

# CARTRIDGE HEATERS

High efficiency and long life, trusted by professionals!!

## ULTRA FIVE

HL Type / SL Type Cartridge Heaters

Inch Size Cartridge Heaters

New Ultra Five

L Type Cartridge Heaters

Cartridge Heaters w/ Internal Thermocouple

**NEW** L Type w/ Internal Thermocouple

Cartridge Heaters w/ Flange

## ULTRA W800

## ULTRA W

## ULTRA WL

## ULTRA W TITANIUM



**HAKKO ELECTRIC CO., LTD.**

[www.hakko.co.jp](http://www.hakko.co.jp)

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# Professional cartridge heaters with outstanding durability that can be trusted by users.

Hakko's cartridge heaters "Ultra Five" has earned great trust from many users due to its excellent durability. Stable operation for long period is assured for molding dies, hot plates or other applications where breakdowns are not tolerated.

## High Efficiency

High precision heaters that are developed through many years of research and practical applications. The heat generated from the heating wires are transferred to the object to be heated without loss.

## Long Life

Longer life compared to conventional products with the use of high performance nickel alloy for heating wire, and temperature resistant insulation magnesia developed originally by our company.

## Robust

Metal sheath is made of stainless steel pipe (SUS304). Robust structure designed to withstand mechanical vibrations or shocks, which has passed long-term testing.

## Excellent Electrical Properties

Excellent electrical insulation and maintains stable insulation performance even at high temperatures.

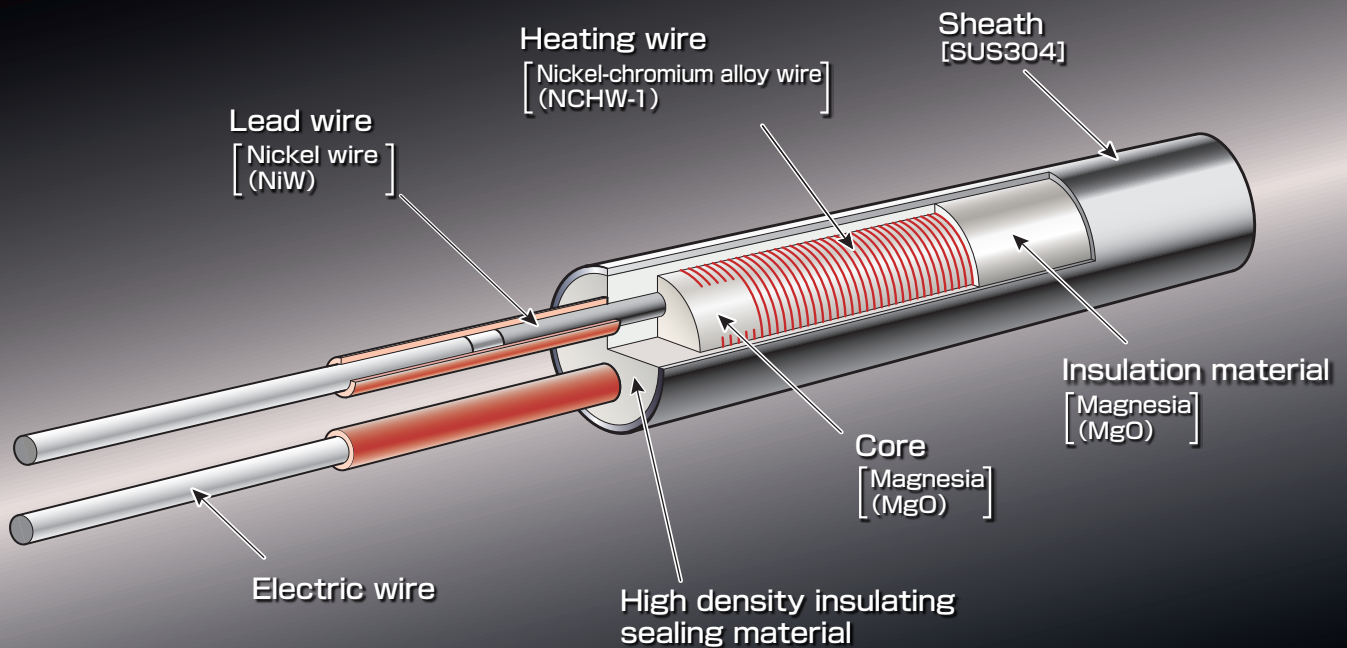
## Workability

Smooth and compact wiring can be done even for multiple installations.

## Wide Variety

Wide variety of products to meet the needs of customers. In addition to millimeter and inch size series, lineup for "water heating" is also available.

The structure of Hakko cartridge heater "Ultra Five" (HL type is shown in the figure)



### ● Sheath

The sheath of cartridge heater is the part that is in direct contact with the object to be heated, therefore it is required that it can efficiently transfer heat, fitted easily and robust. Moreover, it is also important that it has good machinability. Standard specifications "Ultra Five" uses SUS304 for the sheath. For special applications, NCF800 or titanium are also available.

### ● Insulation material

The insulation material separates the heating wire from the sheath. For "Ultra Five", the electrical insulation is excellent at high temperatures. Magnesium oxide (MgO, magnesia) with outstanding thermal conductivity is used. High insulation performance is proven for long usage.

### ● Heating wire

Heating wire is crucial to the cartridge heater. The heating wire for "Ultra Five" uses good quality high performance nickel alloy, which has low impurities and no unevenness in resistance or wire diameter. The high performance nickel alloy is wound with high precision and densely sealed with insulation material.

### ● Core

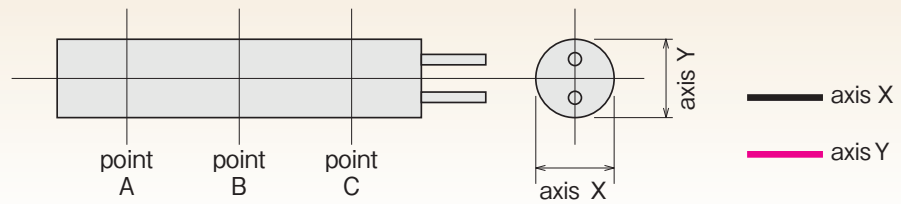
Located at the center of the cartridge heater, it is wound with heating wire. Magnesia ceramics which are magnesia that is baked with high precision are used.

# Structure and performance of products from other manufacturers

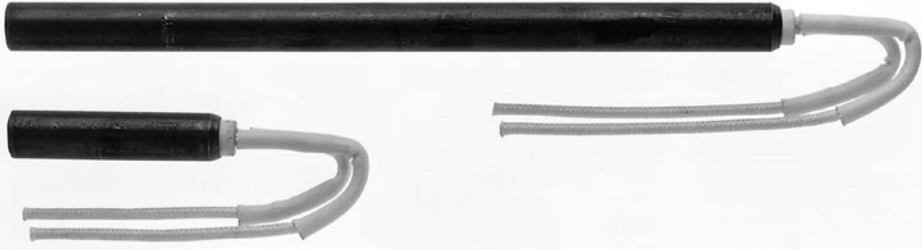
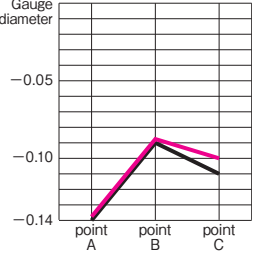
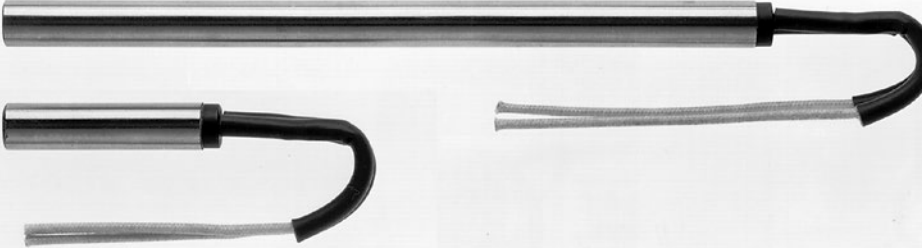
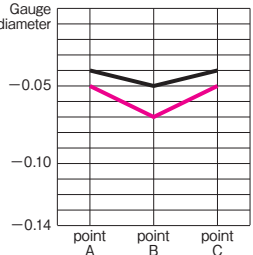
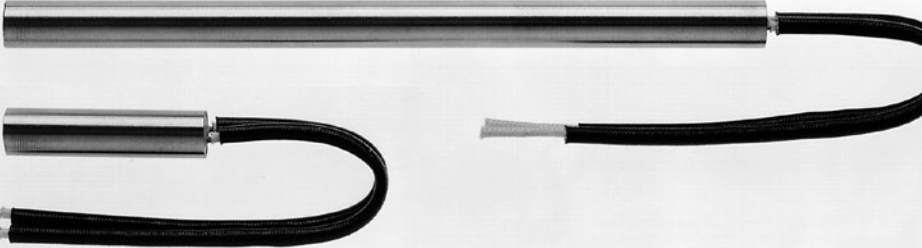
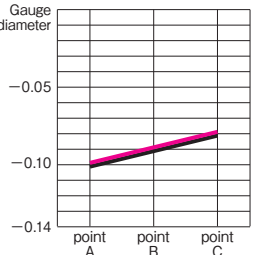
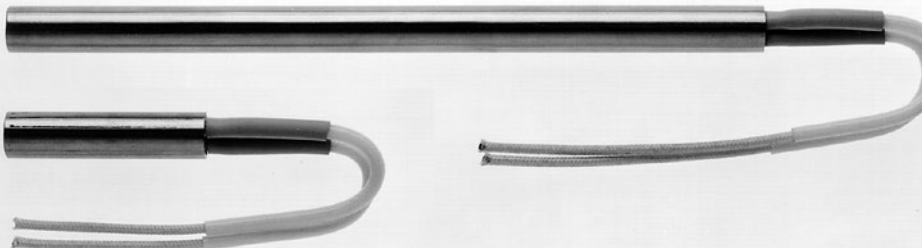
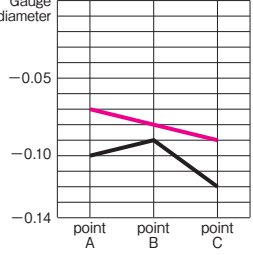

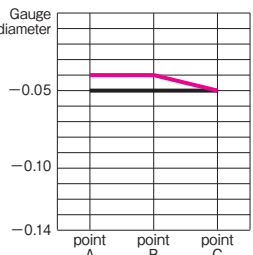
Although the tubular shape of cartridge heaters appears to be the same for all manufacturers, the structure and dimensional accuracy varies significantly. The following is a comparison of some products obtain from several manufactures in Japan and the United States. The comparison was conducted for heaters with length of 50mm. Pictures of heaters with length of 190mm was also included for reference.

## Appearance and dimensions

The appearance (top: length 190mm, bottom: length 50mm) and heater sheath diameter (for heater of length 50mm) of cartridge heaters from several manufactures are shown as follows. Some heaters have diameters which varies with position, while others have excellent precision.



	Appearance	Sheath diameter
Company A		
Company B		

	Appearance	Sheath diameter												
Company C		 <table border="1"> <caption>Gauge diameter data for Company C</caption> <thead> <tr> <th>Point</th> <th>Black Catheter</th> <th>Braided Catheter</th> </tr> </thead> <tbody> <tr> <td>point A</td> <td>-0.14</td> <td>-0.14</td> </tr> <tr> <td>point B</td> <td>-0.08</td> <td>-0.08</td> </tr> <tr> <td>point C</td> <td>-0.11</td> <td>-0.10</td> </tr> </tbody> </table>	Point	Black Catheter	Braided Catheter	point A	-0.14	-0.14	point B	-0.08	-0.08	point C	-0.11	-0.10
Point	Black Catheter	Braided Catheter												
point A	-0.14	-0.14												
point B	-0.08	-0.08												
point C	-0.11	-0.10												
Company D		 <table border="1"> <caption>Gauge diameter data for Company D</caption> <thead> <tr> <th>Point</th> <th>Black Catheter</th> <th>Braided Catheter</th> </tr> </thead> <tbody> <tr> <td>point A</td> <td>-0.04</td> <td>-0.05</td> </tr> <tr> <td>point B</td> <td>-0.05</td> <td>-0.07</td> </tr> <tr> <td>point C</td> <td>-0.04</td> <td>-0.05</td> </tr> </tbody> </table>	Point	Black Catheter	Braided Catheter	point A	-0.04	-0.05	point B	-0.05	-0.07	point C	-0.04	-0.05
Point	Black Catheter	Braided Catheter												
point A	-0.04	-0.05												
point B	-0.05	-0.07												
point C	-0.04	-0.05												
Company E		 <table border="1"> <caption>Gauge diameter data for Company E</caption> <thead> <tr> <th>Point</th> <th>Black Catheter</th> <th>Braided Catheter</th> </tr> </thead> <tbody> <tr> <td>point A</td> <td>-0.10</td> <td>-0.10</td> </tr> <tr> <td>point B</td> <td>-0.08</td> <td>-0.08</td> </tr> <tr> <td>point C</td> <td>-0.07</td> <td>-0.07</td> </tr> </tbody> </table>	Point	Black Catheter	Braided Catheter	point A	-0.10	-0.10	point B	-0.08	-0.08	point C	-0.07	-0.07
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Company F		 <table border="1"> <caption>Gauge diameter data for Company F</caption> <thead> <tr> <th>Point</th> <th>Black Catheter</th> <th>Braided Catheter</th> </tr> </thead> <tbody> <tr> <td>point A</td> <td>-0.10</td> <td>-0.07</td> </tr> <tr> <td>point B</td> <td>-0.09</td> <td>-0.09</td> </tr> <tr> <td>point C</td> <td>-0.13</td> <td>-0.09</td> </tr> </tbody> </table>	Point	Black Catheter	Braided Catheter	point A	-0.10	-0.07	point B	-0.09	-0.09	point C	-0.13	-0.09
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point A	-0.10	-0.07												
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Hakko		 <table border="1"> <caption>Gauge diameter data for Hakko</caption> <thead> <tr> <th>Point</th> <th>Black Catheter</th> <th>Braided Catheter</th> </tr> </thead> <tbody> <tr> <td>point A</td> <td>-0.05</td> <td>-0.04</td> </tr> <tr> <td>point B</td> <td>-0.05</td> <td>-0.04</td> </tr> <tr> <td>point C</td> <td>-0.05</td> <td>-0.05</td> </tr> </tbody> </table>	Point	Black Catheter	Braided Catheter	point A	-0.05	-0.04	point B	-0.05	-0.04	point C	-0.05	-0.05
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point B	-0.05	-0.04												
point C	-0.05	-0.05												

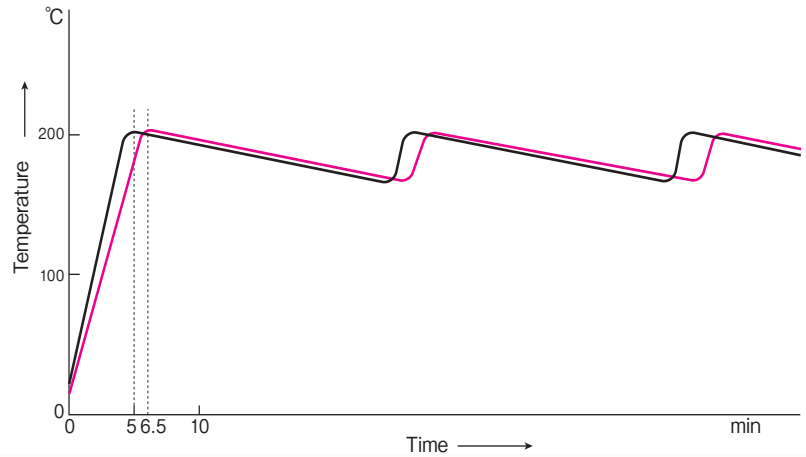
# Response performance

The test was setup with a  $\phi 12 \times L50$  cartridge heater inserted into the  $\phi 12.5$  hole of a  $\phi 62.5 \times L50$  metal cylinder. Temperature was controlled with the settings of 180°C OFF and 150°C ON.

After switching on power supply, the metal cylinder reaches 200°C in 5-6.5mins, depending on the heater used. The temperature recorded is higher than the temperature set because of overshooting. This graph is one of the examples. The better the response (shorter time), the higher the efficiency for applications such as resin molding.

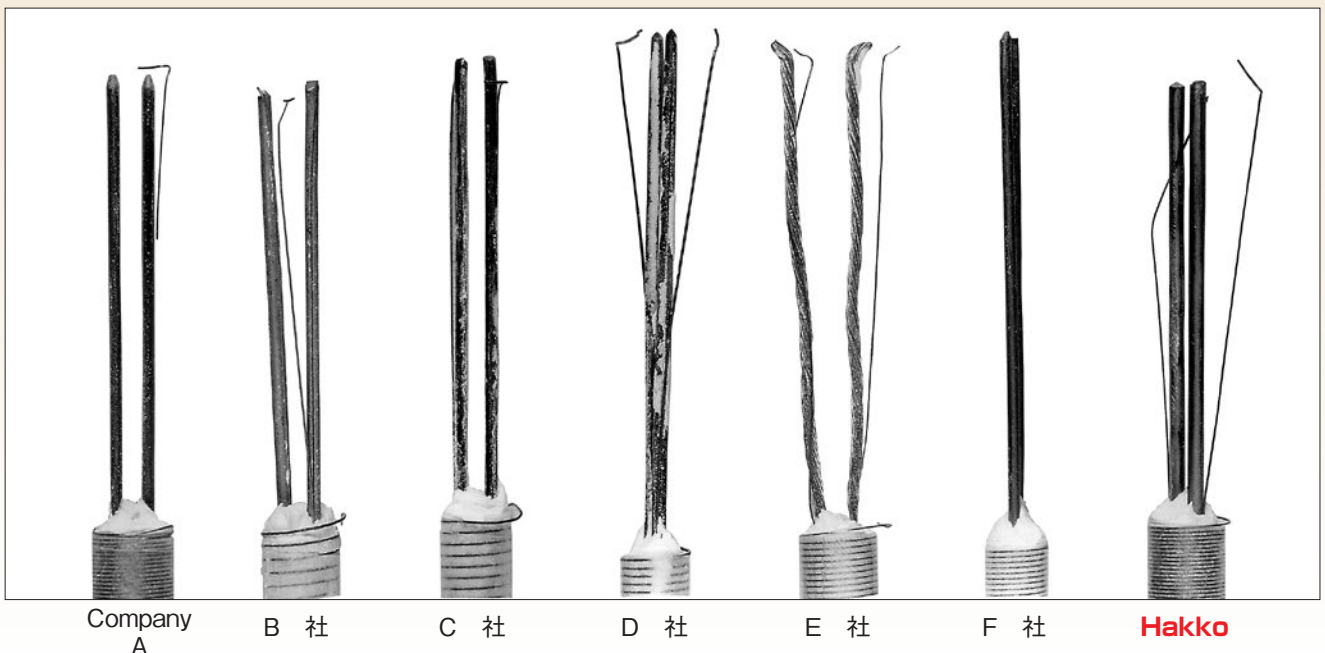
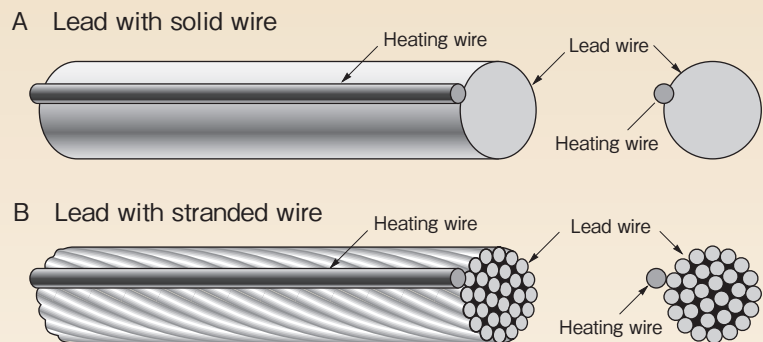
Even with the same wattage, heaters that can conduct internal heat from heating wire to outer parts will result in less heat trapped internally, therefore providing faster temperature rise with excellent response performance.

Manufacturer	Company A	Company B	Company C	Company D	Company E	Company F	Hakko
Time (min) to reach 200°C	5.5	5	5	6.5	6	6	5



# Connection structure of lead with heating wire

This is the structure of the connection between the lead and heating wire. As shown in figure A, heating wire that "bites" into the lead is considered good. If connection is loose, overheat will occur due to contact resistance, and wire will break easily.



## Durability

Time until wire breaks was measured in a test in which a  $\phi 12 \times L50$  cartridge heater was inserted into the  $\phi 12.5$  hole of a  $\phi 62.5 \times L50$  metal cylinder. The voltage for the cartridge heater adjusted until surface watt density is  $30W/cm^2$ , and temperature of the metal cylinder is controlled at  $300^\circ C$ .

Manufacturer	Company A	Company B	Company C	Company D	Company E	Company F	Hakko
Time until wire breaks	60 hrs	50 min	1.5 min	1 min	35 min	2 min	100 hrs

## Insulation performance

Test is performed using our company's standard methods.

Manufacturer	Company A	Company B	Company C	Company D	Company E	Company F	Hakko
Cold insulation resistance (M $\Omega$ )	100	400	600	2000	400	400	200
Hot insulation resistance (M $\Omega$ )	100	160	26	45	10	65	100
Withstand voltage 1800V	OK	OK	OK	OK	OK	OK	OK

## Connection structure of lead with electric wire

The lead is connected to the electric wire by crimping. If crimping is loose, temperature will rise due to contact resistance. If crimping is too tight, electric and lead wire will be damaged.



Company A

Company B

Company C

Company D

Company E

Company F



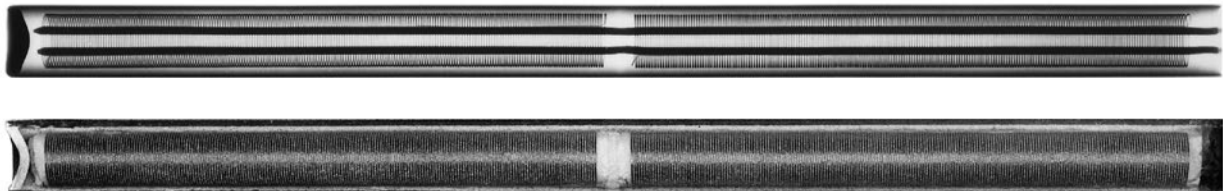


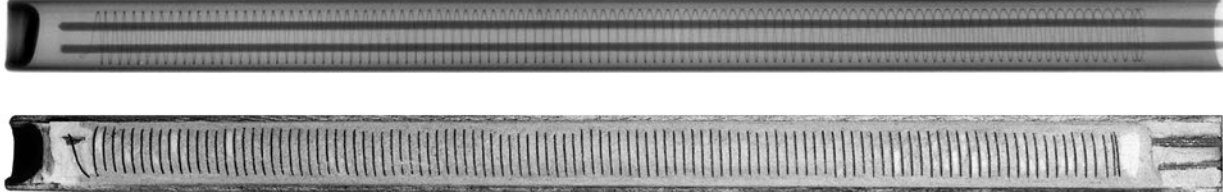


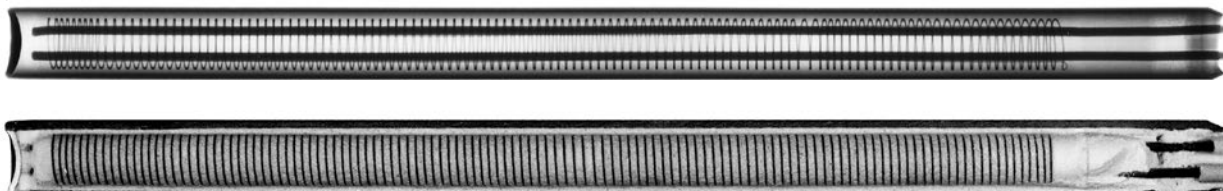
Hakko

# Structure of heating element

Heating element is the heart of the heater. The points that should be noted are as follows:

- Is the winding of the heating wire precise or rough
- Is the heating wire thick or fine
- Is the heating wire winded from end to end
- Is the insulation layer thick or thin
- How is the condition of the lead wires

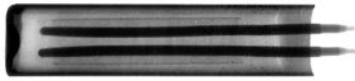
The pictures for each heaters are Top : X-ray  
Bottom : Dismantled

Company A	<p><math>\phi 12.7 \times 50</math> 120V 200W</p> 	<table border="1"> <tbody> <tr> <td>Wire diameter</td> <td>: <math>\phi 0.28</math></td> </tr> <tr> <td>Winding diameter</td> <td>: <math>\phi 8.99</math></td> </tr> <tr> <td>Winding count</td> <td>: 78</td> </tr> <tr> <td>Pitch</td> <td>: 0.5</td> </tr> <tr> <td>Length</td> <td>: 39</td> </tr> <tr> <td>Lead wire diameter</td> <td>: <math>\phi 0.5</math></td> </tr> <tr> <td>Insulation layer thickness</td> <td>: 1.04</td> </tr> </tbody> </table>	Wire diameter	: $\phi 0.28$	Winding diameter	: $\phi 8.99$	Winding count	: 78	Pitch	: 0.5	Length	: 39	Lead wire diameter	: $\phi 0.5$	Insulation layer thickness	: 1.04
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Length	: 39															
Lead wire diameter	: $\phi 0.5$															
Insulation layer thickness	: 1.04															
<p><math>\phi 12.7 \times 200</math> 120V 1kW</p>  																
Company B	<p><math>\phi 12 \times 50</math> 200V 100W</p> 	<table border="1"> <tbody> <tr> <td>Wire diameter</td> <td>: <math>\phi 0.11</math></td> </tr> <tr> <td>Winding diameter</td> <td>: <math>\phi 8.2</math></td> </tr> <tr> <td>Winding count</td> <td>: 78</td> </tr> <tr> <td>Pitch</td> <td>: 0.32</td> </tr> <tr> <td>Length</td> <td>: 25</td> </tr> <tr> <td>Lead wire diameter</td> <td>: <math>\phi 0.94</math></td> </tr> <tr> <td>Insulation layer thickness</td> <td>: 1.01</td> </tr> </tbody> </table>	Wire diameter	: $\phi 0.11$	Winding diameter	: $\phi 8.2$	Winding count	: 78	Pitch	: 0.32	Length	: 25	Lead wire diameter	: $\phi 0.94$	Insulation layer thickness	: 1.01
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Winding diameter	: $\phi 8.2$															
Winding count	: 78															
Pitch	: 0.32															
Length	: 25															
Lead wire diameter	: $\phi 0.94$															
Insulation layer thickness	: 1.01															
<p><math>\phi 12 \times 190</math> 200V 800W</p>  																
Company C	<p><math>\phi 12 \times 50</math> 200V 100W</p> 	<table border="1"> <tbody> <tr> <td>Wire diameter</td> <td>: <math>\phi 0.09</math></td> </tr> <tr> <td>Winding diameter</td> <td>: <math>\phi 7.8</math></td> </tr> <tr> <td>Winding count</td> <td>: 79</td> </tr> <tr> <td>Pitch</td> <td>: 0.28</td> </tr> <tr> <td>Length</td> <td>: 22</td> </tr> <tr> <td>Lead wire diameter</td> <td>: <math>\phi 1.57</math></td> </tr> <tr> <td>Insulation layer thickness</td> <td>: 1.17</td> </tr> </tbody> </table>	Wire diameter	: $\phi 0.09$	Winding diameter	: $\phi 7.8$	Winding count	: 79	Pitch	: 0.28	Length	: 22	Lead wire diameter	: $\phi 1.57$	Insulation layer thickness	: 1.17
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Insulation layer thickness	: 1.17															
<p><math>\phi 12 \times 190</math> 200V 800W</p>  																



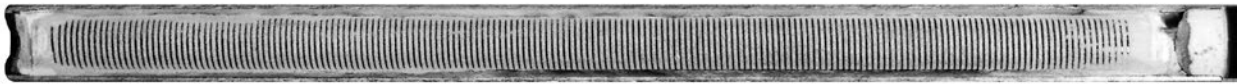
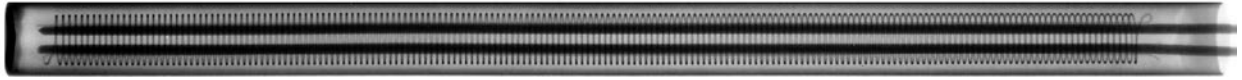
Company D

φ12×50  
200V 100W



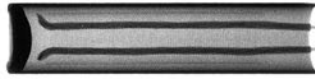
Wire diameter	: φ0.11
Winding diameter	: φ7.5
Winding count	: 124
Pitch	: 0.25
Length	: 31
Lead wire diameter	: φ1.8
Insulation layer thickness	: 1.62

φ12×190 200V 800W



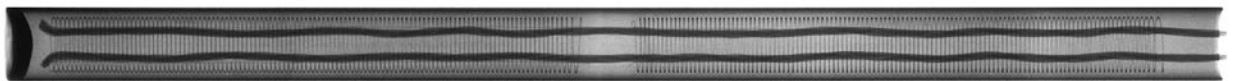
Company E

φ12×50  
200V 100W



Wire diameter	: φ0.10
Winding diameter	: φ8.5
Winding count	: 94
Pitch	: 0.37
Length	: 35
Lead wire diameter	: 0.3×16 wires twisted
Insulation layer thickness	: 1.01

φ12×190 200V 800W



Company F

φ12×50  
200V 100W



Wire diameter	: φ0.11
Winding diameter	: φ7.3
Winding count	: 106
Pitch	: 0.32
Length	: 34
Lead wire diameter	: φ0.95
Insulation layer thickness	: 1.22

φ12×190 200V 800W



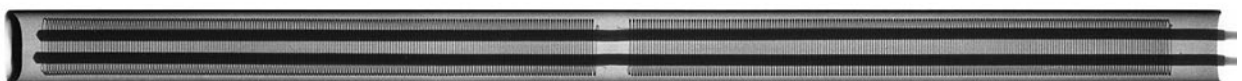
Hakko

φ12×50  
200V 100W

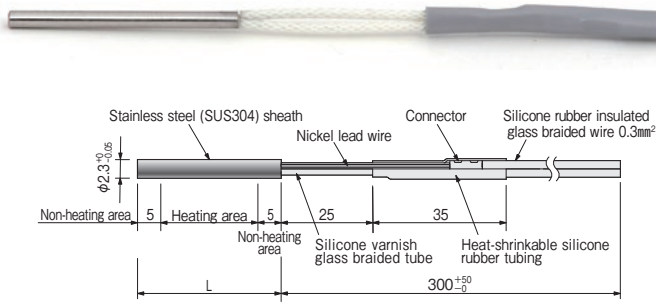


Wire diameter	: φ0.14
Winding diameter	: φ8.8
Winding count	: 139
Pitch	: 0.28
Length	: 39
Lead wire diameter	: φ2.05
Insulation layer thickness	: 1.01

φ12×190 200V 800W



## Sheath diameter $\phi 2.3$



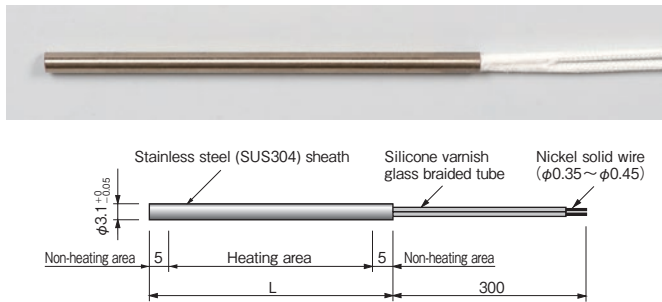
Withstand voltage: AC500V for 1min

WD : Watt density of the effective heating area

In stock	Model No.	Product code	Power voltage	Rated power (W)	dimension L (mm)	WD (W/cm <sup>2</sup> )
○	HL Y0051	03080140	12V	5	15	14
○	HL Y0102	03080145	24V	10	20	
○	HL Y1203	03080150		20	30	
○	HL Y1354	03080155	100V	35	50	12
○	HL Y1605	03080160		60	80	
○	HL Y1806	03080165		80	100	

Transformer (model no. MSA1101, please refer Hakko's general catalog) can be used for 12V/24V heaters.

## Sheath diameter $\phi 3.1$



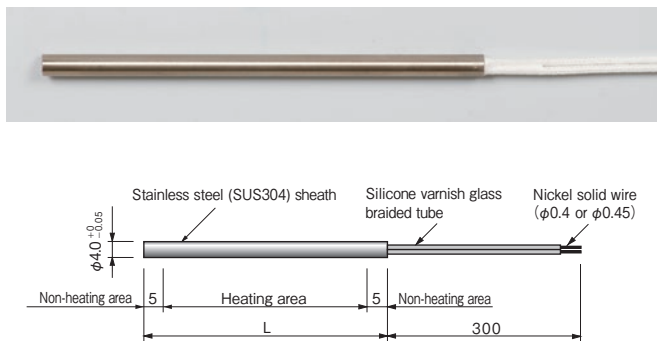
Withstand voltage: AC600V for 1min

WD : Watt density of the effective heating area

In stock	Model No.	Product code	Power voltage	Rated power (W)	dimension L (mm)	WD (W/cm <sup>2</sup> )
	HL J0081	03089410	24V	8	25	5.5
	HL J0152	03089420		15	50	3.9
	HL J0203	03089430		20	75	3.2

Transformer (model No. MSA1101, please refer Hakko's general catalog) can be used for 24V heaters.

## Sheath diameter $\phi 4.0$



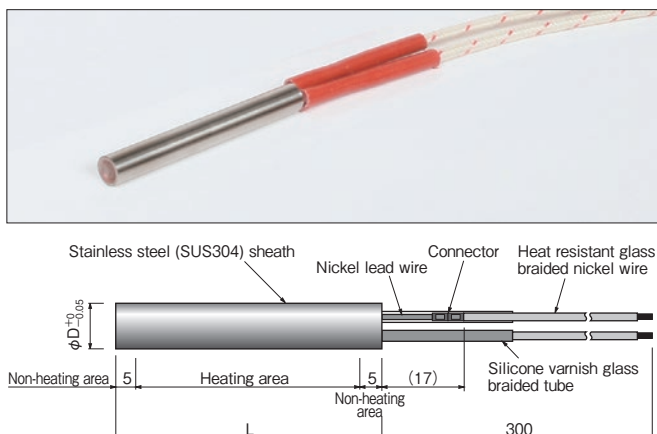
Withstand voltage: AC600V for 1min

WD : Watt density of the effective heating area

In stock	Model No.	Product code	Power voltage	Rated power (W)	dimension L (mm)	WD (W/cm <sup>2</sup> )
	HL W0011	03089440	24V	10	25	5.3
	HL W0025	03089450		20	50	4.0
	HL W0036	03089460		30	75	3.8
○	HL W1021	03081640	100V	25	25	13
○	HL W1032	03081650		30	30	12
○	HL W1033	03081660		35	35	11
○	HL W1044	03081670		45	40	12
○	HL W1065	03081680		60	50	
○	HL W1106	03081690		100	80	11
○	HL W1127	03081700	120	100		
○	HL W2044	03082670	1P 200V	45	40	12
○	HL W2065	03082680		60	50	12
○	HL W2106	03082690		100	80	11
○	HL W2127	03082700		120	100	11

Transformer (model No. MSA1101, please refer Hakko's general catalog) can be used for 24V heaters.

## Sheath diameter $\phi 6.0 \sim 14.0$

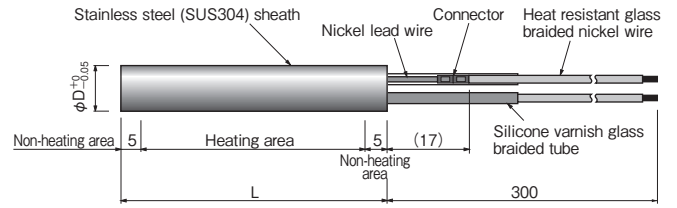


WD : Watt density of the effective heating area

		24V	Wire cross-sectional area	1.25 mm <sup>2</sup>			
In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	
			D	L			
	HL X0052	03089470	6.0	50	50	6.6	
	HL X0103	03089480		100	100	5.9	
	HL X0154	03089490		150	150	5.7	
	HL B0051	03089500	6.5	50	50	6.1	
	HL B0103	03089510		100	100	5.4	
	HL B0154	03089520		150	150	5.3	
	HLC0061	03089530	8.0	50	60	6.0	
	HLC0123	03089540		100	120	4.8	
	HLC0185	03089550		150	180	5.1	
	HLE0101	03089560	10.0	50	100	8.0	
	HLE0153	03089570		100	150	5.3	
	HLE0205	03089580		150	200	4.5	

Transformer (model No. MSA1101, please refer Hakko's general catalog) can be used for 24V heaters.

Sheath diameter  $\phi 6.0 \sim 14.0$



**100V**

WD : Watt density of the effective heating area      WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )
			D	L			
○	HLX1101	03081770	6.0	35	50	11	1.25
○	HLX1152	03081780		50	100	13	
○	HLX1103	03081790		80	150	11	
○	HLX1203	03081800		100	200	12	
	HLA1101	03081720	6.25 (1/4 inch)	50	100	13	1.25
	HLA1102	03081730		80	100	7.3	
	HLA1152	03081740			150	11	
	HLA1103	03081750			100	100	
	HLA1203	03081760	100	200	11		
○	HLB1101	03081020	6.5	50	100	12	1.25
○	HLB1102	03081030		80	100	7.0	
○	HLB1152	03081040			150	10	
○	HLB1103	03081050			100	100	
○	HLB1203	03081060	100	200	11		
○	HLC1101	03081110	8.0	50	100	9.9	1.25
○	HLC1151	03081120		80	150	15	
○	HLC1102	03081130			100	5.7	
○	HLC1202	03081140		100	200	11	
○	HLC1153	03081150			150	6.6	
○	HLC1253	03081160			250	11	
○	HLC1204	03081170			130	200	
○	HLC1304	03081180		300		9.9	
○	HLC1305	03080010		300		8.5	
○	HLC1455	03080020		150	450	13	
○	HLC1356	03080030			350	8.2	
○	HLC1506	03080040		180	500	12	
○	HLC1407	03080050			400	8.4	
○	HLC1607	03080060		200	600	13	
○	HLC1458	03080070			230	450	
○	HLC1658	03080080		650		12	
○	HLC1509	03080090	250	500	8.3		
○	HLC1709	03080100		700	12		
○	HLC3551	03080110	300	550	7.5		
○	HLC3851	03080120		850	12		
	HLD1101	03081810	9.42 (3/8 inch)	50	100	8.4	1.25
	HLD1201	03081820		80	200	17	
	HLD1152	03081830			150	7.2	
	HLD1252	03081840			250	12	
	HLD1203	03081850		100	200	7.5	
	HLD1303	03081860			300	11	
	HLD1204	03081870		130	200	5.6	
	HLD1404	03081880			400	11	
	HLD1305	03081890	150	300	7.2		
	HLD1505	03081900		500	12		
○	HLE1101	03081210	10.0	50	100	8.0	1.25
○	HLE1201	03081220		80	200	16	
○	HLE1152	03081230			150	6.8	
○	HLE1252	03081240		100	250	11	
○	HLE1203	03081250			200	7.1	
○	HLE1303	03081260		130	300	11	
○	HLE1204	03081270			400	11	
○	HLE1404	03081280		150	300	6.8	
○	HLE1305	03081290			500	11	
○	HLE1505	03081300		180	400	7.5	
○	HLE1406	03080210			650	12	
○	HLE1656	03080220		200	450	7.5	
○	HLE1457	03080230	700		12		
○	HLE1707	03080240	700	12			

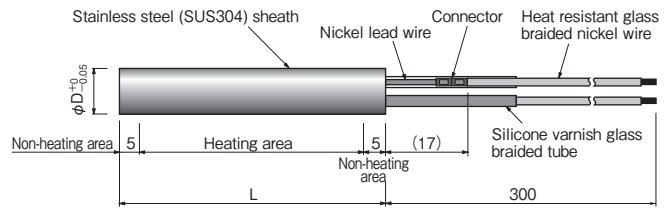
In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )	
			D	L				
○	HLE1558	03080250	10.0	230	550	8	1.25	
○	HLE1808	03080260			800	12		
○	HLE1609	03080270			250	600		8
○	HLE1909	03080280		900		12		
○	HLE3701	03080290		300		700		7.7
○	HLE3101	03080300			1000	11		
○	HLF1101	03081310	12.0	50	100	6.6	1.25	
○	HLF1201	03081320			200	13		
○	HLF1202	03081330				200		7.6
○	HLF1302	03081340		80	300	11		
○	HLF1253	03081350			100	250		7.4
○	HLF1403	03081360				400		12
○	HLF1304	03081370		130	300	6.6		
○	HLF1504	03081380			500	11		
○	HLF1405	03081390		150	400	7.6		
○	HLF1605	03081400			600	11		
○	HLF1506	03081410			190	500		7.4
○	HLF1806	03081420		800		12		
○	HLF1557	03080310		200	550	7.7		
○	HLF1857	03080320			850	12		
○	HLF1708	03080330		230	700	8.4		
○	HLF1108	03080340			1000	12		
○	HLF1709	03080350		250	700	7.7		
○	HLF1109	03080360			1050	12		
○	HLF3851	03080370	300	850	7.8			
○	HLF3131	03080380		1300	12			
	HLG1101	03081910	12.6 (1/2 inch)	50	100	6.3	1.25	
	HLG1201	03081920			200	13		
	HLG1202	03081930		80	200	7.2		
	HLG1302	03081940			300	11		
	HLG1253	03081950		100	250	7		
	HLG1403	03081960			400	11		
	HLG1304	03081970		130	300	6.3		
	HLG1504	03081980			500	11		
	HLG1405	03081990		150	400	7.2		
	HLG1605	03081991			600	11		
	HLG1506	03081992	190	500	7			
	HLG1806	03081993		800	11			
○	HLH1101	03081510	14.0	50	100	5.7	1.25	
○	HLH1201	03081520			200	11		
○	HLH1202	03081530				80		200
○	HLH1302	03081540		300	9.7			
○	HLH1253	03081550		100	250	6.3		
○	HLH1453	03081560			450	11		
○	HLH1354	03081570		130	350	6.6		
○	HLH1554	03081580			550	10		
○	HLH1405	03081590		150	400	6.5		
○	HLH1705	03081600			700	11		
○	HLH1556	03081610		190	550	6.9		
○	HLH1906	03081620			900	11		
○	HLH1657	03080410		200	650	7.8		
○	HLH1107	03080420			1000	12		
○	HLH1758	03080430		230	750	7.8		
○	HLH1118	03080440			1150	12		
○	HLH1809	03080450		250	800	7.6		
○	HLH1129	03080460			1250	12		
○	HLH3101	03080470	300	1000	7.8			
○	HLH3151	03080480		1500	12			

No sign : [Build-to-order]

Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

Sheath diameter  $\phi 6.0 \sim 14.0$  (continued)



**1P 200V** Wire cross-sectional area 1.25 mm<sup>2</sup>

WD : Watt density of the effective heating area

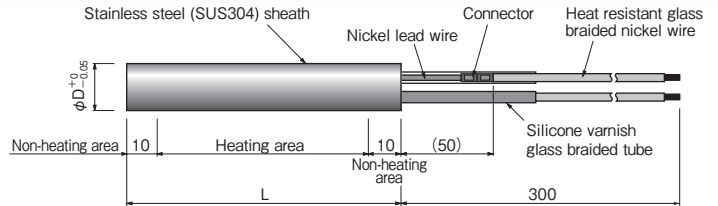
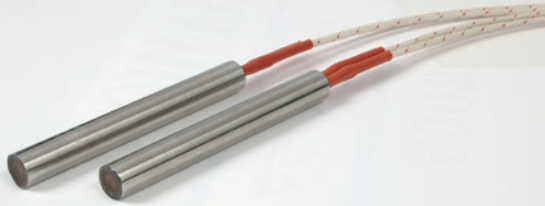
In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )
			D	L		
○	HLX2101	03082770	6.0	35	50	11
○	HLX2152	03082780		50	100	13
○	HLX2103	03082790		80	150	11
○	HLX2203	03082800		100	200	12
	HLA2101	03082720	6.25 (1/4inch)	50	100	13
	HLA2102	03082730		80	100	7.3
	HLA2152	03082740			150	11
	HLA2103	03082750		100	100	5.7
	HLA2203	03082760	200		11	
○	HLB2101	03082020	6.5	50	100	12
○	HLB2102	03082030		80	100	7.0
○	HLB2152	03082040			150	10
○	HLB2103	03082050		100	100	5.4
○	HLB2203	03082060	200		11	
○	HLC2101	03082110	8.0	50	100	9.9
○	HLC2151	03082120			150	15
○	HLC2102	03082130		80	100	5.7
○	HLC2202	03082140			200	11
○	HLC2153	03082150		100	150	6.6
○	HLC2253	03082160			250	11
○	HLC2204	03082170		130	200	6.6
○	HLC2304	03082180			300	9.9
○	HLC2305	03080510		150	300	8.5
○	HLC2455	03080520			450	13
○	HLC2356	03080530		180	350	8.2
○	HLC2506	03080540			500	12
○	HLC2407	03080550		200	400	8.4
○	HLC2607	03080560			600	13
○	HLC2458	03080570		230	450	8.1
○	HLC2658	03080580			650	12
○	HLC2509	03080590	250	500	8.3	
○	HLC2709	03080600		700	12	
○	HLC4551	03080610	300	550	7.5	
○	HLC4851	03080620		850	12	
	HLD2101	03082810	9.42 (3/8 inch)	50	100	8.4
	HLD2201	03082820			200	17
	HLD2152	03082830		80	150	7.2
	HLD2252	03082840			250	12
	HLD2203	03082850		100	200	7.5
	HLD2303	03082860			300	11
	HLD2204	03082870		130	200	5.6
	HLD2404	03082880			400	11
	HLD2305	03082890		150	300	7.2
	HLD2505	03082900			500	12
○	HLE2101	03082210	10.0	50	100	8.0
○	HLE2201	03082220			200	16
○	HLE2152	03082230		80	150	6.8
○	HLE2252	03082240			250	11
○	HLE2203	03082250		100	200	7.1
○	HLE2303	03082260			300	11
○	HLE2204	03082270		130	200	5.3
○	HLE2404	03082280			400	11
○	HLE2305	03082290		150	300	6.8
○	HLE2505	03082300			500	11
○	HLE2406	03080710		180	400	7.5
○	HLE2656	03080720			650	12
○	HLE2457	03080730		200	450	7.5
○	HLE2707	03080740			700	12

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )
			D	L		
○	HLE2558	03080750	10.0	230	550	8.0
○	HLE2808	03080760			800	12
○	HLE2609	03080770		250	600	8.0
○	HLE2909	03080780			900	12
○	HLE4701	03080790	300	700	7.7	
○	HLE4101	03080800		1000	11	
○	HLF2101	03082310	12.0	50	100	6.6
○	HLF2201	03082320			200	13
○	HLF2202	03082330		80	200	7.6
○	HLF2302	03082340			300	11
○	HLF2253	03082350		100	250	7.4
○	HLF2403	03082360			400	12
○	HLF2304	03082370		130	300	6.6
○	HLF2504	03082380			500	11
○	HLF2405	03082390		150	400	7.6
○	HLF2605	03082400			600	11
○	HLF2506	03082410		190	500	7.4
○	HLF2806	03082420			800	12
○	HLF2557	03080810		200	550	7.7
○	HLF2857	03080820			850	12
○	HLF2708	03080830		230	700	8.4
○	HLF2108	03080840			1000	12
○	HLF2709	03080850	250	700	7.7	
○	HLF2109	03080860		1050	12	
○	HLF4851	03080870	300	850	7.8	
○	HLF4131	03080880		1300	12	
	HLG2101	03082910	12.6 (1/2 inch)	50	100	6.3
	HLG2201	03082920			200	13
	HLG2202	03082930		80	200	7.2
	HLG2302	03082940			300	11
	HLG2253	03082950		100	250	7.0
	HLG2403	03082960			400	11
	HLG2304	03082970		130	300	6.3
	HLG2504	03082980			500	11
	HLG2405	03082990		150	400	7.2
	HLG2605	03082991			600	11
	HLG2506	03082992	190	500	7.0	
	HLG2806	03082993		800	11	
○	HLH2101	03082510	14.0	50	100	5.7
○	HLH2201	03082520			200	11
○	HLH2202	03082530		80	200	6.5
○	HLH2302	03082540			300	9.7
○	HLH2253	03082550		100	250	6.3
○	HLH2453	03082560			450	11
○	HLH2354	03082570		130	350	6.6
○	HLH2554	03082580			550	10
○	HLH2405	03082590		150	400	6.5
○	HLH2705	03082600			700	11
○	HLH2556	03082610		190	550	6.9
○	HLH2906	03082620			900	11
○	HLH2657	03080910		200	650	7.8
○	HLH2107	03080920			1000	12
○	HLH2758	03080930		230	750	7.8
○	HLH2118	03080940			1150	12
○	HLH2809	03080950	250	800	7.6	
○	HLH2129	03080960		1250	12	
○	HLH4101	03080970	300	1000	7.8	
○	HLH4151	03080980		1500	12	

Sheath diameter  $\phi$  15.0 ~ 20.0 100V

Sheath diameter  $\phi$  15.0 ~ 20.0 1P 200V

Sheath diameter  $\phi$  15.0 ~ 20.0



**100V**

WD : Watt density of the effective heating area WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )		
			D	L					
	HLQ1151	03087710	15.0	50	150	11	1.25		
	HLQ1291	03087720			200	14			
	HLQ1252	03087730		80	250	8.8			
	HLQ1402	03087740			400	14			
	HLQ1353	03087750		100	350	9.3			
	HLQ1503	03087760			500	13			
	HLQ1454	03087770		130	450	8.7			
	HLQ1654	03087780			650	13			
	HLQ1555	03087790		150	550	9.0			
	HLQ1805	03087800			800	13			
	HLQ1656	03087810		180	650	8.6			
	HLQ1956	03087820			950	13			
	HLQ1707	03087830		200	700	8.3			
	HLQ1107	03087840			1050	12		2	
	HLQ1858	03087850		230	850	8.6		1.25	
	HLQ1128	03087860			1250	13		2	
	HLQ1909	03087870		250	900	8.3		1.25	
	HLQ1139	03087880			1350	12		2	
	HLQ3101	03087890	300	1050	8.0				
	HLQ3161	03087900		1600	12	3.5			
	HLR1151	03087910	16.0	50	150	9.9	1.25		
	HLR1251	03087920			250	17			
	HLR1252	03087930		80	250	8.3			
	HLR1402	03087940			400	13			
	HLR1353	03087950		100	350	8.7			
	HLR1553	03087960			550	14			
	HLR1404	03087970		130	400	7.2		1.25	
	HLR1704	03087980			700	13			
	HLR1555	03087990		150	550	8.4			
	HLR1855	03088000			850	13			
	HLR1656	03088010		180	650	8.1			
	HLR1956	03088020			950	12			
	HLR1757	03088030		200	750	8.3			
	HLR1117	03088040			1150	13			2
	HLR1908	03088050		230	900	8.5			1.25
	HLR1138	03088060			1300	12			2
	HLR1959	03088070		250	950	8.2			1.25
	HLR1149	03088080			1450	13			3.5
	HLR3111	03088090	300	1150	8.2	2			
	HLR3171	03088100		1750	12	3.5			
	HLS1151	03088110	18.0	50	150	8.8	1.25		
	HLS1251	03088120			250	15			
	HLS1302	03088130		80	300	8.8			
	HLS1452	03088140			450	13			
	HLS1403	03088150		100	400	8.8			
	HLS1603	03088160			600	13		1.25	
	HLS1554	03088170		130	550	8.8			
	HLS1804	03088180			800	13			
	HLS1605	03088190		150	600	8.2			
	HLS1955	03088200			950	13			
	HLS1756	03088210		180	750	8.3			
	HLS1116	03088220			1150	13			2
	HLS1857	03088230		200	850	8.4			1.25
	HLS1137	03088240			1300	13			2
	HLS1108	03088250		230	1000	8.4			1.25
	HLS1158	03088260			1500	13			3.5
	HLS1109	03088270		250	1050	8.1			2
	HLS1169	03088280			1600	12			3.5
	HLS3131	03088290	300	1300	8.2	2			
	HLS3191	03088300		1950	12	5.5			

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )	
			D	L				
	HLT1201	03088310	20.0	50	200	11	1.25	
	HLT1301	03088320			300	16		
	HLT1352	03088330		80	350	9.3		
	HLT1502	03088340			500	13		
	HLT1453	03088350		100	450	9.0		
	HLT1653	03088360			650	13		
	HLT1604	03088370		130	600	8.7		
	HLT1904	03088380			900	13		
	HLT1705	03088390		150	700	8.6		
	HLT1105	03088400			1050	13		2
	HLT1856	03088410		180	850	8.5		1.25
	HLT1126	03088420			1250	12		2
	HLT1957	03088430		200	950	8.4		1.25
	HLT1147	03088440			1400	12		2
	HLT1118	03088450		230	1100	8.3		2
	HLT1168	03088460			1650	13		3.5
	HLT1129	03088470		250	1200	8.3		2
	HLT1189	03088480			1800	12		3.5
	HLT3141	03088490	300	1450	8.2	3.5		
	HLT3221	03088500		2200	13	5.5		

**1P 200V**

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )
			D	L			
	HLQ2151	03088510	15.0	50	150	11	1.25
	HLQ2291	03088520			200	14	
	HLQ2252	03088530		80	250	8.8	
	HLQ2402	03088540			400	14	
	HLQ2353	03088550		100	350	9.3	
	HLQ2503	03088560			500	13	
	HLQ2454	03088570		130	450	8.7	
	HLQ2654	03088580			650	13	
	HLQ2555	03088590		150	550	9.0	
	HLQ2805	03088600			800	13	
	HLQ2656	03088610		180	650	8.6	
	HLQ2956	03088620			950	13	
	HLQ2707	03088630		200	700	8.3	
	HLQ2107	03088640			1050	12	
	HLQ2858	03088650		230	850	8.6	
	HLQ2128	03088660			1250	13	
	HLQ2909	03088670		250	900	8.3	
	HLQ2139	03088680			1350	12	
	HLQ4101	03088690	300	1050	8.0		
	HLQ4161	03088700		1600	12		
	HLR2151	03088710	16.0	50	150	9.9	1.25
	HLR2251	03088720			250	17	
	HLR2252	03088730		80	250	8.3	
	HLR2402	03088740			400	13	
	HLR2353	03088750		100	350	8.7	
	HLR2553	03088760			550	14	
	HLR2404	03088770		130	400	7.2	
	HLR2704	03088780			700	13	
	HLR2555	03088790		150	550	8.4	
	HLR2855	03088800			850	13	

No sign : [Build-to-order]

Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

**Sheath diameter  $\phi$  15.0 ~ 20.0 (continued)**

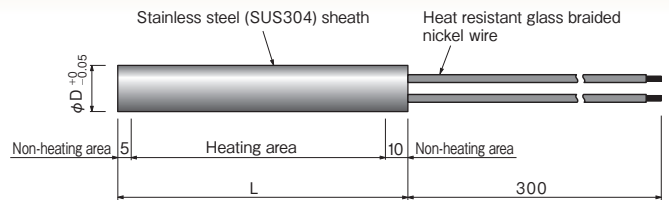
1P 200V			WD : Watt density of the effective heating area				
In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )
			D	L			
	HLR2656	03088810	16.0	180	650	8.1	1.25
	HLR2956	03088820			950	12	
	HLR2757	03088830		200	750	8.3	
	HLR2117	03088840			1150	13	
	HLR2908	03088850		230	900	8.5	
	HLR2138	03088860			1300	12	
	HLR2959	03088870		250	950	8.2	
	HLR2149	03088880			1450	13	
	HLR4111	03088890		300	1150	8.2	
	HLR4171	03088900			1750	12	
	HLS2151	03088910	18.0	50	150	8.8	1.25
	HLS2251	03088920			250	15	
	HLS2302	03088930		80	300	8.8	
	HLS2452	03088940			450	13	
	HLS2403	03088950		100	400	8.8	
	HLS2603	03088960			600	13	
	HLS2554	03088970		130	550	8.8	
	HLS2804	03088980			800	13	
	HLS2605	03088990		150	600	8.2	
	HLS2955	03089000			950	13	
	HLS2756	03089010		180	750	8.3	
	HLS2116	03089020			1150	13	
	HLS2857	03089030		200	850	8.4	
	HLS2137	03089040			1300	13	
	HLS2108	03089050		230	1000	8.4	
	HLS2158	03089060	1500		13		

			WC : Wire cross-sectional area				
In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )
			D	L			
	HLS2109	03089070	18.0	250	1050	8.1	1.25
	HLS2169	03089080			1600	12	
	HLS4131	03089090		300	1300	8.2	
	HLS4191	03089100			1950	12	
	HLT2201	03089110		20.0	50	200	
	HLT2301	03089120	300			16	
	HLT2352	03089130	80		350	9.3	
	HLT2502	03089140			500	13	
	HLT2453	03089150	100		450	9.0	
	HLT2653	03089160			650	13	
	HLT2604	03089170	130		600	8.7	
	HLT2904	03089180			900	13	
	HLT2705	03089190	150		700	8.6	
	HLT2105	03089200			1050	13	
	HLT2856	03089210	180		850	8.5	
	HLT2126	03089220			1250	12	
	HLT2957	03089230	200		950	8.4	
	HLT2147	03089240			1400	12	
	HLT2118	03089250	230		1100	8.3	
	HLT2168	03089260		1650	13		
	HLT2129	03089270	250	1200	8.3		
	HLT2189	03089280		1800	12		
	HLT4141	03089290	300	1450	8.2		
	HLT4221	03089300		2200	13		

# SL TYPE

Sheath diameter  $\phi$  6.25 ~ 10.0 100V

For SL type, the lead is connected to the glass braided nickel wire internally inside the heater.



100V			WD : Watt density of the effective heating area				
In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )
			D	L			
	SLA1101	03104720	6.25 (1/4 inch)	55	100	13	0.5
	SLA1102	03104730			100	7.3	
	SLA1152	03104740		85	150	11	
	SLA1103	03104750			100	5.7	
	SLA1203	03104760		200	11		
◎	SLB1101	03104020	6.5	55	100	12	0.5
◎	SLB1102	03104030			100	7.0	
◎	SLB1152	03104040		85	150	10	
◎	SLB1103	03104050			100	5.4	
◎	SLB1203	03104060		200	11		
◎	SLC1101	03104110	8.0	55	100	9.9	0.75
◎	SLC1151	03104120			150	15	
◎	SLC1102	03104130		85	100	5.7	
◎	SLC1202	03104140			200	11	
◎	SLC1153	03104150		105	150	6.6	
◎	SLC1253	03104160			250	11	
◎	SLC1204	03104170		135	200	6.6	
◎	SLC1304	03104180	300		9.9		

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )		
			D	L					
	SLD1101	03104810	9.42 (3/8 inch)	55	100	8.4	0.75		
	SLD1201	03104820			200	17			
	SLD1152	03104830			85	150		7.2	
	SLD1252	03104840				250		12	
	SLD1203	03104850			105	200		7.5	
	SLD1303	03104860		300		11			
	SLD1204	03104870		135	200	5.6			
	SLD1404	03104880			400	11			
	SLD1305	03104890		155	300	7.2			
	SLD1505	03104900			500	12			
◎	SLE1101	03104210		10.0	55	100		8.0	0.75
◎	SLE1201	03104220				200		16	
◎	SLE1152	03104230			85	150		6.8	
◎	SLE1252	03104240				250		11	
◎	SLE1203	03104250			105	200		7.1	
◎	SLE1303	03104260	300			11			
◎	SLE1204	03104270	135		200	5.3			
◎	SLE1404	03104280			400	11			
◎	SLE1305	03104290	155		300	6.8			
◎	SLE1505	03104300			500	11			

## 100V

WD : Watt density of the effective heating area  
 WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )
			D	L			
○	SLF1101	03104310	12.0	55	100	6.6	1.25
○	SLF1201	03104320			200	13	
○	SLF1202	03104330			200	7.6	
○	SLF1302	03104340		85	300	11	
○	SLF1253	03104350			250	7.4	
○	SLF1403	03104360		105	400	12	
○	SLF1304	03104370			300	6.6	
○	SLF1504	03104380		135	500	11	
○	SLF1405	03104390			400	7.6	
○	SLF1605	03104400		155	600	11	
○	SLF1506	03104410			500	7.4	
○	SLF1806	03104420		195	800	12	
	SLG1101	03104910	12.6 (1/2 inch)	55	100	6.3	1.25
	SLG1201	03104920			200	13	
	SLG1202	03104930		85	200	7.2	
	SLG1302	03104940			300	11	
	SLG1253	03104950		105	250	7.0	
	SLG1403	03104960			400	11	
	SLG1304	03104970		135	300	6.3	
	SLG1504	03104980			500	11	
	SLG1405	03104990		155	400	7.2	
	SLG1605	03104991			600	11	
	SLG1506	03104992		195	500	7.0	
	SLG1806	03104993			800	11	
	SLH1101	03104510	14.0	55	100	5.7	1.25
	SLH1201	03104520			200	11	
	SLH1202	03104530		85	200	6.5	
	SLH1302	03104540			300	9.7	
	SLH1253	03104550		105	250	6.3	
	SLH1453	03104560			450	11	
	SLH1354	03104570		135	350	6.6	
	SLH1554	03104580			550	10	
	SLH1405	03104590		155	400	6.5	
	SLH1705	03104600			700	11	
	SLH1556	03104610		195	550	6.9	
	SLH1906	03104620			900	11	

## 1P 200V

WD : Watt density of the effective heating area  
 WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )
			D	L			
	SLA2101	03105720	6.25 (1/4 inch)	55	100	13	0.5
	SLA2102	03105730			100	7.3	
	SLA2152	03105740		85	150	11	
	SLA2103	03105750			100	5.7	
	SLA2203	03105760			200	11	
○	SLB2101	03105020	6.5	55	100	12	0.5
○	SLB2102	03105030			100	7	
○	SLB2152	03105040		85	150	10	
○	SLB2103	03105050			100	5.4	
○	SLB2203	03105060			200	11	
○	SLC2101	03105110	8.0	55	100	9.9	0.75
○	SLC2151	03105120			150	15	
○	SLC2102	03105130		85	100	5.7	
○	SLC2202	03105140			200	11	
○	SLC2153	03105150		105	150	6.6	
○	SLC2253	03105160			250	11	
○	SLC2204	03105170			200	6.6	
○	SLC2304	03105180		135	300	9.9	

## 1P 200V

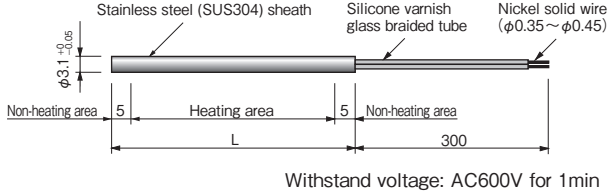
WD : Watt density of the effective heating area  
 WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm <sup>2</sup> )	WC (mm <sup>2</sup> )		
			D	L					
	SLD2101	03105810	9.42 (3/8 inch)	55	100	8.4	0.75		
	SLD2201	03105820			200	17			
	SLD2152	03105830			85	150		7.2	
	SLD2252	03105840		250		12			
	SLD2203	03105850		105	200	7.5			
	SLD2303	03105860			300	11			
	SLD2204	03105870		135	200	5.6			
	SLD2404	03105880			400	11			
	SLD2305	03105890		155	300	7.2			
	SLD2505	03105900			500	12			
○	SLE2101	03105210		10.0	55	100		8	0.75
○	SLE2201	03105220				200		16	
○	SLE2152	03105230	85		150	6.8			
○	SLE2252	03105240			250	11			
○	SLE2203	03105250	105		200	7.1			
○	SLE2303	03105260			300	11			
○	SLE2204	03105270	135		200	5.3			
○	SLE2404	03105280			400	11			
○	SLE2305	03105290	155		300	6.8			
○	SLE2505	03105300			500	11			
○	SLF2101	03105310	12.0		55	100	6.6	1.25	
○	SLF2201	03105320				200	13		
○	SLF2202	03105330		85	200	7.6			
○	SLF2302	03105340			300	11			
○	SLF2253	03105350		105	250	7.4			
○	SLF2403	03105360			400	12			
○	SLF2304	03105370		135	300	6.6			
○	SLF2504	03105380			500	11			
○	SLF2405	03105390		155	400	7.6			
○	SLF2605	03105400			600	11			
○	SLF2506	03105410		195	500	7.4			
○	SLF2806	03105420			800	12			
	SLG2101	03105910	12.6 (1/2 inch)	55	100	6.3	1.25		
	SLG2201	03105920			200	13			
	SLG2202	03105930		85	200	7.2			
	SLG2302	03105940			300	11			
	SLG2253	03105950		105	250	7			
	SLG2403	03105960			400	11			
	SLG2304	03105970		135	300	6.3			
	SLG2504	03105980			500	11			
	SLG2405	03105990		155	400	7.2			
	SLG2605	03105991			600	11			
	SLG2506	03105992		195	500	7			
	SLG2806	03105993			800	11			
	SLH2101	03105510	14.0	55	100	5.7	1.25		
	SLH2201	03105520			200	11			
	SLH2202	03105530		85	200	6.5			
	SLH2302	03105540			300	9.7			
	SLH2253	03105550		105	250	6.3			
	SLH2453	03105560			450	11			
	SLH2354	03105570		135	350	6.6			
	SLH2554	03105580			550	10			
	SLH2405	03105590		155	400	6.5			
	SLH2705	03105600			700	11			
	SLH2556	03105610		195	550	6.9			
	SLH2906	03105620			900	11			

# INCH SIZE

Sheath diameter  $\phi 3.1$   
 Sheath diameter  $\phi 6.25 \sim 12.60$  120V

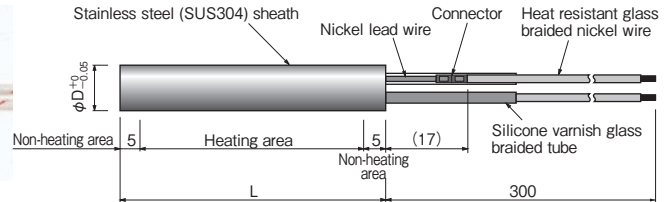
## Sheath diameter $\phi 3.1$



WD : Watt density of the effective heating area  
 WC : Wire cross-sectional area

In stock	Model No.	Product code	Power voltage	dimension L (mm)	Rated power (W)	WD (W/cm <sup>2</sup> )
○	HLJ1021	03083010	120V	31.8	25	12
○	HLJ1051	03083020			50	24
○	HLJ1032	03083030		38.1	30	11
○	HLJ1042	03083040			44	16
○	HLJ1062	03083050			60	22
○	HLJ1053	03083060			50.8	13
○	HLJ1074	03083070		63.5	13	
○	HLJ1115	03083080		88.9	14	
○	HLJ2042	03085010	1P 240V	38.1	44	16
○	HLJ2053	03085020			50.8	13
○	HLJ2074	03085030		63.5	13	
○	HLJ2115	03085040		88.9	14	
○	HLJ2276	03085050		139.7	270	21
○						

## Sheath diameter $\phi 6.25 \sim 12.60$



120V	Wire cross-sectional area	1.25 mm <sup>2</sup>
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WD : Watt density of the effective heating area WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension		Rated power (W)	WD (W/cm <sup>2</sup> )
			D (inch)	L (mm)		
○	HLK1081	03083090	1/4 (6.25 mm)	25.4	80	26
○	HLK1101	03083100			100	33
○	HLK1151	03083110			150	50
○	HLK1072	03083120		31.8	75	18
○	HLK1102	03083130			100	23
○	HLK1152	03083140			150	35
○	HLK1053	03083150		38.1	50	9.1
○	HLK1103	03083160			100	18
○	HLK1153	03083170			150	27
○	HLK1203	03083180		50.8	200	36
○	HLK1104	03083190			100	12
○	HLK1154	03083200			150	19
○	HLK1204	03083210		76.2	200	25
○	HLK1254	03083220			250	31
○	HLK1105	03083230			100	7.7
○	HLK1205	03083240		101.6	200	15
○	HLK1305	03083250			300	23
○	HLK1106	03083260			100	5.6
○	HLK1206	03083270	3/8 (9.42 mm)	38.1	200	11
○	HLK1306	03083280			300	17
○	HLL1051	03083290			55	12
○	HLL1101	03083300	25.4	100	22	
○	HLL1151	03083310		150	33	
○	HLL1102	03083320		100	16	
○	HLL1122	03083330	31.8	125	19	
○	HLL1152	03083340		150	23	
○	HLL1202	03083350		200	31	
○	HLL1053	03083360	38.1	50	6.0	
○	HLL1073	03083370		75	9.0	
○	HLL1103	03083380		100	12	
○	HLL1153	03083390	44.5	150	18	
○	HLL1203	03083400		200	24	
○	HLL1253	03083410		250	30	
○	HLL1124	03083420	125	12		
○	HLL1174	03083430	175	17		
○	HLL1254	03083440	250	24		

In stock	Model No.	Product code	dimension		Rated power (W)	WD (W/cm <sup>2</sup> )
			D (inch)	L (mm)		
○	HLL1055	03083450	3/8 (9.42 mm)	50.8	50	4.1
○	HLL1105	03083460			100	8.3
○	HLL1155	03083470			150	12
○	HLL1205	03083480			200	17
○	HLL1255	03083490			250	21
○	HLL1305	03083500			300	25
○	HLL1405	03083510		400	33	
○	HLL1076	03083520		57.2	75	5.4
○	HLL1126	03083530			125	8.9
○	HLL1176	03083540			175	13
○	HLL1256	03083550		63.5	250	18
○	HLL1306	03083560			300	21
○	HLL1356	03083570			350	25
○	HLL1207	03083580		76.2	200	13
○	HLL1257	03083590			250	16
○	HLL1307	03083600			300	19
○	HLL1407	03083610		88.9	400	25
○	HLL1507	03083620			500	32
○	HLL1108	03083630	100		5.1	
○	HLL1158	03083640	101.6	150	7.7	
○	HLL1208	03083650		200	10	
○	HLL1258	03083660		250	13	
○	HLL1308	03083670	114.3	300	15	
○	HLL1408	03083680		400	20	
○	HLL1508	03083690		500	26	
○	HLL1259	03083700	101.6	250	11	
○	HLL1309	03083710		300	13	
○	HLL1509	03083720		500	21	
○	HLL3121	03083730	101.6	125	4.6	
○	HLL3151	03083740		150	5.5	
○	HLL3251	03083750		250	9.2	
○	HLL3301	03083760	114.3	300	11	
○	HLL3401	03083770		400	15	
○	HLL3501	03083780		500	18	
○	HLL3302	03083790	114.3	300	9.7	
○	HLL3502	03083800		500	16	