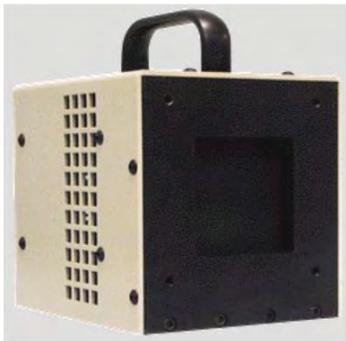


# Calibration Grade Cavity Blackbody Sources



 **INFRARED SYSTEMS DEVELOPMENT**  
CORPORATION

 **Boston** Electronics

91 Boylston Street, Brookline, MA 02445  
tel: (617)566-3821 fax: (617)731-0935  
[www.boselec.com](http://www.boselec.com) [boselec@boselec.com](mailto:boselec@boselec.com)

# INFRARED SYSTEMS DEVELOPMENT CORPORATION

## BLACKBODY SOURCES



IR-508



IR-518 & IR-519



IR-563 & IR-564



IR-574 with IFW

- 0.1 °C Temperature Resolution
- < 0.08 °C N.E.T.
- < +/- 0.2 °C Peak to Peak Stability
- Energy Modulators (Choppers)
- Motorized Aperture/Filter Wheels

Cavity Blackbody Sources ( $\epsilon \approx 0.99$ )		
IR-508	0.25"	50-1050°C
IR-518	0.40"	50-1050°C
IR-519 *NEW*	0.40"	50-1200°C
IR-563	1.0"	50-1050°C
IR-564	1.0"	50-1200°C
IR-574	2.25"	50-1200°C

- Custom Apertures
- Absolute and Differential Modes
- Proven 20 Degree Recessed Cone Cavity
- IR Camera Calibration & Uniformity Testing
- Non-Contact Thermometer Calibration

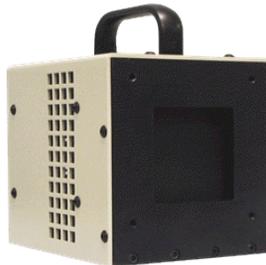
Infrared Systems Development Corporation is dedicated to the Quality Production of a Full Line of Blackbody Sources for Precision Calibration, Alignment and Testing. Choose from our Large, High Temperature IR-574 to our Miniature IR-508 Cavity Blackbody Sources for Point Source or High Energy Applications. Or, for Low Temperature or Larger Area Blackbody Sources from  $-30^{\circ}\text{C}$  to  $+350^{\circ}\text{C}$ , the New IR-2100 2" Square Blackbody and the IR-140 & IR-150 12" Square Blackbody Systems Provide Excellent Stability and Uniformity for IR-camera Calibration, and Non-Contact IR Thermometer Applications. All Of Our Blackbody Sources Are Controlled By The IR-301 Precision PID Controller With 0.1°C Resolution and RTD Cold Junction Sensor.

Extended Area Blackbody Sources ( $\epsilon \approx 0.96$ )		
IR-2100	2"x2"	(-5) to +140 °C
IR-2101	2"x2"	(-30) to +75 °C
IR-2103	3"x3"	(-5) to +125 °C
IR-2106	6"x6"	+5 to +150 °C
IR-140	12"x12"	Amb to 230 °C
IR-150	12"x12"	Amb to 500 °C

IR-140 & IR-150



IR-2100 Series



IR-301 Controller



## CAVITY SERIES BLACKBODY



**IR-508**



**IR-518 & IR-519**



**IR-563 & IR-564**



**IR-574**

The Cavity Blackbody Systems are an ideal source for the Near (1-3  $\mu\text{m}$ ), Mid (3-8  $\mu\text{m}$ ) and Far (8-30+  $\mu\text{m}$ ) infrared bands. They are designed to provide infrared radiation as an ideal blackbody emitter. The output energy from the cavity closely follows the theoretical maximum energy curve described by Max Planck's equation, and allows users to calibrate, align, and measure infrared devices and phenomena of all types.

The 20° tapered - recessed - cone, surface emissivity, and cavity aspect ratio combine to provide blackbody radiation by multiple reflection, absorption and re-emission of its thermal energy. The thermal energy of the cavity is provided by a ceramic-sealed heater coil that uniformly heats the cavity cylinder.

The IR-563 has been the industry standard 1000°C blackbody for more than 30 years, and continues to provide excellent service to infrared applications throughout the industry. The IR-564 extends the temperature range of the IR-563 to 1200 ° C by changing cavity materials to Silicon Carbide and high purity Alumina ceramics; otherwise the two units are virtually identical.

IR-508/301: The smaller size and lower power consumption make the IR-508 ideal for applications with limited space and power, such as in environmental chambers down to -80° C.

**IR-301 Blackbody  
Source Controller**



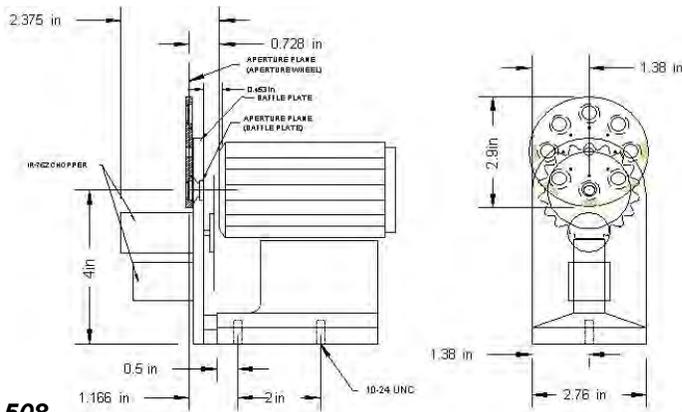
# SPECIFICATIONS

	IR-508	IR-518	IR-519	IR-563	IR-564	IR-574
<b>Temperature Range:</b>	50 to 1050°C	50 to 1050°C	50 to 1200°C	50 to 1050°C	50 to 1200°C	50 to 1200°C
<b>Emittance Watts/Cm<sup>2</sup>:</b>	17.36 (5.5 Watts)	17.36 (14 Watts)	17.36 (14 Watts)	17.36 (88 Watts)	26.88 (135 Watts)	26.68 (684 Watts)
<b>Wavelength Range:</b>	0.5 - 99 um					
<b>Emissivity:</b>	> 0.99					
<b>Emitter Size: in (mm)</b>	0.25" (6.3)	0.4" (10)	0.4" (10)	1" (25.4)	1" (25.4)	2.25" (57)
<b>Temperature Resolution:</b>	0.1 C					
<b>Calibration Accuracy:</b>	+/- 0.2 C to NIST Standard					
<b>Stability:</b>	+/- 0.1 C Short Term; +/- 0.2 C Long Term					
<b>Response Time:</b>	100-1000 <30 Min	100-1000 <40 Min	100-1200 <45 Min	100-1000 <45 Min	100-1200 <70 Min	100-1200 <80 Min
<b>Temperature Sensors:</b>	Embedded 0.01% Matched Type S					
<b>Control Type:</b>	Active Multi-Band P.I.D.					
<b>Line Voltage:</b>	90 to 125 or 208-240 VAC 50-60 Hz					
<b>Power Requirements:</b>	100 Watts Max			550 Watts Max	800 Watts Max	1400 Watts Max
<b>Cable Length:</b>	8 Feet (2.4 m)					
<b>Dimensions: in (mm) Source:</b>	3" Dia 5.9"H x 4.9" D (76.2x150x125)	2.375" Dia 3" Deep (60 x 76.2)	2.375" Dia 4" Deep (60x101.6)	11.75" H x 11.4" D x 8" W (298x289x203)		12.5" H x 20" D x 10" W (130x340x304)
<b>Controller:</b>	5.1"H x 13.4"D x 12"W (130 x 34 0x 304)					
<b>Warranty:</b>	2 Year	1 Year	1 Year	2 Year	1 Year	1 Year
<b>Standard Apertures:</b>	0.1" (2.54)	0.4" (10)	0.4" (10)	0.0125, 0.025, 0.050, 0.10, 0.20, 0.40, 0.60 and 1.0 In		2.0 (50.8)
<b>Remote Interface:</b>	RS-232, RS-485 or IEEE-488/GPIB					

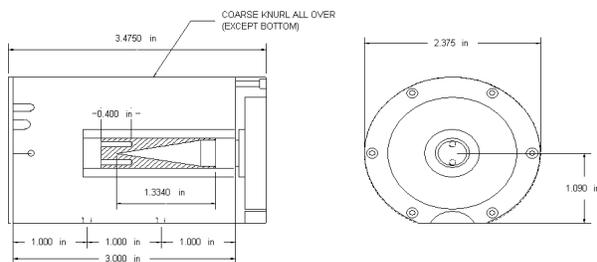
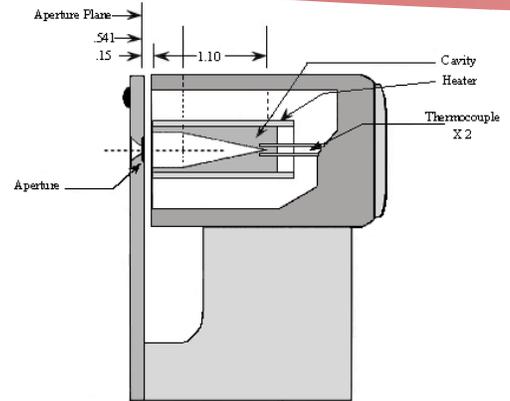
### Optional Accessories:

RS-232, RS-485 or IEEE-488/GPIB Communications Kit  
 IR-762 Energy Modulator for IR-508, 518, 519  
 IR-860 Energy Modulator For IR-563, IR-564  
 1" Remote Control Motorized Indexed Aperture / Filter Wheel for IR-563, IR-564  
 2" Remote Control Motorized Indexed Aperture / Filter Wheel for IR-574  
 Rackmount Kit for IR-301 Controller

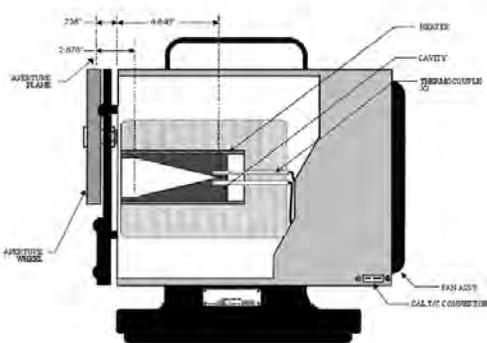
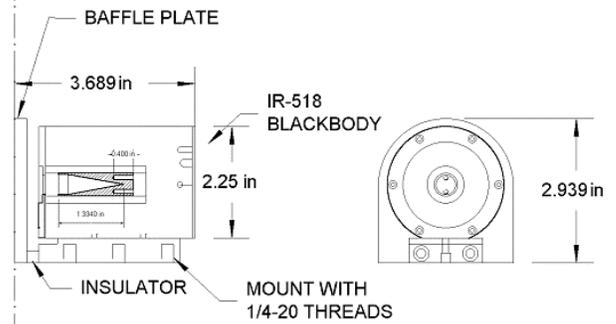
Using an aperture wheel, which comes standard on the IR-563 and IR-564, the infrared flux can be varied by known amounts without disturbing critical optical setups, and combining apertures and distance changes, the flux at any point can easily be determined.



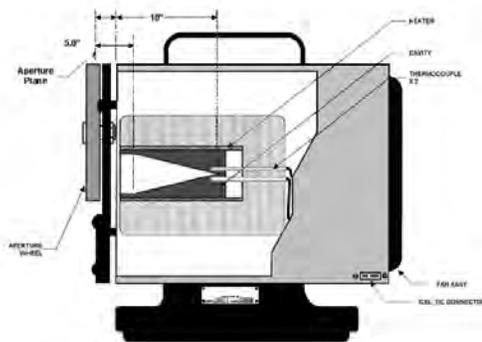
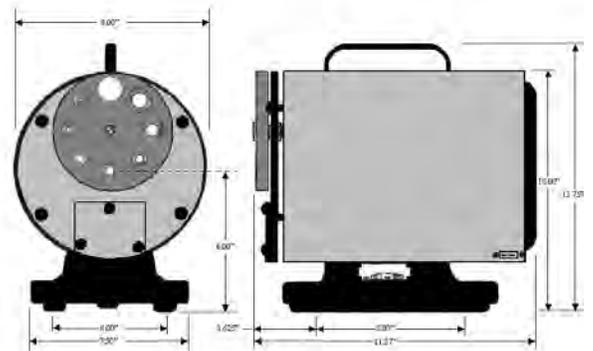
**IR-508**



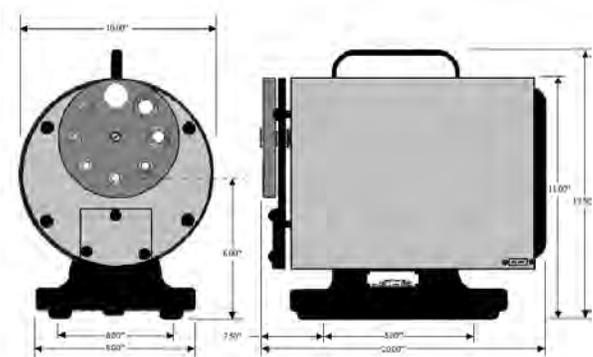
**IR-518**



**IR-563 & IR-564**



**IR-574**





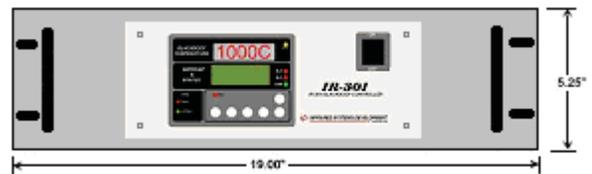
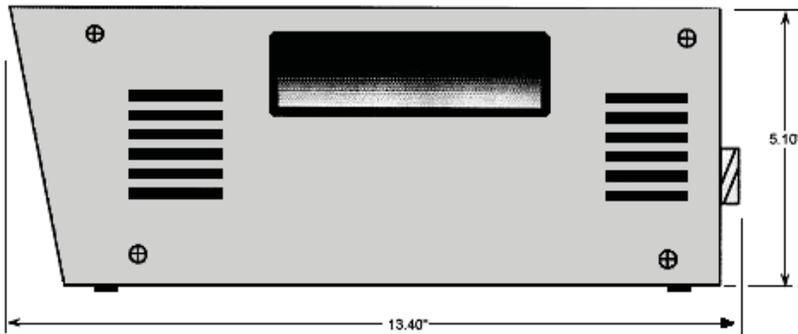
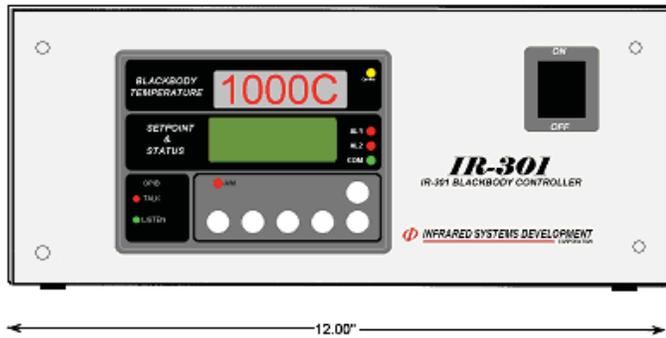
<b>Temperature Range:</b>	50°C to 1200°C	<b>Sample Rate:</b>	Cavity Temp is updated 10 times per second; digitally filtered to eliminate noise Selected at Factory
<b>Calibration Accuracy:</b>	+/- 0.2°C +/- 1 digit	<b>°F/°C</b>	
<b>Stability:</b>	+/- 0.02% of full scale	<b>Alarms:</b>	5.0 amps at 120 VAC, 2.5 amps at 230 VAC
<b>Resolution:</b>	1°C or 0.1°C Selectable	<b>Operating Environment:</b>	0 to 40°C ambient temp with relative humidity less than 95% non-condensing
<b>Warm-Up Time:</b>	35 Minutes	<b>Power Requirement:</b>	105-125 Volts, 50-60 Hz., 500 Watts Max
<b>Control:</b>	PID dual Zero voltage firing state power relays	<b>Dimensions (HxWxL):</b>	5.10" x 12" x 13.4" (Rackmounted 5.25" x 19" x 14.4")
<b>Readout:</b>	Dual display: BB Temp is shown on upper LED display; Set Point and Parameters are shown on lower LCD Display	<b>Weight:</b>	9 lbs. (Rackmounted 10lbs.) (Shipping Weight: 13 lbs. 17lbs.)

The IR-301 controller is a microprocessor based PID (Proportional, Integral and Derivative) system for regulating the Blackbody's Radiating Surface. At Infrared Systems Development, we have taken a leap forward from the standard PID Controller types of past years. We do this by utilizing five (5) independent PID parameter groups, each for a specific temperature range, internally selected based on the Setpoint. To control stability, the Standard Proportional Band with Automatic Reset and Derivative method is utilized. Unlike standard PID control, these parameters are totally dedicated to control stability only. This allows us to reduce the Proportional Band, creating a much more stable Blackbody system.

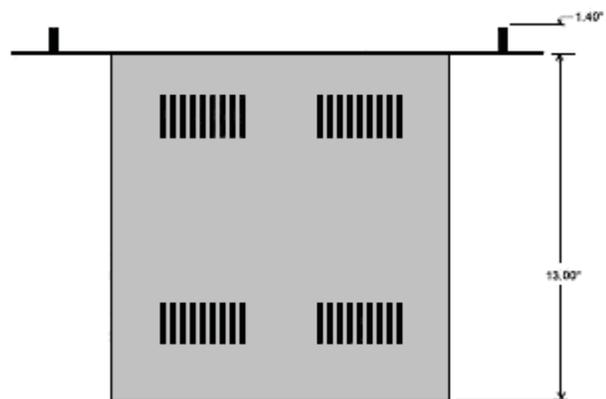
To control warm-up characteristics, we start with an independent Proportional Band, much wider than the stability Proportional Band. We then take the operational span and divide it into five smaller spans. Each of these spans is assigned a factory-selected range of PID Parameters values. Selecting a set temperature automatically loads the proper warm-up parameters into memory for that specific temperature. This process practically eliminates the need for continuous reactionary parameter changes as required by standard PID.

All control parameters, selections, and calibration procedures are accomplished through simple MENU selections using the four front panel buttons. These MENU selections are organized into Sections. Each Section presents a specific set of related functions. Internally the IR-301 was designed for maximum accuracy while maintaining our trademark reliability and quality. As is apparent with the use of dual redundant solid state (zero-voltage switching) power relays, RFI filters and an entire temperature sensor feedback loop; wire, cable, pins and connectors, being manufactured from special thermocouple alloys to eliminate the effects of ambient temperature change. The Thermocouple Cold Junction is mounted to a high precision RTD sensor to accurately monitor the CJC to provide compensation for ambient temperature variations. All connections are made from the rear for true Rackmount capabilities.

# DIMENSIONS



**IR-301 WITH RACKMOUNT ACCESSORY**





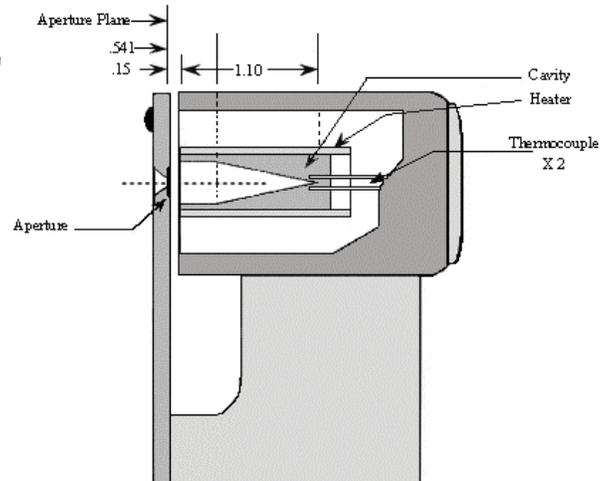
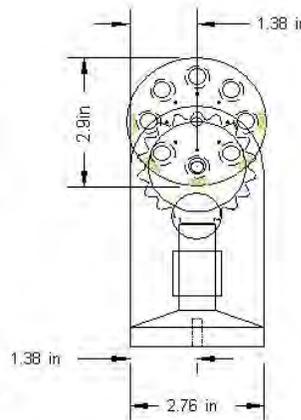
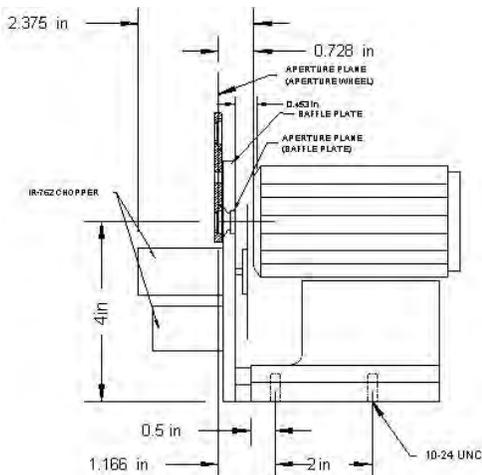
**0.25"  
1050 °C**

### Specifications:

<b>Temperature Range:</b>	50 to 1050°C
<b>Emittance Watts/Cm<sup>2</sup> (Watts):</b>	17.36 (5.5)
<b>Wavelength Range:</b>	0.5 - 99um
<b>Emissivity:</b>	>0.99
<b>Emitter Size: in (mm)</b>	0.25" (6.3)
<b>Source Type:</b>	Cavity
<b>Temperature Resolution:</b>	0.1°C
<b>Calibration Accuracy:</b>	+/- 0.2°C to NIST Standard
<b>Stability: Short (Long) Term:</b>	+/- 0.1°C (+/- 0.2°C)
<b>Response Time:</b>	100-1000 <30 Minutes
<b>Temperature Sensors:</b>	Embedded 0.01% Matched Type S
<b>Control Type:</b>	Active Multi-Band P.I.D.
<b>Line Voltage:</b>	90 to 125 or 208-240 VAC 50-60 Hz
<b>Power Requirements:</b>	100 Watts Max
<b>Cable Length:</b>	8 Feet (2.4 m)
<b>Dimensions: in (mm)</b>	<b>Source:</b> 3" Diam x 5.9" H x 4.9" D (76.2x150x125)
	<b>Controller:</b> 5.1"H x 13.4"D x 12"W (130x340x304)
	<b>Warranty:</b> 2 Year
	<b>Standard Apertures:</b> 0.1" (2.54)

### Optional Accessories:

- ~ RS-232, RS-485 or IEEE-488/GPIB
- ~ IR-762 Energy Modulator
- ~ Aperture Wheel with Aperture sizes:  
0.200", 0.100", 0.050", 0.0250", 0.0125"





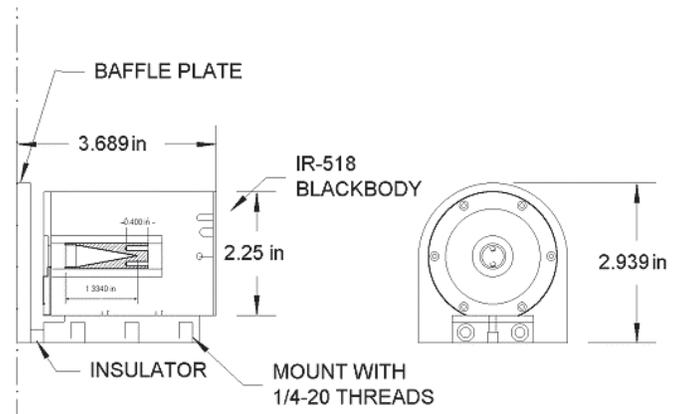
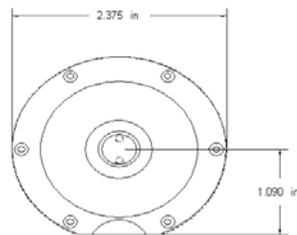
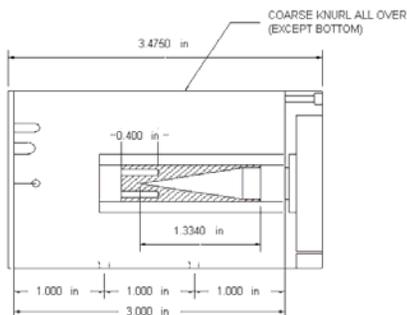
**0.40"**  
**1050 °C**

### Specifications:

<b>Temperature Range:</b>	50 to 1050°C
<b>Emittance Watts/Cm<sup>2</sup> (Watts):</b>	17.36 (14)
<b>Wavelength Range:</b>	0.5 - 99um
<b>Emissivity:</b>	>0.99
<b>Emitter Size: in (mm)</b>	0.4" (10)
<b>Source Type:</b>	Cavity
<b>Temperature Resolution:</b>	0.1°C
<b>Calibration Accuracy:</b>	+/- 0.2°C to NIST Standard
<b>Stability: Short (Long) Term:</b>	+/- 0.1°C (+/- 0.2°C)
<b>Response Time:</b>	100-1000 <40 Minutes
<b>Temperature Sensors:</b>	Embedded 0.01% Matched Type S
<b>Control Type:</b>	Active Multi-Band P.I.D.
<b>Line Voltage:</b>	90 to 125 or 208-240 VAC 50-60 Hz
<b>Power Requirements:</b>	100 Watts Max
<b>Cable Length:</b>	8 Feet (2.4 m)
<b>Dimensions: in (mm)</b>	<b>Source:</b> 2.375" Diam x 3" Deep (60 x 76.2)
	<b>Controller:</b> 5.1"H x 13.4"D x 12"W (130x340x304)
	<b>Warranty:</b> 1 Year
	<b>Standard Apertures:</b> 0.4" (10)

### Optional Accessories:

- ~ RS-232, RS-485 or IEEE-488/GPIB
- ~ IR-762 Energy Modulator
- ~ Aperture Wheel with Aperture sizes: 0.200", 0.100", 0.050", 0.0250", 0.0125"



## IR-519/301 Blackbody System



The IR-519 Radiation Source extends the temperature range of the IR-518 to 1200°C. The length of the cavity is extended by 1". It can be used as a standard radiation source for the calibration of other laboratory sources, detectors, or other infrared devices requiring calibration against a standard.

The 20° tapered - recessed - cone, surface emissivity, and cavity aspect ratio combine to provide blackbody radiation by multiple reflection, absorption and re-emission of its thermal energy. The thermal energy of the cavity is provided by a ceramic-sealed heater coil that uniformly heats the cavity cylinder to temperatures from 50 ° C to 1200°C. The IR-519 is covered by a one-year warranty.

Shown with additional Baffle Plate and Mounting Block

### Specifications:

**Temperature Range:** 50 – 1200 C  
**Emittance Watts/Cm<sup>2</sup> (Watts):** 17.36 (14)  
**Wavelength Range:** 0.5 - 99um  
**Emissivity:** >0.99  
**Emitter Size: in (mm)** 0.4" (10)  
**Source Type:** Cavity  
**Temperature Resolution:** 0.1 C  
**Calibration Accuracy:** +/- 0.2 C to NIST Standard  
**Stability: Short (Long) Term:** +/- 0.1 C (+/- 0.2C)  
**Response Time:** 100-1200 <45 Minutes  
**Temperature Sensors:** Embedded 0.01% Matched Type S  
**Control Type:** Active Multi-Band P.I.D.  
**Line Voltage:** 90 to 125 or 208-240 VAC 50-60 Hz  
**Power Requirements:** 100 Watts Max  
**Cable Length:** 8 Feet (2.4 m)  
**Dimensions: in (mm)** **Source:** 2.375" Diam x 4 " Deep(60 x 101.6)  
**Controller:** 5.1"H x 13.4"D x 12"W (130x340x304)  
**Warranty:** 1 Year  
**Standard Apertures:** 0.4" (10)  
**Remote Interface:** RS-232 or IEEE-488/GPIB  
**Weight:** Source: 2.5 lbs  
Controller: 9 lbs (Rackmounted 10 lbs)  
**Shipping Weight :** 1 Box; 17 lbs

### Options and Additional Accessories:

RS232 or IEEE/GPIB Communications

[IR-762 Energy Modulator](#)

Baffle Plate and Mounting Block (Shown in Picture)

Rackmount for Controller

# IR-563 & IR-564



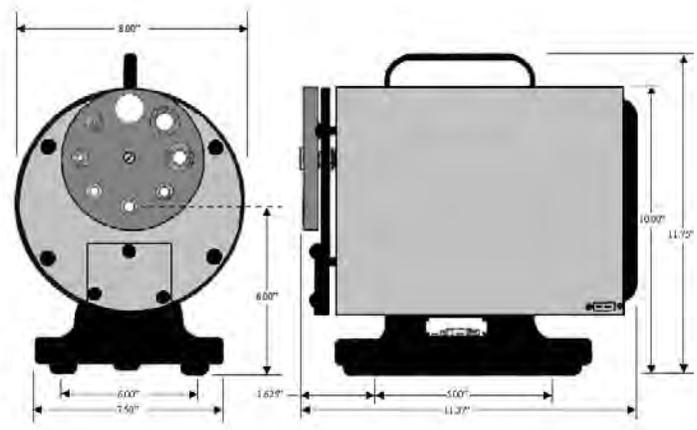
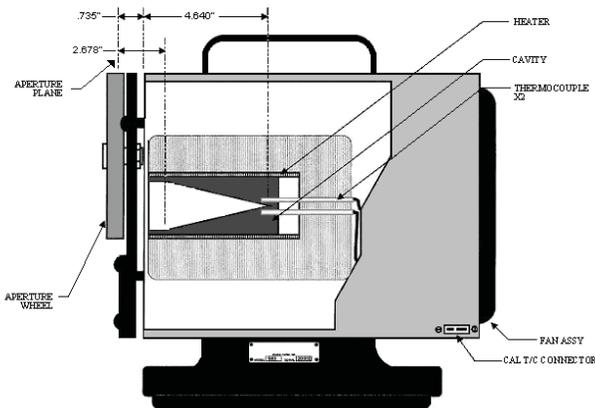
**1.0"**  
**1050° C**  
**1200° C**

## Specifications:

<b>Temperature Range:</b>	IR-563: 50 to 1050° C IR-564: 50 to 1200° C
<b>Emittance Watts/Cm<sup>2</sup> (Watts):</b>	IR-563: 17.36 (88) IR-564: 26.68 (135)
<b>Wavelength Range:</b>	0.5 - 99um
<b>Emissivity:</b>	>0.99
<b>Emitter Size: in (mm)</b>	1" (25.4)
<b>Source Type:</b>	Cavity
<b>Temperature Resolution:</b>	0.1 C
<b>Calibration Accuracy:</b>	+/- 0.2 C to NIST Standard
<b>Stability: Short (Long) Term:</b>	+/- 0.1 C (+/- 0.2C)
<b>Response Time:</b>	IR-563: 100-1000 <45 Minutes IR-564: 100-1200 <70 Minutes
<b>Temperature Sensors:</b>	Embedded 0.01% Matched Type S
<b>Control Type:</b>	Active Multi-Band P.I.D.
<b>Line Voltage:</b>	90 to 125 or 208-240 VAC 50-60 Hz
<b>Power Requirements:</b>	IR-563: 550 Watts Max IR-564: 800 Watts Max
<b>Cable Length:</b>	8 Feet (2.4 m)
<b>Dimensions: in (mm)</b>	<b>Source:</b> 11.75" H x 11.4" D x 8" W (298x289x203) <b>Controller:</b> 5.1"H x 13.4"D x 12"W (130x340x304)
<b>Warranty:</b>	IR-563: 2 Year IR-564: 1 Year
<b>Standard Apertures:</b>	0.0125, 0.025, 0.050, 0.10, 0.20, 0.40, 0.60 and 1.0 In

## Optional Accessories:

- ~ RS-232, RS-485 or IEEE-488/GPIB
- ~ IR-860 Energy Modulator
- ~ 1" Remote Control Motorized Indexed Aperture Wheel



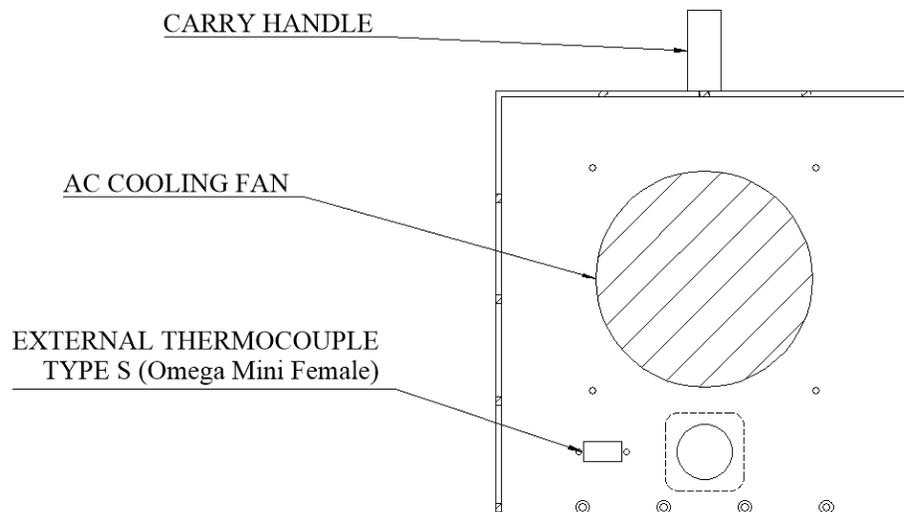
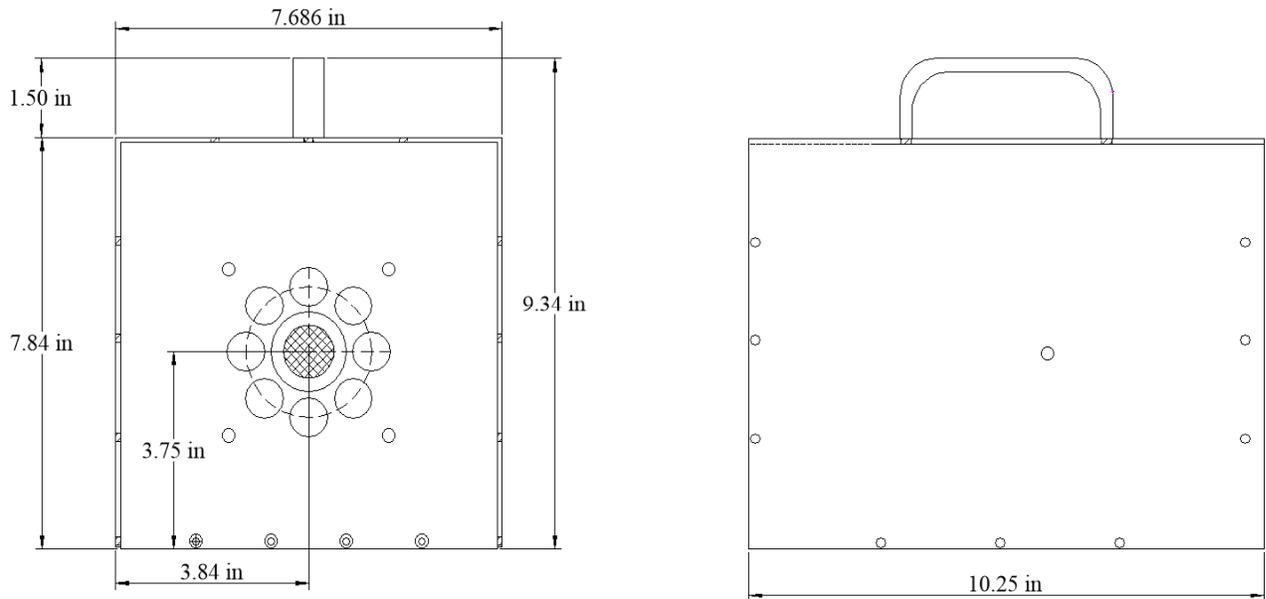


**1.0"**  
**1200 °C**

### **Specifications:**

<b>Temperature Range:</b>	50 – 1200 C
<b>Emittance Watts/Cm<sup>2</sup> (Watts):</b>	26.68 (135)
<b>Wavelength Range:</b>	0.5 - 99um
<b>Emissivity:</b>	>0.99
<b>Emitter Size: in (mm)</b>	1" (25.4)
<b>Source Type:</b>	Cavity
<b>Temperature Resolution:</b>	0.1 C
<b>Calibration Accuracy:</b>	+/- 0.2 C to NIST Standard
<b>Stability: Short (Long) Term:</b>	+/- 0.1 C (+/- 0.2C)
<b>Response Time:</b>	100-1200 <70 Minutes
<b>Temperature Sensors:</b>	Embedded 0.01% Matched Type S
<b>Control Type:</b>	Active Multi-Band P.I.D.
<b>Line Voltage:</b>	90 to 125 or 208-240 VAC 50-60 Hz
<b>Power Requirements:</b>	800 Watts Max
<b>Cable Length:</b>	8 Feet (2.4 m)
<b>Dimensions: in (mm)</b>	<b>Source:</b> 9.34" H x 10.25" D x 7.69" W (298x289x203)
	<b>Controller:</b> 5.1"H x 13.4"D x 12"W (130x340x304)
	<b>Warranty:</b> 1 Year
	<b>Standard Apertures:</b> N/A
	<b>Remote Interface:</b> RS-232 or IEEE-488/GPIB
	<b>Housing Temperature:</b> <15 C above amb. At 1200 C

# IR-565/301 DIMENSIONS



# IR-574/301

## CAVITY BLACKBODY



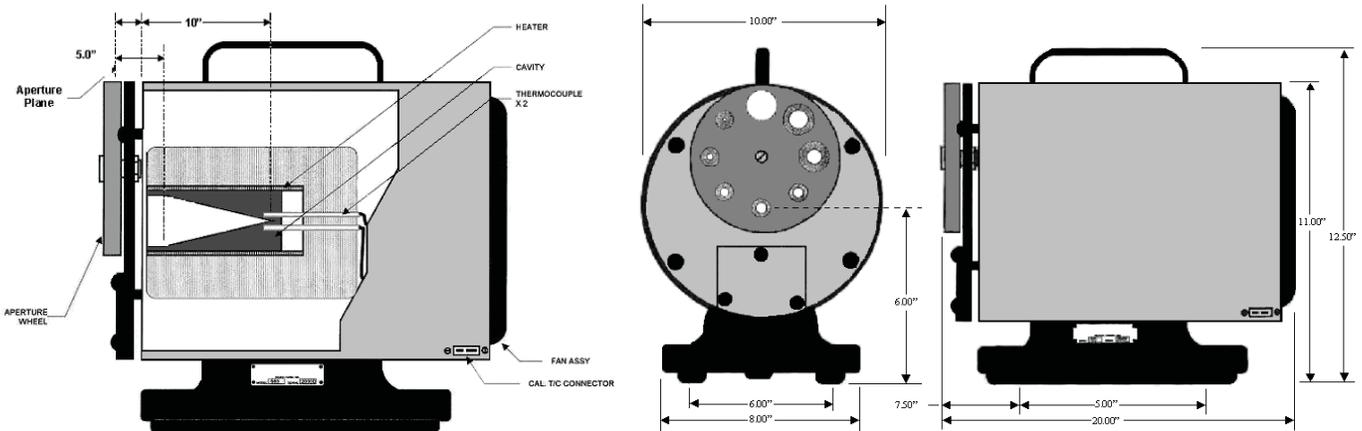
2.25"  
1200 °C

### Specifications:

Temperature Range:	50 to 1200° C
Emittance Watts/Cm <sup>2</sup> (Watts):	26.68 (684)
Wavelength Range:	0.5 - 99um
Emissivity:	>0.99
Emitter Size: in (mm)	2.25" (57)
Source Type:	Cavity
Temperature Resolution:	0.1 C
Calibration Accuracy:	+/- 0.2 C to NIST Standard
Stability: Short (Long) Term:	+/- 0.1 C (+/- 0.2C)
Response Time:	100-1200 <80 Minutes
Temperature Sensors:	Embedded 0.01% Matched Type S
Control Type:	Active Multi-Band P.I.D.
Line Voltage:	90 to 125 or 208-240 VAC 50-60 Hz
Power Requirements:	1400 Watts Max
Cable Length:	8 Feet (2.4 m)
Dimensions: in (mm) Source:	12.5" H x 20" D x 10" W (317x508x254)
Controller:	5.1"H x 13.4"D x 12"W (130x340x304)
Warranty:	1 Year
Standard Apertures:	2.0" (50.8)

### Optional Accessories:

- ~ RS-232, RS-485 or IEEE-488/GPIB
- ~ 2" Remote Control Motorized Indexed Aperture Wheel
- ~ 2" Manual Aperture Wheel
- ~ 2" Apertures



# IR-860 Energy Modulator



The IR-860 Energy Modulator is a variable speed rotating disk chopper designed for use with radiation sources, including blackbody, tungsten filament, mercury lamps, Nernst glowers and as part of instruments where modulated radiation is needed. The IR-860 has been specially designed to integrate with the IR-563 & IR-564 Blackbody Sources. For other applications a table mount is available. The IR-860 Energy Modulator System consists of the Modulator head assembly and Modulator controller. The controller operates the motor, blade rotation, and speed of the modulation frequency. Interchangeable blades are available to allow modulation from 1.25 Hz to 45,000 Hz. The standard blade is an 8-slot blade with a frequency range from 10 to 1000 Hz.

## IR-860 Controller

Motor Spindle Speed Range:	75-7500 RPM
Warm up Time:	One Hour for optimum stability
Stability:	0.5% of set frequency or 0.25% of full scale over 4 hours
Control Type:	Closed Loop Brushless DC motor controller with phase sensors.
Meter Indication:	Chopping Frequency in Hertz.
Meter Accuracy:	± 1 digit.
Reference Frequency Output:	0-5 V TTL level, 600 Ohms output.
Power requirements:	200 Watts 110 or 220VAC 50-60 Hz

**Blades, frequencies for IR-860**

Blade	Frequency Range	Number of Slots	Slot Width	Maximum Aperture
A	1.25–125Hz	1	7.854	1
B	2.5–250 Hz	2	3.927	1
C	10–1000 Hz	8	0.982	0.992
D	30–3000 Hz	24	0.327	0.327
E	50–5000 Hz	40	0.196	0.196
F	100–10000 Hz	80	0.098	0.098
G	300–30000 Hz	240	0.0327	0.0327
H	62.5–6250 Hz	50	0.157	0.157
J	450–45000 Hz	360	0.022	0.022
K	3.75–375 Hz	3	2.618	1

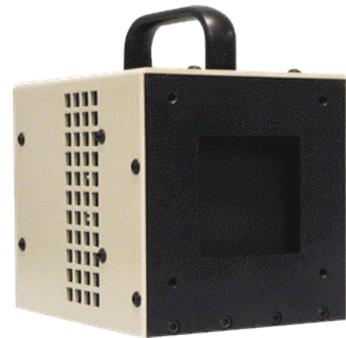


## $\Phi$ EXTENDED AREA BLACKBODY SYSTEMS



Our extended area sources are flat plate emitters with special high emissivity coating providing 0.96 average emissivity. Extended area sources provide large target with high radiant intensity for application where a cavity blackbody is too small.

The NEW Low-Cost Thermo-Electrically cooled / Heated blackbody sources with a solid Copper Emitter plate provides superior uniformity and energy emission. Our Proprietary High Emissivity Black Coating provides >0.95 uniform Emissivity from 0.8 to 30  $\mu\text{m}$ . A Type "T" Thermocouple is embedded in the emitter plate to allow independent monitoring and calibration of the surface temperature. The IR-2100 series offers stability and uniformity comparable to competitive systems costing more than \$20,000 for a fraction of their costs, providing the best cost to performance ratio.



# EXTENDED AREA BLACKBODY SYSTEMS

<i>MODEL</i>	<i>TEMPERATURE</i>	<i>CAVITY OPENING</i>
IR-2100	-5 to 145°C	2.5" x 2.5"
IR-2101	-30 to 75°C	2.5" x 2.5"
IR-2103	-5 to 145°C	3" x 3"
IR-2106	5 to 150°C	6" x 6"
IR-140	AMBIENT TO 230°C	12" x 12"
IR-150	AMBIENT TO 500°C	12" x 12"



**IR-301 CONTROLLER**

# IR-140, 150

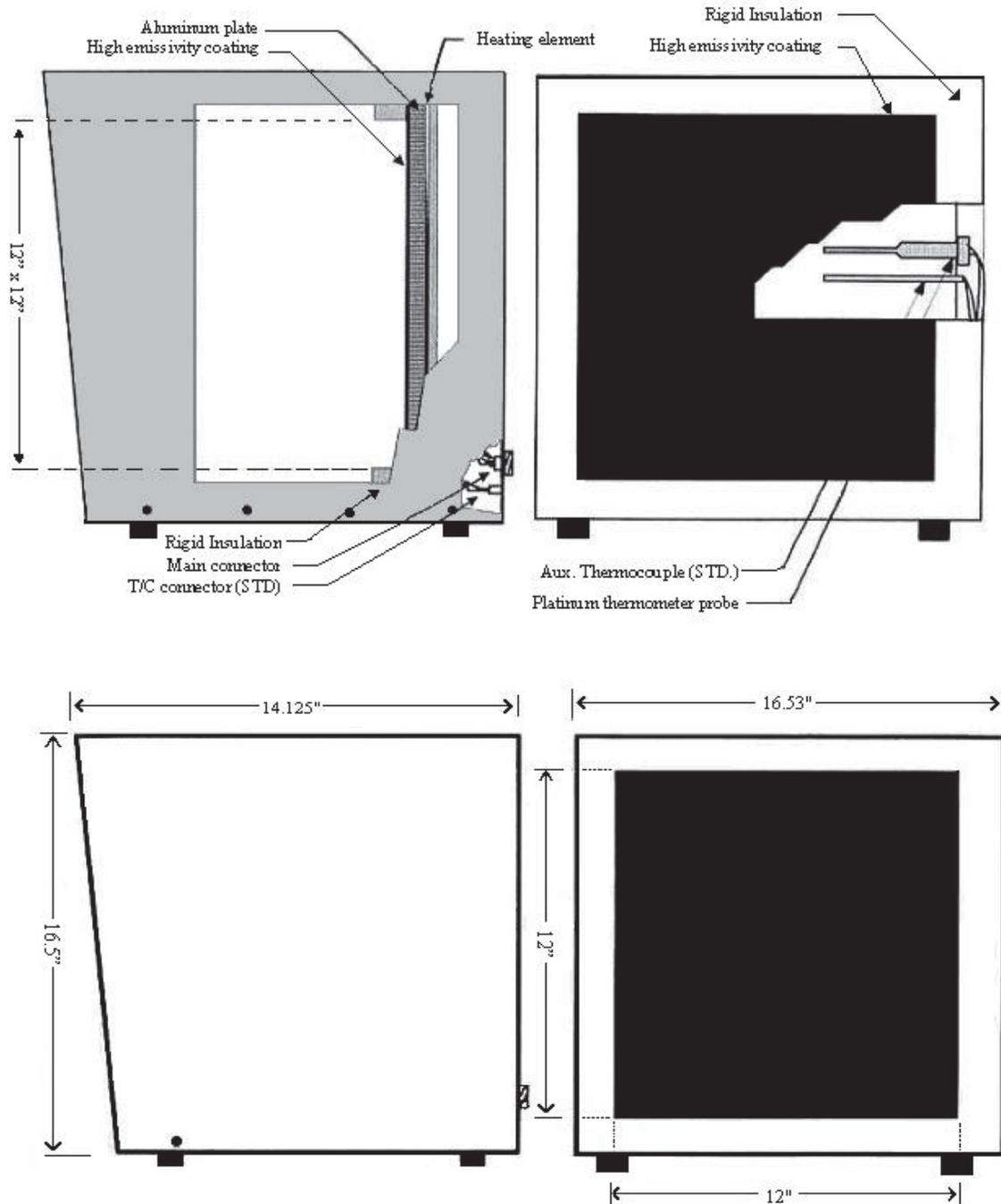


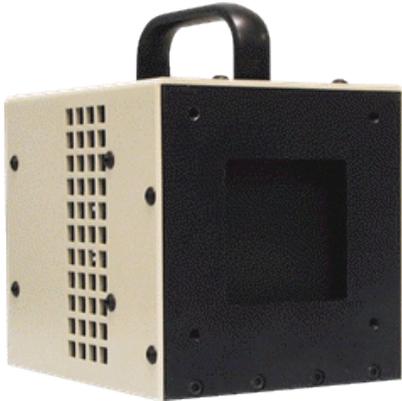
12" x 12"

## Specifications:

<b>Temperature Range:</b>	IR-140: Amb to 230° C IR-150: Amb to 500° C
<b>Emittance Watts/Cm<sup>2</sup> (Watts):</b>	IR-140: 0.36 (334) IR-150: 2.02 (1876)
<b>Wavelength Range:</b>	1 - 99um
<b>Emissivity:</b>	0.96 +/- 0.02
<b>Emitter Size: in (mm)</b>	12" x 12" (304 x 304)
<b>Source Type:</b>	Extended Area
<b>Temperature Resolution:</b>	0.1C
<b>Calibration Accuracy:</b>	+/- 0.2 C to NIST Standard
<b>Stability: Short (Long) Term:</b>	+/- 0.1 C (+/- 0.2C)
<b>Response Time:</b>	Ambient – Max < 50 Minutes
<b>Temperature Sensors:</b>	IR-140: Platinum RTD & Type T IR-150: Platinum RTD & Type S
<b>Control Type:</b>	Active Multi-Band P.I.D.
<b>Line Voltage:</b>	IR-140: 90-125 or 208-240 VAC 50-60 Hz IR-150: 208-240 VAC 50-60 Hz
<b>Power Requirements:</b>	IR-140: 1500 Watts Max IR-150: 4500 Watts Max
<b>Cable Length:</b>	8 Feet (2.4 m)
<b>Dimensions: in (mm) Source:</b>	17" H x 17" D x 17" W (432x432x432)
<b>Controller:</b>	5.1"H x 13.4"D x 12"W (130x340x304)
<b>Warranty:</b>	1 Year
<b>Standard Apertures:</b>	12" x 12" (304 x 304 mm)
<b>Remote Interface:</b>	RS-232, RS-485 or IEEE-488/GPIB

# DIMENSIONS

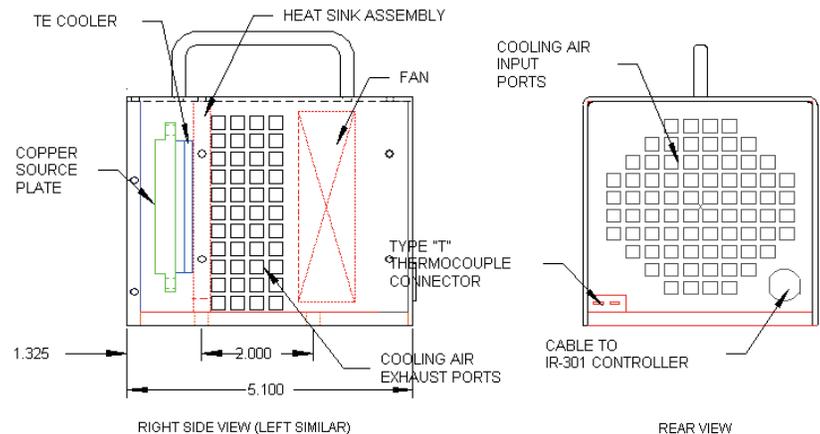
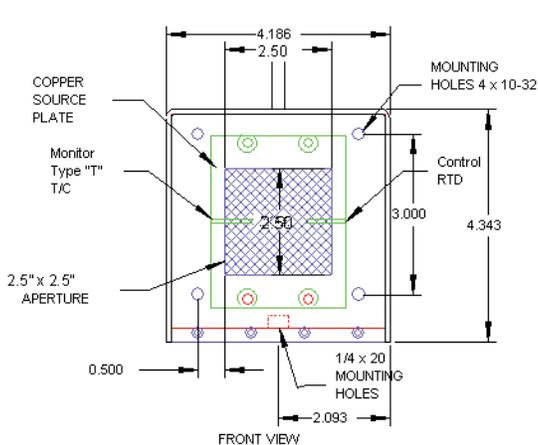




**2.5" x 2.5"**  
**-5 to 145 °C**  
**-30 to 75 °C**

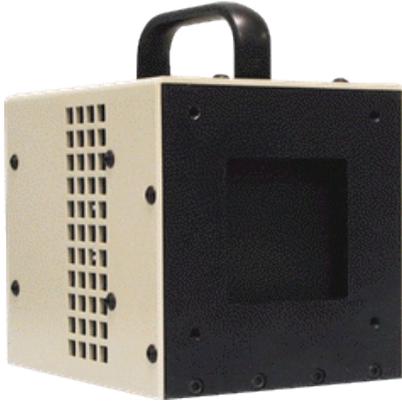
### Specifications:

<b>Temperature Range:</b>	IR-2100: -5 to 145 C IR-2101: -30 to 75°C
<b>Emittance Watts/Cm<sup>2</sup> (Watts):</b>	.17 (5.4)
<b>Wavelength Range:</b>	1-99 um
<b>Emissivity:</b>	0.96 +/- 0.02
<b>Emitter Size: in (mm)</b>	2.5" x 2.5" (63.5 x 63.5)
<b>Source Type:</b>	Extended Area
<b>Temperature Resolution:</b>	0.1 C
<b>Calibration Accuracy:</b>	+/- 0.2 C to NIST Standard
<b>Stability: Short (Long) Term:</b>	+/- 0.1 C (+/- 0.2C)
<b>Response Time:</b>	Ambient – Max <20 Min
<b>Temperature Sensors:</b>	Platinum RTD & Type T
<b>Control Type:</b>	Active Multi-Band P.I.D.
<b>Line Voltage:</b>	90 to 125 or 208-240 VAC 50-60 Hz
<b>Power Requirements:</b>	200 Watts Max
<b>Cable Length:</b>	8 Feet (2.4 m)
<b>Dimensions: in (mm)</b>	<b>Source:</b> 4.25" H x 4.25" D x 5" W (108x108x127)
	<b>Controller:</b> 5.1"H x 13.4"D x 12"W (130x340x304)
	<b>Warranty:</b> 1 Year
<b>Standard Apertures:</b>	2.5" x 2.5" (63.5 x 63.5)
<b>Remote Interface:</b>	RS-232, RS-485 or IEEE-488/GPIB



# IR-2103/301

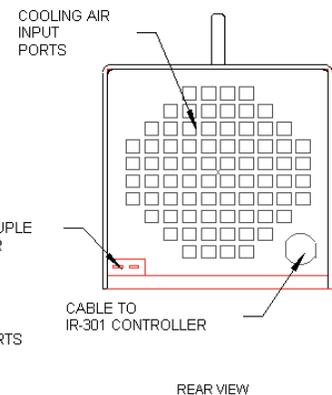
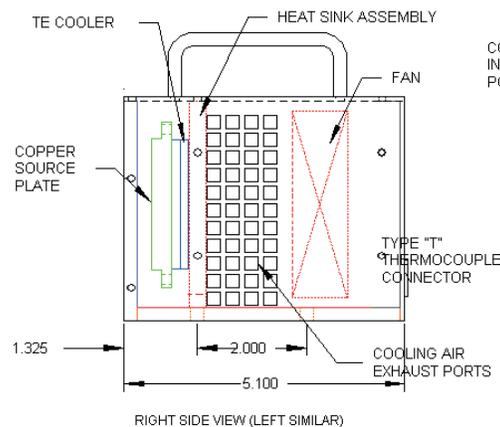
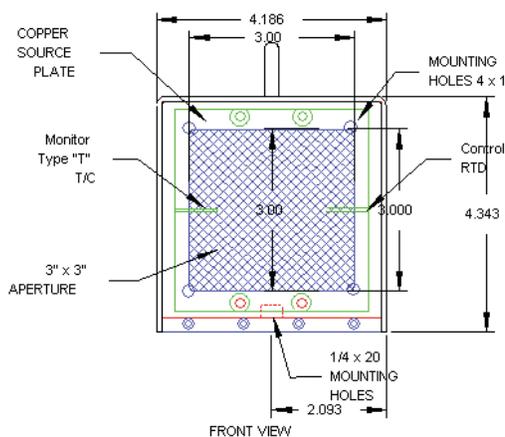
## EXTENDED AREA BLACKBODY



3" x 3"  
-5 to 145 °C

### Specifications:

Temperature Range:	-5 to 145 °C
Emittance Watts/Cm <sup>2</sup> (Watts):	.17 (7.75)
Wavelength Range:	1-99 um
Emissivity:	0.96 +/- 0.02
Emitter Size: in (mm)	3" x 3" (76.2 x 76.2)
Source Type:	Extended Area
Temperature Resolution:	0.1 C
Calibration Accuracy:	+/- 0.2 C to NIST Standard
Stability: Short (Long) Term:	+/- 0.1 C (+/- 0.2C)
Response Time:	Ambient – Max <20 Min
Temperature Sensors:	Platinum RTD & Type T
Control Type:	Active Multi-Band P.I.D.
Line Voltage:	90 to 125 or 208-240 VAC 50-60 Hz
Power Requirements:	200 Watts Max
Cable Length:	8 Feet (2.4 m)
Dimensions: in (mm)	Source: 4.25" H x 4.25" D x 5" W (108x108x127)
Controller:	5.1"H x 13.4"D x 12"W (130x340x304)
Warranty:	1 Year
Standard Apertures:	3" x 3" (76.2 x 76.2)
Remote Interface:	RS-232, RS-485 or IEEE-488/GPIB





**6" x 6"**  
**5 to 150 °C**

### Specifications:

<b>Temperature Range:</b>	5 to 150° C
<b>Emittance Watts/Cm<sup>2</sup> (Watts):</b>	0.17 (5.4)
<b>Wavelength Range:</b>	1-99 um
<b>Emissivity:</b>	0.96 +/- 0.02
<b>Emitter Size: in (mm)</b>	6" x 6" (152.4 x 152.4)
<b>Source Type:</b>	Extended Area
<b>Temperature Resolution:</b>	0.1 C
<b>Calibration Accuracy:</b>	+/- 0.2 C to NIST Standard
<b>Stability: Short (Long) Term:</b>	+/- 0.1 C (+/- 0.2C)
<b>Response Time:</b>	Ambient – Max <20 Min
<b>Temperature Sensors:</b>	Platinum RTD & Type T
<b>Control Type:</b>	Active Multi-Band P.I.D.
<b>Line Voltage:</b>	90 to 125 or 208-240 VAC 50-60 Hz
<b>Power Requirements:</b>	200 Watts Max
<b>Cable Length:</b>	8 Feet (2.4 m)
<b>Dimensions: in (mm) Source:</b>	8" H x 8" D x 8" W (203.2x203.2x203.2)
<b>Controller:</b>	5.1"H x 13.4"D x 12"W (130x340x304)
<b>Warranty:</b>	1 Year
<b>Standard Apertures:</b>	6" x 6" (152.4 x 152.4)
<b>Remote Interface:</b>	RS-232, RS-485 or IEEE-488/GPIB

