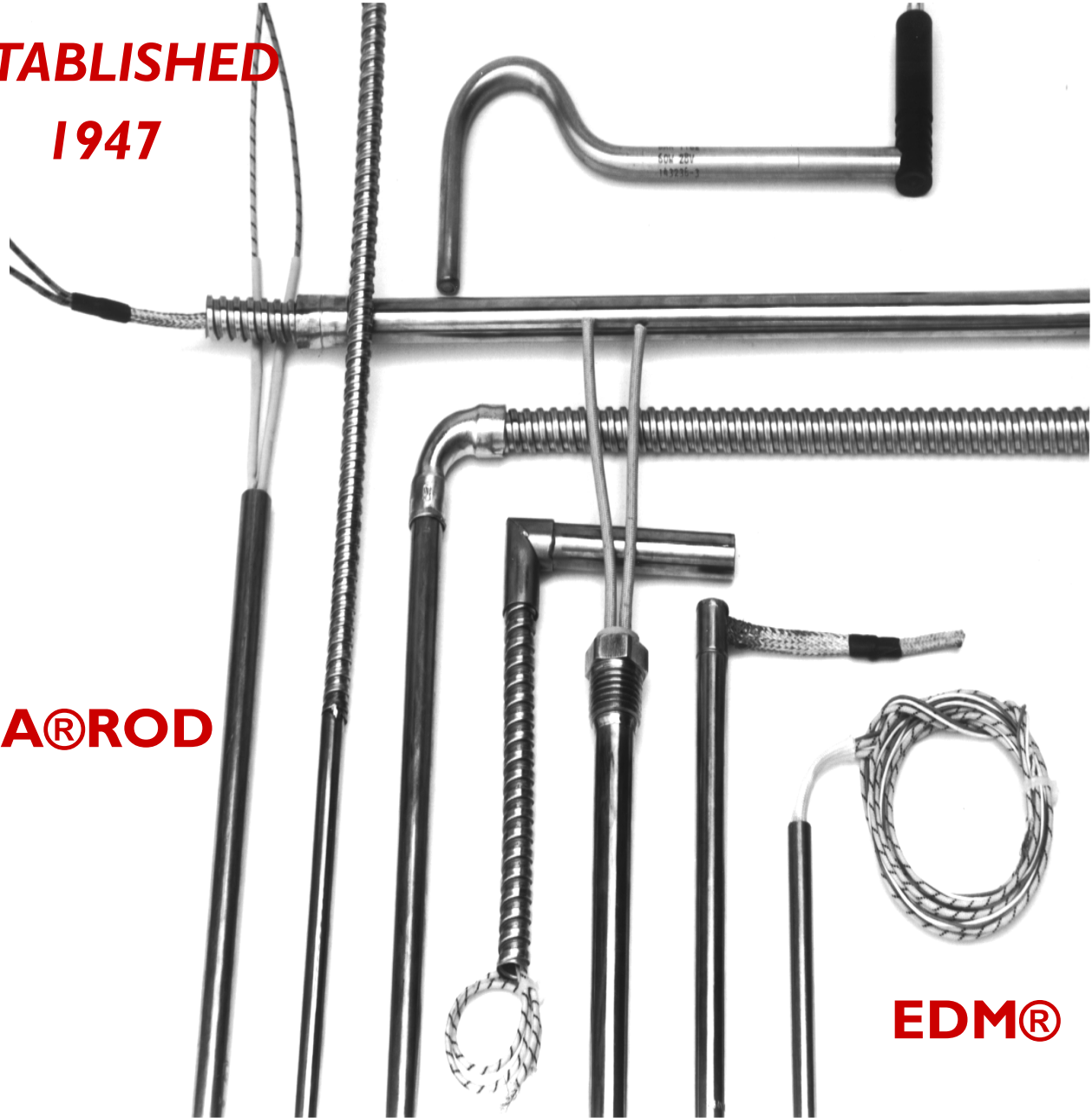




# RAMA CORPORATION CARTRIDGE HEATERS

**ESTABLISHED  
1947**



**RAMA®ROD**

**EDM®**

**RAMA CORPORATION**

**"INNOVATION THROUGH EXPERIENCE"**

**600 WEST ESPLANADE AVE SAN JACINTO CA 92583**

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**EMAIL: SALES@RAMACORPORATION.COM**



## RAMA®ROD AND EDM® CARTRIDGE HEATERS

Rama's cartridge heaters are the highest quality available. The Rama®Rod heaters are the result of many years experience perfecting high watt-density elements which are capable of long life at elevated temperatures. Rama®Rod heaters are manufactured with an Incoloy sheath and Incoloy end disc in addition to lava seal. They provide continuous sheath temperature up to 1600°F, as well as uniform, accurate heating in the lower temperature range. Our EDM® cartridge heaters are manufactured with stainless steel sheath, stainless steel end disc material and mica seal. These heaters are designed specifically to provide excellent heating in the moderate ranges. The EDM® cartridge heater can provide sheath temperature up to 1200°F. Whatever your heating requirements, RAMA can provide the right heater for your application.

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**MULTICIRCUITS:** 3/4" diameter RAMA®RODs can be provided with independent heat zones through multicircuit or 3-phase resistance wire windings which permits uniform heat along the entire length of the heater where heat transfer rates must vary between specific heated areas. Consult RAMA for minimum length requirements.

**PROFILED HEAT:** Type H RAMA®ROD cartridge heaters with Type J thermocouples are stocked heaters with profiled heat in 3" lengths and over.

**THERMOSTATS:** Thermostats are available to regulate temperature and act as a safety monitor. Consult factory for quote.

**MOISTURE RESISTANT BARRIERS:** In addition to the heaters with a Teflon seal, which will withstand operating temperatures up to 300°F, various epoxy compounds can be supplied at the leadwire end for heater operation up to 450°F. Consult factory for detailed information.

**METRIC SIZE HEATERS:** RAMA stocks EDM® metric cartridge heaters.

**OTHER ACCESSORIES:** Cartridge heaters can be supplied with ground, twist-lock and UL-listed electrical plugs. Post terminals and terminal boxes for protection of electrical connectors are available. UL & cUL approved flexible stranded wires with silicone fiberglass oversleeve are available, which insulate the wires to temperatures of 480°F (250°C)

### COMPLIANCES

RAMA produces heaters that meet stringent regulatory codes of several industries and agencies. Our production process is accepted by NASA, the aerospace industry, military and nuclear communities as well as local, state and federal codes. All of our heating elements are designed to meet the specifications of NEMA (National Electrical Manufacturers Association), unless otherwise specified by the customer .

# TOLERANCES



DIAMETER	INCHES (±.002")					MILLIMETER +.000 –.003					
NOMINAL:	1/4	3/8	1/2	5/8	3/4	6.5	8	10	12.5	16	20
ACTUAL:	.245"	.370"	.495"	.620"	.745"	.255"	.315"	.394"	.492"	.630"	.787"

**Camber:** .020 inch/ft      **Wattage:** +5%, -10%

**Leadwire Length:** ±2% or ± 1/2" whichever is greater

**Heater Length:** ±2% or ± 3/32" whichever is greater

**Note:** Standard materials and tolerances are shown. Consult RAMA for availability of other materials and tighter tolerances

1 Standard Configuration Heaters Type 'A'      2 Swaged-in Leadwire configuration Type 'B'

## Heater Diameter (Inch)

	1/4	3/8	1/2	5/8		3/4	
<b>PARAMETERS</b>	RR/EDM	RR/EDM	RR/EDM	RR	EDM	RR	EDM
AMPERAGE	4	6	10	22	18	22	18
VOLTAGE	240	240	240	240	240	240	240
WATTAGE @120V @240V	480	720	1200	2640	2160	2640	2160
	960	1440	2400	5280	4320	5280	4320
AMPERAGE	3.5	4.1	8.2	11		11	
VOLTAGE	240	240	240	240		240	
WATTAGE @120V @240V	420	490	985	1320		1320	
	840	980	1970	2640		2640	

## Heater Diameter (Metric)

		6.5MM	8MM	10MM	12.5MM	16MM	20MM
<b>CONFIGURATIONS</b>	<b>PARAMETERS</b>	EDM	EDM	EDM	EDM	EDM	EDM
1	STANDARD	AMPERAGE	4	5	6	10	18
	CONFIGURATION	VOLTAGE	240	240	240	240	240
	HEATERS	WATTAGE @120V	480	600	720	1200	2160
		@240V	960	1200	1440	2400	4320
2	SWAGED-IN	AMPERAGE	3.5	3.8	4.1	8.2	11
	LEADWIRE	VOLTAGE	240	240	240	240	240
	CONFIGURATION	WATTAGE @120V	420	455	490	985	1320
		@240V	840	910	980	1970	2640

Heaters 3/8" (10mm) diameter or larger can be rated 480V. Consult RAMA for requirements and power rating limits of other configurations.



## STANDARD CONFIGURATIONS & ACCESSORIES



If you are a designer or manufacturer of equipment which must meet US and/or Canadian National Safety standards, RAMA's RAMA®ROD and EDM® cartridge heater types A, B and C have been found to be acceptable under UL and c-UL (CSA equivalent) Component Recognition Program File No. EI 19533

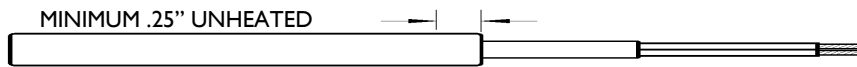


All RAMA®ROD and EDM® heaters have a minimum of 1/4" unheated section at the end disc end. Teflon leadwires and seals are rated at 300°F; all other leadwires are rated at 840°F



**Type A-**  
**Standard Leadwires**

2" Solid nickel terminal pins are butt-connected to insulated, stranded nickel leadwires. This heater is stocked in many sizes and power ratings. UL/cUL component recognition



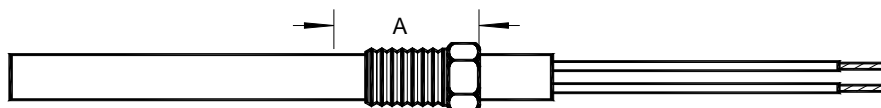
**Type B-**  
**All Flexible Leadwires**

Stranded nickel leadwires with insulation swaged into heater. This heater is stocked in many sizes and power ratings. Not recommended for use in applications where the temperature at the leadwire end exceeds 840°F. UL/cUL component recognition



**Type C-**  
**Teflon Seal & Leads**

Teflon seal at leadwire end with Teflon insulated, stranded silver plated copper leadwires. Not recommended for use where temperature at leadwire end will exceed 300°F. This heater cannot be modified from stock. UL/cUL component recognition.



**Type CE-**  
**Teflon Seal With**  
**NPT Bushing**

Stainless Steel or brass bushings are welded or brazed to heater sheath at cold junction. Cold requirements are per dimension 'A' are 1" minimum on stainless steel and 2" minimum on brass. Includes Teflon insulated, stranded, silver-plated, copper leadwires.

Heater DIA	1/4"	3/8"	1/2"	5/8"	3/4"
NPT Size	1/8"	1/4"	3/8"	1/2"	3/4"

MINIMUM .25" UNHEATED

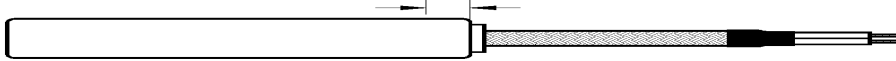


**Type D-**  
**Terminal Pins With**  
**Swaged In Insulation**

1.75" Solid nickel terminal pins with fiberglass insulating sleeving swaged into seal. Insulated, stranded nickel leadwires are butt-connected to terminal pins. This heater cannot be modified from stock.

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MINIMUM 1" UNHEATED

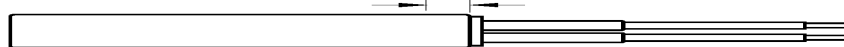


**Type E-**  
**Braided Stainless**  
**Steel Sleeving**

Insulated, stranded nickel leadwires are covered by a stainless steel braid. Shrink tubing covers end of sleeving at leadwire end. 1/4" diameter heaters are supplied with an optional 3/4" long metal sleeve at the leadwire end. Can be modified from stock. Consult factory for specifications.

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MINIMUM .875" UNHEATED

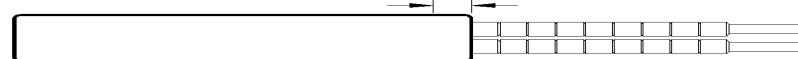


**Type F-**  
**Ceramic-To-Metal**  
**Seal**

Seal is brazed to sheath on 3/8" diameter or larger heater. Teflon insulated, stranded, silver plated copper leadwires are connected to solid nickel terminal pins. This heater cannot be modified from stock. Special order item, consult factory for specifications.

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MINIMUM .25" UNHEATED

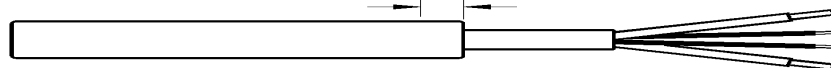


**Type G-**  
**Ceramic Bead Insulators**

Ceramic bead insulators cover terminal pins. Leadwires can be butt-connected to the terminal pins by the factory. When ordering, specify length of ceramic bead insulators and leadwires desired. This heater can be modified from stock. Note: when modifying type A stock heaters, the length of the ceramic beads will be approximately 2" max.

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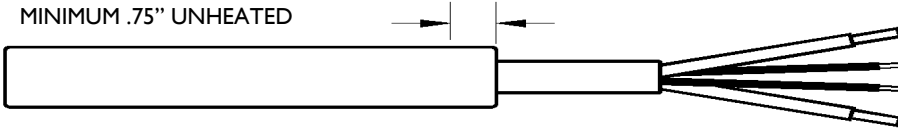
MINIMUM .25" UNHEATED



**Type H & I-**  
**Internal Thermocouple**

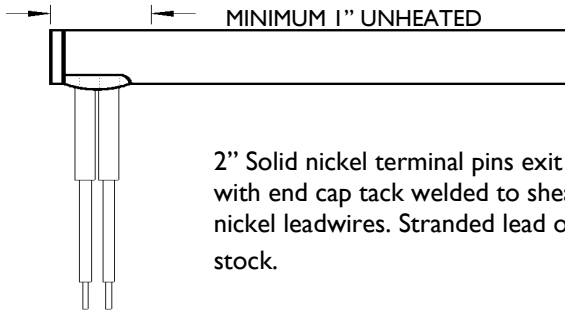
Type 'J' insulated stranded, 24-gauge thermocouple wires are integral in heater. Type (H) T/C junction located at the end disc. These units are stocked in a variety of sizes with 36" thermocouple and leadwires. Type (I) T/C junction located per customer specification. Type 'K' thermocouple available upon customer request. This heater cannot be modified from stock. (**Special Note:** Solid thermocouple wires are required on heaters manufactured in 1/4" diameter.)

MINIMUM .75" UNHEATED



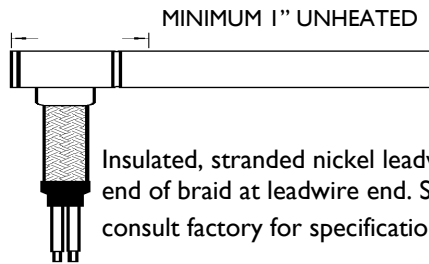
**Type HR-  
Molding System Probe  
Heater**

Internal 'J' insulated, stranded, 24-gauge thermocouple wires are integral in heater. Other features include flat end disc, Teflon seal, profiled heat, and 3/4" cold section. Thermocouple junction per customer specification. Type 'K' thermocouple available per customer request. (Special note: Solid thermocouple wires are required on heaters manufactured in 1/4" diameter.)



2" Solid nickel terminal pins exit 90° from end slot. Heater end is potted and finished with end cap tack welded to sheath. Terminal pins are connected to insulated, stranded nickel leadwires. Stranded lead orientation shown. This heater can be modified from stock.

**Type J-  
Right Angle Leadwires**



Insulated, stranded nickel leadwires with stainless steel braid. Shrink sleeving covers end of braid at leadwire end. Standard lead orientation shown. For 1/4" heaters consult factory for specifications. This heater can be modified from stock.

**Type K-  
Stainless Steel Braid  
Right Angle Leadwires**



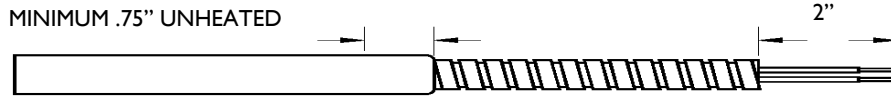
Stainless steel flexible conduit tack-welded to heater sheath with stranded, nickel leadwires. This heater can be modified per modifications E and G. This heater can be modified from stock.

**Type L-  
Welded Flexible  
Conduit**

Conduit Sizes Available

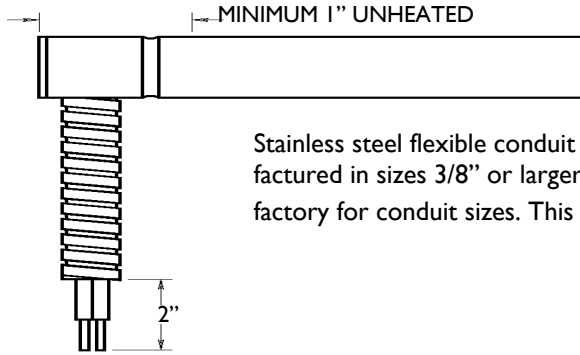
Heater Diameter	3/8"	1/2" 12.5	5/8" 16mm	3/4"
Conduit Diameter	27/64"	1/2"	5/8"	25/32"

**Type N-  
Swaged Flexible  
Conduit**



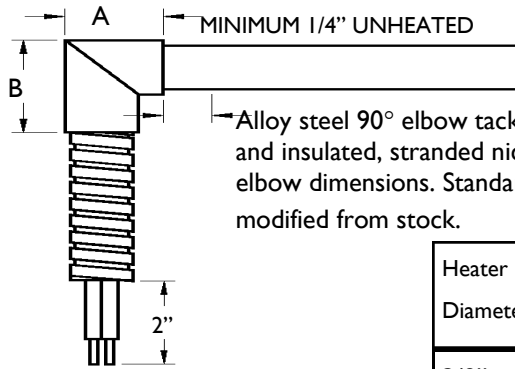
Stainless steel flexible conduit swaged-in with insulated, stranded, nickel leadwires. For 1/4" diameter heaters and conduit sizes consult factory. This heater cannot be modified from stock.

**Type Q-  
Flexible Conduit With Right  
Angle Leadwires**



Stainless steel flexible conduit with insulated, stranded, nickel leadwires. Manufactured in sizes 3/8" or larger. Standard lead connection shown. Consult factory for conduit sizes. This heater can be modified from stock.

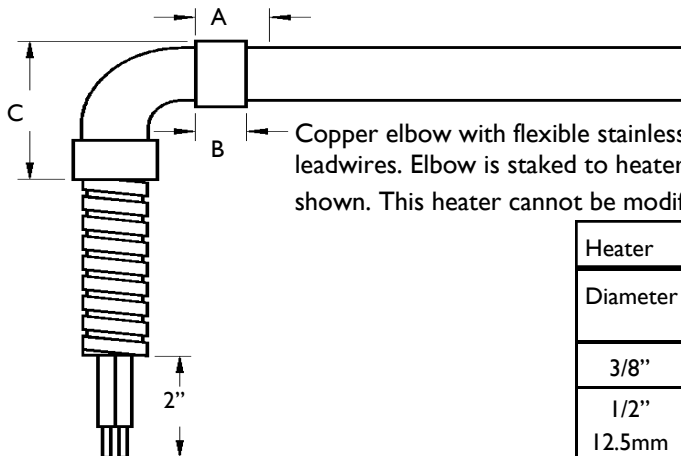
**Type S-  
Flexible Conduit with  
90° Elbow**



Alloy steel 90° elbow tack-welded to heater with stainless steel flexible conduit and insulated, stranded nickel leadwires. Consult factory for customer specific elbow dimensions. Standard leadwire orientation shown. This heater can be modified from stock.

Heater Diameter	Nominal O.D. Conduit	Dimension Elbow	Dimension	
			A	B
3/8"	27/64"	7/16"	3/4"	1"
1/2"	1/2"	9/16"	3/4"	1"
5/8"	5/8"	3/4"	7/8"	1-1/8"
3/4"	25/32"	7/8"	1"	1-1/8"

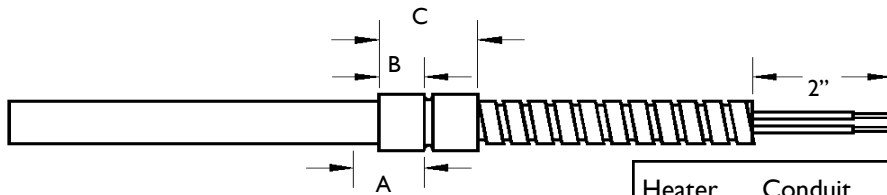
**Type U-  
Flexible Conduit Copper  
Elbow**



Copper elbow with flexible stainless steel conduit and insulated, stranded, nickel leadwires. Elbow is staked to heater end and conduit. Standard lead orientation shown. This heater cannot be modified from stock.

Heater Diameter	Conduit Nom	Dimensions		
		A	B	C
3/8"	1/2"	5/8"	3/8"	1-1/4"
1/2" 12.5mm	1/2"	5/8"	3/8"	1-5/16"
5/8" 16mm	5/8"	3/4"	1/2"	1-11/16"
3/4"	25/32"	3/4"	1/2"	2"

**Type W-  
Copper Coupling With  
Flexible Conduit**

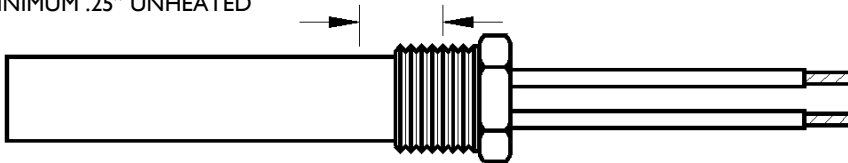


Copper coupling staked onto heater sheath and flexible stainless steel conduit with insulated, stranded, nickel leadwires. This heater cannot be modified from stock.

Heater Diameter	Conduit Nom O.D.	Dimensions		
		A	B	C
3/8"	1/2"	5/8"	3/8"	1-1/4"
1/2" 12.5mm	1/2"	5/8"	3/8"	1-5/16"
5/8" 16mm	5/8"	3/4"	1/2"	1-11/16"
3/4"	25/32"	3/4"	1/2"	2"

**Modification E-  
NPT Bushing**

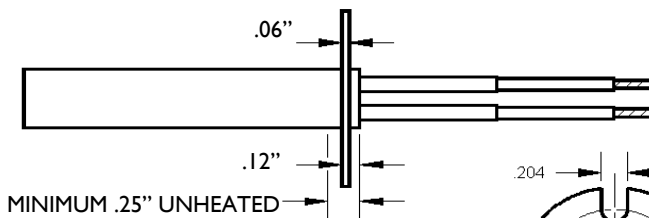
MINIMUM .25" UNHEATED



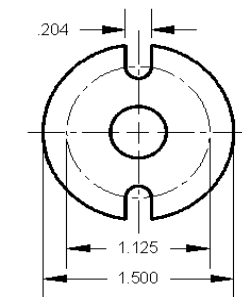
Stainless steel or brass bushing, welded or brazed to terminal end of heater sheath at cold junction. Leadwires using fiberglass, Teflon, or silicone rubber insulation may be butt-connected to terminal pins. Bushing may also be potted with epoxy, silicone rubber, or castable ceramics to fill cavity if desired. This heater can be modified from stock.

Heater Dia:	1/4"	3/8"	1/2"	5/8"	3/4"
NPT Size:	1/8"	1/4"	3/8"	1/2"	3/4"

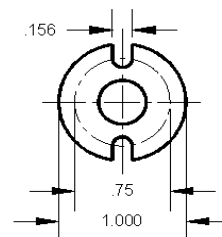
**Modification G-  
Stainless Steel Flange**



Flange, stainless steel, 1/16" thick tack welded to heater at leadwire end. Standard flange placement shown. Special immersed lengths to be specified by customer. This heater can be modified from stock.



USED ON DIAMETERS  
1/4", 3/8", 1/2", 5/8", 3/4"



USED ON DIAMETERS  
1/4", 3/8", 1/2"



# Ramarod Cartridge Heaters

**Includes 10" Type "A" Leads  
Incoloy 800 Sheath Material**

DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	WATT DESITY	APPOX. Wgt/Lbs	RAMA PART #
1/4"	1"	50	120	130	0.02	2A1A/DVE
1/4"	1"	80	120	208	0.02	2A1A/DVK
1/4"	1"	100	120	260	0.02	2A1A/DVO
1/4"	1"	150	120	390	0.02	2A1A/DVZ
1/4"	1-1/4"	75	120	130	0.02	2A1C/DVJ
1/4"	1-1/4"	100	120	173	0.02	2A1C/DVO
1/4"	1-1/4"	125	120	217	0.02	2A1C/DVT
1/4"	1-1/4"	150	120	260	0.02	2A1C/DVZ
1/4"	1-1/4"	150	240	260	0.02	2A1C/PBU
1/4"	1-1/4"	200	240	346	0.02	2A1C/PCF
1/4"	1-1/2"	50	120	65	0.02	2A1E/DVE
1/4"	1-1/2"	100	120	130	0.02	2A1E/DVO
1/4"	1-1/2"	100	240	130	0.02	2A1E/PBK
1/4"	1-1/2"	150	120	195	0.02	2A1E/DVZ
1/4"	1-1/2"	150	240	195	0.02	2A1E/PBU
1/4"	1-1/2"	200	120	260	0.02	2A1E/DWJ
1/4"	1-1/2"	200	240	260	0.02	2A1E/PCF
1/4"	1-1/2"	250	240	325	0.02	2A1E/PCP
1/4"	2"	50	120	48	0.03	2A2A/DVE
1/4"	2"	100	120	87	0.03	2A2A/DVO
1/4"	2"	125	240	109	0.03	2A2A/PBP
1/4"	2"	150	120	130	0.03	2A2A/DVZ
1/4"	2"	200	120	173	0.03	2A2A/DWJ
1/4"	2"	200	240	173	0.03	2A2A/PCF
1/4"	2"	250	120	217	0.03	2A2A/DWT
1/4"	2"	250	240	217	0.03	2A2A/PCP
1/4"	2"	300	240	260	0.03	2A2A/PDA
1/4"	2-1/2"	200	240	130	0.03	2A2E/PCF
1/4"	2-1/2"	250	240	163	0.03	2A2E/PCP
1/4"	2-1/2"	350	240	228	0.03	2A2E/PDK
1/4"	2-3/4"	350	240	203	0.04	2A2G/PDK
1/4"	3"	100	120	52	0.04	2A3A/DVO
1/4"	3"	150	120	78	0.04	2A3A/DVZ
1/4"	3"	150	240	78	0.04	2A3A/PBU
1/4"	3"	200	120	104	0.04	2A3A/DWJ
1/4"	3"	200	240	104	0.04	2A3A/PCF
1/4"	3"	250	240	130	0.04	2A3A/PCP
1/4"	3"	300	120	156	0.04	2A3A/DYE
1/4"	3"	300	240	156	0.04	2A3A/PDA
1/4"	3"	350	240	182	0.04	2A3A/PDK
1/4"	3-1/2"	200	240	87	0.04	2A3E/PCF
1/4"	3-1/2"	300	240	130	0.04	2A3E/PDA

1/4"	4"	200	120	74	0.04	2A4ADWJ
DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	WATT DESITY	APPOX. Wgt/Lbs	RAMA PART #
1/4"	4"	200	240	74	0.04	2A4A/PCF
1/4"	4"	250	240	93	0.04	2A4A/PCP
1/4"	4"	300	120	111	0.04	2A4A/DYE
1/4"	4"	300	240	111	0.04	2A4A/PDA
1/4"	4"	400	240	149	0.04	2A4A/PDU
1/4"	4-1/2"	500	240	162	0.05	2A4E/PEP
1/4"	5"	250	240	72	0.05	2A5A/PCP
1/4"	5"	350	240	102	0.05	2A5A/PDK
1/4"	5"	400	120	116	0.05	2A5A/DYZ
1/4"	5"	400	240	116	0.05	2A5A/PDU
1/4"	6"	300	120	71	0.06	2A6A/DYE
1/4"	6"	400	240	95	0.06	2A6A/PDU
1/4"	6"	600	120	142	0.06	2A6A/EAO*
1/4"	6"	600	240	142	0.06	2A6A/PFK
DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	WATT DESITY	APPOX. Wgt/Lbs	RAMA PART #
3/8"	1"	100	120	172	0.03	3A1A/DVO
3/8"	1"	200	240	345	0.03	3A1A/PCF
3/8"	1-1/4"	150	120	170	0.03	3A1C/DVZ
3/8"	1-1/4"	150	240	170	0.03	3A1C/PBU
3/8"	1-1/4"	200	120	230	0.03	3A1C/DWJ
3/8"	1-1/4"	200	240	230	0.03	3A1C/PCF
3/8"	1-3/8"	100	240	99	0.03	3A1D/PBK
3/8"	1-3/8"	150	240	148	0.03	3A1D/PBU
3/8"	1-1/2"	75	120	65	0.04	3A1E/DVJ
3/8"	1-1/2"	100	120	85	0.04	3A1E/DVO
3/8"	1-1/2"	150	120	127	0.04	3A1E/DVZ
3/8"	1-1/2"	150	240	127	0.04	3A1E/PBU
3/8"	1-1/2"	200	120	170	0.04	3A1E/DWJ
3/8"	1-1/2"	200	240	170	0.04	3A1E/PCF
3/8"	1-1/2"	250	120	216	0.04	3A1E/DWT
3/8"	1-1/2"	250	240	216	0.04	3A1E/PCP
3/8"	1-3/4"	200	240	137	0.05	3A1G/PCF
3/8"	1-3/4"	250	240	172	0.05	3A1G/PCP
3/8"	1-7/8"	250	120	156	0.06	3A1H/DWT
3/8"	2"	150	120	85	0.06	3A2A/DVZ
3/8"	2"	200	120	115	0.06	3A2A/DWJ
3/8"	2"	200	240	115	0.06	3A2A/PCF
3/8"	2"	200	115	115	0.06	3A2A/CHK
3/8"	2"	250	120	142	0.06	3A2A/DWT
3/8"	2"	250	240	142	0.06	3A2A/PCP
3/8"	2"	300	120	173	0.06	3A2A/DYE
3/8"	2"	300	240	173	0.06	3A2A/PDA
3/8"	2"	350	240	198	0.06	3A2A/PDK
3/8"	2"	400	120	230	0.06	3A2A/DYZ
3/8"	2"	400	240	230	0.06	3A2A/PDU
3/8"	2"	500	120	287	0.06	3A2A/DZT

### Ramrod Cartridge Heaters

3/8"	2"	500	240	287	0.06	3A2A/PEP
DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	WATT DESITY	APPOX. Wgt/Lbs	RAMA PART #
3/8"	2-1/4"	200	240	97	0.07	3A2C/PCF
3/8"	2-1/4"	250	120	122	0.07	3A2C/DWT
3/8"	2-1/4"	350	120	172	0.07	3A2C/DYO
3/8"	2-3/8"	250	120	115	0.07	3A2D/DWT
3/8"	2-1/2"	150	240	65	0.07	3A2E/PBU
3/8"	2-1/2"	200	120	87	0.07	3A2E/DWJ
3/8"	2-1/2"	250	120	108	0.07	3A2E/DWT
3/8"	2-1/2"	250	240	108	0.07	3A2E/PCP
3/8"	2-1/2"	300	120	130	0.07	3A2E/DYE
3/8"	2-1/2"	300	240	130	0.07	3A2E/PDA
3/8"	2-1/2"	400	120	172	0.07	3A2E/DYZ
3/8"	2-1/2"	400	240	172	0.07	3A2E/PDU
3/8"	2-1/2"	450	240	194	0.07	3A2E/PEF
3/8"	2-1/2"	500	240	243	0.07	3A2E/PEP
3/8"	2-3/4"	250	240	95	0.08	3A2G/PCP
3/8"	3"	200	120	68	0.08	3A3A/DWJ
3/8"	3"	200	240	68	0.08	3A3A/PCF
3/8"	3"	250	120	85	0.08	3A3A/DWT
3/8"	3"	250	240	85	0.08	3A3A/PCP
3/8"	3"	300	120	102	0.08	3A3A/DYE
3/8"	3"	300	240	102	0.08	3A3A/PDA
3/8"	3"	350	240	120	0.08	3A3A/PDK
3/8"	3"	400	120	138	0.08	3A3A/DYZ
3/8"	3"	500	120	170	0.08	3A3A/DZT
3/8"	3"	500	240	170	0.08	3A3A/PEP
3/8"	3"	600	240	208	0.08	3A3A/PFK
3/8"	3"	750	240	258	0.08	3A3A/PGP
3/8"	3-1/2"	225	240	64	0.09	3A3E/PCK
3/8"	3-1/2"	250	240	72	0.09	3A3E/PCP
3/8"	3-1/2"	300	120	86	0.09	3A3E/DYE
3/8"	3-1/2"	300	240	86	0.09	3A3E/PDA
3/8"	3-1/2"	400	240	115	0.09	3A3E/PDU
3/8"	3-1/2"	500	120	144	0.09	3A3E/DZT
3/8"	3-1/2"	500	240	144	0.09	3A3E/PEP
3/8"	4"	125	120	31	0.09	3A4A/DVT
3/8"	4"	200	120	49	0.09	3A4A/DWJ
3/8"	4"	200	240	49	0.09	3A4A/PCF
3/8"	4"	250	120	61	0.09	3A4A/DWT
3/8"	4"	250	240	61	0.09	3A4A/PCP
3/8"	4"	300	120	73	0.09	3A4A/DYE
3/8"	4"	300	240	73	0.09	3A4A/PDA
3/8"	4"	350	240	86	0.09	3A4A/PDK
3/8"	4"	400	120	97	0.09	3A4A/DYZ
3/8"	4"	400	240	97	0.09	3A4A/PDU
3/8"	4"	450	240	110	0.09	3A4A/PEF
3/8"	4"	500	120	122	0.09	3A4A/DZT
3/8"	4"	500	240	122	0.09	3A4A/PEP
3/8"	4"	550	120	135	0.09	3A4A/EAE
3/8"	4"	750	240	184	0.09	3A4A/PGP

**Ramarod Cartridge Heaters**

DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	WATT DESITY	APPOX. Wgt/Lbs	RAMA PART #
3/8"	4-1/2"	300	240	65	0.10	3A4E/PDA
3/8"	4-1/2"	350	120	75	0.10	3A4E/DYO
3/8"	4-1/2"	350	240	75	0.10	3A4E/PDK
3/8"	4-1/2"	425	240	91	0.10	3A4E/PEA
3/8"	4-1/2"	500	120	108	0.10	3A4E/DZT
3/8"	4-1/2"	500	240	108	0.10	3A4E/PEP
3/8"	4-13/16"	300	240	74	0.11	3A4X/PDA
3/8"	5"	300	120	57	0.11	3A5A/DYE
3/8"	5"	300	240	57	0.11	3A5A/PDA
3/8"	5"	350	240	67	0.11	3A5A/PDK
3/8"	5"	450	240	86	0.11	3A5A/PEF
3/8"	5"	500	120	95	0.11	3A5A/DZT
3/8"	5"	500	240	95	0.11	3A5A/PEP
3/8"	5"	700	240	134	0.11	3A5A/PGF
3/8"	5"	750	240	142	0.11	3A5A/PGP
3/8"	5"	1000	240	191	0.11	3A5A/PIP
3/8"	5-1/2"	400	240	69	0.12	3A5E/PDU
3/8"	5-1/2"	600	240	103	0.12	3A5E/PFK
3/8"	5-1/2"	1000	240	172	0.12	3A5E/PIP
3/8"	6"	200	120	31	0.13	3A6A/DWJ
3/8"	6"	250	120	39	0.13	3A6A/DWT
3/8"	6"	300	120	47	0.13	3A6A/DYE
3/8"	6"	400	120	63	0.13	3A6A/DYZ
3/8"	6"	500	120	79	0.13	3A6A/DZT
3/8"	6"	500	240	79	0.13	3A6A/PEP
3/8"	6"	600	120	94	0.13	3A6A/EAO*
3/8"	6"	600	240	94	0.13	3A6A/PFK
3/8"	6"	750	120	117	0.13	3A6A/EBT*
3/8"	6"	750	240	117	0.13	3A6A/PGP
3/8"	6"	1000	240	155	0.13	3A6A/PIP
3/8"	7"	500	240	66	0.14	3A7A/PEP
3/8"	7"	600	120	80	0.14	3A7A/EAO*
3/8"	7"	600	240	80	0.14	3A7A/PFK
3/8"	7"	750	240	99	0.14	3A7A/PGP
3/8"	7"	1000	240	132	0.14	3A7A/PIP
3/8"	8"	300	120	34	0.16	3A8A/DYE
3/8"	8"	300	240	34	0.16	3A8A/PDA
3/8"	8"	400	120	46	0.16	3A8A/DYZ
3/8"	8"	500	120	58	0.16	3A8A/DZT
3/8"	8"	500	240	58	0.16	3A8A/PEP
3/8"	8"	600	120	68	0.16	3A8A/EAO*
3/8"	8"	750	240	85	0.16	3A8A/PGP
3/8"	8"	1000	240	114	0.16	3A8A/PIP
3/8"	8-5/8"	500	240	52	0.19	3A8F/PEP
3/8"	9"	1000	240	101	0.19	3A9A/PIP

**Ramrod Cartridge Heaters**

3/8"	10"	750	240	68	0.19	3A10A/PGP
3/8"	10"	800	240	72	0.19	3A10A/PHA
3/8"	10"	1000	240	90	0.19	3A10A/PIP
3/8"	10"	1500	240	136	0.19	3A10A/PMP*

DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	WATT DESITY	APPOX. Wgt/Lbs	RAMA PART #
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3/8"	12"	600	120	45	0.22	3A12A/EAO*
3/8"	12"	600	240	45	0.22	3A12A/PHK
3/8"	12"	1000	240	74	0.22	3A12A/PIP

DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	WATT DESITY	APPOX. Wgt/Lbs	RAMA PART #
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1/2"	1"	150	120	193	0.06	4A1A/DVZ
1/2"	1-1/4"	200	240	171	0.07	4A1C/PCF
1/2"	1-1/2"	150	240	97	0.08	4A1E/PBU
1/2"	1-1/2"	200	240	129	0.08	4A1E/PCF
1/2"	2"	150	120	54	0.09	4A2A/DVZ
1/2"	2"	200	120	86	0.09	4A2A/DWJ
1/2"	2"	200	240	86	0.09	4A2A/PCF
1/2"	2"	250	120	108	0.09	4A2A/DWT
1/2"	2"	250	240	108	0.09	4A2A/PCP
1/2"	2"	300	120	129	0.09	4A2A/DYE
1/2"	2"	300	240	129	0.09	4A2A/PDA
1/2"	2"	400	120	171	0.09	4A2A/DYZ
1/2"	2"	400	240	171	0.09	4A2A/PDU
1/2"	2"	700	240	300	0.09	4A2A/PGF
1/2"	2-1/2"	250	120	81	0.11	4A2E/DWT
1/2"	2-1/2"	250	240	81	0.11	4A2E/PCP
1/2"	2-1/2"	300	120	96	0.11	4A2E/DYE
1/2"	2-1/2"	300	240	96	0.11	4A2E/PDA
1/2"	2-1/2"	350	240	112	0.11	4A2E/PDK
1/2"	2-1/2"	400	240	129	0.11	4A2E/PDU
1/2"	2-1/2"	500	120	161	0.11	4A2E/DZT
1/2"	3"	300	240	77	0.12	4A3A/PDA
1/2"	3"	400	240	104	0.12	4A3A/PDU
1/2"	3"	500	120	129	0.12	4A3A/DZT
1/2"	3"	500	240	129	0.12	4A3A/PEP
1/2"	3"	600	120	154	0.12	4A3A/EAO
1/2"	3"	600	240	154	0.12	4A3A/PHK
1/2"	3"	750	120	193	0.12	4A3A/EBT
1/2"	3"	750	240	193	0.12	4A3A/PGP
1/2"	3"	1000	240	257	0.12	4A3A/PIP
1/2"	3-1/2"	300	240	64	0.14	4A3E/PDA
1/2"	3-1/2"	350	240	73	0.14	4A3E/PDK
1/2"	3-1/2"	500	240	107	0.14	4A3E/PEP
1/2"	3-1/2"	750	240	160	0.14	4A3E/PGP
1/2"	4"	250	240	46	0.15	4A4A/PCP
1/2"	4"	300	120	56	0.15	4A4A/DYE
1/2"	4"	400	240	74	0.15	4A4A/PDU

**Ramrod Cartridge Heaters**

1/2"	4"	500	120	92	0.15	4A4A/DZT
1/2"	4"	500	240	92	0.15	4A4A/PEP
1/2"	4"	750	120	138	0.15	4A4A/EBT
1/2"	4"	750	240	138	0.15	4A4A/PGP
1/2"	4"	1000	240	184	0.15	4A4A/PIP
DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	WATT DESITY	APPOX. Wgt/Lbs	RAMA PART #
1/2"	4-1/2"	500	120	80	0.17	4A4E/DZT
1/2"	4-1/2"	500	240	80	0.17	4A4E/PEP
1/2"	4-1/2"	750	120	120	0.17	4A4E/EBT
1/2"	4-1/2"	750	240	120	0.17	4A4E/PGP
1/2"	4-1/2"	1000	240	160	0.17	4A4E/PIP
1/2"	5"	400	120	58	0.19	4A5A/DYZ
1/2"	5"	500	120	72	0.19	4A5A/DZT
1/2"	5"	500	240	72	0.19	4A5A/PEP
1/2"	5"	750	120	107	0.19	4A5A/EBT
1/2"	5"	750	240	107	0.19	4A5A/PGP
1/2"	5"	1000	240	143	0.19	4A5A/PIP
1/2"	5-1/2"	500	240	64	0.20	4A5E/PEP
1/2"	6"	250	120	29	0.21	4A6A/DWT
1/2"	6"	250	240	29	0.21	4A6A/PCP
1/2"	6"	500	120	58	0.21	4A6A/DZT
1/2"	6"	500	240	58	0.21	4A6A/PEP
1/2"	6"	600	240	70	0.21	4A6A/PFK
1/2"	6"	750	120	88	0.21	4A6A/EBT
1/2"	6"	750	240	88	0.21	4A6A/PGP
1/2"	6"	1000	120	117	0.21	4A6A/EDT
1/2"	6"	1000	240	117	0.21	4A6A/PIP
1/2"	6-1/2"	500	240	53	0.22	4A6E/PEP
1/2"	7"	500	240	50	0.24	4A7A/PEP
1/2"	7"	600	240	59	0.24	4A7A/PFK
1/2"	7"	700	240	70	0.24	4A7A/PGF
1/2"	7"	750	120	74	0.24	4A7A/EBT
1/2"	7"	750	240	74	0.24	4A7A/PGP
1/2"	7"	1000	240	99	0.24	4A7A/PIP
1/2"	7"	1500	240	148	0.24	4A7A/PMP
1/2"	7-1/2"	500	240	46	0.27	4A7E/PEP
1/2"	8"	500	240	43	0.28	4A8A/PEP
1/2"	8"	750	240	64	0.28	4A8A/PGP
1/2"	8"	800	120	69	0.28	4A8A/ECE
1/2"	8"	900	240	77	0.28	4A8A/PHU
1/2"	8"	1000	120	86	0.28	4A8A/EDT
1/2"	8"	1000	240	86	0.28	4A8A/PIP
1/2"	8"	1500	240	129	0.28	4A8A/PMP
1/2"	8-1/2"	1000	240	80	0.30	4A8E/PIP
1/2"	9"	750	240	57	0.30	4A9A/PGP
1/2"	9"	1000	240	76	0.30	4A9A/PIP
1/2"	9"	1500	240	113	0.30	4A9A/PMP
1/2"	10"	500	120	34	0.33	4A10A/DZT

**Ramrod Cartridge Heaters**

1/2"	10"	500	240	34	0.33	4A10A/PEP
1/2"	10"	800	240	54	0.33	4A10A/PHA
1/2"	10"	1000	120	68	0.33	4A10A/EDT
1/2"	10"	1000	240	68	0.33	4A10A/PIP
1/2"	10"	1250	240	85	0.33	4A10A/PKP
1/2"	10"	1500	240	102	0.33	4A10A/PMP
DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	WATT DESITY	APPOX. Wgt/Lbs	RAMA PART #
1/2"	10"	2000	240	135	0.33	4A10A/PQP*
1/2"	11"	1000	240	61	0.36	4A11A/PIP
1/2"	11"	1500	240	92	0.36	4A11A/PMP
1/2"	11"	2000	240	122	0.36	4A11A/PQP*
1/2"	12"	500	240	28	0.40	4A12A/PEP
1/2"	12"	1000	240	56	0.40	4A12A/PIP
1/2"	12"	1500	240	84	0.40	4A12A/PMP
1/2"	12"	2000	240	112	0.40	4A12A/PQP*
1/2"	14"	1000	240	48	0.48	4A14A/PIP
1/2"	14"	2300	240	110	0.48	4A14A/PTA*
1/2"	15"	1500	240	67	0.50	4A15A/PMP
1/2"	16"	1000	240	42	0.52	4A16A/PIP
1/2"	18"	1500	240	55	0.57	4A18A/PMP
DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	WATT DESITY	APPOX. Wgt/Lbs	RAMA PART #
5/8"	1-1/4"	250	120	172	0.013	5A1C/DWT
5/8"	2"	200	120	69	0.13	5A2A/DWJ
5/8"	2"	200	240	69	0.13	5A2A/PCF
5/8"	2"	500	240	171	0.13	5A2A/PEP
5/8"	2"	750	240	257	0.13	5A2A/PGP
5/8"	2-1/4"	350	120	103	0.14	5A2C/DYO
5/8"	3"	250	120	52	0.20	5A3A/DWT
5/8"	3"	250	240	52	0.20	5A3A/PCP
5/8"	3"	500	240	103	0.20	5A3A/PEP
5/8"	3"	750	240	154	0.20	5A3A/PGP
5/8"	4"	500	240	73	0.26	5A4A/PEP
5/8"	4"	550	240	81	0.26	5A4A/PFA
5/8"	4"	600	240	88	0.26	5A4A/PFK
5/8"	4"	750	240	110	0.26	5A4A/PGP
5/8"	4"	1000	240	146	0.26	5A4A/PIP
5/8"	4-1/2"	500	240	64	0.28	5A4E/PEP
5/8"	5"	750	240	86	0.29	5A5A/PGP
5/8"	5"	1000	240	114	0.29	5A5A/PIP
5/8"	6"	500	240	46	0.34	5A6A/PEP
5/8"	6"	750	240	70	0.34	5A6A/PGP
5/8"	6"	1000	240	93	0.34	5A6A/PIP
5/8"	6"	1500	120	140	0.34	5A6A/EHT*

### Ramard Cartridge Heaters

5/8"	6"	1500	240	140	0.34	5A6A/PMP
5/8"	7"	1000	240	79	0.40	5A7A/PIP
5/8"	8"	500	120	34	0.47	5A8A/DZT
5/8"	8"	500	240	34	0.47	5A8A/PEP
<b>DIA (INCH.)</b>	<b>LENGTH (INCH)</b>	<b>WATTS</b>	<b>VOLTS</b>	<b>WATT DESITY</b>	<b>APPOX. Wgt/Lbs</b>	<b>RAMA PART #</b>
5/8"	8"	800	240	55	0.47	5A8A/PHA
5/8"	8"	1000	240	68	0.47	5A8A/PIP
5/8"	8"	1200	240	82	0.47	5A8A/PKF
5/8"	8"	1500	240	102	0.47	5A8A/PMP
5/8"	8"	2000	240	136	0.47	5A8A/PQP
5/8"	9"	1500	240	91	0.50	5A9A/PMP
5/8"	10"	500	240	27	0.53	5A10A/PEP
5/8"	10"	1500	240	81	0.53	5A10A/PMP
5/8"	10"	1600	240	86	0.53	5A10A/PNK
5/8"	10"	2000	240	108	0.53	5A10A/PQP
5/8"	11"	2000	240	98	0.61	5A11A/PQP
5/8"	12"	500	240	22	0.66	5A12A/PEP
5/8"	12"	600	120	27	0.66	5A12A/EAO
5/8"	12"	1000	240	45	0.66	5A12A/PIP
5/8"	12"	1500	240	67	0.66	5A12A/PMP
5/8"	12"	2000	240	90	0.66	5A12A/PQP
5/8"	14"	3700	240	141	0.79	5A14A/QFF*
5/8"	15"	750	240	27	0.84	5A15A/PGP
5/8"	15"	2400	240	85	0.84	5A15A/PTU
5/8"	16"	2500	240	83	0.91	5A16A/PUP*
5/8"	16"	4500	240	149	0.91	5A16A/QLP*
5/8"	18"	1500	240	44	1.03	5A18A/PMP
5/8"	18"	3000	240	88	1.03	5A18A/PZP*
5/8"	18"	4700	240	138	1.03	5A18A/QNF*
5/8"	20"	1500	240	40	1.25	5A20A/PMP*
5/8"	24"	2000	240	44	1.47	5A24A/PQP*
5/8"	36"	3000	240	44	2.30	5A36A/PZP*
<b>DIA (INCH.)</b>	<b>LENGTH (INCH)</b>	<b>WATTS</b>	<b>VOLTS</b>	<b>WATT DESITY</b>	<b>APPOX. Wgt/Lbs</b>	<b>RAMA PART #</b>
3/4"	3"	500	240	86	0.24	6A3A/PEP
3/4"	4"	500	240	61	0.31	6A4A/PEP
3/4"	4"	1000	240	122	0.31	6A4A/PIP
3/4"	5"	500	240	48	0.38	6A5A/PEP
3/4"	5"	1000	240	95	0.38	6A5A/PIP

**Ramarod Cartridge Heaters**



3/4"	6"	500	240	39	0.44	6A6A/PEP
3/4"	6"	1000	240	78	0.44	6A6A/PIP
3/4"	7"	500	240	33	0.51	6A7A/PEP
3/4"	7"	1000	240	66	0.51	6A7A/PIP
3/4"	8"	500	120	29	0.58	6A8A/DZT
3/4"	8"	500	240	29	0.58	6A8A/PEP
<b>DIA (INCH.)</b>	<b>LENGTH (INCH)</b>	<b>WATTS</b>	<b>VOLTS</b>	<b>WATT DESITY</b>	<b>APPOX. Wgt/Lbs</b>	<b>RAMA PART #</b>
3/4"	8"	1000	240	57	0.58	6A8A/PIP
3/4"	8"	2000	240	114	0.58	6A8A/PQP
3/4"	10"	1000	240	45	0.72	6A10A/PIP
3/4"	10"	2000	240	90	0.72	6A10A/PQP
3/4"	12"	1000	240	37	0.84	6A12A/PIP
3/4"	12"	2000	240	74	0.84	6A12A/PQP
3/4"	12"	4000	240	148	0.84	6A12A/QHP*
3/4"	13"	1000	240	34	0.93	6A13A/PIP
3/4"	14"	1250	240	40	1.03	6A14A/PKP
3/4"	14"	2500	240	79	1.03	6A14A/PUP
3/4"	15"	1500	240	44	1.09	6A15A/PMP
3/4"	16"	1800	240	49	1.14	6A16A/PPA
3/4"	18"	2000	240	49	1.25	6A18A/PQP
3/4"	20"	1200	240	26	1.40	6A20A/PKF
3/4"	20"	2250	240	49	1.40	6A20A/PSP
3/4"	20"	2300	240	50	1.40	6A20A/PTA
3/4"	24"	1375	240	25	1.80	6A24A/PLP
3/4"	24"	1400	240	25	1.80	6A24A/PLU
3/4"	24"	2800	240	51	1.80	6A24A/PYA
3/4"	36"	2500	240	30	2.50	6A36A/PUP

**Ramarod Cartridge Heaters**

# Ramarod Cartridge Heaters

**Includes 36" Type "B" Leads  
Incoloy 800 Sheath Material**

DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	LEADWIRE LENGTH	RAMA PART #
1/4"	1-1/4"	200	240	36"	2B1C/PCF36
1/4"	1-1/2"	150	240	36"	2B1E/PBU36
1/4"	1-1/2"	200	240	36"	2B1E/PCF36
3/8"	2"	200	240	36"	3B2A/PCF36
3/8"	2-1/2"	250	240	36"	3B2E/PCP36
3/8"	3"	260	240	36"	3B3A/PCR36
3/8"	3"	500	240	36"	3B3A/PEP36
3/8"	3-1/2"	320	240	36"	3BA3E/PDE36
3/8"	3-1/2"	320	240	36"	3B3E/PDE36
3/8"	4"	370	240	36"	3BA4A/PDO36
3/8"	4-1/2"	420	240	36"	3BA4E/PDZ36
3/8"	5"	470	240	36"	3BA5A/PEJ36
3/8"	5-1/2"	525	240	36"	3BA5E/PEU36
3/8"	6"	575	240	36"	3BA6A/PFF36
3/8"	6-1/2"	625	240	36"	3BA6E/PFP36
1/2"	3"	400	240	36"	4B3A/PDU36
1/2"	4-1/2"	550	240	36"	4BA4E/PFA36
1/2"	5"	625	240	36"	4BA5A/PFP36
1/2"	5-1/2"	700	240	36"	4BA5E/PGF36
1/2"	6"	775	240	36"	4BA6A/PGU36
1/2"	6-1/2"	850	240	36"	4BA6E/PHK36



# Ramarod Cartridge Heaters

With Internal Type J Thermocouple  
Grounded to End Disc

DIA (INCH.)	LENGTH (INCH)	WATTS	VOLTS	RAMA PART #
1/4"	1-1/4"	200	240	2H1C/PCF36
1/4"	1-1/2"	200	240	2H1E/PCF36
1/4"	1-3/4"	200	240	2H1G/PCF36
1/4"	2"	200	240	2H2A/PCF36
1/4"	2"	250	240	2H2A/PCP36
1/4"	2-1/2"	200	240	2H2E/PCF36
1/4"	3"	200	240	2HA3A/PCF36
1/4"	3-1/2"	250	240	2HA3E/PCP36
1/4"	4"	250	240	2HA4A/PCP36
1/4"	5"	250	240	2HA5A/PCP36
3/8"	1-1/2"	200	240	3H1E/PCF36
3/8"	1-3/4"	200	240	3H1G/PCF36
3/8"	1-3/4"	250	240	3H1G/PCP36
3/8"	2"	200	240	3H2A/PCF36
3/8"	2"	250	240	3H2A/PCP36
3/8"	2-1/2"	250	240	3H2E/PCP36
3/8"	3"	260	240	3H3A/PCR36
3/8"	3"	300	240	3H3A/PDA36
3/8"	3-1/2"	320	240	3HA3E/PDE36
3/8"	3-1/2"	350	240	3HA3E/PDK36
3/8"	4"	370	240	3HA4A/PDO36
3/8"	4-1/2"	420	240	3HA4E/PDZ36
3/8"	5"	300	240	3HA5A/PDA36
3/8"	5"	470	240	3HA5A/PEJ36
3/8"	5-1/2"	525	240	3HA5E/PEU36
3/8"	6"	575	240	3HA6A/PFF36
3/8"	6-1/2"	625	240	3HA6E/PFP36

1/2"	1-3/4"	230	240	4H1G/PCL36
1/2"	2-1/2"	280	240	4H2E/PCV36
1/2"	3"	500	240	4H3A/PEP36
1/2"	3-1/2"	420	240	4HA3E/PDZ36
1/2"	4"	490	240	4HA4A/PEN36
1/2"	4-1/2"	550	240	4HA4E/PFA36
1/2"	5"	625	240	4HA5A/PFP36
1/2"	5-1/2"	700	240	4HA5E/PGF36
1/2"	6"	775	240	4HA6A/PGU36
1/2"	6-1/2"	850	240	4HA6E/PHK36

# EDM Cartridge Heaters

**Includes 10" Type "A" Leads  
304 Stainless Steel Sheath Material**

DIA (INCH.)	LENGTH (INCH.)	WATTS	VOLTS	WATT DENSITY	APPROX Wgt/Lbs.	RAMA PART #
1/4"	2"	100	120	86	0.03	AA2A/DVO
1/4"	3"	100	120	52	0.04	AA3A/DVO
1/4"	3"	150	120	78	0.04	AA3A/DVZ
1/4"	4"	100	120	37	0.04	AA4A/DVO
1/4"	4"	150	120	56	0.04	AA4A/DVZ
1/4"	4"	250	120	93	0.04	AA4A/DWT
1/4"	4"	250	240	93	0.04	AA4A/PCP
1/4"	6"	200	240	47	0.06	AA6A/PCF
1/4"	6"	300	120	71	0.06	AA6A/DYE
1/4"	6"	300	240	71	0.06	AA6A/PDA
1/4"	6"	400	120	95	0.06	AA6A/DYZ
1/4"	6"	400	240	95	0.06	AA6A/PDU
DIA (INCH.)	LENGTH (INCH.)	WATTS	VOLTS	WATT DENSITY	APPROX Wgt/Lbs.	RAMA PART #
3/8"	1-1/4"	100	120	113	0.03	BA1C/DVO
3/8"	2"	100	120	56	0.06	BA2A/DVO
3/8"	2"	150	120	85	0.06	BA2A/DVZ
3/8"	2"	150	240	85	0.06	BA2A/PBU
3/8"	2"	250	240	143	0.06	BA2A/PCP
3/8"	2-1/4"	75	120	37	0.07	BA2C/DVJ
3/8"	2-1/4"	100	120	49	0.07	BA2C/DVO
3/8"	2-1/2"	250	120	108	0.07	BA2E/DWT
3/8"	2-1/2"	250	240	108	0.07	BA2E/PCP
3/8"	3"	100	120	34	0.08	BA3A/DVO
3/8"	3"	100	240	34	0.08	BA3A/PBK
3/8"	3"	250	120	85	0.08	BA3A/DWT
3/8"	3-1/2"	300	240	87	0.09	BA3E/PDA
3/8"	4"	200	240	49	0.09	BA4A/PCF
3/8"	4"	250	120	61	0.09	BA4A/DWT
3/8"	4"	250	240	61	0.09	BA4A/PCP
3/8"	4"	400	240	97	0.09	BA4A/PDU
3/8"	4-1/2"	250	240	54	0.11	BA4E/PCP
3/8"	5"	250	240	48	0.11	BA5A/PCP
3/8"	5"	300	120	57	0.11	BA5A/DYE
3/8"	5"	300	240	57	0.11	BA5A/PDA
3/8"	5"	500	240	96	0.11	BA5A/PEP
3/8"	6"	200	120	31	0.13	BA6A/DWJ

**EDM Cartridge Heaters**

3/8"	6"	250	120	39	0.13	BA6A/DWT
DIA (INCH.)	LENGTH (INCH.)	WATTS	VOLTS	WATT DENSITY	APPROX Wgt/Lbs.	RAMA PART #
3/8"	6"	250	240	39	0.13	BA6A/PCP
3/8"	6"	300	120	47	0.13	BA6A/DYE
3/8"	6"	300	240	47	0.13	BA6A/PDA
3/8"	6"	400	120	63	0.13	BA6A/DYZ
3/8"	6"	400	240	63	0.13	BA6A/PDU
3/8"	6"	500	120	79	0.13	BA6A/DZT
3/8"	6"	500	240	79	0.13	BA6A/PEP
3/8"	6"	600	120	94	0.13	BA6A/EAO*
3/8"	6"	600	240	94	0.13	BA6A/PFK
3/8"	7"	250	240	33	0.14	BA7A/PCP
3/8"	7"	600	240	80	0.14	BA7A/PFK
3/8"	8"	300	120	34	0.16	BA8A/DYE
3/8"	8"	300	240	34	0.16	BA8A/PDA
3/8"	8"	450	120	51	0.16	BA8A/DZJ
3/8"	8"	500	120	58	0.16	BA8A/DZT
3/8"	8"	500	240	58	0.16	BA8A/PEP
3/8"	8"	600	120	68	0.16	BA8A/EAO*
3/8"	8"	750	240	85	0.16	BA8A/PGP
3/8"	8"	1000	240	113	0.16	BA8A/PIP
3/8"	9-3/16"	500	120	50	0.19	BA9C/DZT
3/8"	9-3/4"	600	240	56	0.19	BA9G/PFK
3/8"	10"	400	120	36	0.19	BA10A/DYZ
3/8"	10"	500	120	45	0.19	BA10A/DZT
3/8"	10"	500	240	45	0.19	BA10A/PEP
3/8"	10"	600	240	54	0.19	BA10A/PFK
3/8"	12"	400	120	30	0.22	BA12A/DYZ
3/8"	12"	600	120	45	0.22	BA12A/EAO*
3/8"	12"	600	240	45	0.22	BA12A/PFK
3/8"	12"	1000	240	74	0.22	BA12A/PIP
DIA (INCH.)	LENGTH (INCH.)	WATTS	VOLTS	WATT DENSITY	APPROX Wgt/Lbs.	RAMA PART #
1/2"	1-1/4"	180	240	154	0.07	CA1C/PCB
1/2"	2"	75	120	32	0.09	CA2A/DVJ
1/2"	2"	150	120	54	0.09	CA2A/DVZ
1/2"	2"	200	240	86	0.09	CA2A/PCF
1/2"	2"	250	240	108	0.09	CA2A/PCP
1/2"	2-1/4"	125	120	46	0.10	CA2C/DVT
1/2"	2-1/2"	100	120	32	0.11	CA2E/DVO
1/2"	2-1/2"	300	120	96	0.11	CA2E/DYE
1/2"	3"	125	120	32	0.12	CA3A/DVT
1/2"	3"	125	240	32	0.12	CA3A/PBP
1/2"	3"	200	240	51	0.12	CA3A/PCF
1/2"	3"	250	120	64	0.12	CA3A/DWT
1/2"	3"	250	240	64	0.12	CA3A/PCP
1/2"	3"	300	120	77	0.12	CA3A/DYE
1/2"	3"	300	240	77	0.12	CA3A/PDA

### EDM Cartridge Heaters

1/2"	3"	400	230	103	0.12	CA3A/LYV
DIA (INCH.)	LENGTH (INCH.)	WATTS	VOLTS	WATT DENSITY	APPROX Wgt/Lbs.	RAMA PART #
1/2"	3-1/2"	500	240	107	0.14	CA3E/PEP
1/2"	4"	150	120	28	0.15	CA4A/DVZ
1/2"	4"	250	120	46	0.15	CA4A/DWT
1/2"	4"	400	240	74	0.15	CA4A/PDU
1/2"	4"	500	120	92	0.15	CA4A/DZT
1/2"	4"	500	240	92	0.15	CA4A/PEP
1/2"	5"	350	240	50	0.19	CA5A/PDK
1/2"	5"	400	120	58	0.19	CA5A/DYZ
1/2"	5"	400	240	58	0.19	CA5A/PDU
1/2"	5"	500	120	72	0.19	CA5A/DZT
1/2"	5"	750	240	107	0.19	CA5A/PGP
1/2"	6"	250	120	29	0.21	CA6A/DWT
1/2"	6"	250	240	29	0.21	CA6A/PCP
1/2"	6"	350	120	41	0.21	CA6A/DYO
1/2"	6"	350	240	41	0.21	CA6A/PDK
1/2"	6"	500	240	58	0.21	CA6A/PEP
1/2"	6"	750	240	88	0.21	CA6A/PGP
1/2"	6"	800	120	93	0.21	CA6A/ECE
1/2"	6"	1000	240	117	0.21	CA6A/PIP
1/2"	7"	400	240	40	0.24	CA7A/PDU
1/2"	7"	500	120	50	0.24	CA7A/DZT
1/2"	7"	500	240	50	0.24	CA7A/PEP
1/2"	7"	600	120	60	0.24	CA7A/EAO
1/2"	7"	600	240	60	0.24	CA7A/PFK
1/2"	7"	1000	240	99	0.24	CA7A/PIP
1/2"	8"	300	120	26	0.28	CA8A/DYE
1/2"	8"	300	240	26	0.28	CA8A/PDA
1/2"	8"	500	120	43	0.28	CA8A/DZT
1/2"	8"	500	240	43	0.28	CA8A/PEP
1/2"	8"	600	240	52	0.28	CA8A/PFK
1/2"	8"	1000	240	86	0.28	CA8A/PIP
1/2"	9"	500	240	38	0.30	CA9A/PEP
1/2"	9"	750	240	57	0.30	CA9A/PGP
1/2"	10"	500	120	34	0.33	CA10A/DZT
1/2"	10"	500	240	34	0.33	CA10A/PEP
1/2"	10"	800	240	54	0.33	CA10A/PHA
1/2"	10"	1000	120	68	0.33	CA10A/EDT
1/2"	10"	1000	240	68	0.33	CA10A/PIP
1/2"	11"	1000	240	61	0.38	CA11A/PIP
1/2"	12"	600	120	34	0.40	CA12A/EAO
1/2"	12"	600	240	34	0.40	CA12A/PFK
1/2"	12"	1000	120	56	0.40	CA12A/EDT
1/2"	12"	1000	240	56	0.40	CA12A/PIP
1/2"	12"	2000	240	112	0.40	CA12A/PQP
DIA (INCH.)	LENGTH (INCH.)	WATTS	VOLTS	WATT DENSITY	APPROX Wgt/Lbs.	RAMA PART #

### EDM Cartridge Heaters

5/8"	2"	200	120	68	0.13	DA2A/DWJ
5/8"	2-1/4"	350	120	103	0.14	DA2C/DYO
DIA (INCH.)	LENGTH (INCH.)	WATTS	VOLTS	WATT DENSITY	APPROX Wgt/Lbs.	RAMA PART #
5/8"	3"	250	120	51	0.20	DA3A/DWT
5/8"	3"	250	240	51	0.20	DA3A/PCP
5/8"	3"	500	240	103	0.20	DA3A/PEP
5/8"	4"	250	120	37	0.26	DA4A/DWT
5/8"	4"	250	240	37	0.26	DA4A/PCP
5/8"	4"	300	240	44	0.26	DA4A/PDA
5/8"	4"	400	240	59	0.26	DA4A/PDU
5/8"	4"	500	240	73	0.26	DA4A/PEP
5/8"	4"	750	240	110	0.26	DA4A/PGP
5/8"	4-1/2"	250	240	32	0.28	DA4E/PCP
5/8"	4-1/2"	300	240	38	0.28	DA4E/PDA
5/8"	5"	250	240	28	0.29	DA5A/PCP
5/8"	5"	500	240	57	0.29	DA5A/PEP
5/8"	6"	300	120	28	0.34	DA6A/DYE
5/8"	6"	300	240	28	0.34	DA6A/PDA
5/8"	6"	500	120	46	0.34	DA6A/DZT
5/8"	6"	500	240	46	0.34	DA6A/PEP
5/8"	7"	500	120	39	0.40	DA7A/DZT
5/8"	7"	500	240	39	0.40	DA7A/PEP
5/8"	7"	750	240	59	0.40	DA7A/PGP
5/8"	8"	500	120	34	0.47	DA8A/DZT
5/8"	8"	500	240	34	0.47	DA8A/PEP
5/8"	8"	750	240	51	0.47	DA8A/PGP
5/8"	8"	800	240	55	0.47	DA8A/PHA
5/8"	8"	850	240	58	0.47	DA8A/PHK
5/8"	9"	500	240	30	0.51	DA9A/PEP
5/8"	9"	750	240	45	0.51	DA9A/PGP
5/8"	9"	1000	240	60	0.51	DA9A/PIP
5/8"	10"	500	240	27	0.53	DA10A/PEP
5/8"	10"	600	120	32	0.53	DA10A/EAO
5/8"	10"	750	240	41	0.53	DA10A/PGP
5/8"	10"	1000	240	54	0.53	DA10A/PIP
5/8"	12"	500	120	22	0.66	DA12A/DZT
5/8"	12"	500	240	22	0.66	DA12A/PEP
5/8"	12"	1000	240	45	0.66	DA12A/PIP
5/8"	12"	1500	240	67	0.66	DA12A/PMP

DIA (INCH.)	LENGTH (INCH.)	WATTS	VOLTS	WATT DENSITY	APPROX Wgt/Lbs.	RAMA PART #
3/4"	3"	250	120	43	0.24	EA3A/DWT
3/4"	3"	500	240	86	0.24	EA3A/PEP
3/4"	4"	500	240	61	0.31	EA4A/PEP
3/4"	6"	500	120	39	0.44	EA6A/DZT

### EDM Cartridge Heaters



3/4"	6"	500	240	39	0.44	EA6A/PEP
3/4"	8"	500	120	29	0.58	EA8A/DZT
3/4"	8"	500	240	29	0.58	EA8A/PEP
<b>DIA (INCH.)</b>	<b>LENGTH (INCH.)</b>	<b>WATTS</b>	<b>VOLTS</b>	<b>WATT DENSITY</b>	<b>APPROX Wgt/Lbs.</b>	<b>RAMA PART #</b>
3/4"	8"	1000	240	57	0.58	EA8A/PIP
3/4"	10"	1000	240	45	0.72	EA10A/PIP
3/4"	12"	950	240	35	0.84	EA12A/PIF
3/4"	12"	1000	240	37	0.84	EA12APIP
3/4"	12"	2000	240	74	0.84	EA12A/PQP



# EDM Metric Cartridge Heaters

All Designs Are 220 Volts  
Includes 10" Type "A" Leads

DIA (MM)	LENGTH (MM)	WATTS	WATT DENSITY	APPROX. Wgt/Lbs.	RAMA PART #
6.5	40	150	174	0.02	QA40M/IQW
8.0	40	200	189	0.04	RA40M/IRH
8.0	60	300	163	0.07	RA60M/ISC
8.0	80	400	153	0.09	RA80M/ISW
10.0	40	250	188	0.05	SA40M/IRR
10.0	60	400	174	0.07	SA60M/ISW
10.0	100	400	94	0.09	SA100M/ISW
10.0	100	500	118	0.09	SA100M/ITR
10.0	160	500	70	0.14	SA160M/ITR
10.0	200	400	44	0.16	SA200M/ISW
10.0	300	500	36	0.22	SA300M/ITR
12.5	50	400	176	0.09	UA50M/ISW
12.5	60	400	139	0.11	UA60M/ISW
16.0	80	400	76	0.23	VA80M/ISW
16.0	80	500	95	0.23	VA80M/ITR
16.0	160	750	65	0.37	VA160M/IVR

