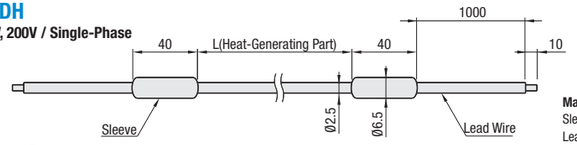
Cord Heaters / Heat Resistance Tapes

Cord Heater

RoHS 10

MCDH
100V, 200V / Single-Phase



Material: Elements: Silicon Rubber
Sleeve: Silicon Rubber
Lead Wire: Copper (Cu)
Lead Wire Film: Silicon Rubber

Maximum Operating Temperature: 180°

Part Number Type	No.	L (Heat-Generating Part)	W (Electrical Power)	V (Voltage)	Electrical Power Density (W/cm²)
MCDH	1	1000	10	100	0.13
	2	2000	20		
	3	3000	30	200	
	4	4000	40		
	5	5000	50		

Part Number Example

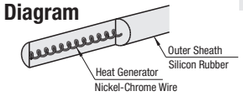
Part Number
MCDH2

Application Example

Features
– Excels in heat resistance as the sheathing of the heater is silicon rubber.
– As the heater is flexible, it can be fitted in any type of shape. Maximum Operating Temperature is 180°C.

Basic Structure
This is a heater integrating a heat generating body with the silicon rubber.

Basic Structure Diagram



How to Mount
– Install directly onto piping.
– As an example to secure the heater, heat resistant aluminum tape can be used.

(Fig. 1)

Selection Method (Cord Heaters and Silicon Belt Heaters)
Calculate with the following formula by using the heat insulating thickness, size of piping, temperature of piping and temperature difference with the external atmospheric temperature.
(Refer to Fig. 2, Table 1 and 2)

Heat Quantity Required for The Heater(W) = Number of Watt per 1m of Pipe (W/m) x Length of Pipe (m)

Ex.) For piping size 15A (1/4B) and length 1m to be 30°C
(Heat-insulation thickness is 25mm and external atmospheric temperature is 20°C)
From Table 1, when the insulation thickness is 25 mm, piping size is 15A (1/4B) and the temperature difference between pipe temperature (30°C) and external atmospheric temperature (20°C) is 10°C, the wattage is 4.0 (W/m).

Heat Quantity Required for The Heater (W)=4.0 (W/m)x1 (m)=4.0W

(Fig. 2)

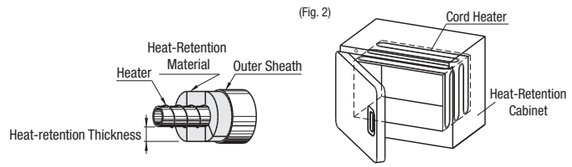


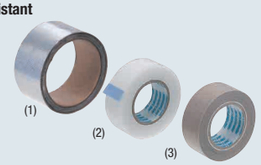
Table 1 When heat-retention thickness is 25mm — Unit: W/m (Watts per 1m of Tube)

Tube Size A	Tube Size B	Temperature Difference between Pipe Temperature and External Atmospheric Temperature 10°C	20°C	30°C	40°C	60°C	80°C
15	1/4	4.0	8.1	12.1	16.1	24.4	32.6
20	1/2	4.6	9.2	13.9	18.5	27.6	36.9
25	1	5.4	10.6	16.0	21.4	32.0	42.8
32	1 1/4	6.3	12.5	18.8	24.9	37.5	50.1
40	1 1/2	6.9	13.7	20.5	27.5	41.3	54.9
50	2	8.1	16.1	24.2	32.2	48.4	64.5
65	2 1/2	9.5	19.1	28.6	38.3	57.2	76.4
80	3	10.9	21.6	32.5	43.4	65.0	86.6
100	4	13.2	26.6	39.9	53.3	79.6	126.5
150	6	18.2	36.5	54.8	73.1	109.5	145.9
200	8	23.3	46.5	69.6	92.9	139.1	185.5
250	10	28.1	56.3	84.4	112.5	168.8	225.0

Table 2 When heat-retention thickness is 50mm — Unit: W/m (Watts per 1m of Tube)

Hollow Size A	Hollow Size B	Temperature Difference between Pipe Temperature and External Atmospheric Temperature 10°C	20°C	30°C	40°C	60°C	80°C
15	1/4	2.7	5.6	8.4	11.3	16.9	22.5
20	1/2	3.1	6.2	9.4	12.5	18.8	25.5
25	1	3.5	7.0	10.6	14.1	21.1	28.1
32	1 1/4	4.0	8.0	12.0	16.0	24.1	32.1
40	1 1/2	4.4	8.6	13.0	17.3	26.0	34.7
50	2	5.0	9.9	14.9	19.7	29.9	39.8
65	2 1/2	5.7	11.5	17.3	23.1	34.5	46.0
80	3	6.4	12.9	19.2	25.6	38.5	51.2
100	4	7.6	15.4	23.0	30.8	46.0	61.4
150	6	10.2	20.4	30.6	40.9	61.1	81.5
200	8	12.8	25.4	38.1	50.9	76.1	101.5
250	10	15.1	30.4	45.5	60.8	91.0	121.4

Heat-Resistant Tapes



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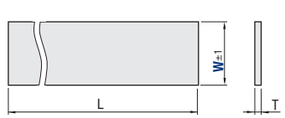


	Type	Material: Surface	Material: Heater	Material: Adhesive Part	Heat Resistance Temp.
(1)	MCAT	Aluminum Alloy	Glass Cloth	Acrylic Adhesive Material	150°C
(2)	MCTF	Fluoro Resin (PTFE)		Silicon Adhesives	200°C
(3)	MCTFG	Fluoro Resin (PTFE)	Glass Cloth	Silicon Adhesives	200°C

Peel off backing paper to adhere it to an object after peeling off the backing paper. (MCAT only) Wipe off oil and dust on the mating surface before adhering.
Can be cut with a utility knife.

Part Number Type	W (mm)	L (m)	T (mm)
MCAT	20	20	0.25
	50		
MCTF	25	10	0.23
	50		
MCTFG	25	10	0.18
	50		

L dimension is in meters.

Characteristic Values of Heat Resistance Tapes
(Listed values are not guaranteed values but reference values.)

Item	MCAT	MCTF	MCTFG
Operating Temperature (°C)	150	200	200
Tensile Strength (N/cm)	24	108	330
Elongation (%)	12.5	20.0	4.7
Adhesive Strength (N/25mm Width)	16	10	12.9

* The adhesive strength means the 180° peeling strength. (When adhered to 304 Stainless Steel)

Part Number Example

Part Number
MCAT20

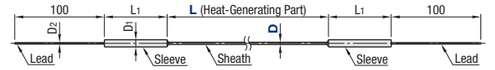
MiSUMi

Micro Heaters / Silicon Belt Heaters

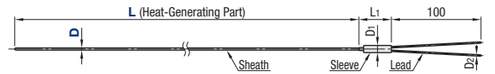
Micro Heaters

RoHS 10

MBHKR
Both Terminal Type



MBHK
One Terminal Type

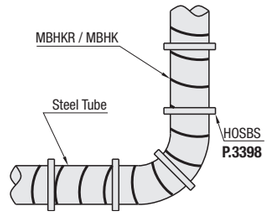


Material:
Sheath Body: 316 Stainless Steel
Heat Generator: Nickel Heat Generator
Lead: Nickel Lead

Maximum Operating Temperature: 600°C Heat Resistance Temperature of Sleeve: 200°C

Part Number Type	D	V (Voltage)	W (Electrical Power)	L (Heat-Generating Part)	L_1	D_1	D_2	Electrical Power Density (W/cm²)
MBHKR	1.0	100	200	1750	50	5.0	1.0	3.6
		200	400	3500		6.4		
	1.6	100	300	3000	50	6.4	1.0	2
		200	600	6000				
	2.4	100	600	3600	70	8.0	1.4	2.2
		200	1200	7200				
MBHK	1.6	100	250	1350	36	6.4	1.0	3.7
		200	500	2700				3.7
	2.4	100	400	1950		8.0	1.0	2.7
		200	800	3800				2.8

Application Example



Structure
Insulating powers and a heat generator are hermetic-sealed and enclosed within sheath in the same manner as sheath thermocouple.

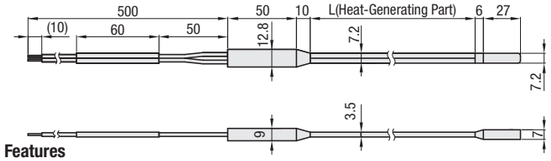
Features
– The tube of the heater is extremely thin, and usable for narrow and complicated places.
– Enhanced flexibility enables part to be molded into different shapes.
– Minimum bending radius should be up to 3 times of D dimension.

Precautions for Use
– Do not cross the sheath part or contact to the part.
– Be sure to use Temperature Control Unit since heat tends to stay by covering with material of low thermal conductivity such as heat insulation material.
– The tube of the heater is extremely thin. Excessive tension may cause breakage in the tube.

Silicon Belt Heaters

RoHS 10

MBEH 100V, 200V Single-Phase



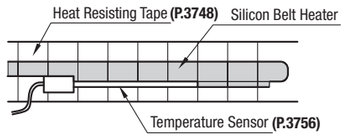
Operating Temperature: -50~180°C

Selecting Method: See table on left-hand page
Material:
Heat Generator: Nickel-Chrome Wire
Coating Material: Silicon Rubber
Lead Wire: Silicon Rubber Film
: Tin Plated Annealed Copper Wire

Features
– Belt type heater with Nickel-chrome wire molded with silicon rubber.
– The belt type structure enables to stick to the object closely and heat it.
– For Selection Method, refer to **P.3745**.

Part Number Type	No.	L (Heat-Generating Part)	V (Voltage)	W (Electrical Power)	Electrical Power Density (W/cm²)
MBEH	1050	1000	100	50	0.7
	2050	2000	200	50	0.35
	3100	3000	200	100	0.5

Application Example



Precautions for Use
Do not let heater run idle in the atmosphere. It may cause fires and broken wire.
Do not install by overlapping the heater.
Do not use over the rated voltage (V).
This product is not water-proof. Do not use in places where water splashes or humidity is high.
Wrap with heat resistant tape from the top to use.
When removing the heater from the heated object, make sure the power is turned off. Do not touch the heater immediately after the power is turned off.
Use Temperature Adjusters or Temperature Controllers for safety.

Part Number Example

Part Number	-	V	-	W	-	L
MBHKR1.0		- V100		- W200		- L1750
MBEH 1050						