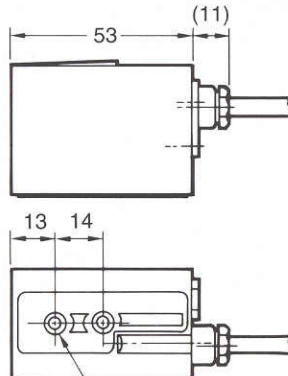
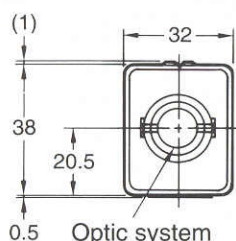
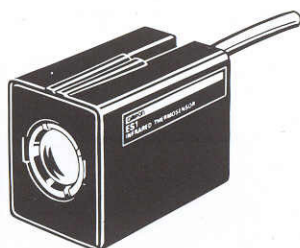
### ES1-LP3/ES1-LP10 Infrared Thermosensor



## Specifications

Item	ES1-LP3	ES1-LP10
Measurement temperature range	0 to 500 °C	
Visual field	3-mm diameter/30 mm (14-mm diameter opening)	8-mm diameter/100 mm (14-mm diameter opening)
Applied wavelength range	8 to 16 $\mu$ m	
Measurement accuracy	$\pm(3 + 0.1\%$ of output range) °C max., (measured temperature: 0 to 300 °C) $\pm\{(2\%$ of rdg -3) + 0.1% of output range}, (measured temperature: 300 to 500 °C) "rdg" is temperature conversion value of the current output. Ambient temperature/humidity: 23 °C, 55% Emissivity: 1.00	
Repeatability	$\pm 0.5$ °C max	
Temperature drift	$\pm(0.2$ °C in units of °C + 0.01% of output range in units of °C) max.	
Analog output	Normal output: 4 to 20 mA/0 to 500 °C Error output: 2.4 mA max. Load impedance: 300 $\Omega$ max. (Output range, 0 to 500 °C can be set via optional Programmer)	
Response time	0.40 s max. (95% response)	
Supply voltage	12 to 24 VDC	
Current consumption	40 mA max. (without Programmer connected)	
Operating environment	Temperature: 0 to 55 °C; Humidity: 35% to 85%	
Water resistance	IP-X2	
Cable length	2 m $\pm$ 10 cm	
Accessories	Mounting Bracket, Instruction Manual, Installation Gauge	
Case material	ABS	
Emissivity	Set at 0.95 (Can be set between 0.10 and 1.00 at 0.01 interval via optional Programmer.)	
Weight	120 g max.	

## Dimensions (Unit: mm)



An Installation Gauge used to confirm the visual field has been provided as an accessory.

