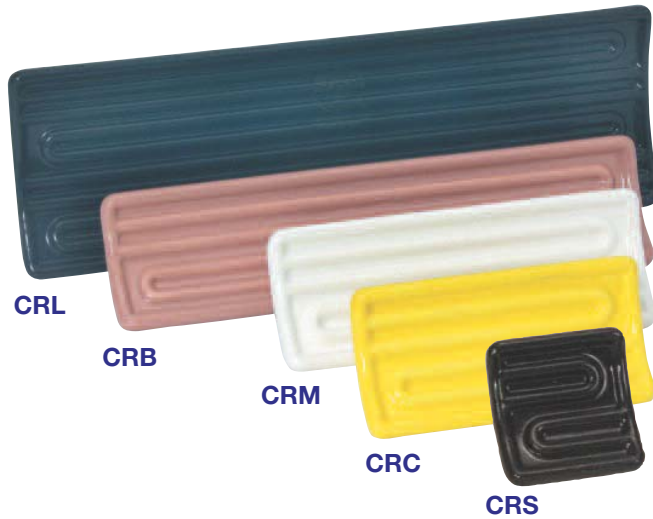


Radiant Process Heaters



Ceramic E-Mitters

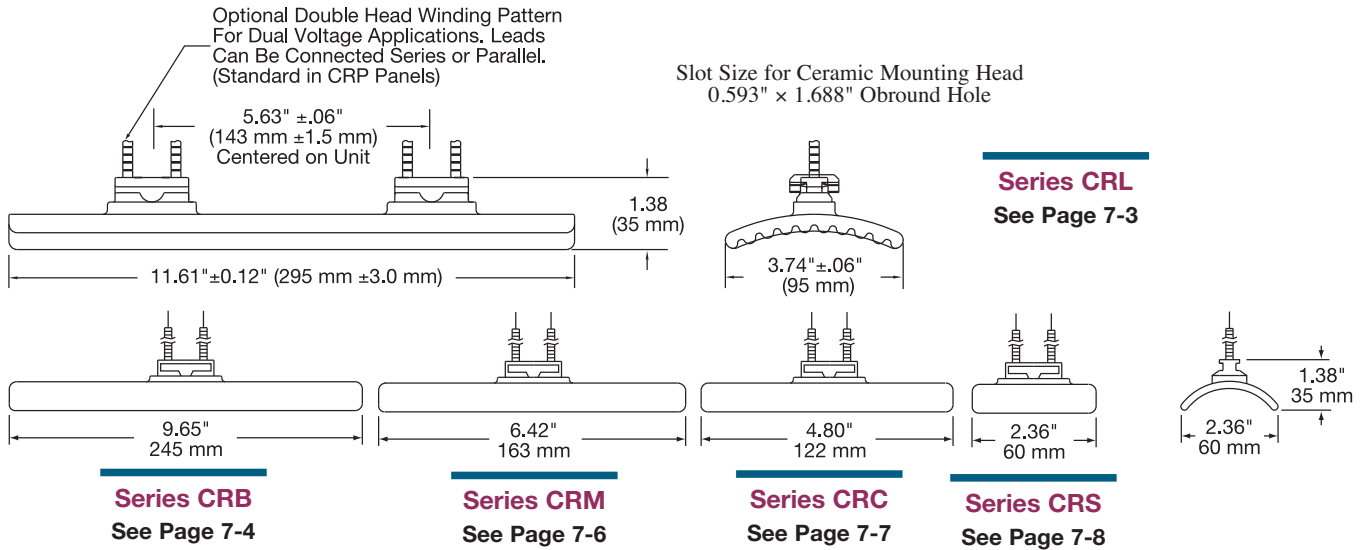
Series CRL, CRB, CRM, CRC and CRS Curved Face Ceramic E-Mitters



Design Features

- * Universal mount designed to be dropped into existing systems regardless of manufacturer.
- * Standard colors are metamorphing rose (cold) to grey (hot), and traditional white. Optional colors are metamorphing yellow (cold) to orange (hot), and black.
- * Standard stocked voltage: 120 or 220/240V as noted; other voltages are available.
- * Available with built-in type K thermocouple. Type J thermocouple is also available. Low noise options are also available.
- * Long operating life—over 10,000-plus hours of continuous operation under normal conditions
- * Performance is unaffected by vibration or adverse atmospheric conditions.
- * 2.5 to 6 μ m infrared radiation wavelength

5 Standard Solid Curved Face sizes to accommodate a wide range of new or existing applications

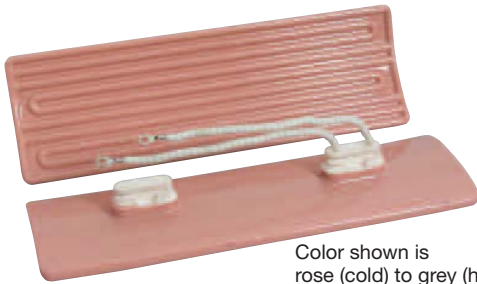




Radiant Process Heaters

Series CRL E-Mitters

Stock Series CRL Curved Face Ceramic E-Mitters – Size: 95 mm × 295 mm (3.74" × 11.61")



Color shown is rose (cold) to grey (hot)

Optional Features

- * *Additional Power or Thermocouple Lead Lengths (page 7-23)*
- * *Two-Piece Wave Mounting Clip (page 7-14)*
- * *Reflectors and Other Accessories (pages 7-20 through 7-23)*
- * *Arrays and Power/Temperature Control Panels (start on page 7-15)*

Standard (Non-Stock) CRL E-Mitters

E-Mitters listed have 6" ceramic bead insulated leads, #8-10 spade terminals, and one-piece spring clips for mounting in 20 or 22 gauge sheet metal.

Wattage	Voltage	Color	Watt Density*		Heater Body Temp.**		Peak Emitted Wavelength***	Part Number		
			(W/in ²)	(W/cm ²)	°F	°C		Without Thermocouple	Standard Type K Thermocouple	Low Noise Type K Thermocouple
500	120	Yellow to Orange	11.9	1.9	796	424	4.15	CRL20021	—	CRL20022
500	220-240	Rose to Grey	11.9	1.9	796	424	4.15	CRL10009	CRL10010	—
500	220-240	White	11.9	1.9	796	424	4.15	CRL00009	CRL00010	—
500	240/480	Yellow to Orange	11.9	1.9	796	424	4.15	CRL20023	—	CRL20024
750	120	Yellow to Orange	17.9	2.8	956	513	3.68	CRL20025	—	CRL20026
750	220-240	Rose to Grey	17.9	2.8	956	513	3.68	CRL10011	CRL10012	—
750	220-240	White	17.9	2.8	956	513	3.68	CRL00011	CRL00012	—
750	240/480	Yellow to Orange	17.9	2.8	956	513	3.68	CRL20027	—	CRL20028
950	220-240	Rose to Grey	22.7	3.5	1053	567	3.45	CRL10001	CRL10002	—
950	220-240	White	22.7	3.5	1053	567	3.45	CRL00001	CRL00002	—
1000	220-240	Rose to Grey	23.9	3.7	1076	580	3.40	CRL10013	CRL10014	—
1000	220-240	White	23.9	3.7	1076	580	3.40	CRL00013	CRL00014	—
1000	240/480	Yellow to Orange	23.9	3.7	1076	580	3.40	CRL20029	—	CRL20030
1150	220-240	Rose to Grey	27.5	4.3	1145	618	3.25	CRL10003	CRL10004	—
1150	220-240	White	27.5	4.3	1145	618	3.25	CRL00003	CRL00004	—
1250	240/480	Yellow to Orange	29.9	4.6	1191	644	3.16	CRL20031	—	CRL20032
1400	480	Rose to Grey	33.5	5.2	1262	683	3.03	CRL10015	CRL10016	—
1400	480	White	33.5	5.2	1262	683	3.03	CRL00015	CRL00016	—
1500	240/480	Yellow to Orange	35.9	5.6	1308	709	2.95	CRL20033	—	CRL20034
1600	480	Rose to Grey	38.2	5.9	1351	733	2.88	CRL10017	CRL10018	—
1600	480	White	38.2	5.9	1351	733	2.88	CRL00017	CRL00018	—
1800	480	Rose to Grey	43.0	6.7	1418	770	2.78	CRL10019	CRL10020	—
1800	480	White	43.0	6.7	1418	770	2.78	CRL00019	CRL00020	—

NOTES: All 240/480V heaters have two windings for dual voltage use. (Parallel connected for 240V & series connected for 480V.) 120V heaters are single winding designs.

Units with an internal "low noise" style thermocouple have 12" leads (see page 7-14). Standard type "K" T/C units also available.

Heaters with yellow to orange color are exact replacements for heaters in CRP Modular 12 × 12 CRP Radiant Panels on page 7-24.

* **Watt density** calculated using heater face surface area.

** **E-Mitter heater body temperature** as measured with internal thermocouple when mounted facedown in stock CRK reflector and operating in 72°F (22°C) room ambient.

*** **Peak infrared radiation wavelength** as calculated from Wien's Law, for operating temperature shown. Expressed in microns (μm).

Custom Heater Assemblies & Power Control Panels

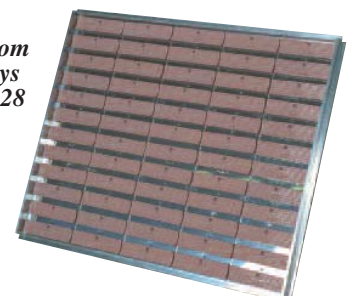


Type CRA Custom Linear Arrays start on page 7-18

Array Power/Temperature



Type ARA Custom Structural Arrays start on page 7-28

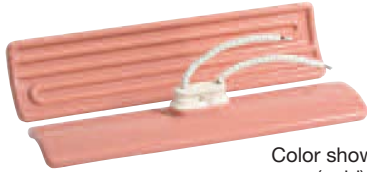


Radiant Process Heaters



Series CRB E-Mitters

Series CRB Curved Face Ceramic E-Mitters – Size: 60 mm × 245 mm (2.36" × 9.65")



Color shown is
rose (cold) to grey (hot)

Optional Features

- * *Additional Power or Thermocouple Lead Lengths (page 7-23)*
- * *Two-Piece Wave Mounting Clip (page 7-14)*
- * *Reflectors and Other Accessories (pages 7-20 through 7-23)*
- * *Arrays and Power/Temperature Control Panels (start on page 7-15)*

Standard (Non-Stock) CRB E-Mitters

E-Mitters listed have 3.50" ceramic bead insulated leads, #8-10 spade terminals, and a one-piece spring clip for mounting.

Wattage	Voltage	Color	Watt Density*		Heater Body Temp.** (Typical Operating)		Part Number	
			(W/in ²)	(W/cm ²)	°F	°C	Without Thermocouple	With Type K Thermocouple
150	220/240	Rose to Grey	6.48	1.00	560	293	CRB10216	CRB10217
150	220/240	White	6.48	1.00	560	293	CRB00216	CRB00217
250	220/240	Rose to Grey	10.80	1.67	756	402	CRB10006	CRB10008
250	220/240	White	10.80	1.67	756	402	CRB00006	CRB00008
400	220/240	Rose to Grey	17.27	2.68	942	506	CRB10014	CRB10016
400	220/240	White	17.27	2.68	942	506	CRB00014	CRB00016
650	120	Rose to Grey	28.07	4.35	1156	624	CRB10020	CRB10022
650	120	White	28.07	4.35	1156	624	CRB00020	CRB00022
650	220/240	Rose to Grey	28.07	4.35	1156	624	CRB10023	CRB10025
650	220/240	White	28.07	4.35	1156	624	CRB00023	CRB00025
650	480	Rose to Grey	28.07	4.35	1156	624	CRB10088	CRB10165
650	480	White	28.07	4.35	1156	624	CRB00088	CRB00165
1000	120	Rose to Grey	43.18	6.69	1420	771	CRB10028	CRB10030
1000	120	White	43.18	6.69	1420	771	CRB00028	CRB00030
1000	220/240	Rose to Grey	43.18	6.69	1420	771	CRB10031	CRB10033
1000	220/240	White	43.18	6.69	1420	771	CRB00031	CRB00033
1000	480	Rose to Grey	43.18	6.69	1420	771	CRB10089	CRB10045
1000	480	White	43.18	6.69	1420	771	CRB00089	CRB00045

Semi-Finished Stock CRB E-Mitters (Five Business Day Manufacturing)

Semi-Finished Series CRB E-Mitters listed below are stocked ready for color glazing. Colors available are metamorphing rose (cold) to grey (hot), traditional white, metamorphing yellow (cold) to orange (hot), and black.

They can be terminated with beaded leads up to 6" long with spliced-on lead wire for lengths beyond 6" and straight, ring, or spade terminals. Some are available with a thermocouple (any length).

A part number will be assigned at time of order.

Wattage	Voltage	Watt Density*		Heater Body** Temperature (Typical)		Optional Thermocouple (Any Length)
		(W/in ²)	(W/cm ²)	°F	°C	
400	230	17.27	2.68	942	506	N/A
650	230	28.07	4.35	1156	624	Type K
650	480	28.07	4.35	1156	624	N/A
1000	230	43.18	6.69	1420	771	Type K
1000	480	43.18	6.69	1420	771	Type J or K



Radiant Process Heaters

Series CRB E-Mitters

Series CRB Curved Face Ceramic E-Mitter Specifications

Series CRB – Size: 60 mm × 245 mm (2.36" × 9.65") Watts/Square Inch vs. Temperature Data

Watts	Surface W/in ² *	Heater Body °F Rise	Heater Body Temp @ 72°F**	Primary Emitted Wavelength*** (μm)
100	4.32	357	429	5.87
125	5.40	426	498	5.45
150	6.48	488	560	5.11
163	7.04	518	590	4.97
200	8.64	596	668	4.63
250	10.80	684	756	4.29
300	12.95	756	828	4.05
325	14.03	788	860	3.95
350	15.11	817	889	3.87
400	17.27	870	942	3.72
500	21.59	960	1032	3.50
600	25.91	1043	1115	3.31
650	28.07	1084	1156	3.23
700	30.23	1126	1198	3.15
750	32.39	1169	1241	3.07
800	34.55	1211	1283	2.99
875	37.78	1271	1343	2.89
900	38.86	1290	1362	2.86
1000	43.18	1348	1420	2.78

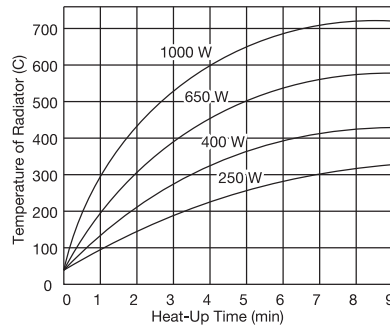
* **Watt density** calculated using heater face surface area.

** **E-Mitter heater body temperature** as measured with internal thermocouple when mounted facedown in stock CRK reflector and operating in 72°F (22°C) room ambient.

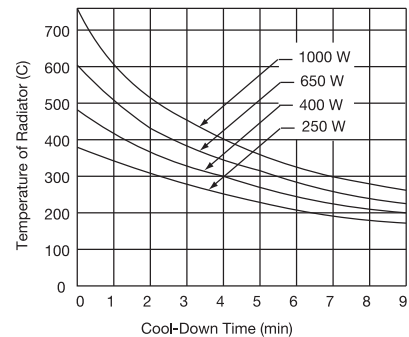
*** **Peak infrared radiation wavelength** as calculated from Wien's Law, for operating temperature shown. Expressed in microns (μm).

Typical Heating and Cooling Behavior of CRB Ceramic E-Mitters

Warm-Up Time Graph



Cool-Down Time Graph



Radiant Process Heaters



Series CRM E-Mitters

Series CRM Curved Face Ceramic E-Mitters – Size: 60 mm × 163 mm (2.36" × 6.42")



Color shown is rose (cold) to grey (hot)

Optional Features

- * Additional Power or Thermocouple Lead Lengths (page 7-23)
- * Two-Piece Wave Mounting Clip (page 7-14)
- * Reflectors and Other Accessories (pages 7-20 through 7-23)
- * Arrays and Power/Temperature Control Panels (start on page 7-15)

Standard (Non-Stock) CRM E-Mitters

E-Mitters listed have 3.50" ceramic bead insulated leads, #8-10 spade terminals, and a one-piece spring clip for mounting.

Wattage	Voltage	Color	Watt Density*		Heater Body Temp.**		Part Number	
			(W/in ²)	(W/cm ²)	(Typical Operating) °F	°C	Without Thermocouple	With Type K Thermocouple
425	120	Rose to Grey	27.44	4.25	1144	618	CRM10008	CRM10011
425	120	White	27.44	4.25	1144	618	CRM00008	CRM00011
500	120	Rose to Grey	32.28	5.00	1239	671	CRM10009	CRM10012
500	120	White	32.28	5.00	1239	671	CRM00009	CRM00012
600	220/240	Rose to Grey	38.74	6.00	1360	738	CRM10010	CRM10013
600	220/240	White	38.74	6.00	1360	738	CRM00010	CRM00013

Series CRM Curved Face Ceramic E-Mitter Specifications

Series CRM – Size: 60 mm × 163 mm (2.36" × 6.42")

Watts/Square Inch vs. Temperature Data

Watts	Surface W/in ² *	Heater Body °F Rise	Heater Body Temp @ 72°F**	Primary Emitted Wavelength*** (μm)
100	6.46	487	559	5.12
150	9.68	641	713	4.45
200	12.91	755	827	4.05
250	16.14	843	915	3.79
300	19.37	915	987	3.60
350	22.60	979	1051	3.45
400	25.82	1041	1113	3.32
450	29.05	1103	1175	3.19
500	32.28	1167	1239	3.07
550	35.51	1230	1302	2.96
600	38.74	1288	1360	2.87
650	41.96	1335	1407	2.79

* **Watt density** calculated using heater face surface area.

** **E-Mitter heater body temperature** as measured with internal thermocouple when mounted facedown in stock CRK reflector and operating in 72°F (22°C) room ambient.

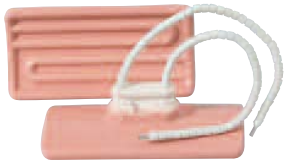
*** **Peak infrared radiation wavelength** as calculated from Wien's Law, for operating temperature shown. Expressed in microns (μm).



Radiant Process Heaters

Series CRC E-Mitters

Series CRC Curved Face Ceramic E-Mitters – Size: 60 mm × 122 mm (2.36" × 4.80")



Color shown is
rose (cold) to grey (hot)

Optional Features

- * *Additional Power or Thermocouple Lead Lengths (page 7-23)*
- * *Two-Piece Wave Mounting Clip (page 7-14)*
- * *Reflectors and Other Accessories (pages 7-20 through 7-23)*
- * *Arrays and Power/Temperature Control Panels (start on page 7-15)*

Standard (Non-Stock) CRC E-Mitters

E-Mitters listed have 3.50" ceramic bead insulated leads, #8-10 spade terminals, and a one-piece spring clip for mounting.

Wattage	Voltage	Color	Watt Density*		Heater Body Temp.**		Part Number	
			(W/in ²)	(W/cm ²)	(Typical Operating) °F	°C	Without Thermocouple	With Type K Thermocouple
125	220/240	Rose to Grey	10.80	1.67	756	402	CRC10005	CRC10007
125	220/240	White	10.80	1.67	756	402	CRC00005	CRC00007
200	220/240	Rose to Grey	17.27	2.68	942	506	CRC10013	CRC10015
200	220/240	White	17.27	2.68	942	506	CRC00013	CRC00015
325	120	Rose to Grey	28.07	4.35	1156	624	CRC10018	CRC10020
325	120	White	28.07	4.35	1156	624	CRC00018	CRC00020
325	220/240	Rose to Grey	28.07	4.35	1156	624	CRC10021	CRC10023
325	220/240	White	28.07	4.35	1156	624	CRC00021	CRC00023
325	480	Rose to Grey	28.07	4.35	1156	624	CRC10064	CRC10140
325	480	White	28.07	4.35	1156	624	CRC00064	CRC00140
500	120	Rose to Grey	43.18	6.69	1420	771	CRC10024	CRC10026
500	120	White	43.18	6.69	1420	771	CRC00024	CRC00026
500	220/240	Rose to Grey	43.18	6.69	1420	771	CRC10027	CRC10029
500	220/240	White	43.18	6.69	1420	771	CRC00027	CRC00029
500	480	Rose to Grey	43.18	6.69	1420	771	CRC10066	CRC10141

Semi-Finished Stock CRC E-Mitters (Five Business Day Manufacturing)

Semi-Finished Series CRC E-Mitters listed below are stocked ready for color glazing. Colors available are metamorphing rose (cold) to grey (hot), traditional white, metamorphing yellow (cold) to orange (hot), and black.

They can be terminated with beaded leads up to 6" long with spliced-on lead wire for lengths beyond 6" and straight, ring, or spade terminals. Some are available with a thermocouple (any length).

A part number will be assigned at time of order.

Wattage	Voltage	Watt Density*		Heater Body**		Optional Thermocouple (Any Length)
		(W/in ²)	(W/cm ²)	Temperature (Typical) °F	°C	
200	230	17.27	2.68	942	506	Type K
325	230	28.07	4.35	1156	624	Type K
325	480	28.07	4.35	1156	624	N/A
500	230	43.18	6.69	1420	771	Type K
500	480	43.18	6.69	1420	771	N/A

CONTINUED

Radiant Process Heaters

Series CRC & CRS Ceramic E-Mitters



Series CRC Curved Face Ceramic E-Mitter Specifications

Continued from previous page...

Series CRC Curved Face Ceramic E-Mitters – Size: 60 mm × 122 mm (2.36" × 4.80")

Watts/Square Inch vs. Temperature Data

Watts	Surface W/in ² *	Heater Body °F Rise	Heater Body Temp @ 72°F**	Primary Emitted Wavelength*** (µm)
100	8.64	596	668	4.63
125	10.80	684	756	4.29
150	12.95	756	828	4.05
163	14.08	789	861	3.95
200	17.27	870	942	3.72
250	21.59	960	1032	3.50
300	25.91	1043	1115	3.31
325	28.07	1084	1156	3.23
350	30.23	1126	1198	3.15
375	32.39	1169	1241	3.07
400	34.55	1211	1283	2.99
500	43.18	1348	1420	2.78

Series CRS Curved Face Ceramic E-Mitters – Size: 60 mm × 60 mm (2.36" × 2.36")



Optional Features

- * Additional Power or Thermocouple Lead Lengths (page 7-23)
- * Two-Piece Wave Mounting Clip (page 7-14)
- * Reflectors and Other Accessories (pages 7-20 through 7-23)
- * Arrays and Power/Temperature Control Panels (start on page 7-15)

Standard (Non-Stock) CRS E-Mitters

E-Mitters listed have 3.50" ceramic bead insulated leads, #8-10 spade terminals, and a one-piece spring clip for mounting.

Wattage	Voltage	Color	Watt Density*		Part Number	
			(W/in ²)	(W/cm ²)	Without Thermocouple	With Type K Thermocouple
162	120	White	28.07	4.35	CRS00002	CRS00009
162	220/240	White	28.07	4.35	CRS00005	CRS00012
250	120	White	43.18	6.69	CRS00003	CRS00010
250	220/240	White	43.18	6.69	CRS00006	CRS00013