
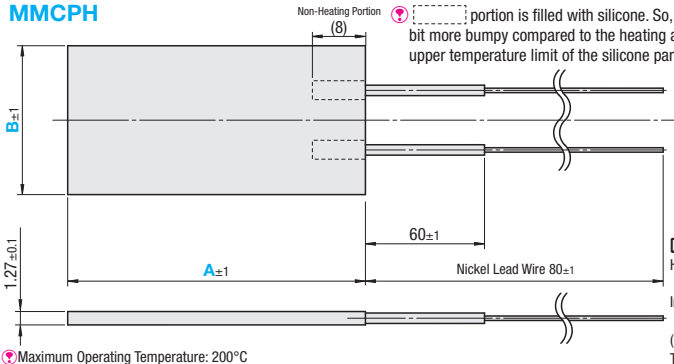


# Small-Size Ceramic Plate Heaters

⚠ Temperature Controllers ( P.1674 ) and Temperature Adjusters ( P.1669 ) cannot be used. See "How to Use" below.



**MMCPH**



⚠ Maximum Operating Temperature: 200°C

⚠ Material  
Heater : Ceramics  
Insulation Tube : Fluorine Resin Tube (Heat Resistant Temperature: 260°C)

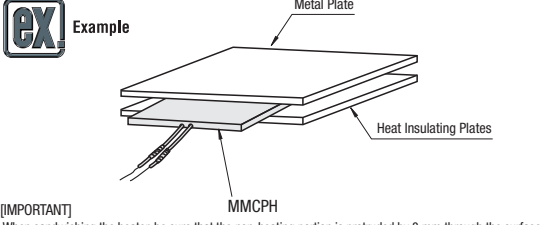
| Part Number Type | A  | B  | V (Voltage) | W (Electric Power) | Maximum Operating Temperature (°C) | Unit Price |
|------------------|----|----|-------------|--------------------|------------------------------------|------------|
| MMCPH            | 15 | 10 | 15~45       | 6~21               | 200                                |            |
|                  |    | 15 | 10~40       | 5~19               |                                    |            |
|                  | 20 | 10 | 15~80       | 4~26               |                                    |            |
|                  |    | 15 | 10~60       | 3~25               |                                    |            |

⚠ The heaters can be used within the range of the above operating voltage (V) and operating electric power (W), but please note that rapid application or temperature rise could cause damage to the heaters.  
⚠ Do not use the heater at a temperature exceeding the maximum operating temperature.

**Ordering Example**

Part Number - A - B  
**MMCPH - 15 - 10**

**Example**



[IMPORTANT] When sandwiching the heater, be sure that the non-heating portion is protruded by 8 mm through the surface.

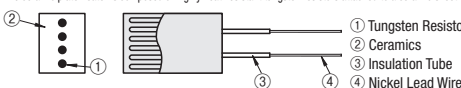
## Features of the Small-Size Ceramic Heater

MISUMI's small-size ceramic plate heaters are made of ceramic, which has excellent heat resistance and insulation characteristics. The heater is made of a ceramic sheet incorporating tungsten resistors.

- This small, thin plate-shaped heater can be operated in a small space.
- As the ceramic plate heater is plate-shaped, it can provide uniform heating.
- The speed at which the heater temperature changes is quite fast.
- Available for both direct current and alternate current.

## Basic Structure

The ceramic plate heater is composed of highly heat-resistant tungsten resistors attached to a ceramic sheet.



## Selecting Method

- ① Calculate the amount of heat (W) required to heat the object. Refer to "Selecting Method ① Determine the calories (W) required for the heater" on P.1606.
- ② Select the size of heater depending on the required amount of heat (W) and the size of the object, and determine the operating voltage (V) using the Table of Temperature Characteristics as a reference.

## How to Use

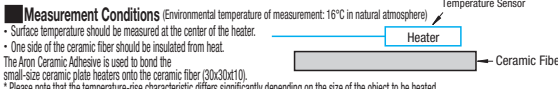
Maintain the operating voltage of the selected heater by using the following method.

- ① Operate the heater at a constant voltage by using a step-down transformer.
- ② Control the temperature by using a variable voltage transformer.
- ③ Conduct precise temperature control by using a phase controller.

**Measurement Conditions** (Environmental temperature of measurement: 16°C in natural atmosphere)

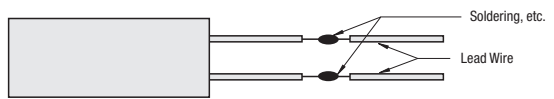
- Surface temperature should be measured at the center of the heater.
- One side of the ceramic fiber should be insulated from heat.

The Aron Ceramic Adhesive is used to bond the small-size ceramic plate heaters onto the ceramic fiber (30x30x1.0).  
 \* Please note that the temperature-rise characteristic differs significantly depending on the size of the object to be heated.

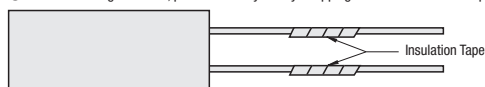


## Connection Method

① Attach the lead wire to the two terminals and firmly connect them by soldering, etc.



② After connecting the wires, protect them by firmly wrapping them with insulation tape.



## How to Mount

Use the heater in a position sandwiched between the metal block to be heated and the insulation board. The clearance between the block and the insulation board should be as small as possible. \* The degree of contact between the heater and the object to be heated will affect the life of the heater. A large clearance will delay the temperature rise time and create a delayed response to temperature adjustments.

## Precautions for Use

- ⚠ Do not use the heater at a temperature exceeding the maximum operating temperature of 200°C.
- ⚠ Never operate the heater when it is empty. Doing so may result in damage to the unit.
- ⚠ Apply electric power under the condition in which an object such as metal to be heated is attached to the heater.
- ⚠ Attach the object so that the heater comes into close contact with the surface to be heated.
- ⚠ Make sure that the lead wire is not touching the metal plates when the heater is sandwiched between them.
- ⚠ Do not forcibly insert the heater between the metal plates. Doing so will cause the heater to crack.
- ⚠ The heater is not waterproof. Never expose the heater to water or any other liquids.
- ⚠ Use the temperature-rise data as a reference and do not heat too rapidly. Doing so will definitely result in breakage of wire.
- ⚠ Do not exceed the operating voltage (V) shown below. Doing so will cause breakage of the wire in the heater.
- ⚠ Do not bend fluorine resin tubes.

