


Cartridge Heaters

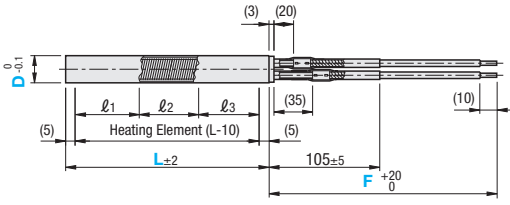
Uniform Heating Type

Be sure to refer to "Precautions for Use" in the Cartridge Heater Overview on P.1605.



RoHS 10

MCHC



	l ₁	l ₂	l ₃
Length Ratio	1	1	1
Winding Ratio			
A	1.1	1	1.1
B	1.3	1	1.3

* Winding Ratio of Nickel-chrome Wire

☑ If the length of the heating element is not a multiple of 3, it is produced by approximating the length ratio to 1:1:1.

Material Heater : SUS304
Lead Wire : See Below
Terminal : Copper (Tin Plating)

☑ Maximum Operating Temperature: 600°C
☑ Maximum Operating Temperature means value at the sheath part. Please pay attention to Lead Wire Heat Resistance Temperature and be sure to put the lead wire out of the mounting hole.

Uniform Heating Type

Type	Part Number		L 10mm Increment	V (Voltage) Selection	W (Electric Power) 10W Increment	F (Lead Wire Length)		Terminal	Electrical Power Density (W/cm ²)
	☑ Winding Ratio	D				Lead Wire Type	10mm Increment		
MCHC	A (1.1:1:1.1)	8	150~300	100	70~600	B G T M	100~1000	N M Y	2 ≤ W/cm ² ≤ 15 ☑ W/cm ² = W / (Dπ(L-10)/100) (Calculate with the electrical power density of heat-generating part, not with the overall length.)
		10		200	70~1000				
	B (1.3:1:1.3)	12		100	90~600				
				200	90~1000				
				100	110~600				
				200	110~1200				

☑ Winding Ratio is the winding ratio of Nickel-chrome wire. (Refer to the diagram and Selection Point below.)

Type of Lead Wire

Symbol	Selection	Heat Resistance Temperature	Features
B	Tin Plated Annealed Copper Fiber Glass Braided Wire	180°C	General Use
G	Silicon Rubber + Tin Plated Annealed Copper Wire	180°C	For chemical and water resistant items
T	Teflon + Nickel Plated Annealed Copper Wire	260°C	For chemical, water and weather resistant items
M	Mica Polyimide-Wound Silica + Nickel Coated Copper Wire	400°C	For heat resistant items

Type of Terminal

Symbol	Type of Terminal	Nominal Screw
N	No Crimp Terminal	-
M	Crimp Terminal - Round	M4
Y	Crimp Terminal - Y-Shaped	M4



Ordering Example

Part Number **L** **V** **W** **F Lead Wire** **Terminal**
Type Winding Ratio D Lead Wire Type Length

MCHC A 8 - 200 - V100 - W300 - G 500 - M

D	Heater Body Price		Additional Lead Wire Price (Body Price +)				Additional Terminal Price (Body Price +)		
	L150~200	L201~300	B	G	T	M	N	M	Y
8									
10									
12									

Features

- This heater has different winding ratio of Nickel-chrome wire in one cartridge heater from conventional ones.
- Compared with conventional cartridge heater, the temperature on the heated object will be more uniform.
- Comparison with Conventional Cartridge Heaters**

	Conventional Cartridge Heaters	Cartridge Heaters Uniform Heating Type (MCHC)
Winding Method of the Nickel-chrome Wire of Heater on Each Part	Uniform	Low winding turns on the center part (l ₂).
Capacity of Heater on Each Part	Uniform	Low capacity on the center part (l ₂).
Temperature Distribution of Heated Object	The temperature of the center of the heater may be relatively high (temperature unevenness).*	Better balance of temperature distribution (uniform heating effect) than conventional heaters.

- * The temperature of the center part increases easily because radiation is hard and the heat may accumulate.
- This heater is more effective than conventional ones when higher uniform heating is required.
 - (Ex.) Heating board for welding seal, engraving heating, roller heating and heating board of rubber welding machine, etc.

Selection Point

- Calculate the total wattage required for heating metal block. See **☑ P.1606**
- Select the distribution ratio of Nickel-chrome wire from A or B Type.

- ⇒ A Type: Improving the temperature consistency of heated object.
- ⇒ B Type: Temperature on the both ends of heated object is low obviously.

The temperature consistency may not be improved even if either type is used.

Precautions for Use

- Do not let the heaters run idle in the atmosphere. If the heater is used with some or the whole of the heating element projected from the heated objects, the wire may break or ignite due to abnormal heating.
- This product offers improved temperature uniformity compared to the conventional cartridge heaters, but does not guarantee completely uniform heating. Uniform heating may not go into effect depending on the operating condition.
- Because the uniform heating effect varies depending on slight difference of the operating condition (such as the shape, size of the heated object and the air flow, etc.), even for the same type of products, the stability of the uniform heating effect cannot be guaranteed.
- Keep the temperature around the lead wire exit at 130°C or less.

Actual Measurements of Temperature Distribution of Cartridge Heater Uniform Heating Type

- The heat-generating part is divided into three parts, and winding method of Nickel-chrome wire for each part is different.
- The balance of the temperature distribution improves because the temperature of l₂ becomes lower compared to the conventional cartridge heaters.

