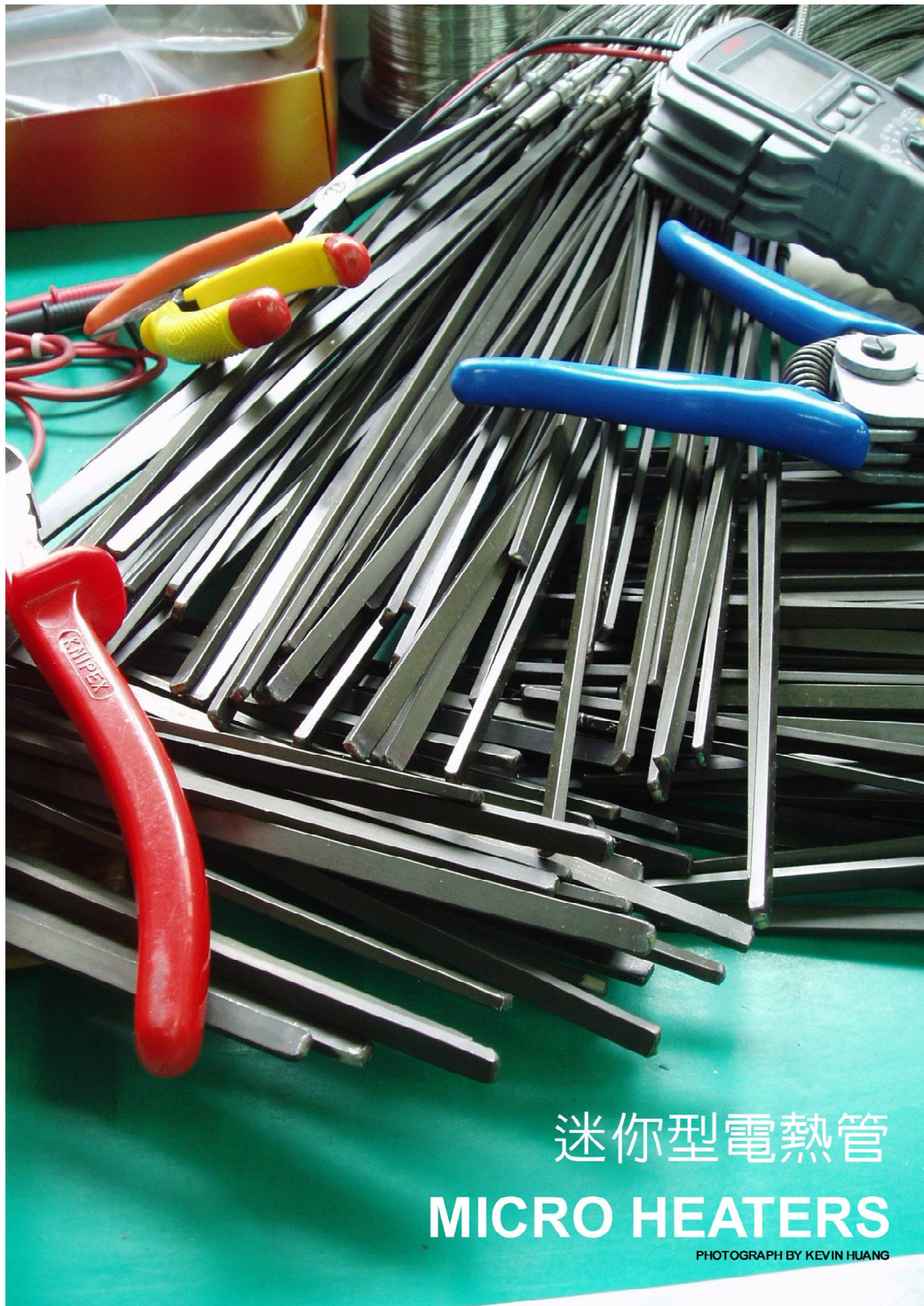


High Quality Heating Elements & Sensor for Hot Runner System



迷你型電熱管

MICRO HEATERS

PHOTOGRAPH BY KEVIN HUANG

 **正泰電熱**
CT HEATERS

since1971

COMPANY PROFILE

Established in 1971, CHENG TAY HEATER & INSTRUMENT CO., LTD. as known as “CT HEATERS” has been in the business of developing and introducing the latest machinery while pioneering new electrical heating techniques and comprehensive thermocouple design. We have the engineering and manufacturing capabilities to be or define world-class quality. Therefore, made us the only specialists in Taiwan that can supply tailor-made or prototype heating elements for the entire scientific and industrial spectrum. Our years of experience have enabled us to even help our clients to solve their own machinery problems or improving its performance.

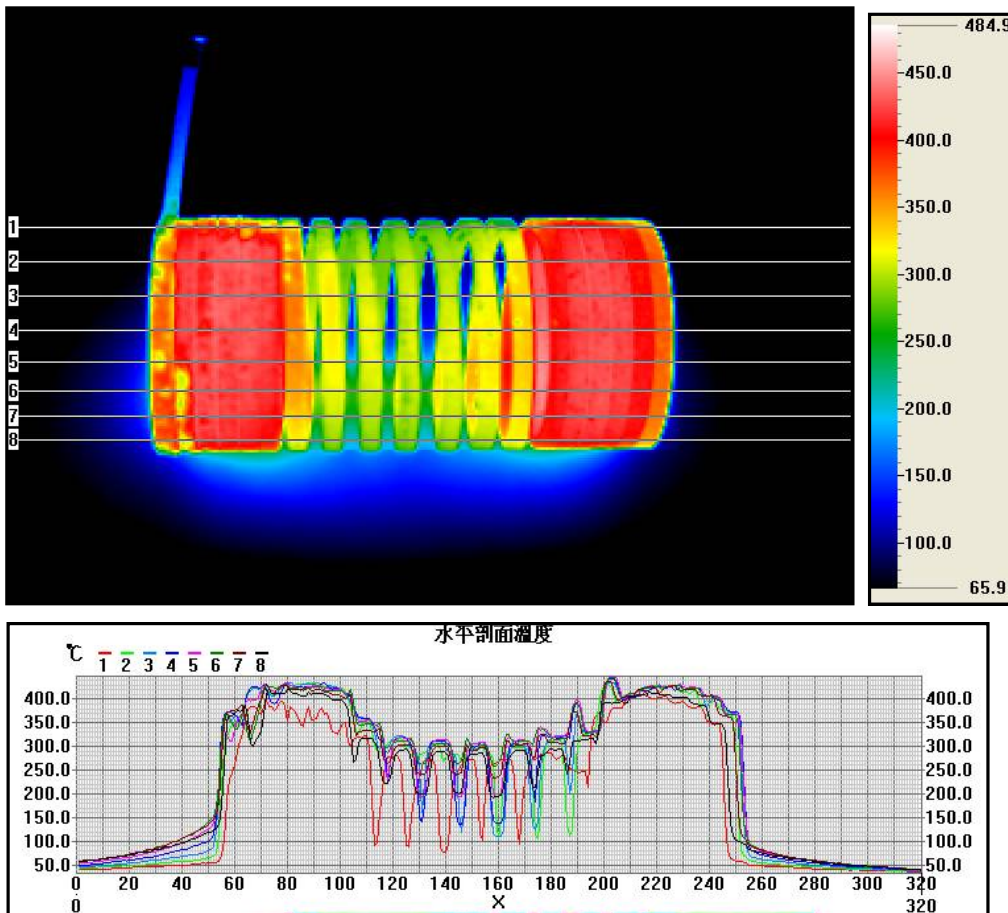
For over 46 years, CT HEATERS has stood for quality, flexibility and innovation. Our clients come to us with the knowledge that whatever their heating needs are, we have the solution for them.

We are committed to continually building our reputation, knowledge and respond quickly to the world’s changing needs. Our business approach is to meet our client’s needs and to offer a competitive price.

From a single item to a large scale project, we can supply all your heater and thermocouple needs. All inquiries are welcome.

TECHNICAL DATA

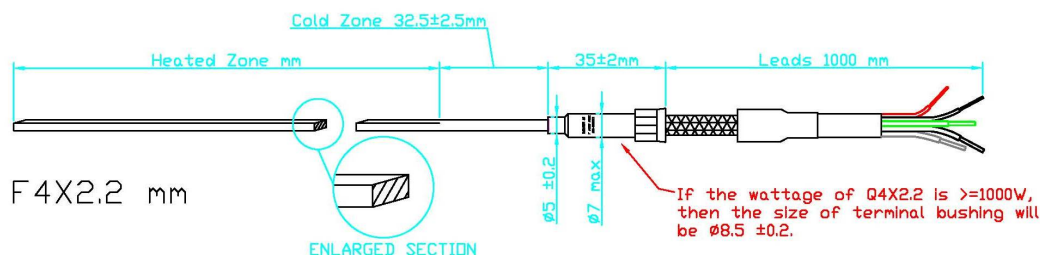
- Heater sheath: SUS304
- The tolerance maintained on the heater ID: ID Φ -0.15~-0.20 mm
- The tolerance maintained on coiled length: Coiled length $\pm 2\%$
- Maximum cold heater length (un-heated length): Standard 32.5 $\pm$ 2.5 mm
- Un-heated length bending possibilities: See “**LEAD ORIENTATION**” section
- Thermocouple accuracy: Fe-CuNi or NiCr-Ni, standard tolerance
- Power tolerance detail: Wattage $\pm 10\%$ in cold
- Insulation resistance detail:
 - High voltage stability (cold): 600 V-AC
 - Insulation resistance (cold): ∞ M ohm at 500V-DC before shipping out to customer (see the “**PRECAUTIONS**” section)
 - Leakage current (cold): ≤ 0.5 mA at 253V-AC
- Length tolerance (straight form): Heated section $\pm 1.5\%$, unheated section $\pm 2.5\%$
- Refer drawing and give nearest possible wattage detail: As customer requested
- Warranty: See “**PLEASE NOTE**” & “**TERMS AND CONDITIONS**” sections



F4X2.2 mm Straight MH

Volt	Watt	Heated Length	Unheated Length	W/c m ²	Outlet (M)
230	195	250	30-35	6.29	1
230	215	280	30-35	6.19	1
230	240	335	30-35	5.78	1
230	295	385	30-35	6.18	1
230	350	460	30-35	6.14	1
230	400	520	30-35	6.20	1
230	460	600	30-35	6.18	1
230	610	760	30-35	6.47	1
230	690	900	30-35	6.18	1
230	850	1300	30-35	5.27	1

Thermocouples: Internal thermocouples are available in **Type J** or **K**.



How to order

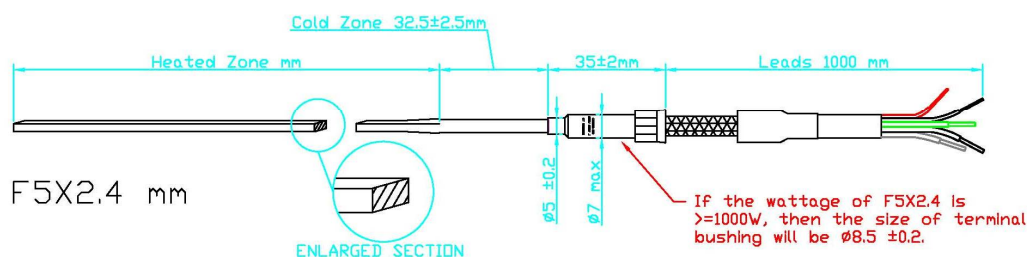
To order your Micro Heater, please specify:

- Volts, Watts, and internal thermocouple type
- Straight length or coiled (if coiled please specify inside diameter, coil width and lead orientation.)
- Lead wire length (Standard lengths PFA 1000 mm will be supplied if not otherwise specified.)
- Lead **CONNECTION TYPE FOR MICRO HEATER** (Standard length and SUS braided metal sleeving will be furnished if not otherwise specified.)

F5X2.4 mm Straight MH

Volt	Watt	Heated Length	Unheated Length	W/c m ²	Outlet (M)
230	195	250	30-35	5.27	1
230	215	280	30-35	5.18	1
230	240	335	30-35	4.84	1
230	295	385	30-35	5.18	1
230	350	460	30-35	5.14	1
230	400	520	30-35	5.20	1
230	460	600	30-35	5.18	1
230	610	760	30-35	5.14	1
230	690	900	30-35	5.18	1
230	850	1300	30-35	4.42	1

Thermocouples: Internal thermocouples are available in **Type J** or **K**.



How to order

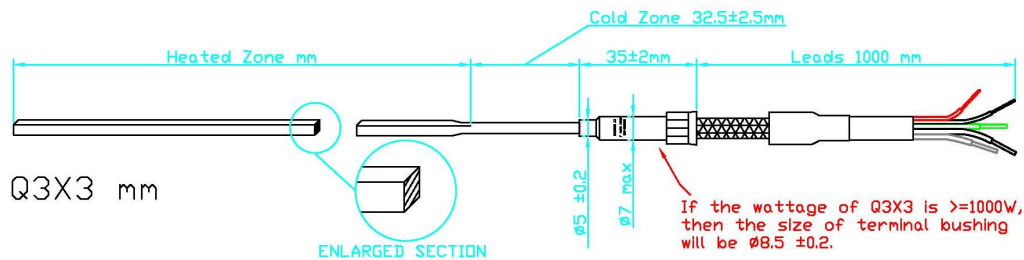
To order your Micro Heater, please specify:

- Volts, Watts, and internal thermocouple type
- Straight length or coiled (if coiled please specify inside diameter, coil width and lead orientation.)
- Lead wire length (Standard lengths PFA 1000 mm will be supplied if not otherwise specified.)
- Lead **CONNECTION TYPE FOR MICRO HEATER** (Standard length and SUS braided metal sleeving will be furnished if not otherwise specified.)

Q3X3 mm Straight MH

Volt	Watt	Heated Length	Unheated Length	W/c m ²	Outlet (M)
230	215	285	30-35	6.29	1
230	300	405	30-35	6.17	1
230	380	450	30-35	7.00	1
230	400	550	30-35	6.06	1
230	420	555	30-35	6.31	1
230	450	650	30-35	5.77	1
230	690	900	30-35	6.39	1
230	920	1340	30-35	5.72	1
230	1150	1675	30-35	5.72	1
230	1200	2290	30-35	4.37	1
230	1300	3310	30-35	3.27	1

Thermocouples: Internal thermocouples are available in **Type J** or **K**.



How to order

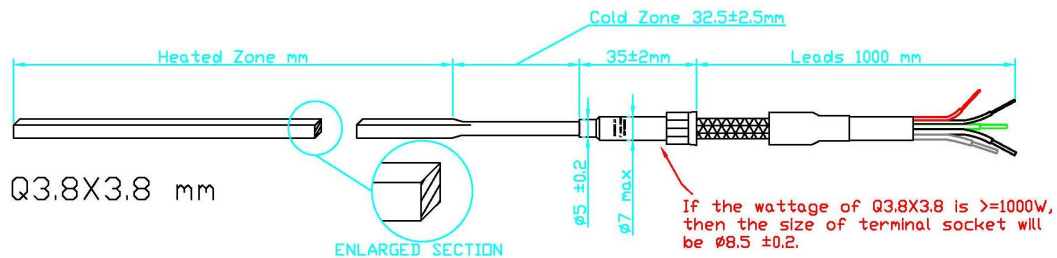
To order your Micro Heater, please specify:

- Volts, Watts, and internal thermocouple type
- Straight length or coiled (if coiled please specify inside diameter, coil width and lead orientation.)
- Lead wire length (Standard lengths PFA 1000 mm will be supplied if not otherwise specified.)
- Lead **CONNECTION TYPE FOR MICRO HEATER** (Standard length and SUS braided metal sleeving will be furnished if not otherwise specified.)

Q3.8X3.8 mm Straight MH

Volt	Watt	Heated Length	Unheated Length	W/c m ²	Outlet (M)
230	215	285	30-35	4.96	1
230	300	405	30-35	4.87	1
230	380	450	30-35	5.56	1
230	400	550	30-35	4.78	1
230	420	555	30-35	6.58	1
230	450	650	30-35	4.55	1
230	690	900	30-35	5.04	1
230	920	1340	30-35	4.52	1
230	1150	1675	30-35	4.52	1
230	1200	2290	30-35	3.45	1
230	1300	3310	30-35	2.58	1

Thermocouples: Internal thermocouples are available in **Type J** or **K**.

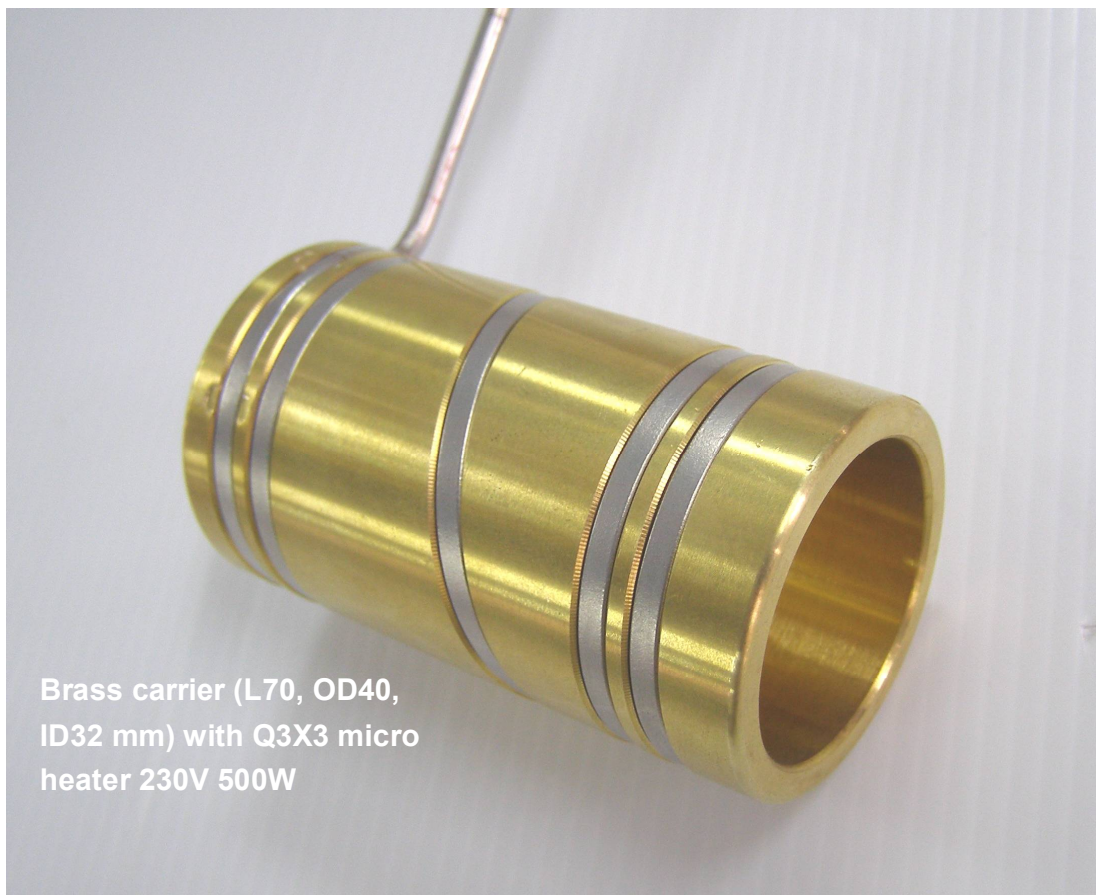


How to order

To order your Micro Heater, please specify:

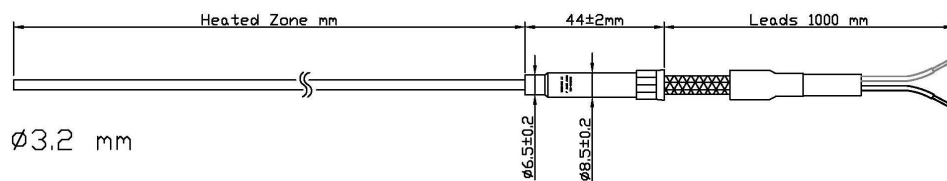
- Volts, Watts, and internal thermocouple type
- Straight length or coiled (if coiled please specify inside diameter, coil width and lead orientation.)
- Lead wire length (Standard lengths PFA 1000 mm will be supplied if not otherwise specified.)
- Lead **CONNECTION TYPE FOR MICRO HEATER** (Standard length and SUS braided metal sleeving will be furnished if not otherwise specified.)

EXAMPLE OF Q3X3 with carrier material: Brass represented



We do also manufactured Q4.8X4.8, Q6X6, Q7X7 and Q9.5X9.5, too!

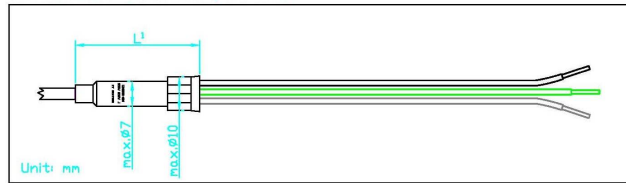
Φ2.4, 2.8, 3.2, 4.0, 4.8 mm Straight MH



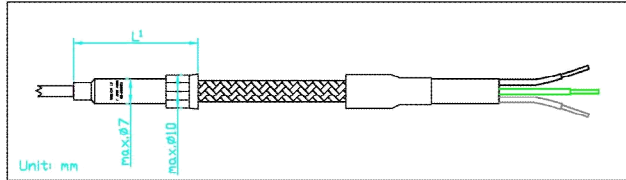
For these three sections, please contact CT HEATERS representative for more information!!

CONNECTION TYPE FOR MICRO HEATER

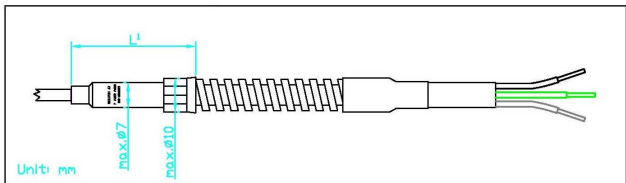
- PFA² insulated nickel leads, stranded (standard)³
- with grounding wire⁴
- If the wattage of heater is $\geq 1000\text{W}$, then the size of bushing will be $\Phi 8.5 \pm 0.2\text{mm}$ or larger (applied to all)



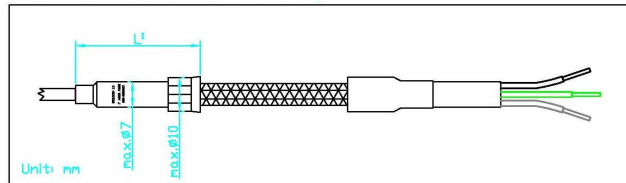
- PFA² insulated nickel leads, stranded (standard)³
- with SUS braided metal sleeving⁵
- with grounding wire⁴



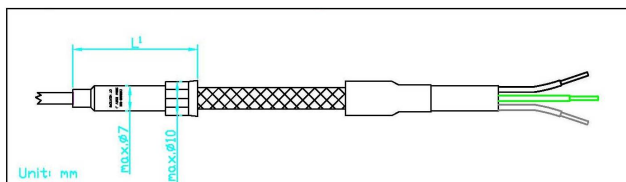
- PFA² insulated nickel leads, stranded (standard)³
- with SUS flexible metal sleeving
- with grounding wire⁴



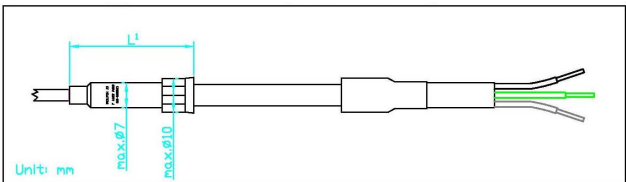
- PFA² insulated nickel leads, stranded (standard)³
- with glass silk insulated protective sleeving⁶
- with grounding wire⁴



- PFA² insulated nickel leads, stranded (standard)³
- with fiberglass insulated protective sleeving⁷
- with grounding wire⁴



- PFA² insulated nickel leads, stranded (standard)³
- with silicon coating glass silk insulated protective sleeving⁸
- with grounding wire⁴



- 1 Length of bushing $L=35 \pm 2\text{ mm}$ (Standard) or $45 \pm 2\text{ mm}$
- 2 Maximum temperature at connection sector: 260°C
- 3 Other types upon request (higher temp. available)
- 4 Green Color TFE insulated Cu-tin plated lead

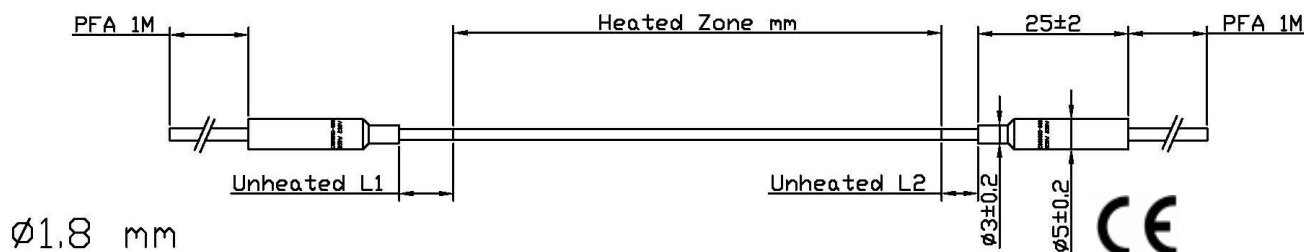
- 5 SUS304, braided metal sleeving $\geq 94\%$ coverage
- 6 Continuously at maximum temperature 600°C (protective sleeving only)
- 7 Continuously at maximum temperature 400°C (protective sleeving only)
- 8 Optional color: red, black, and white, maximum temperature 260°C

TECHNICAL DATA FOR $\Phi 1.8$ mm & F1.8X1.4 mm & F2.3X1.3 mm

- Heater sheath: SUS304
- Minimum internal coiling $\Phi 6$ mm
- The tolerance maintained on coiled length: Coiled length $\pm 2\%$
- Cold heater length (un-heated length): Standard of $\Phi 1.8$ mm is 60/90 and Standard of F1.8X1.4 mm is 140/190. Standard of F2.3X1.3 mm, please contact CT HEATERS representative for more information!
- Power tolerance detail: Wattage $\pm 10\%$ in cold
- Insulation resistance detail:
 - High voltage stability (cold): 600 V-AC
 - Insulation resistance (cold): ∞ M ohm at 500V-DC before shipping out to customer (see the “**PRECAUTIONS**” section)
 - Leakage current (cold): ≤ 0.5 mA at 253V-AC
- Length tolerance (straight form): Heated section $\pm 1.5\%$, unheated section $\pm 2.5\%$
- Refer drawing and give nearest possible wattage detail: As customer requested
- Warranty: See “**PLEASE NOTE**” & “**TERMS AND CONDITIONS**” sections

$\Phi 1.8$ mm STRAIGHT MH

Volt	Watt	Heated Length	Unheated L1 ¹	Unheated L2 ¹	W/c m ²	Outlet (M)
230	125	400	60	90	5.53	1
230	150	450	60	90	5.89	1
230	175	500	60	90	6.19	1
230	200	600	60	90	5.89	1
230	250	700	60	90	6.32	1
230	300	800	60	90	6.63	1
230	400	1000	60	90	7.07	1
230	500	1200	60	90	7.37	1



¹Unheated length L1 & L2 are standard (60 & 90 mm) for $\Phi 1.8$ mm miniature micro heater.

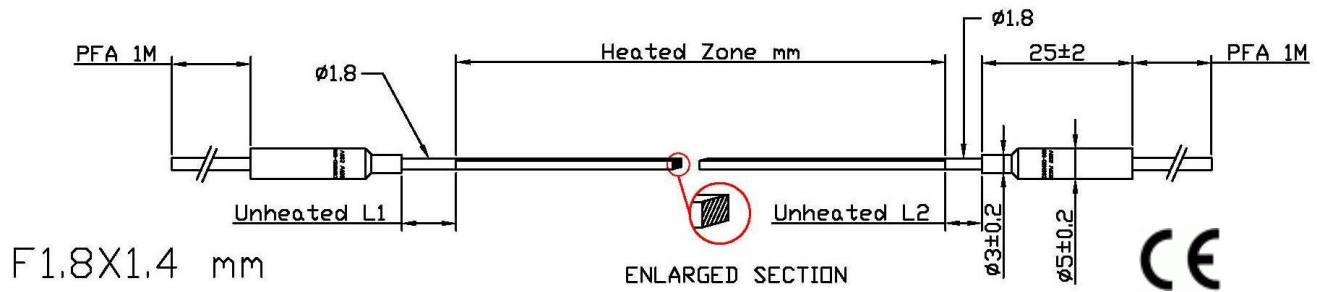
Different unheated length is upon request. For optional connection please refer to

“**CONNECTION TYPE FOR MINITURE MICRO HEATER**” section for detail.

We manufacture products according to drawings which serve as contractual documents. We are not responsible for damage resulting from inappropriate installation or use of our product.

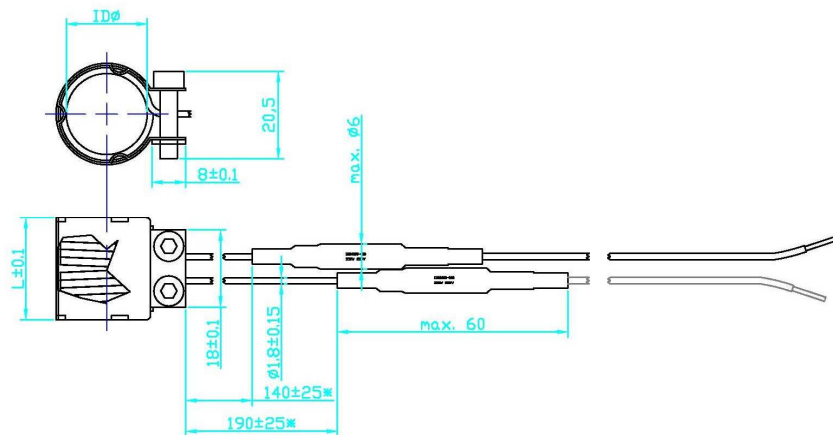
F1.8X1.4 mm STRAIGHT MH

Volt	Watt	Heated Length	Unheated L1 ¹	Unheated L2 ¹	W/c m ²	Outlet (M)
230	125	400	140	190	5.53	1
230	150	450	140	190	5.89	1
230	175	500	140	190	6.19	1
230	200	600	140	190	5.89	1
230	250	700	140	190	6.32	1
230	300	800	140	190	6.63	1
230	400	1000	140	190	7.07	1
230	500	1200	140	190	7.37	1



¹Unheated length L1 & L2 are standard (140 & 190 mm) for F1.8X1.4 mm miniature micro heater. Different unheated length is upon request. For optional connection please refer to “CONNECTION TYPE FOR MINITURE MICRO HEATER” section for detail.

**EXAMPLE OF F1.8X1.4
with clamping and tangential screwing**



L=Coiled length measurement of mm

*Other lengths of unheated lengths available upon request

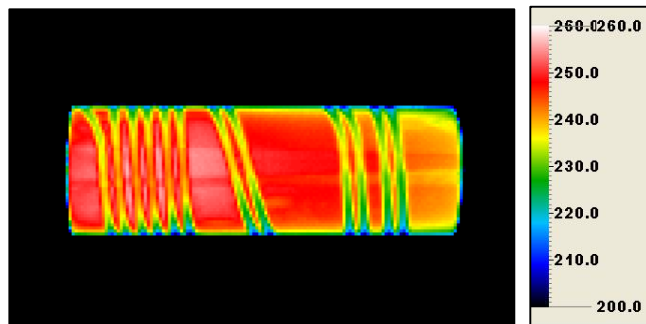
We manufacture products according to drawings which serve as contractual documents. We are not responsible for damage resulting from inappropriate installation or use of our product.

EXAMPLE OF $\Phi 1.8$ with carrier material: Brass represented
Other dimensions and product variants upon request.

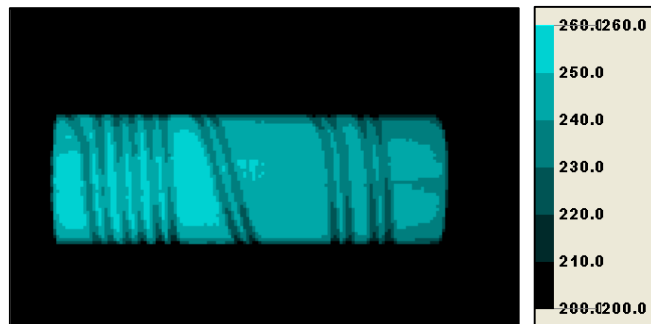


Thermo Image Analysis Service available upon request!

The actual **thermo**
imaging and contour
temperature analysis
 for brass carrier (L80,
 OD28, ID22 mm)
 with $\Phi 1.8$ miniature
 micro heater 240V
 375W with set
 temperature at 250°C



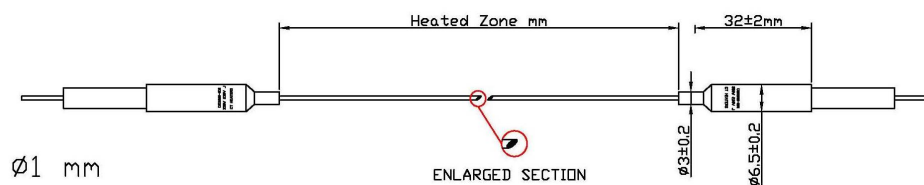
Thermo Image Analysis



Contour Temperature Analysis

We manufacture products according to drawings which serve as contractual documents. We are not responsible for damage resulting from inappropriate installation or use of our product.

Φ1.0, 1.6, 1.8, 2.4, 2.8, 3.2, 4, 4.8, 5.4, 6.35, 6.7 mm Straight MH

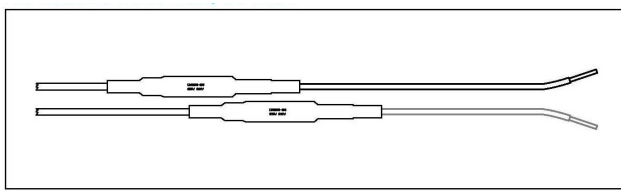
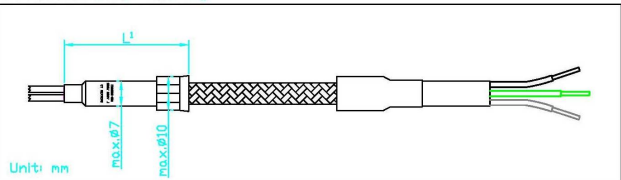
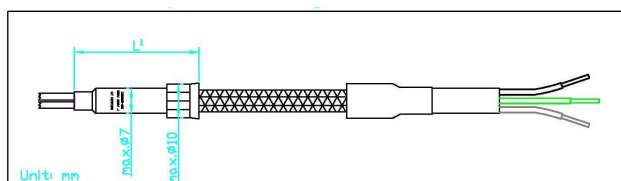
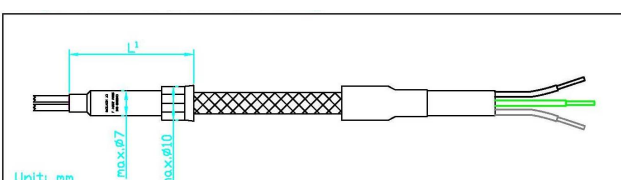
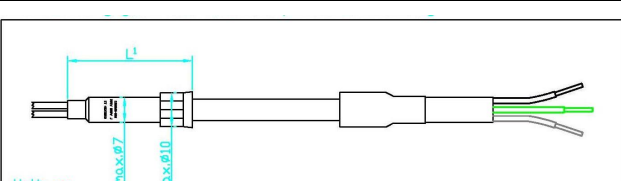


How to order

To order your Micro Heater, please specify:

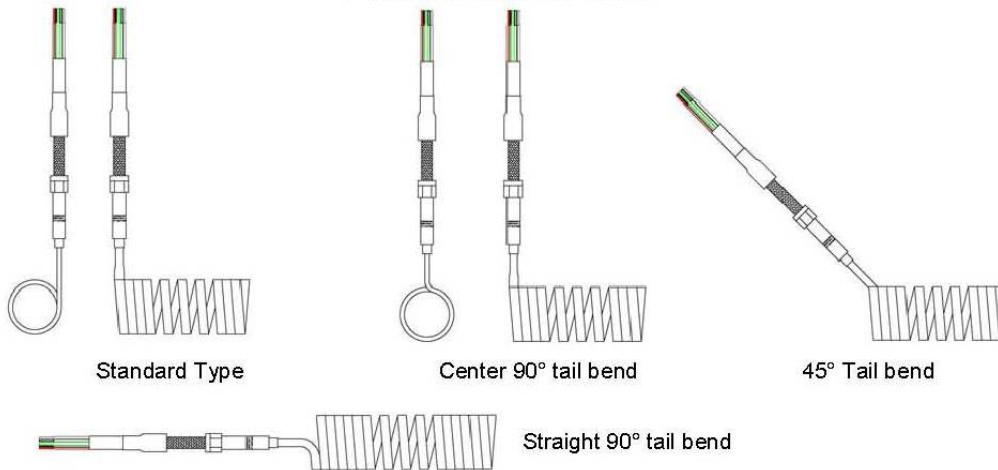
- Volts, Watts
- Straight length or coiled (if coiled please specify inside diameter, coil width and lead orientation.)
- Lead wire length (Standard lengths 1000 mm will be supplied if not otherwise specified.)
- Lead **CONNECTION TYPE FOR MINITURE MICRO HEATER** (Standard length PFA insulated nickel leads will be furnished if not otherwise specified.)

CONNECTION TYPE FOR MINITURE MICRO HEATER

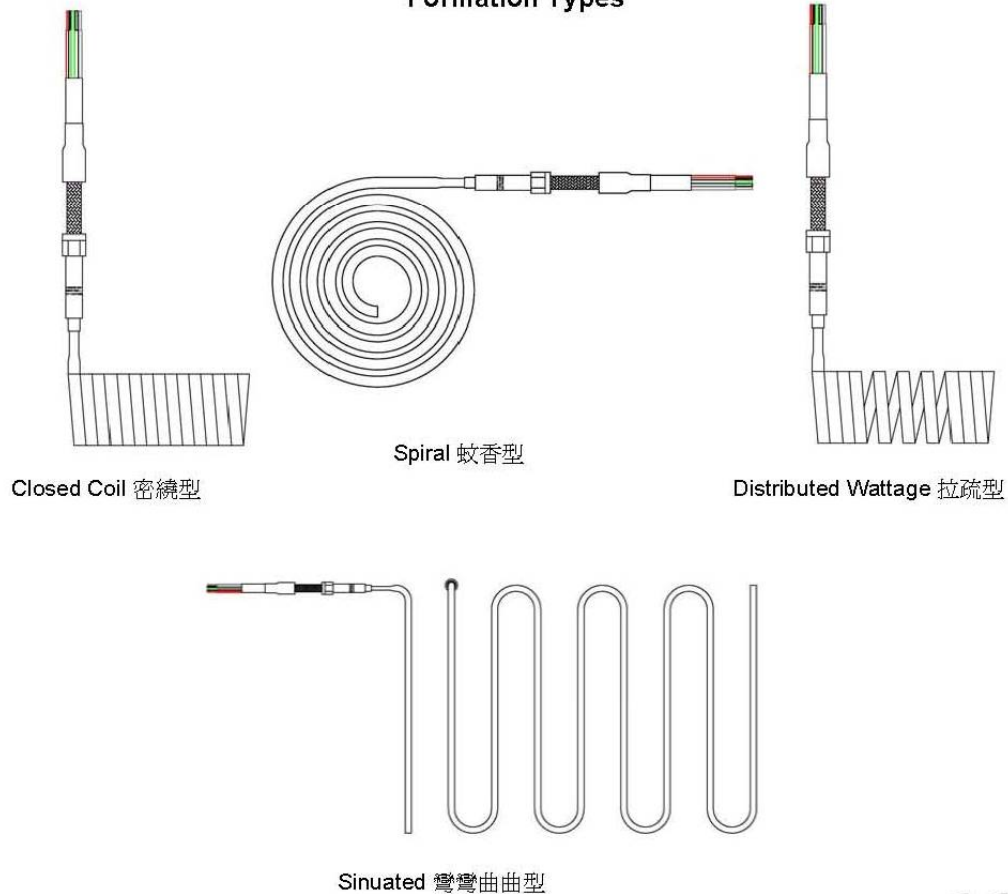
● PFA² insulated nickel leads, stranded (standard)³	
● PFA² insulated nickel leads, stranded (standard)³ ● with grounding wire⁴	 Unit: mm max. $\phi 7$ max. $\phi 10$
● PFA² insulated nickel leads, stranded (standard)³ ● with SUS braided metal sleeving⁵ ● with grounding wire⁴	 Unit: mm max. $\phi 7$ max. $\phi 10$
● PFA² insulated nickel leads, stranded (standard)³ ● with glass silk insulated protective sleeving⁶ ● with grounding wire⁴	 Unit: mm max. $\phi 7$ max. $\phi 10$
● PFA² insulated nickel leads, stranded (standard)³ ● with fiberglass insulated protective sleeving⁷ ● with grounding wire⁴	 Unit: mm max. $\phi 7$ max. $\phi 10$
● PFA² insulated nickel leads, stranded (standard)³ ● with silicon coating glass silk insulated protective sleeving⁸ ● with grounding wire⁴	 Unit: mm max. $\phi 7$ max. $\phi 10$
1 Length of bushing L=25±2 mm (Standard) 2 Maximum temperature at connection sector: 260℃ 3 Other types upon request (higher temp. available) 4 Green Color TFE insulated Cu-tin plated lead	5 SUS304, braided metal sleeving ≥94% coverage 6 Continuously at maximum temperature 600℃ (protective sleeving only) 7 Continuously at maximum temperature 400℃ (protective sleeving only) 8 Optional color: red, black, and white, maximum temperature 260℃

LEAD ORIENTATION

Lead Orientation Types



Formation Types



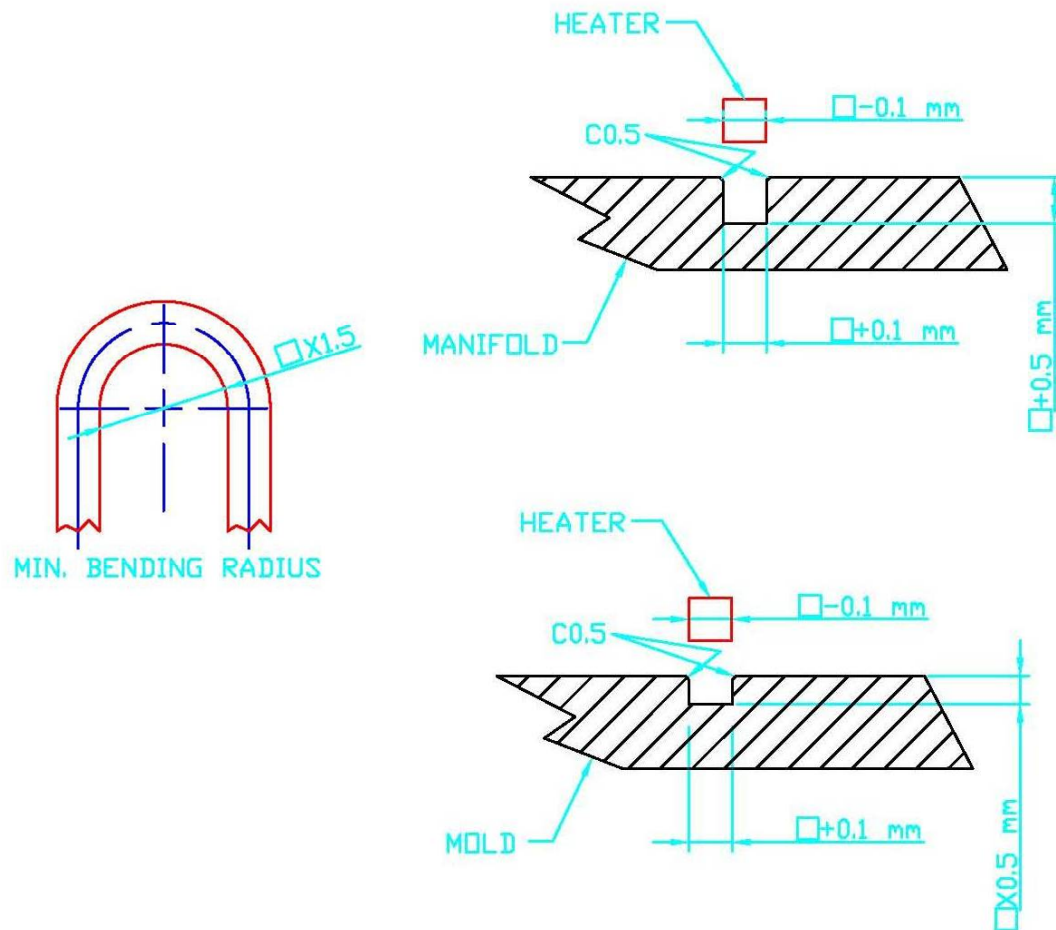
For other geometrical formations, please consult your CT HEATERS representative.

HEATER FOR MANIFOLD SYSTEMS TUBULAR HEATER



Tubular Heater Q6X6, Q7X7, and Q9.5X9.5, $\Phi 8$, $\Phi 10.8$,

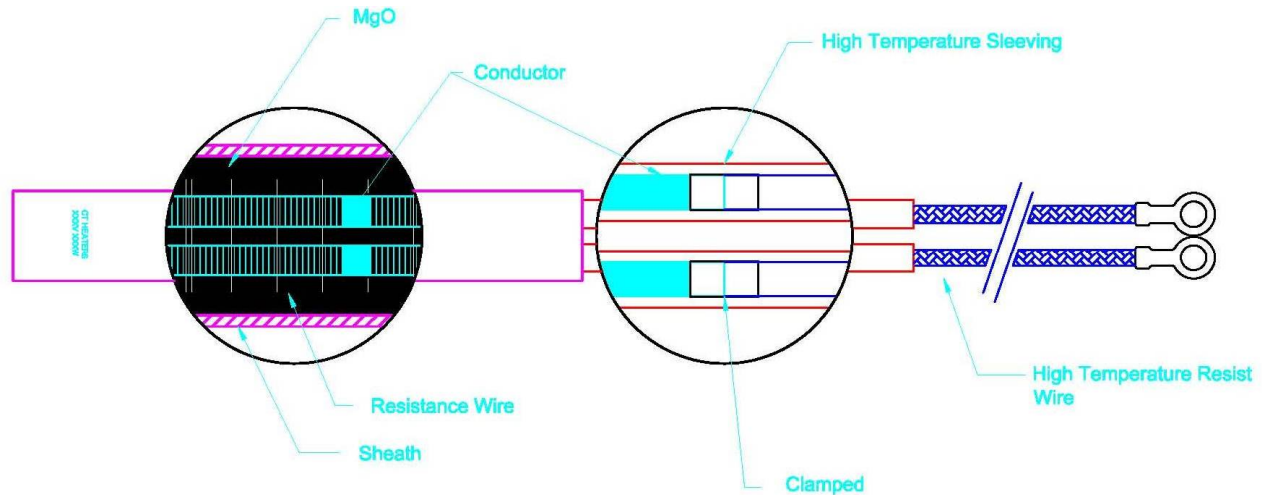
INSTALLATION- for our bending service, please provide the manifold(s) or mold plate(s). The detail of groove as the following



HEATER FOR MANIFOLD SYSTEMS

CARTRIDGE HEATER

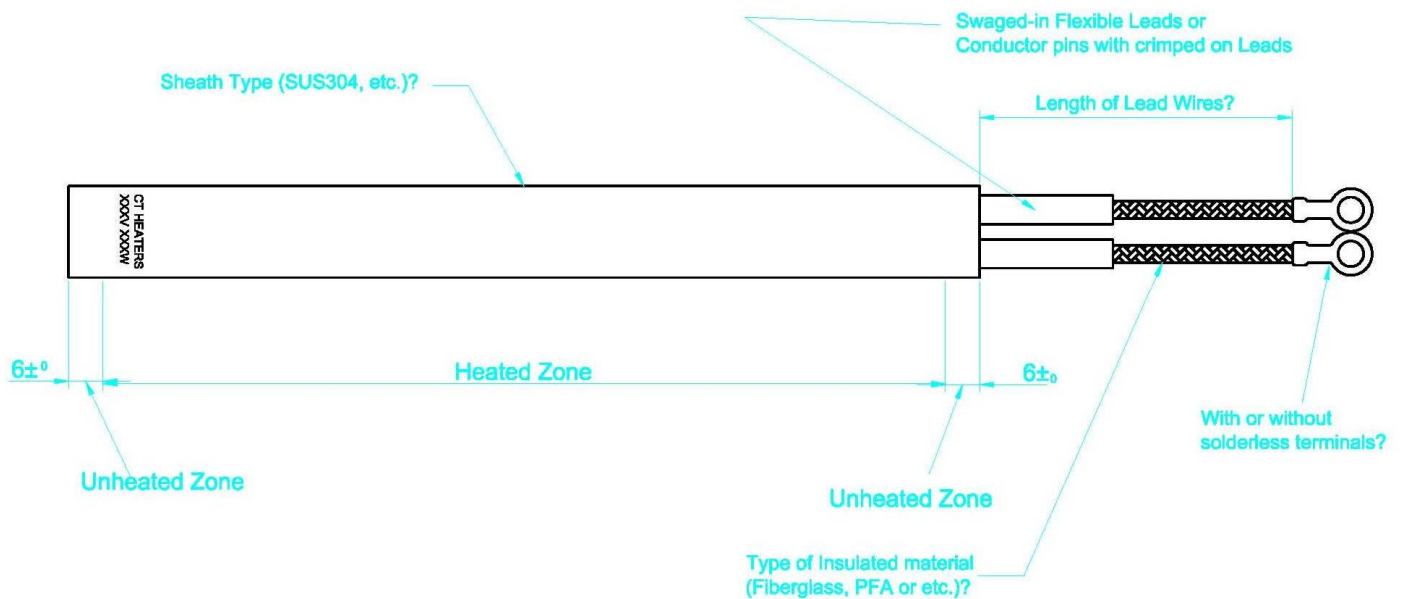
Basic Construction



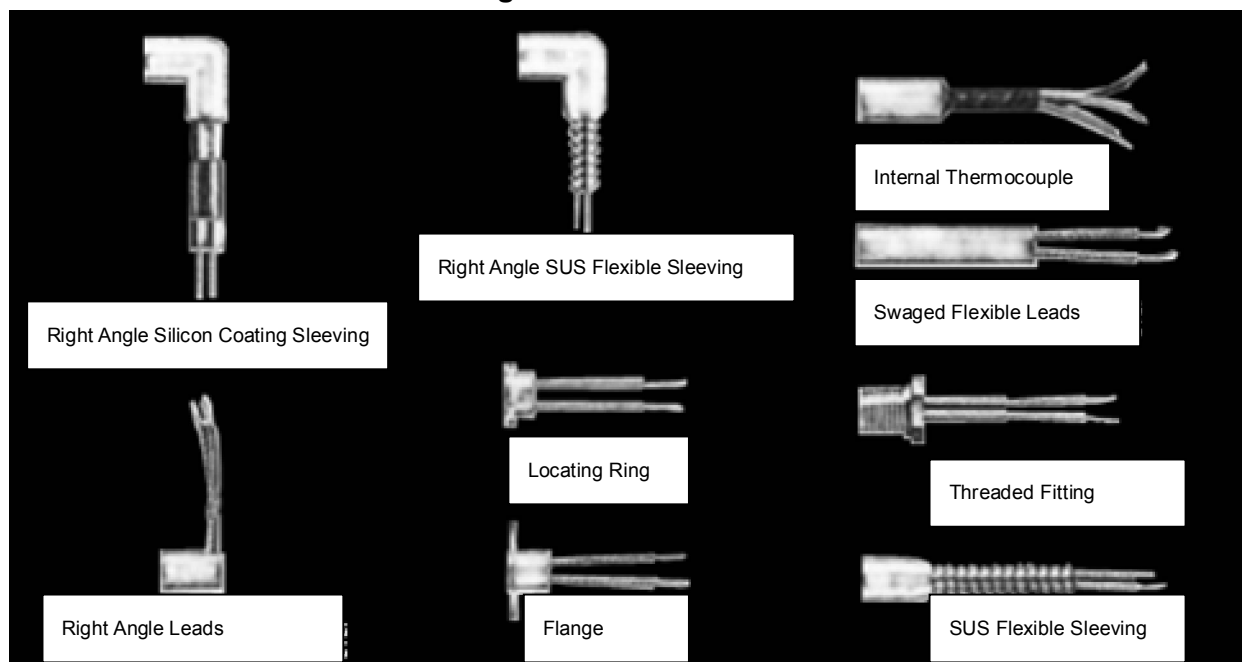
How to order

To order your Cartridge Heater, please specify:

- Volts, Watts, OD Φ of your actual insertion holes (tolerance of insertion holes: if the overall length of element is ≤ 100 , then the OD Φ of element will be +0, -0.03~0.04mm. if the overall length of element is >100 , then the OD Φ of element will be +0, -0.05~0.1mm)
- Overall length of element (excluded the lead wires), length of heated zone
- Lead wire length (Standard lengths 300 mm will be supplied if not otherwise specified.) and lead orientation
- Internal thermocouple available upon request

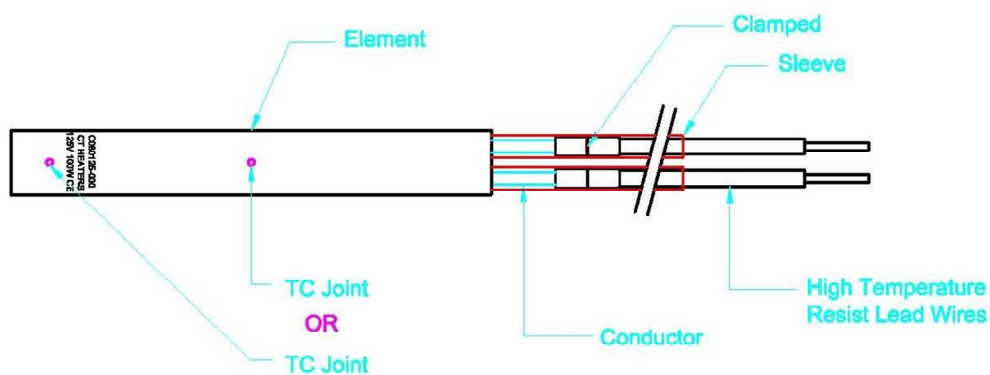


Lead Orientation for Cartridge Heater



For other lead orientations, please contact CT HEATERS Representative for more detail.

Position of thermocouple



Thermocouple Types: J or K type

For more information on Cartridge heater section, please e-mail us at
ct.heaters@msa.hinet.net

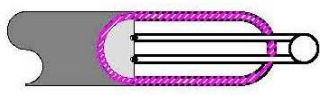
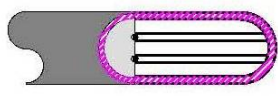
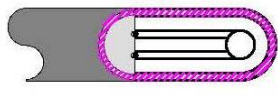
THERMOCOUPLES FOR HOT RUNNER SYSTEM

OPTIONAL THERMOCOUPLE TYPES

ANSI CODE	CONDUCTOR CHARACTERISTICS		TEMPERATURE RANGE	
	POSITIVE +	NEGATIVE -	°C	°F
J	IRON MAGNETIC WHITE	CONSTANTAN NON-MAGNETIC RED	-20 TO 760	0 TO 1400
K	CHROMEL® NON-MAGNETIC YELLOW	ALUMEL® MAGNETIC RED		

ALUMEL® and CHROMEL® are registered trademarks of the Hoskins Manufacturing Company

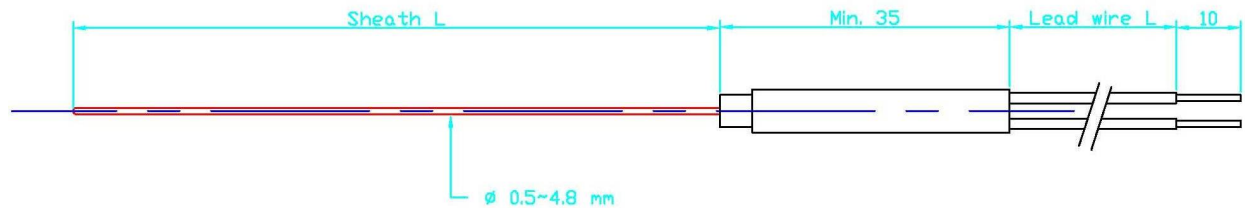
Junction Styles

 Exposed Junction	An exposed junction is recommended for the measurement of static or flowing non-corrosive gas temperatures where fast response time is required
 Grounded Junction	A grounded junction is recommended for the measurement of static or flowing corrosive gas and liquid temperatures and for high-pressure applications. The junction of a grounded thermocouple is welded to the protective sheath giving faster response than the ungrounded junction type.
 Ungrounded Junction	An ungrounded junction is recommended for measurements in corrosive environments it is desirable to have the thermocouple electronically isolated from and shielded by the sheath. The welded wire thermocouple is physically insulated from the thermocouple sheath by MgO.

MINERAL INSULATED SHEATH TYPE FOR NOZZLE

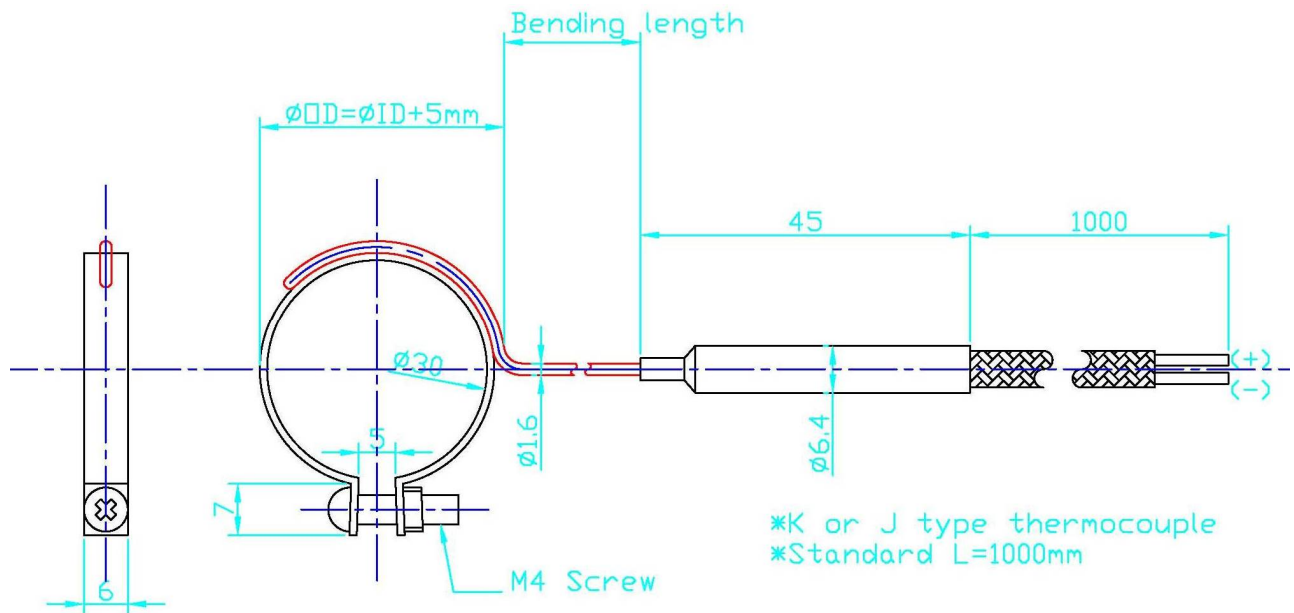
Basic Sheath Thermocouple

(Grounded or Ungrounded Junction)



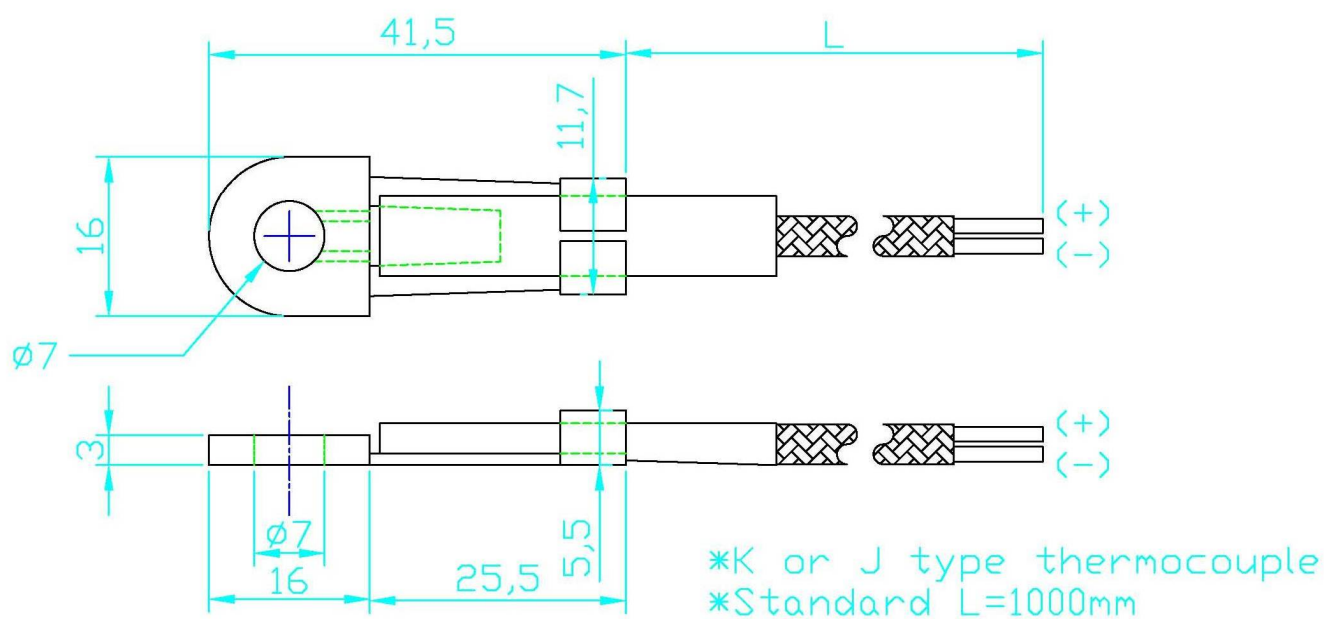
Clamp Type Sheath Thermocouple

(Grounded or Ungrounded Junction)

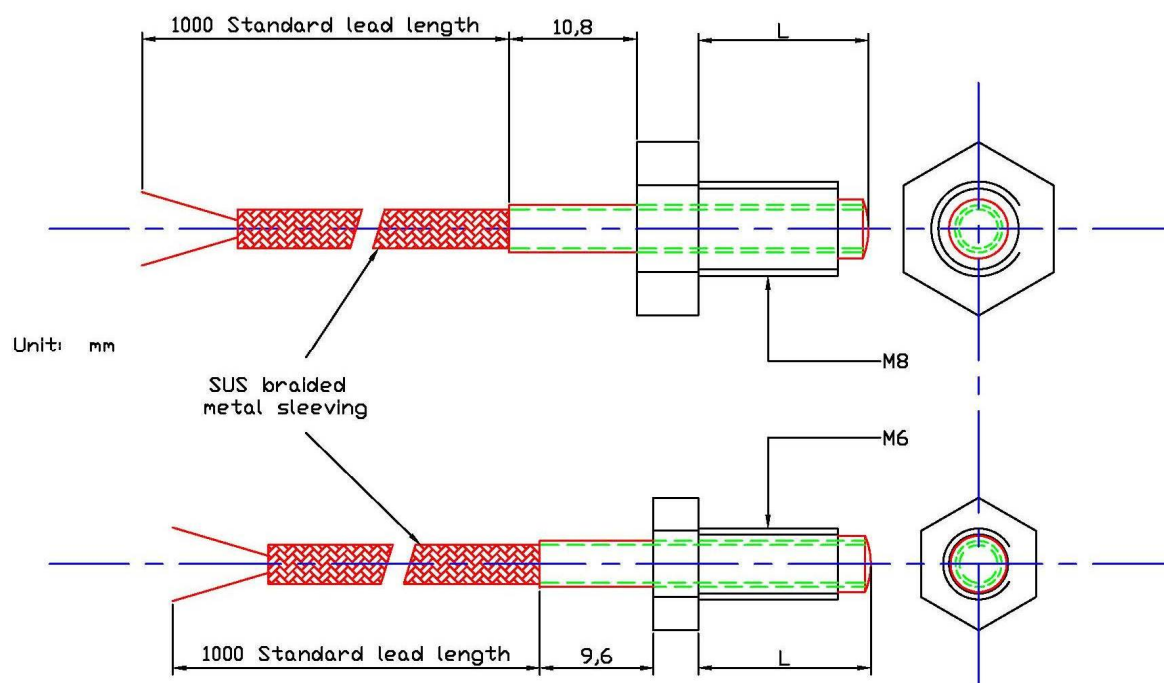


THERMOCOUPLE FOR MAINFOLD

Ring Terminal Style (Grounded & Exposed Junction)

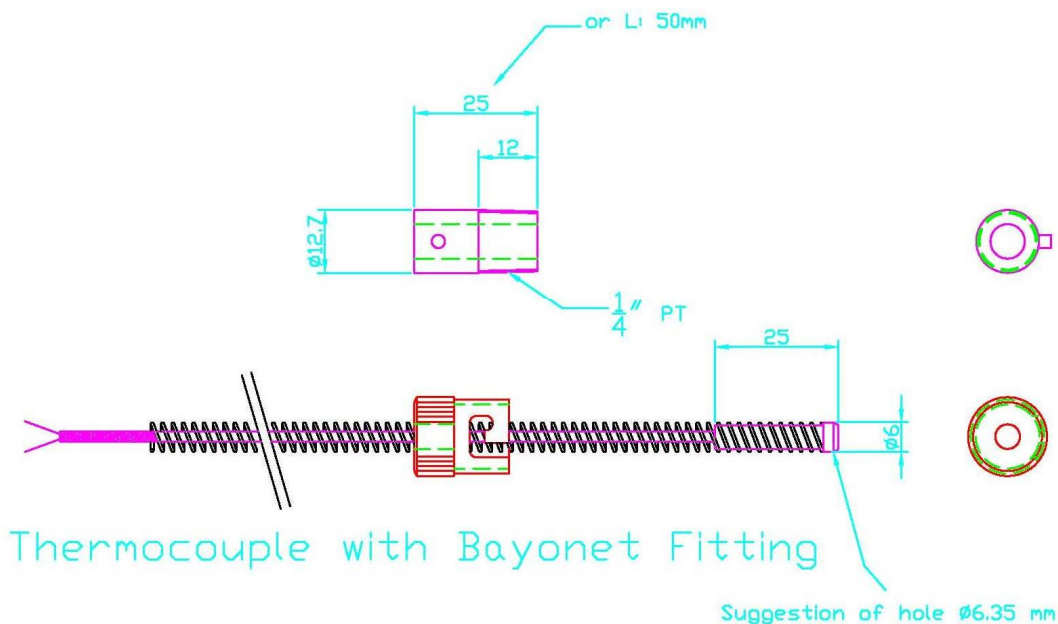


Nozzle Style (Grounded Junction)



Spring Variable Adjustable Thermocouple Style (Grounded Junction)

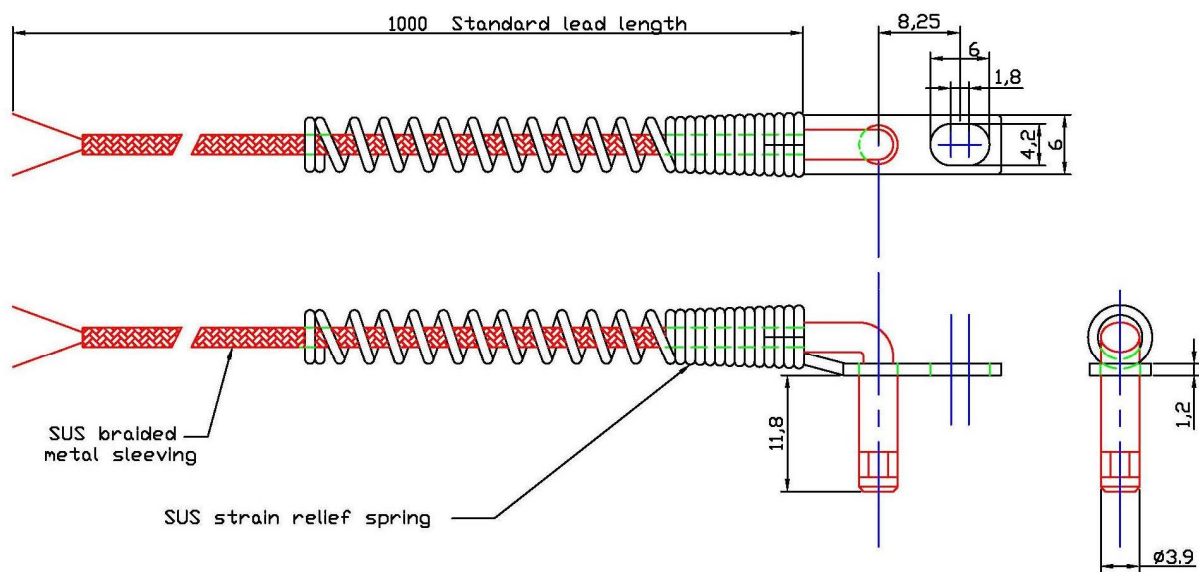
Bayonet Adapter



SST Plate type (Grounded Junction)

Suggestion for installation:

- *Drilling a $\phi 4.1$ X 11.5 mm deep hole
- * Offset 8.25 mm, then drilling a hole for M4X10



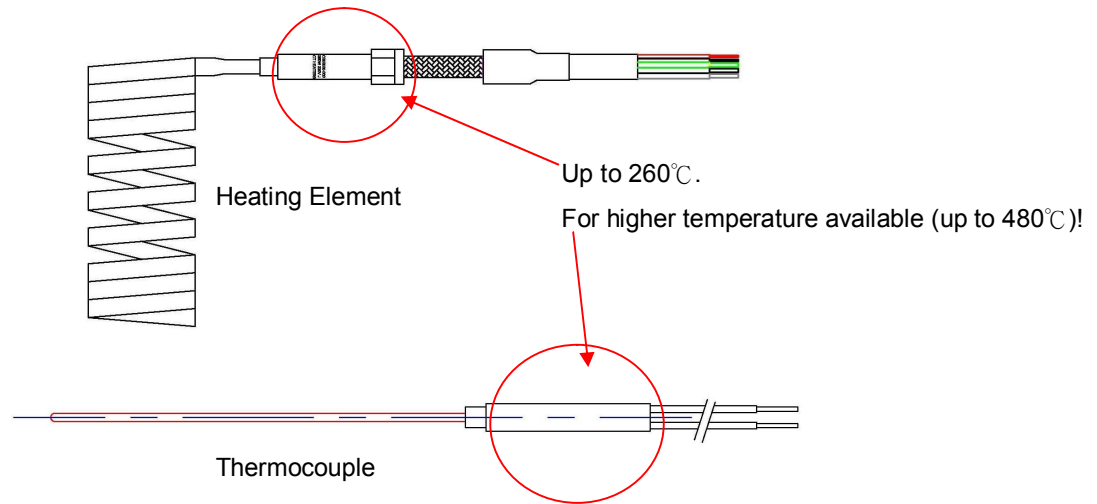
There are many different types and shapes of thermocouples for Hot Runner System.

Please write us an e-mail to ct.heaters@msa.hinet.net for more information!

We manufacture products according to drawings which serve as contractual documents. We are not responsible for damage resulting from inappropriate installation or use of our product.

PRECAUTIONS

1. Coil Heaters are hygroscopic in nature due to MgO contents. If kept unused for longer period, there is moisture deposition on the terminals. Therefore CT HEATERS recommend you to de-moisture the heaters prior to installation by heating them at 90~120°C in an oven for at least 2 hours or use controllers with soft start function. This will help evaporate any moisture present inside.
2. Adapter area should be kept under 260°C



3. Stabilized voltage supply increases the life of the heater as well as increases the wattage output. Grounding connection is must at all the time (green color coded wire).
4. Unheated zone once bent should not be re-bent or de-coiled. This will lead to breakage. Sharp edges along the lead wire path areas should be protected from combustible gases & liquid to avoid short-circuits.

INSTALLATION

1. Due to high watt densities per cm/sq, COIL & CAST-IN HEATERS are requiring precise temperature controllers. CT HEATERS strongly recommends to using good quality soft start Hot Runner controllers.
2. While installing Coil Heaters on to the nozzle, they should be tight fit for even heat transfer. There should not be air gaps between the heater and the nozzle. Never open the ID of the heater by twisting as it will not fit tight which leads to premature heater failure.

TERMS AND CONDITIONS

1. CT HEATERS warrants its Products against defects in material and workmanship for three months from the date of delivery. Many of Heaters are hygroscopic in nature due to MgO contents. If kept unused for longer period, there is moisture deposition on the terminals. Therefore CT HEATERS recommend you to de-moisture the heaters prior to installation by heating them at 90~120°C in an oven for at least 2 hours or use controllers with soft start function. This will help evaporate any moisture present inside. CT HEATERS do not warrant any PRODUCT against damage from corrosion, contamination, misapplication, improper specification or wear and tear and operational conditions beyond CT HEATERS' control. In no event shall CT HEATERS be liable for special, indirect, incidental or consequential damages. CT HEATERS shall not be liable for, and buyer and any other person or entity to whom Products are transferred during the period of this warranty assumes responsibility for, all personal injury and property damage resulting from or related to the handling, possession or use of Products and Products manufactured and sold by CT HEATERS hereunder.
2. Deliveries may be suspended by either party in the event of: Act of God, war, riot, fire, explosion, accident, flood, sabotage; lack of adequate fuel, power, raw materials, labor, containers or transportation facilities; compliance with Governmental Requirements; breakage or failure of machinery or apparatus; national defense requirements or any other event, whether or not of the class or kind enumerated herein, beyond the reasonable control of such party; or in the event of labor trouble, strike, lockout or injunction which event makes impracticable the manufacture, transportation, sale, purchase, acceptance, use or resale of Products or a material upon which the manufacture of Products is dependent.
3. If Buyer orders and/or CT HEATERS delivers a Product designated as a "Prototype", no guarantees, warranties or representations as to fitness for a particular purpose or merchantability are made with respect to such Prototype. Buyer shall have the duty and sole responsibility to test a Prototype prior to acceptance and/or incorporation into end-use applications. Further, a production Product based on a Prototype design may differ in assembly methods and materials from the Prototype. Buyer, therefore, shall have the duty and sole responsibility for testing and acceptance of production Products which are based on Prototype designs.

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PLEASE NOTE:

No warranty shall attach to all consumable parts (including the heater elements, thermocouples, etc.); therefore, you are requested to observe the above conditions. CT HEATERS dose not warrant any PRODUCT against damage from corrosion, contamination, misapplication, improper specification or wear and tear and operational conditions beyond CT HEATERS' control.

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