

CARTRIDGE HEATERS



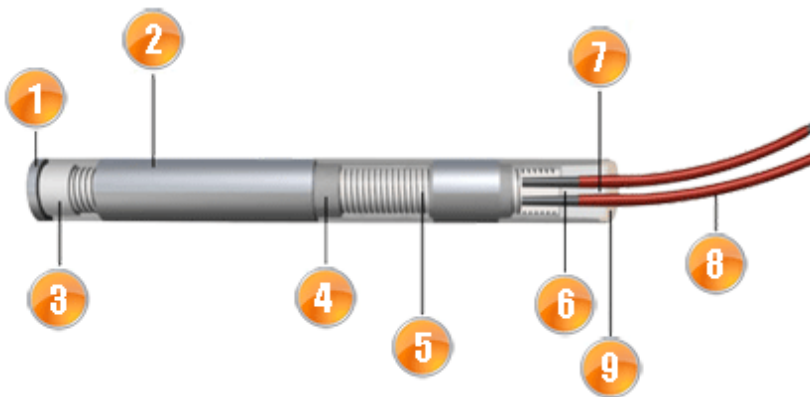
APPLICATIONS

Cartridge heaters are most frequently used for heating metal parts by insertion into drilled holes. For easy installation, the heaters are made slightly undersize relative to their nominal diameter.

The majority of applications do not require maximum watt/in². Using as little wattage as possible to meet process requirements will ensure maximum heater life.

Holes should be drilled and reamed, rather than just drilled to the final diameter with a general purpose drill. At high watt densities, a close fit is important. The fit is the difference between the minimum diameter of the heater and maximum diameter of the hole.

Standard Construction



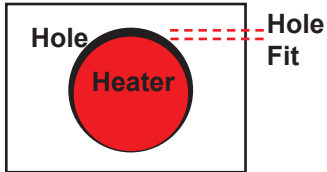
1. Welded Disc
2. Stainless steel tube in 304/316/321/INCOLOY
3. Ceramic disc insulator
4. Pure magnesium oxide
5. Nickel-chrome 80/20 heater wire
6. Ceramic core
7. Hard ceramic head
8. Lead Wire
9. Optional Potting Compound

Max Watt Density (watts / in²)

Max Watt Density on heaters is effected by the Hole Fit. Heaters in a loose whole will result in poor heat heat transfer and shorter heater life.

Faster on/off cycling will increase heater life.

Preventing Contamination on heater ends will reduce failures.



$$\text{Watt Density (watts / in}^2\text{)} = \frac{\text{Wattage}}{\text{Heated Length x Dia x 3.14}}$$

Hole Fit	200°F	400°F	600°F	800°F	1000°F	1200°F
0.002"	300	300	300	300	270	140
0.003"	300	300	300	295	205	120
0.004"	300	300	300	240	175	100
0.005"	300	300	285	200	145	90
0.007"	300	250	200	150	100	70
0.010"	225	200	150	110	90	60
0.015"	165	140	110	95	75	50
0.030"	110	100	90	80	60	40
0.060"	65	65	55	50	40	30
0.100"	50	50	50	45	35	20

Diameter Sizes Available

SIZES - Round

Nom Dia	min Dia	max Dia	max Amps	max Volts
1/8"	.119	.124	3.6	240
1/4"	.244	.249	9	30
6.5mm	.250	.255	9	300
8mm	.309	.314	9	300
3/8"	.369	.374	9	480
10mm	.388	.393	15	480
7/16"	.432	.437	15	600
12mm	.466	.471	15	600
12.5mm	.486	.491	15	600
1/2"	.494	.499	15	600
13mm	.506	.511	15	600

SIZES - Round

Nom Dia	min Dia	max Dia	max Amps	max Volts
17/32"	.525	.530	15	600
14mm	.545	.550	26	600
5/8"	.619	.624	26	600
16mm	.624	.629	26	600
17mm	.663	.668	26	600
11/16"	.682	.687	26	600
19mm	.742	.747	26	600
3/4"	.744	.749	26	600
20mm	.782	.786	26	600
25mm	.978	.983	26	600
1"	.994	.999	26	600

SIZES - Square

Nom Size	min Size	max Size	max Amps	max Volts
3/8"x3/8"	.369	.374	9	300
1/2"x1/2"	.494	.499	9	300
5/8"x5/8"	.619	.624	15	300

SIZES - Rectangle

Nom Size	Max wide	Max depth	Min watts	Max W/inch
1/8"x1/4"	.124	.249	10	30
1/8"x3/8"	.124	.374	10	50
1/4"x5/8"	.249	.624	10	70
1/4"x1"	.249	.999	10	100

Lead Wire Options

Picture	Type	Max Temp	Notes
	Duraflex	1022°F 550°C	Flexible , Not Waterproof
	TGGT	482°F 550°C	Durable, Flexible, Not Waterproof
	Teflon	482°F 550°C	Abrasion Resistant, Small OD, Waterproof
	Silicone Rubber	302°F 550°C	Very Flexible, Waterproof, Easy to Nick
	SEW2	392°F 200°C	Very Flexible, Waterproof, Fair Abrasion Resist.

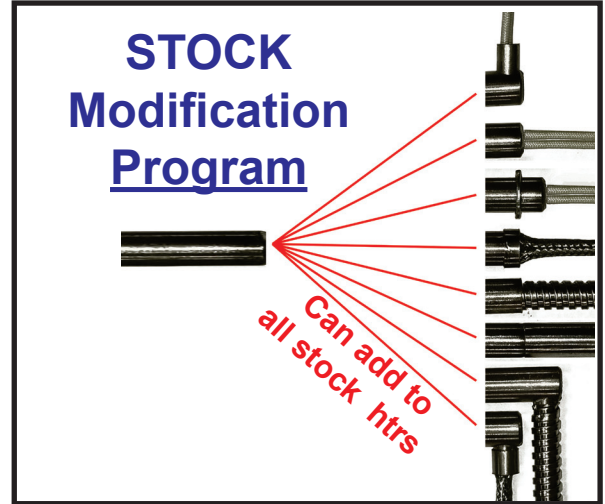
End Seal Options

Type	Max Temp	Moisture Protection	Contaminat. Protection	Mech. Strength	Vibration Resist.
Ceramic	2500°F 1371°C	Poor	Poor	Excellent	Excellent
Teflon	300°F 149°C	Excellent	Excellent	Very Good	Excellent
Lava	3000°F 1649°C	Poor	Good	Good	Poor
Cement Potting	1800°F 982°C	Poor	Fair	Good	Poor
Epoxy Potting	650°F 343°C	Fair	Very Good	Very Good	Excellent
Epoxy Potting	265°F 129°C	Good	Good	Excellent	Excellent
Silicone Rubber	500°F 260°C	Excellent	Excellent	Fair	Excellent

STOCK CARTRIDGE HEATERS



1 Day RUSH
1 Week Standard



STOCK - 1/4" Dia with 10" Fiberglass leads

Length(inch)	Watts	120V	240V
1	55	CH-25010H	
1	100	CH-25010J	CH-25010K
1	150	CH-25010L	
1.25	75	CH-25012T	
1.25	100	CH-25012F	
1.25	150	CH-25012G	CH-25012H
1.5	100	CH-25015K	
1.5	150	CH-25015L	CH-25015AU
1.5	200	CH-25015M	CH-25015N
2	40	CH-25020AX	CH-25020AY

Length(inch)	Watts	120V	240V
2	100	CH-25020N	
2	150	CH-25020P	CH-25020Q
2	200	CH-25020R	CH-25020S
2	250	CH-25020T	CH-25020U
2.5	200	CH-25025E	CH-25025H
3	75	CH-25030AR	CH-25030AS
3	200	CH-25030H	CH-25030J
3	300	CH-25030K	CH-25030L
3.75	220		CH-25037F
4	100	CH-25040J	CH-25040AQ

Length(inch)	Watts	120V	240V
4	200	CH-25040K	CH-25040L
4	300	CH-25040M	CH-25040N
4	375	CH-25040AR	
4.75	275		CH-25047F
5	300	CH-25050AF	
5	350	CH-25050P	CH-25050Q
5	450	CH-25050AP	
5.75	350		CH-25057C
6	150	CH-25060AC	CH-25060AD
6	400	CH-25060R	CH-25060S

STOCK - 5/16" Dia with 10" Fiberglass leads

Length(inch)	Watts	120V	240V
2	100	CH-31020E	CH-31020F
2	300		CH-31020G

Length(inch)	Watts	120V	240V
3	300	CH-31030D	CH-31030E
4	300	CH-31040A	CH-31040B

Length(inch)	Watts	120V	240V
5	300	CH-31050F	CH-31050G

STOCK - 3/8" Dia with 10" Fiberglass leads

Length(inch)	Watts	120V	240V
1	100	CH-37010G	CH-37010M
1.25	100	CH-37012K	CH-37012J
1.25	150	CH-37012L	CH-37012M
1.5	50	CH-37015L	
1.5	100	CH-37015N	CH-37015M
1.5	150	CH-37015P	CH-37015Q
1.5	200	CH-37015R	CH-37015S
1.5	250	CH-37015X	CH-37015Y
1.75	100		CH-37017E
1.75	200	CH-37017F	CH-37017G
2	50	CH-37020L	
2	75	CH-37020BF	CH-37020BG
2	100	CH-37020Q	CH-37020R
2	150	CH-37020M	CH-37020N
2	200	CH-37020S	CH-37020T
2	250	CH-37020P	CH-37020U
2	300	CH-37020V	CH-37020W
2.25	125	CH-37022E	
2.25	175	CH-37022F	
2.25	300	CH-37022G	CH-37022H
2.5	155		CH-37025Z
2.5	250	CH-37025J	CH-37025K

Length(inch)	Watts	120V	240V
3	100	CH-37030U	CH-37030V
3	150	CH-37030AV	
3	200	CH-37030AF	CH-37030Y
3	250	CH-37030Z	CH-37030AA
3	300	CH-37030AB	CH-37030AC
3	350		CH-37030BM
3	400	CH-37030AD	CH-37030AE
3	500	CH-37030W	CH-37030AG
3.5	300	CH-37035F	CH-37535G
3.5	500		CH-37035T
4	150	CH-37040Y	CH-37040W
4	250	CH-37040Z	CH-37040AA
4	300	CH-37040AB	CH-37040AC
4	350		CH-37040BH
4	400	CH-37040AD	CH-37040AE
4	500	CH-37040X	CH-37040AF
4.5	300	CH-37045E	CH-37045F
4.5	500		CH-37045G
5	150	CH-37050V	CH-37050W
5	185	CH-37050BN	CH-37050BP
5	300	CH-37050U	CH-37050X
5	400		CH-37050BB

Length(inch)	Watts	120V	240V
5	500	CH-37050Y	CH-37050Z
5	550		CH-37050BQ
5	750		CH-37050AA
5	1000		CH-37050AB
5.5	300		CH-37055J
6	225	CH-37060BL	CH-37060BM
6	250	CH-37060R	CH-37060S
6	400	CH-37060AR	CH-37060AQ
6	500	CH-37060Z	CH-37060AA
6	600	CH-37060T	CH-37060U
6	750		CH-37060AB
7	300		CH-37070R
7	1000		CH-37070G
8	300	CH-37080AP	CH-37080Y
8	600	CH-37080Z	CH-37080AA
8	1000		CH-37080AB
9	1000		CH-37090F
10	600	CH-37100H	CH-37100J
10	1000		CH-37100K
12	750		CH-37120L
12	1000		CH-37120M

STOCK CARTRIDGE HEATERS...continued

STOCK - 1/2" Dia with 10" Fiberglass leads

Length(inch)	Watts	120V	240V
1	50	CH-50010C	
1.25	125	CH-50012F	CH-50012G
1.25	150		CH-50012H
1.5	200	CH-50015D	CH-50015E
2	75	CH-50020Z	CH-50020AA
2	200	CH-50020G	CH-50020H
2	250		CH-50020AB
2	300	CH-50020K	CH-50020J
2	400	CH-50020U	CH-50020V
2.25	250	CH-50022C	CH-50022D
2.5	300	CH-50025L	CH-50025M
2.5	400	CH-50025N	CH-50025P
2.5	500		CH-50025AA
3	150	CH-50030AP	CH-50030AQ
3	250	CH-50030AE	CH-50030R
3	300	CH-50030S	CH-50030T
3	400	CH-50030U	CH-50030V
3	500		CH-50030W
3.5	500	CH-50035E	CH-50035F
4	180	CH-50040AX	CH-50040AY
4	250		CH-50040AA
4	300	CH-50040AB	CH-50040V

Length(inch)	Watts	120V	240V
4	350		CH-50040AS
4	400	CH-50040W	CH-50040X
4	500	CH-50040T	CH-50040Y
4	750		CH-50040Z
4.5	500	CH-50045F	CH-50045G
5	200	CH-50050M	CH-50050N
5	300		CH-50050AG
5	350	CH-50050AH	CH-50050AJ
5	500	CH-50050P	CH-50050R
5	750	CH-50050Q	CH-50050S
5	800		CH-50050AZ
5	1000		CH-50050T
5.5	750		CH-50050E
6	300	CH-50060V	CH-50060W
6	500		CH-50060X
6	750	CH-50060R	CH-50060Z
6	1000	CH-50060S	CH-50060BZ
6	1500		CH-50060AZ
6.5	1000		CH-50065F
7	500		CH-50070R
7	600	CH-50070F	CH-50070G
7	1000		CH-50070H

Length(inch)	Watts	120V	240V
8	400	CH-50080BN	CH-50080BP
8	500	CH-50080U	CH-50080Y
8	750	CH-50080V	CH-50080W
8	1000	CH-50080X	CH-50080Z
8	1200		CH-50080BR
8	1500		CH-50080AA
9	500		CH-50090G
9	1000		CH-50090H
10	500	CH-50100K	CH-50100M
10	1000	CH-50100P	CH-50100Q
10	1500		CH-50100R
10	2000		CH-50100N
12	600	CH-50120AF	CH-5012AG
12	1000	CH-50120K	CH-50120L
12	1500		CH-50120M
12	2000		CH-50120N
14	1000		CH-50140C
15	1000		CH-50150K
15	1500		CH-50150L
16	800	CH-50160T	CH-50160U
16	1000		CH-50160N

STOCK - 5/8" Dia with 10" Fiberglass leads

Length(inch)	Watts	120V	240V
1.5	200	CH-62015A	
2	100	CH-62020F	CH-62020G
2	200	CH-62020C	CH-62020D
2	300		CH-62020H
2.25	250	CH-62022A	CH-62022B
3	200	CH-62030R	CH-62030S
3	250	CH-62030E	CH-62030F
3	400	CH-62030G	CH-62030J
3	500	CH-62030K	CH-62030L
3.75	525	CH-62037B	CH-62037C
4	250	CH-62040AH	CH-62040AJ
4	500	CH-62040E	CH-62040F
4	700		CH-62040AK
4	750		CH-62040H
4	1000		CH-62040G
5	300	CH-62050V	CH-62050W
5	500	CH-62050G	CH-62050H
5	750		CH-62050J

Length(inch)	Watts	120V	240V
5	1000		CH-62050K
5.38	800		CH-62053A
6	375	CH-62060W	CH-62060X
6	500		CH-62060H
6	750		CH-62060J
6	1000		CH-62060K
7	1000	CH-62070D	CH-62070F
7	1500		CH-62070E
8	500	CH-62080AB	CH-62080AC
8	1000	CH-62080J	CH-62080H
8	1200		CH-62080AE
8	1500		CH-62080K
9	1000		CH-62090B
9	1400		CH-62090L
9	1500		CH-62090C
10	650	CH-62100S	CH-62100T
10	1000		CH-62100F
10	1500		CH-62100G

Length(inch)	Watts	120V	240V
10	2000		CH-62100E
12	775	CH-62120Q	CH-62120R
12	1000		CH-62120E
12	1500		CH-62120C
12	2000		CH-62120D
14	900		CH-62140M
14	1500		CH-62140G
14	2000		CH-62140P
14	2400		CH-62140H
16	1000		CH-62160N
16	1050	CH-62160V	CH-62160W
16	2110		CH-62160P
24	1000		CH-62240G
24	1500		CH-62240H
24	2000		CH-62240J

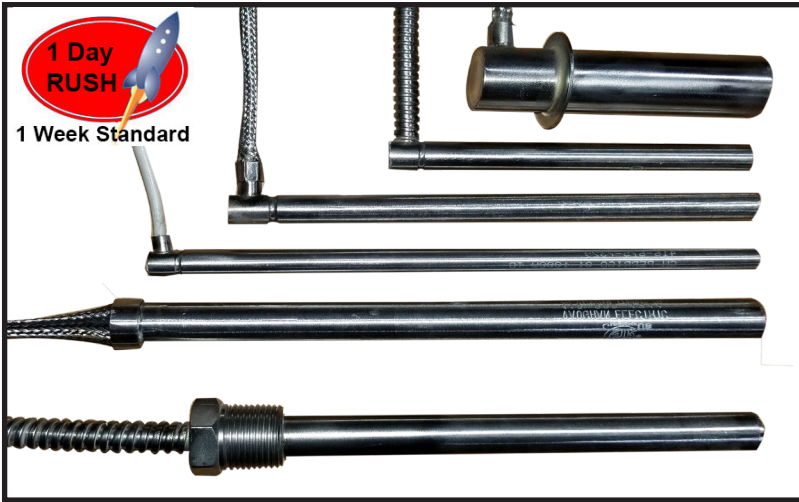
STOCK - 3/4" Dia with 10" Fiberglass leads

Length(inch)	Watts	120V	240V
2	200	CH-75020A	CH-75020B
2	300		CH-75020C
3	225		CH-75030H
3	400		CH-75030A
3	500	CH-75030G	CH-75030B
4	300	CH-75040T	CH-75040U
4	500	CH-75040D	CH-75040E
4	750		CH-75040F
4	1000		CH-75040G
5	375	CH-75050L	CH-75050M
5	500		CH-75050E
5	1000	CH-75050G	CH-75050F
6	450	CH-75060N	CH-75060P
6	500	CH-75060C	CH-75060F

Length(inch)	Watts	120V	240V
6	750		CH-75060D
6	1000		CH-75060G
6	1200		CH-75060Q
6	1500		CH-75060E
7	500	CH-75070A	CH-75070B
7	1000		CH-75070C
7	1500		CH-75070D
8	600	CH-75080W	CH-75080X
8	750	CH-75080G	CH-75080H
8	1000		CH-75080L
8	1500		CH-75080J
8	2000		CH-75080K
9	1800		CH-75090D
10	800	CH-75100P	CH-75100Q

Length(inch)	Watts	120V	240V
10	1000		CH-75100B
10	1500		CH-75100C
10	1600		CH-75100R
10	2000		CH-75100D
12	950	CH-75120R	CH-75120S
12	1000		CH-75120C
12	1500		CH-75120D
12	2000		CH-75120E
14	1100		CH-75140J
14	2200		CH-75140K
16	1250		CH-75160F
24	1000		CH-75240L
24	1500		CH-75240M
24	2000		CH-75240N

CUSTOM CARTRIDGE HEATERS



lube
ure
tridge heater release
nt. Easy to use and
vides a barrier to high
perature oxidation. Al-
s easy removal of car-
ge heaters.

tle Size: 6 oz

Termination Options

Picture	Type	Notes
	S	Swaged In Leads Standard 550°C Duraflex Flexible
	SL	Swaged In Leads c/w Silicone Coat F/G Sleeve Moist. protection up to 200°C
	C	Crimped On Leads Standard 550°C Duraflex NOT Flexible
	P	Post Terminals Used in applications with easy leadwire replacement (min 1/2" Dia)
	90	90°Exit Suitable where leads must be at 90° with minimal space
	B	SS Braid Excellent Abrasion Protection
	90B	90°Exit c/w SS Braid Suitable where leads must be at 90° with minimal space and Excellent Abrasion Protection
	H	SS Armour Best Mechanical protection Cannot be bent as sharply as SS Braid
	90H	90°Exit c/w SS Armour Best Mechanical Protection c/w 90°Exit

Add Ons Features

Picture	Type	Notes
	Stainless Steel Fittings	Single or Double ended : 1/8", 1/4", 3/8"NPT 1/2", 3/4", 1"NPT
	Brass Fittings	Single or Double ended : 1/8", 1/4", 3/8"NPT 1/2", 3/4", 1"NPT
	Flanges	Standard Stainless Steel. Flanges can be round or irregularly shaped.
	Strain Relief	Provides extra support for leads. Great for Flexing applications

Special Constructions

Picture	Type	Notes
	Bent Heater	Must be bent in an unheated section
	MultiZone or Distributed Watts	Multi Zone - Up to 3 zones Distributed Wattage - custom
	Double Ended	Electrical Termination on Both Sides - either Lead Wires, Post terminals
	Internal T/C (J/K)	Type A - Center Core - Heater Temperature Type B - Middle - Block Temperature Type C - End - Disk End Temperature Flat Bottom

CARTRIDGE HEATER - Custom Specification Sheet

Company _____ City _____

Contact _____ Phone _____ Email _____

Max Operating Temp _____ F _____ C

Dia _____ in _____ mm Immersion Length _____ in _____ mm Watt _____ Volts _____

Qty _____ Date Required : 1day 1week 2week

Lead Wire Insulation

- Duraflex (1022F) *****Standard*****
 TGGT (482F) Teflon (482F) SEW2 (392F) Silicone Rubber (302F)

End Seal Options

- Ceramic Potting **Standard** Lava Plug Teflon Plug Epoxylite Epoxy Silicone Potting

Termination Options

- S - Swaged *****Standard***** SL C P 90 B 90B H 90H

Add On Features (need sketch)

- S/S NPT(single) _____ S/S NPT(double) _____ Strain relief
 Brass NPT(single) _____ Brass NPT(single) _____ Flange _____

Special Construction Options (need sketch)

- Bent Multizone Distributed Wattege Cold Section Double Ended

Thermocouple Options

- J K Location : Type A Type B Type C

Sketch (if required) :