



#### **SPECIAL FEATURES**

##### **HORIZONTAL OR VERTICAL OPERATION**

The Casso-Solar Technologies' Duo-Tube™ can be configured to operate in a vertical position with heated lengths of up to 24"(61 cm). The vertical burn Duo-Tube™ will not experience coil sag and will remain uniform in temperature over the entire life span.

##### **CUSTOM WATTAGE AND VOLTAGES**

The Casso-Solar Technologies' Duo-Tube™ infrared heaters are available at wattage densities of up to 80 watts per lineal inch (31.5 watts per lineal centimeter) per side of the heater or 160 watts per lineal inch (63 watts per lineal centimeter) for both sides, depending on dispersion angle and availability of cooling air. Custom operating voltages to 600 volts.

##### **DESIGN FLEXIBILITY**

Both Casso-Solar Technologies' White and Gold Duo-Tube™ infrared heaters are available in heated lengths to 112" (2844 cm). Gold Duo-Tube™ infrared heaters are standard with a 160 deg gold wrap but can be ordered with 90 and 120 degree wraps for wider energy dispersion. Duo-Tube™ infrared heaters can be configured with leads out one end, leads out both ends or separate circuits for each side. Heated length can be centered within the heater or divided into one or two edge areas for width zone control.

##### **LOW INRUSH CURRENT**

The resistance of the Casso-Solar Technologies' Duo-Tube™ is highly stable during operation or from a cold startup. Similar cold and hot heater resistance means virtually no current surges during startup and a power factor of 1.

**W**ith new product and process technology under continuous development, production equipment is required to give precise and flexible control over quality, while operating efficiently with minimum maintenance. With over 50 years of experience, Casso-Solar Technologies has been providing our customers the competitive edge.

#### **NO REFLECTORS REQUIRED**

The Casso-Solar Technologies' Duo-Tube™ is available with a dual coat integral gold reflective coating or an integral white refractory that directs the infrared energy to the product without the need for external reflectors. Both the gold coating and the white refractory provide for maintenance free service. The gold is the most efficient reflective material for all infrared energy, as it will not oxidize like most other metallic reflectors and is recommended for applications for extended heater life with heater temperatures of up to 1400 deg F. The white refractory, slightly less efficient than the gold coating, will provide a wider emission spectrum and is suitable for extended life applications with heater temperatures of up to 1750 deg F. Heaters are maintenance free during their life span.

#### **MEDIUM WAVELENGTH CONSERVES ENERGY**

Most organic materials absorb infrared energy most efficiently in the medium wavelength range of 2.4 to 6 microns. Energy from medium wavelength heaters is generally readily and rapidly absorbed on the surface of a product or coating without heating the core of the product, when tuned to the peak absorption point of the product. Penetration into the product can be accomplished by detuning the heater. The Casso-Solar Technologies' Duo-Tube™ provides overall energy efficiencies of up to 80%.

Casso-Solar Technologies' Duo-Tube™ infrared heaters can be arranged to provide temperature profiling, or can be shut down to conserve energy with narrow width products. Center and edge zones can be configured within a single heater.

#### **FAST RESPONSE**

Rapid warm-up is an important feature of the Casso-Solar Technologies' Duo-Tube™. Peak radiant output is achieved in less than 15 seconds with complete saturation in under one minute. On cool down, radiant energy is lost within a matter of seconds and can be accelerated to protect a sensitive product on line shutdown with the aid of an air purge.

#### **STURDY CONSTRUCTION**

The Casso-Solar Technologies' Duo-Tube™ is constructed with dual, heavy walled, 5/8" (15mm) diameter quartz tubing, welded together and annealed as an assembly for maximum strength. End caps are one piece ceramic, providing for lead wires to exit and the addition of a thermocouple for process control. Overall profile is 33 mm x 15 mm to match and replace other twin tube assemblies.

#### **EASY TO CONTROL**

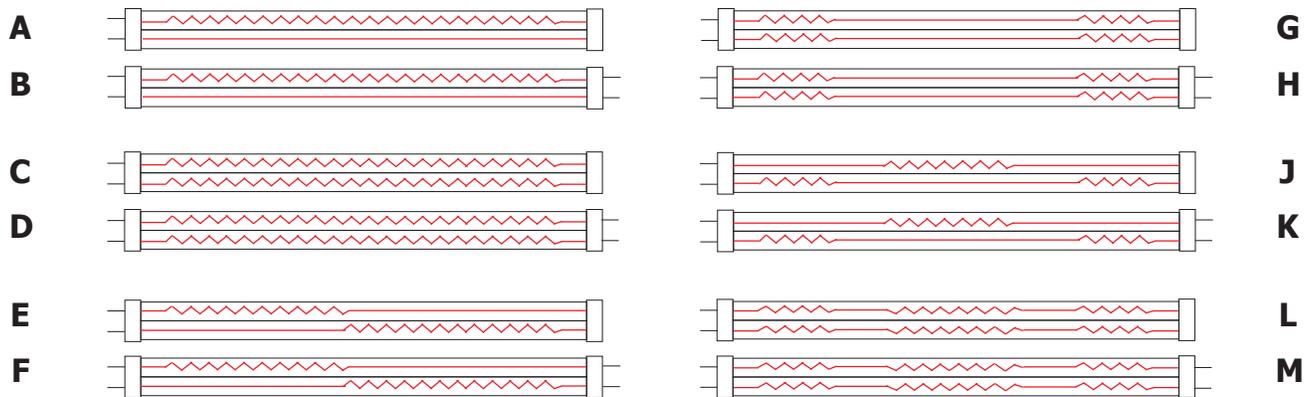
Depending on the line speed of the product and product sensitivity, heater control can be through fast cycle zero-crossing SCR or SSR power controllers. Phase angle firing SCR power controllers will provide the most precise process control, holding the heater temperature to +/- 2 deg F. In all cases, closed loop control with a thermocouple in a heater is recommended. Optical pyrometers can measure the product temperature and automatically adjust for process variations.

#### **Sales & Technical Information**

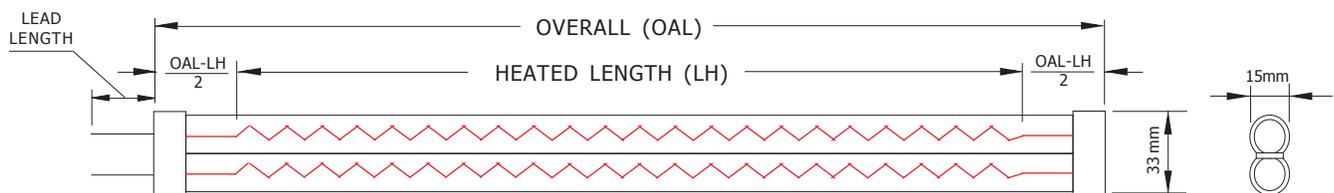
**1-845-354-2010**

Fax: 1-845-547-0328  
Website: [www.cassosolartechnologies.com](http://www.cassosolartechnologies.com)  
E-mail: [sales@cassosolartechnologies.com](mailto:sales@cassosolartechnologies.com)

### Construction Types



### Twin-tube Dimensions



### DUO-TUBE™ QUARTZ HEATERS SPECIFICATIONS:

<b>Dual Heavy Wall Quartz:</b>	33 mm x 15 mm
<b>Maximum Heated Length:</b>	112" (2844 cm)
<b>Minimum Length:</b>	Consult our Sales Department with your requirements
<b>Maximum Coil Temperatures:</b>	1400 deg F (760 deg C) on Gold heaters without cooling air and 1750 deg F (920 deg C) with cooling air; 1750 deg F (920 deg C) on White heaters
<b>Heater Temperature:</b>	Gold coating on heater is limited to 1100 deg F (600 deg C)
<b>Peak Wavelength:</b>	2.4-2.6 microns at 1750 deg F (920 deg C)
<b>Wavelength Range:</b>	2.4- 6 microns, peak adjusted by emitter temperature
<b>Maximum Watt Density:</b>	126 watts per square inch (19.3 watts per square centimeter) or 160 watts per lineal inch (63 watts per lineal centimeter)
<b>Mode of Operation:</b>	Horizontal to 112" (2844 cm) and Vertical to 24" (61 cm)
<b>Reflective Designs:</b>	Dual coat <b>Gold</b> or <b>White</b> refractory
<b>Thermocouple:</b>	Type K available
<b>Life Expectancy:</b>	Nominal 20,000-40,000 hours depending on operating conditions

### DUO-TUBE™ QUARTZ HEATERS PART NUMBERS

DT-X-11111-22222-33333-4-555-6-777 - Special Description

<b>x</b>	= G = Gold; W = White
<b>11111</b>	= Overall Length - end cap to end cap - xxx.xx inches
<b>22222</b>	= Heated Length - xxx.xx inches
<b>33333</b>	= Total Wattage in Watts
<b>4</b>	= Construction Type - A through D, Construction Types E-K require detailed description at the end of part number
<b>555</b>	= Voltage
<b>6</b>	= 0 for No Thermocouple and No Thermowell; W for Thermowell Only, T for Termowell and Thermocouple
<b>777</b>	= Lead Length in Inches