Calibration Grade Cavity Blackbody Sources

INFRARED SYSTEMS DEVELOPMENT CORPORATION

BostonElectronics

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NIGHTINGALE

BODY TEMPERATURE BLACKBODY

INFRARED SYSTEMS DEVELOPMENT CORPORATION

ACQUIRE BODY TEMPERATURE WITH INFRARED CAMERA IN-SCENE REFERENCE

- CONTROLLED TO HUMAN BODY TEMPERATURE
- REFERENCE SOURCE IN-SCENE WITH SUBJECT
- COMPENSATION OF ENVIRONMENTAL EFFECTS
- REMOVE THERMAL CAMERA ERROR
- CALIBRATION OF THERMAL CAMERAS

Infrared Systems Development has teamed with Santa Barbara Infrared to offer this new low cost solution for real-time body temperature measurement systems.

- **The NightinGale Reference Target source is designed for in-scene comparison of human body temperature.**
- **Using the NightinGale in the same scene as the subject allows for immediate visual and reporting verification of the Infrared Camera Temperature.**
- **Infrared Cameras and spot sensors can be affected by many factors in the environment. These can be minimized with the NightinGale.**

BostonElectronics
Authorized Distributors

www.boselec.com | shop.boselec.com

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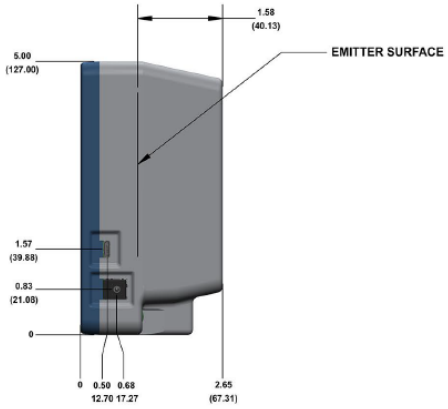
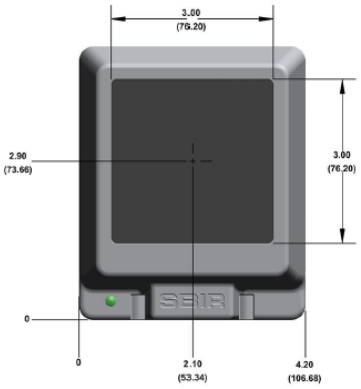
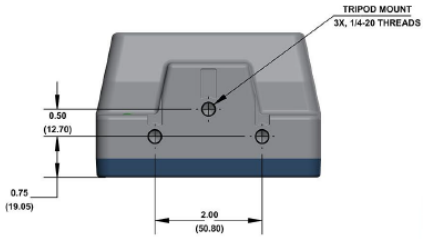
NIGHTINGALE
SPECIFICATIONS AND DIMENSIONS

Specifications:

Temperature Range :	**30 – 45 °C (86-113°F)**
Wavelength Range :	**3 – 14 um**
Emissivity :	**>0.95**
Emitter Size: in (mm) :	**3” x 3” (76.2 x 76.2 mm)**
Source Type :	**Extended Area**
Temperature Uniformity :	**+/- 0.15 °C (+/- 0.3 °F) Center 1.5 x 1.5” Area**
Calibration Accuracy :	**+/- 0.15 °C (+/- 0.3 °F) Radiometric**
Stability :	**+/- 0.05 °C (+/- 0.1 °F)**
Response Time :	**< 5 Minutes**
Set Temperature Resolution :	**0.1 °C (0.2 °F)**
Control Type :	**Active Multi-Band P.I.D.**
AC Adapter Line Voltage :	**90 to 125 or 208-240 VAC 50-60 Hz**
Power Requirements :	**18 VDC, 1A AC Power Adapter Provided**
Operating Environment :	**22° C +/- 3°C (71.6°F +/- 5.4°F) 5%-90% R.H. N.C.**
Storage Temperature Range:	**-20°C to 70°C (-4°F to 158°F)**
Warranty:	**1 Year**
Remote Interface:	**USB**
Mounting :	**¼ - 20 Tripod Mount**
Weight :	**1.5 lbs (.682 Kg)**
Model Number :	**BTR-03**







Specifications subject to change without prior notice

INFRARED SYSTEMS DEVELOPMENT CORPORATION

INFRARED SYSTEMS DEVELOPMENT CORPORATION

BLACKBODY SOURCES

IR-508

IR-518 & IR-519

IR-563 & IR-564

IR-574 with IFW

Cavity Blackbody Sources (ε≈0.99)			
IR-508		0.25”	50-1050ºC
IR-518		0.40”	50-1050ºC
IR-519	*NEW*	0.40”	50-1200ºC
IR-563		1.0”	50-1050ºC
IR-564		1.0”	50-1200ºC
IR-574		2.25”	50-1200ºC

- 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

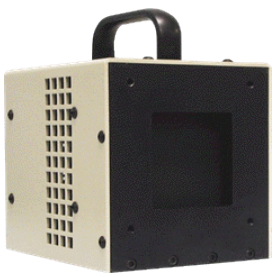
- Custom Apertures
- Absolute and Differential Modes
- Proven 20 Degree Recessed Cone Cavity
- IR Camera Calibration & Uniformity Testing
- Non-Contact Thermometer Calibration

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° C to +350° 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 0.1ºC Resolution and RTD Cold Junction Sensor.

Extended Area Blackbody Sources (ε≈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

BostonElectronics INFRARED SYSTEMS DEVELOPMENT CORPORATION

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 um), Mid (3-8) and Far (8-30+ um) 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 20º 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 1000ºC 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 º 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 -80º C.

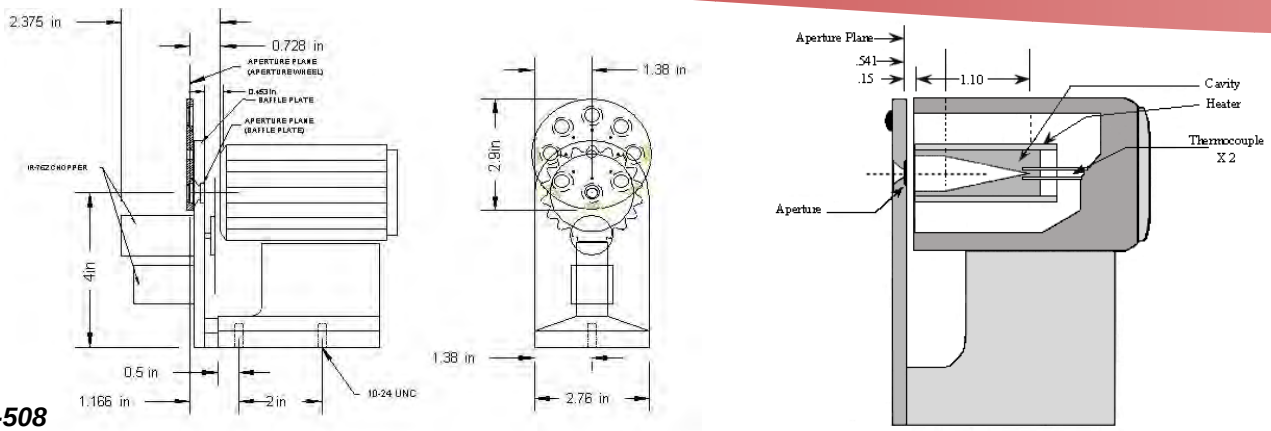
IR-301 Blackbody Source Controller

SPECIFICATIONS

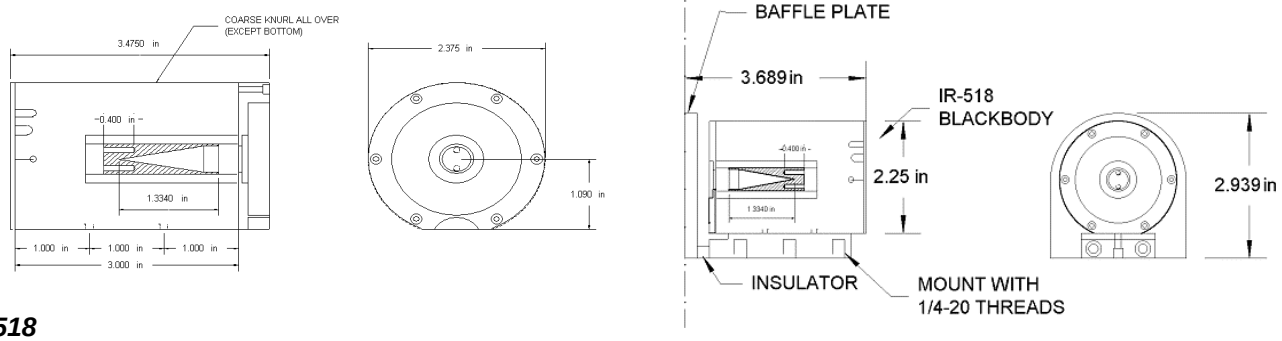
	IR-508	IR-518	IR-519	IR-563	IR-564	IR-574
Temperature Range:	50 to 1050ºC	50 to 1050ºC	50 to 1200ºC	50 to 1050ºC	50 to 1200ºC	50 to 1200ºC
Emittance Watts/Cm^2:	17.36 (5.5 Watts)	17.36 (14 Watts)		17.36 (88 Watts)	26.88 (135 Watts)	26.68 (684 Watts)
Wavelength Range:	0.5 - 99 um					
Emissivity:	> 0.99					
Emitter Size: in (mm)	0.25” (6.3)	0.4” (10)		1” (25.4)	1” (25.4)	2.25” (57)
Temperature Resolution:	0.1 C					
Calibration Accuracy:	+/- 0.2 C to NIST Standard					
Stability:	+/- 0.1 C Short Term; +/- 0.2 C Long Term					
Response Time:	100-1000 <30 Min	100-1000 <40 Min	100-1200 <45 Min	100-1000 <45 Min	100-1200 <70 Min	100-1200 <80 Min
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			550 Watts Max	800 Watts Max	1400 Watts Max
Cable Length:	8 Feet (2.4 m)					
Dimensions: in (mm) Source:	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)
Controller:	5.1"H x 13.4"D x 12"W (130 x 34 0x 304)					
Warranty:	2 Year	1 Year	1 Year	2 Year	1 Year	1 Year
Standard Apertures:	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)
Remote Interface:	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

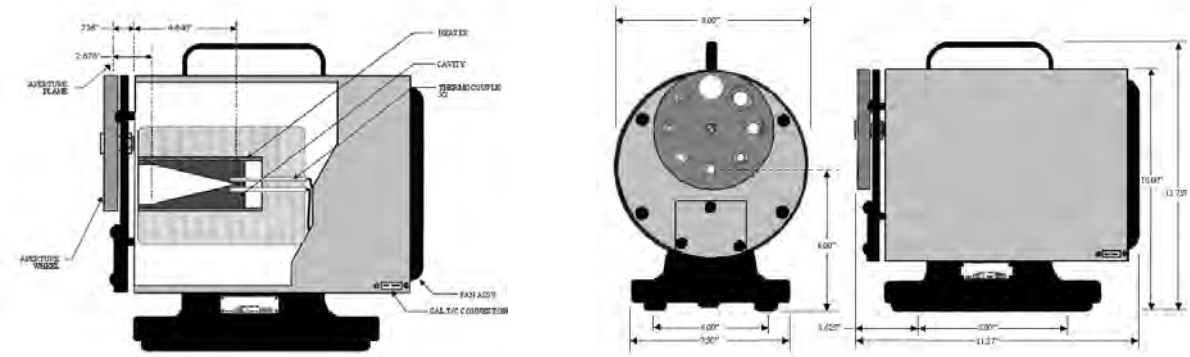
Using an aperture wheel, which comes standard on the IR-563 and IR-564, the infrared flux can be varied by known amounts without disturbing critical optical setups, and combining apertures and distance changes, the flux at any point can easily be determined.



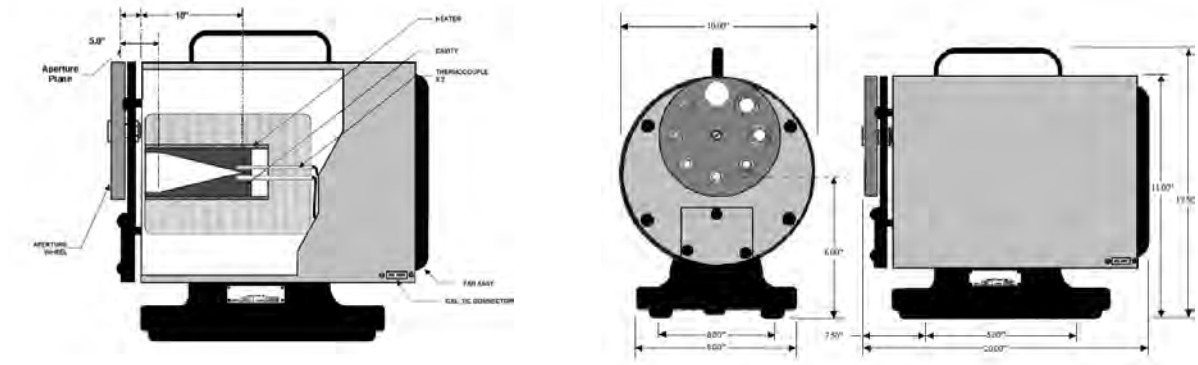
IR-508



IR-518



IR-563 & IR-564



IR-574

IR-301

BLACKBODY SOURCE CONTROLLER

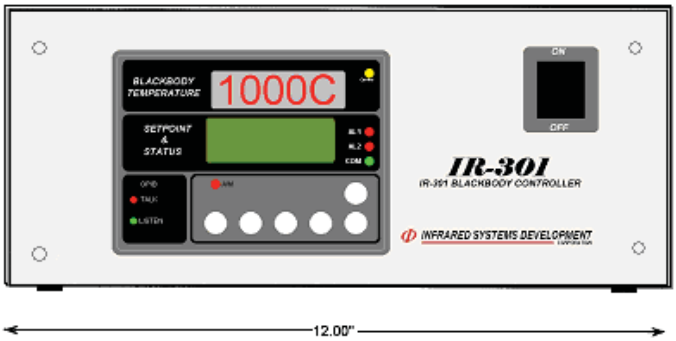
Temperature Range:	50ºc to 1200ºC	**Sample Rate:**	Cavity Temp is updated 10 times per second; digitally filtered to eliminate noise
Calibration Accuracy:	+/- 0.2ºC +/- 1 digit	**ºF/ºC**	Selected at Factory
Stability:	+/- 0.02% of full scale	**Alarms:**	5.0 amps at 120 VAC, 2.5 amps at 230 VAC
Resolution: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

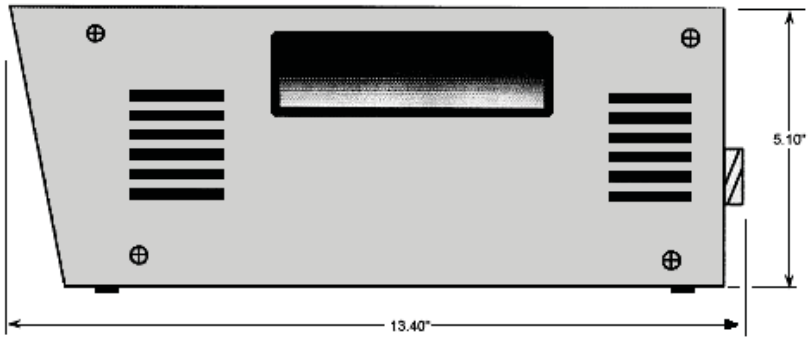
The IR-301 controller is a microprocessor based PID (Proportional, Integral and Derivative) system for regulating the Blackbody's Radiating Surface. At Infrared Systems Development, we have taken a leap forward from the standard PID Controller types of past years. We do this by utilizing five (5) independent 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.

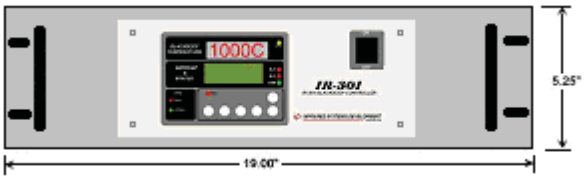
To control warm-up characteristics, we start with an independent Proportional Band, much wider than the stability Proportional Band. We then take the operational span and divide it into five smaller spans. Each of these spans is assigned a factory-selected range of PID Parameters values. Selecting a 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.

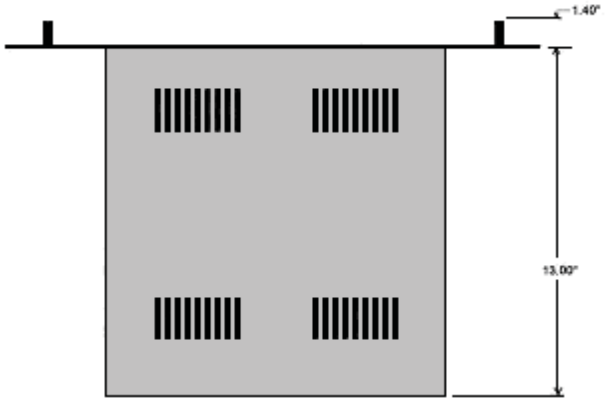
All control parameters, selections, and calibration procedures are accomplished through simple MENU selections using the four front panel buttons. These MENU selections are organized into Sections. Each Section presents a specific set of related functions. Internally the IR-301 was designed for maximum 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

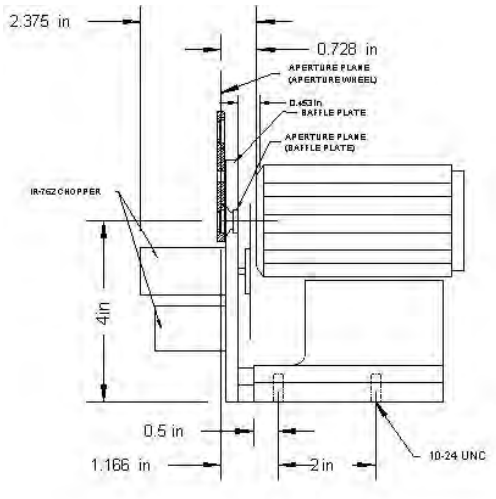
IR-508/301

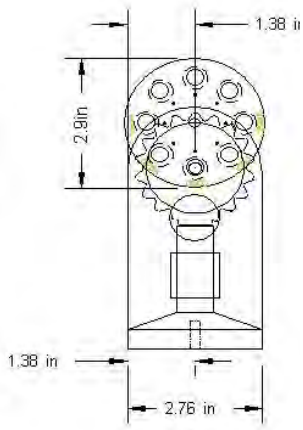
0.25"
1050 ºC

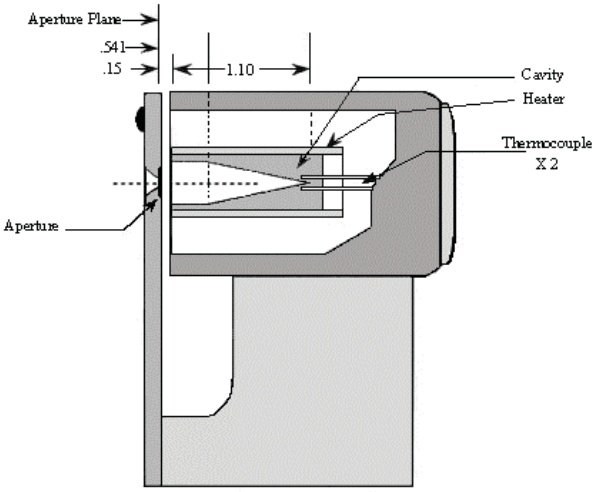
Specifications:

Temperature Range:	50 to 1050ºC
Emittance Watts/Cm^2 (Watts):	17.36 (5.5)
Wavelength Range:	0.5 - 99um
Emissivity:	>0.99
Emitter Size: in (mm)	0.25" (6.3)
Source Type:	Cavity
Temperature Resolution:	0.1ºC
Calibration Accuracy:	+/- 0.2ºC to NIST Standard
Stability: Short (Long) Term:	+/- 0.1ºC (+/- 0.2ºC)
Response Time:	100-1000 <30 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:	3" Diam x 5.9" H x 4.9" D (76.2x150x125)
Controller:	5.1"H x 13.4"D x 12"W (130x340x304)
Warranty:	2 Year
Standard Apertures:	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"







IR-518/301

CAVITY BLACKBODY

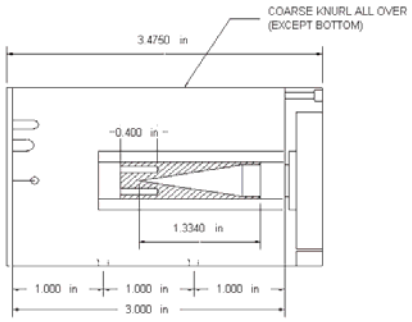
0.40"
1050 °C

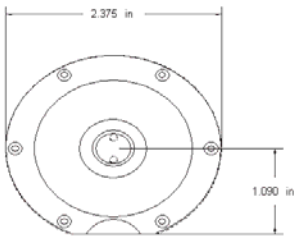
Specifications:

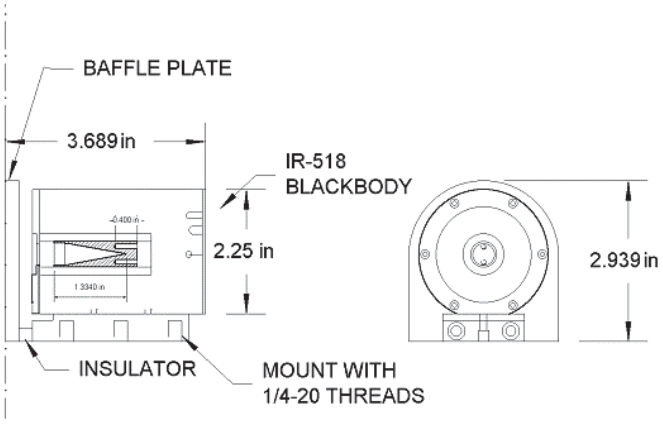
Temperature Range:	50 to 1050ºC
Emittance Watts/Cm^2 (Watts):	17.36 (14)
Wavelength Range:	0.5 - 99um
Emissivity:	>0.99
Emitter Size: in (mm)	0.4" (10)
Source Type:	Cavity
Temperature Resolution:	0.1ºC
Calibration Accuracy:	+/- 0.2ºC to NIST Standard
Stability: Short (Long) Term:	+/- 0.1ºC (+/- 0.2ºC)
Response Time:	100-1000 <40 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 3” Deep (60 x 76.2)
Controller:	5.1"H x 13.4"D x 12"W (130x340x304)
Warranty:	1 Year
Standard Apertures:	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

Shown with additional Baffle Plate and Mounting Block

The IR-519 Radiation Source extends the temperature range of the IR-518 to 1200ºC. 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 20º 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 º C to 1200ºC. The IR-519 is covered by a one-year warranty.

Specifications:

Temperature Range: 50 – 1200 C
Emittance Watts/Cm^2 (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

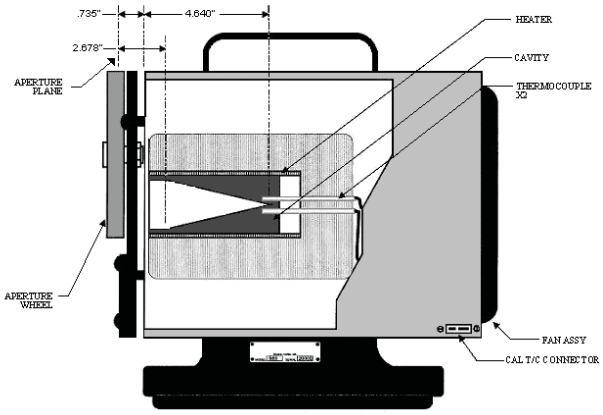
1.0"
1050° C
1200° C

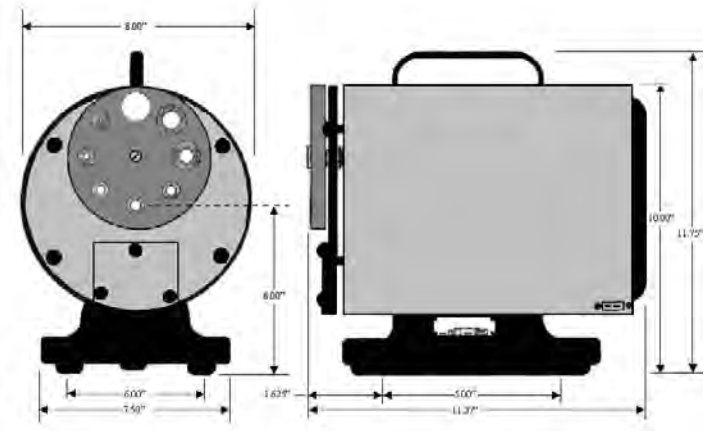
Specifications:

Temperature Range:	IR-563: 50 to 1050° C IR-564: 50 to 1200° C
Emittance Watts/Cm^2 (Watts):	IR-563: 17.36 (88) IR-564: 26.68 (135)
Wavelength Range:	0.5 - 99um
Emissivity:	>0.99
Emitter Size: in (mm)	1" (25.4)
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:	IR-563: 100-1000 <45 Minutes IR-564: 100-1200 <70 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:	IR-563: 550 Watts Max IR-564: 800 Watts Max
Cable Length:	8 Feet (2.4 m)
Dimensions: in (mm) Source:	11.75" H x 11.4" D x 8" W (298x289x203)
Controller:	5.1"H x 13.4"D x 12"W (130x340x304)
Warranty:	IR-563: 2 Year IR-564: 1 Year
Standard Apertures:	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





IR-564A/301

Agents: Boston Electronics Corporation

CAVITY BLACKBODY

1.0"
1200 °C

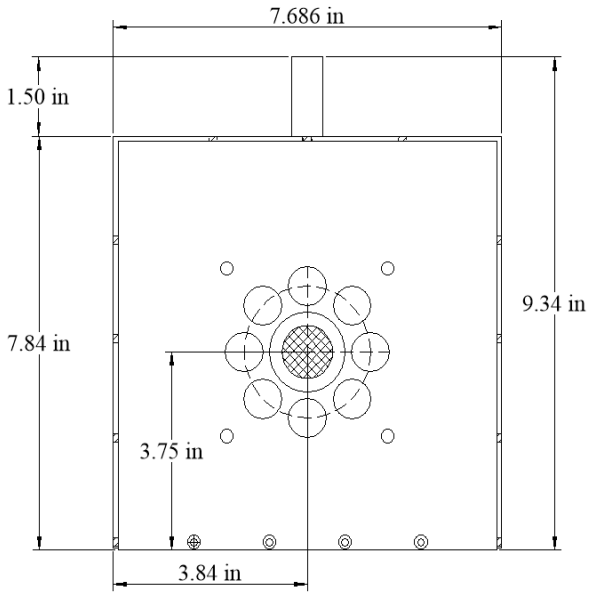
Specifications:

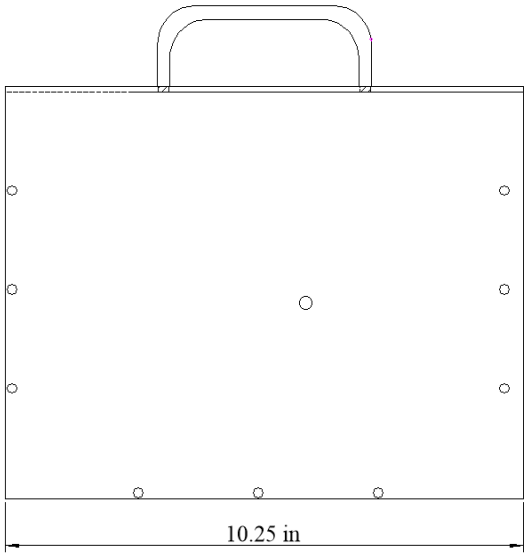
Temperature Range:	50 – 1200 C
Emittance Watts/Cm^2 (Watts):	26.68 (135)
Wavelength Range:	0.5 - 99um
Emissivity:	>0.99
Emitter Size: in (mm)	1" (25.4)
Source Type:	Cavity
Temperature Resolution:	0.1 C
Calibration Accuracy:	+/- 0.2 C to NIST Standard
Stability: Short (Long) Term:	+/- 0.1 C (+/- 0.2C)
Response Time:	100-1200 <70 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:	800 Watts Max
Cable Length:	8 Feet (2.4 m)
Dimensions: in (mm) Source:	9.34” H x 10.25” D x 7.69” W (298x289x203)
Controller:	5.1"H x 13.4"D x 12"W (130x340x304)
Warranty:	1 Year
Standard Apertures:	N/A
Remote Interface:	RS-232 or IEEE-488/GPIB
Housing Temperature:	<15 C above amb. At 1200 C

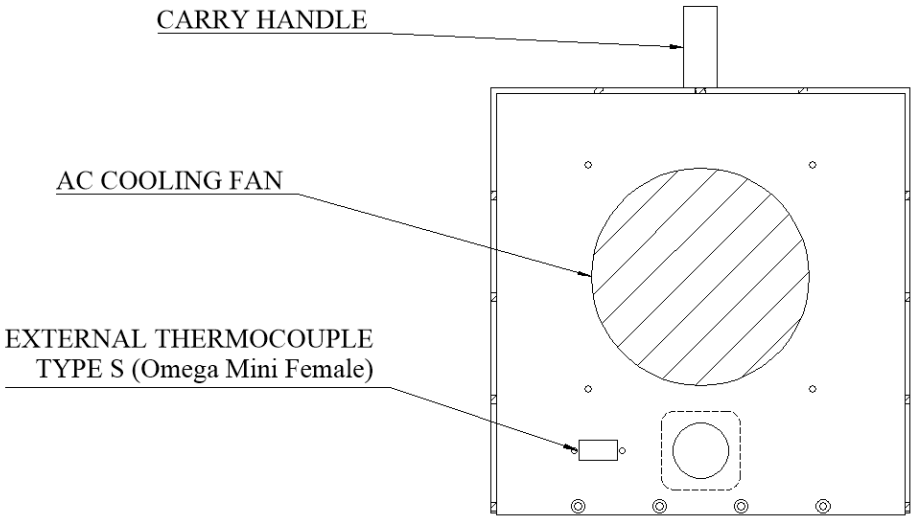
7319 SANDSCOVE CT. #4 Φ WINTER PARK, FL 32792

Boston Electronics, +1(617)566-3821 * boselec@boselec.com

IR-564A/301 DIMENSIONS







IR-574/301

CAVITY BLACKBODY

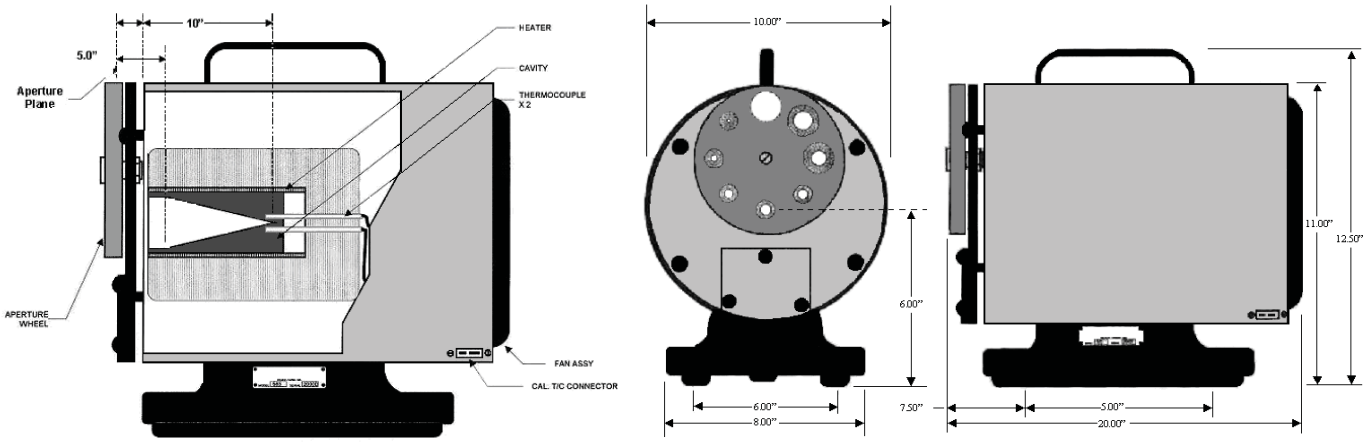
2.25"
1200 °C

Specifications:

Temperature Range:	50 to 1200º C
Emittance Watts/Cm^2 (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

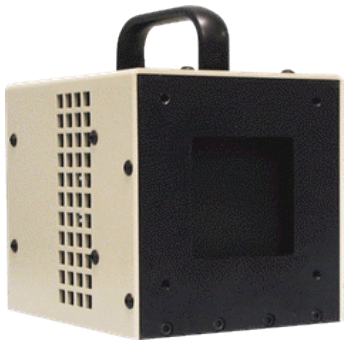
Blades, frequencies for IR-860

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

Φ Extended Area Blackbody Systems

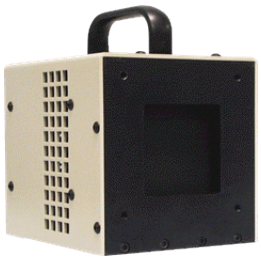
Our extended area sources are flat plate emitters with special high emissivity coating providing 0.96 average emissivity. Extended area sources provide large target with high radiant intensity for application where a cavity blackbody is too small.

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 um. 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

Model	Temperature	Cavity Opening
IR-2100	-5 to 145ºC	2.5” x 2.5”
IR-2101	-30 to 75ºC	2.5” x 2.5”
IR-2103	-5 to 145ºC	3” x 3”
IR-2106	5 to 150ºC	6” x 6”
IR-140	Ambient to 230ºC	12” x 12”
IR-150	Ambient to 500ºC	12” x 12”



IR-301 Controller

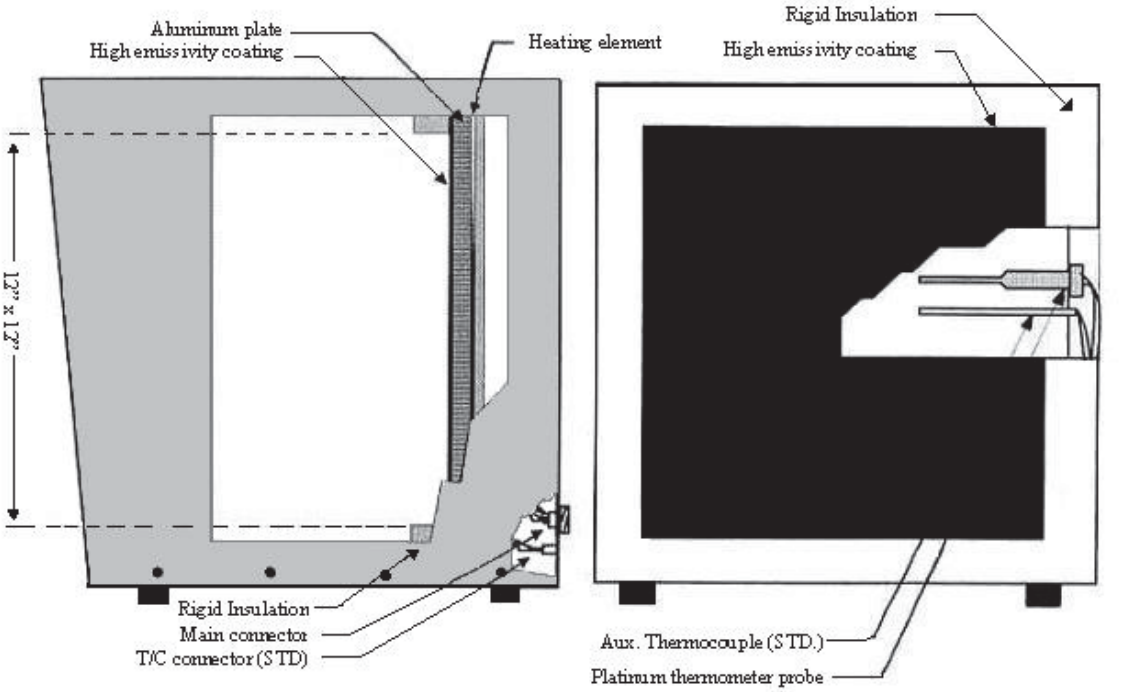
IR-140, 150

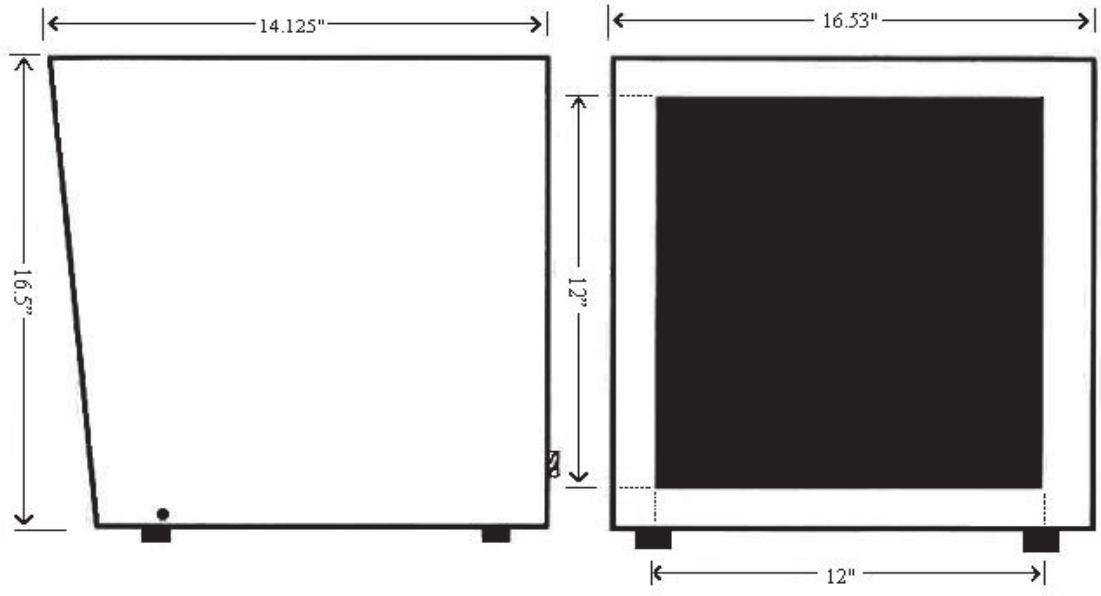
12"x 12"

Specifications:

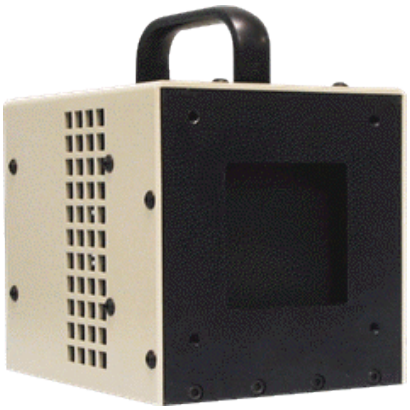
Temperature Range:	IR-140: Amb to 230º C IR-150: Amb to 500º C
Emittance Watts/Cm^2 (Watts):	IR-140: 0.36 (334) IR-150: 2.02 (1876)
Wavelength Range:	1 - 99um
Emissivity:	0.96 +/- 0.02
Emitter Size: in (mm)	12” x 12” (304 x 304)
Source Type:	Extended Area
Temperature Resolution:	0.1C
Calibration Accuracy: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

DIMENSIONS


Aluminum plate
High emissivity coating
Heating element
Rigid Insulation
High emissivity coating
12" x 12"
Rigid Insulation
Main connector
T/C connector (STD)
Aux. Thermocouple (STD.)
Platinum thermometer probe


14.125"
16.53"
16.5"
12"
12"

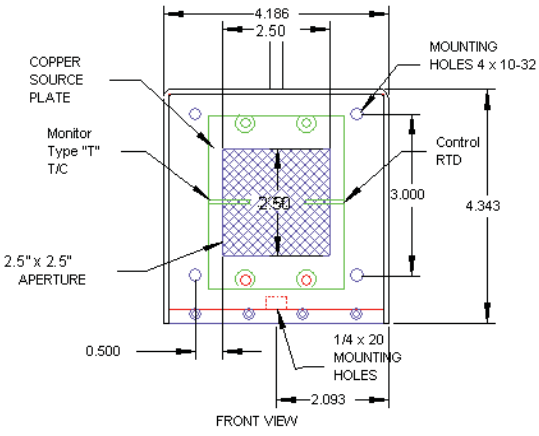
IR-2100/301

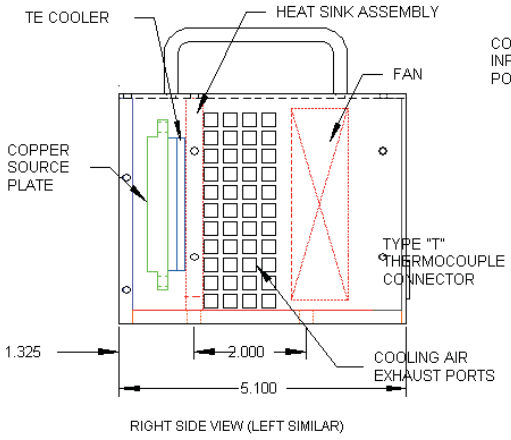


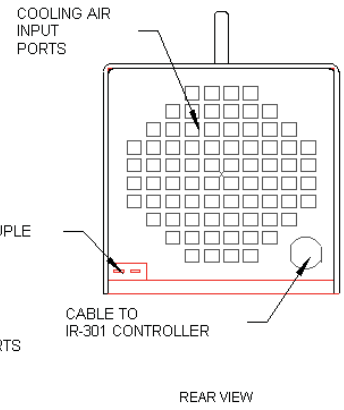
2.5"x 2.5"
-5 to 145 ºC
-30 to 75ºC

Specifications:

Temperature Range:	IR-2100: -5 to 145 C IR-2101: -30 to 75ºC
Emittance Watts/Cm^2 (Watts):	.17 (5.4)
Wavelength Range:	1-99 um
Emissivity:	0.96 +/- 0.02
Emitter Size: in (mm)	2.5” x 2.5” (63.5 x 63.5)
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:	2.5” x 2.5” (63.5 x 63.5)
Remote Interface:	RS-232, RS-485 or IEEE-488/GPIB

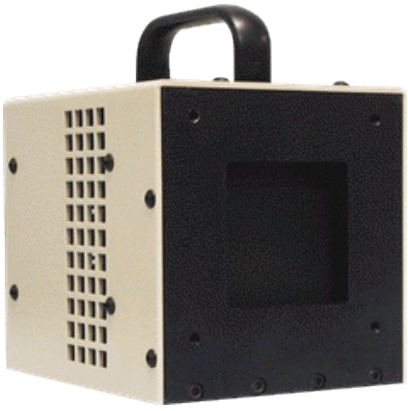






IR-2103/301

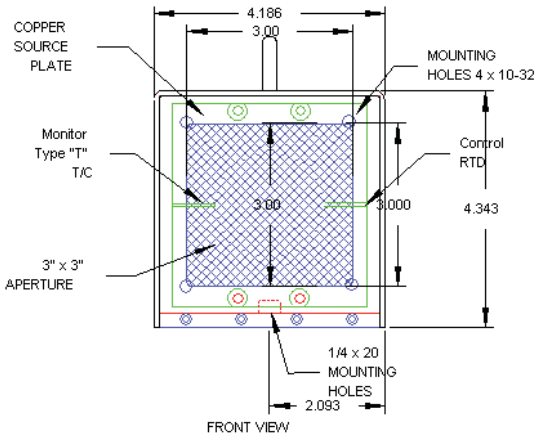
Extended Area Blackbody

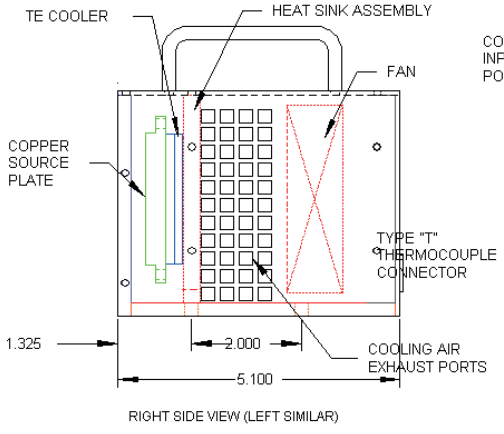


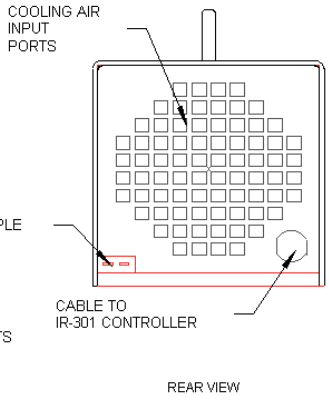
3"x 3"
-5 to 145 ºC

Specifications:

Temperature Range:	-5 to 145 ºC
Emittance Watts/Cm^2 (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







IR-2106/301

6"x 6"
5 to 150 °C

Specifications:

Temperature Range:	5 to 150º C
Emittance Watts/Cm^2 (Watts):	0.17 (5.4)
Wavelength Range:	1-99 um
Emissivity:	0.96 +/- 0.02
Emitter Size: in (mm)	6” x 6” (152.4 x 152.4)
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:	8” H x 8” D x 8” W (203.2x203.2x203.2)
Controller:	5.1"H x 13.4"D x 12"W (130x340x304)
Warranty:	1 Year
Standard Apertures:	6” x 6” (152.4 x 152.4)
Remote Interface:	RS-232, RS-485 or IEEE-488/GPIB