

# Heat Exchanger Instruction Manual

**HX-0051H-44TK2NL05T35NNN**  
**HX-0051H-44TK2NL06T35NNN**

## Safety precautions

**⚠ WARNING** Incorrect handling can cause serious injury or death.

- Before connecting with the fittings, check if no damage or problems are found on the fittings. Connect properly and make sure that leak test is conducted before actual operation to prevent fluid from leaking into the atmosphere (Hereafter, the measured fluid is called "gas" or "fluid").
- DO NOT** apply any fluids corrosive to stainless steel. Corrosion may cause fluid to leak into the atmosphere. Please confirm the physical properties of liquid before using.
- This device is not designed as an explosion-proof structure. **DO NOT** use this device in a place where explosion-proof structure are required. Doing so may cause fire or explosion.
- Please make sure the device is properly grounded to prevent shock hazard.
- Prepare temperature controller unit when operating Vaporizer/Heat Exchanger and do not set the temperature over than maximum operating temperature. Wrong temperature setting may cause fire or destruction of the device. It is recommended to add abnormal overheating detector or heater disconnection detector if necessary.
- This device is not designed to be waterproof. **DO NOT** locate this device outdoors or in a place where it may be splashed with water. Doing so may cause fire, trouble, or malfunction of the device.

**⚠ CAUTION** Incorrect handling may lead to slight or moderate injuries or may cause damage to or loss of facilities or equipment.

- Observe the listed in the **WARNING** (above)
- The rated voltage is AC100 to 120VDC or AC200 to 240VDC. Use out-of-spec power supply will cause electric shock, fire, and malfunction of device.
- DO NOT** modify this device. It may cause fire or other problems.
- Attach/remove connector and terminals, please make sure that power supply turning off. It may cause fire or shock hazard.
- This device is a precious device, please handle it carefully. Dropping down or handling it carelessly will cause damage. Please use assist instrument while moving or setting the device.
- This product is packed in a clean room before shipment. Please break seals in a clean room after taking it out of the packing box.
- A warm-up period of 60 minutes is recommended after reaching the set temperature.
- Please use a screw with depth of 5mm or less from the case surface when mounting HX by the hole on the surface (M4). It will crush the internal surface of the product, and lead the break.

## 1. Introduction

This manual explains the basic operation of the HX-0051H-44TK2NL05(06)T35NNN (Hereafter called "HX"). Please read through this manual carefully to become familiar with the features of this device.

## 2. Summary

This is an ultra-clean, highly efficient heat exchanger composed of metal. With maximum operating temperature up to 300 °C and maximum heat exchange rate up to 20L per minute, this apparatus is employed over a wide range of applications from semiconductor industries to other major manufacturing sectors.

## 3. Features

The HX has the following features.

- Superior corrosion-resistant Stainless steel 316L materials make maintenance
- Particle-free structure
- RoHS compliant

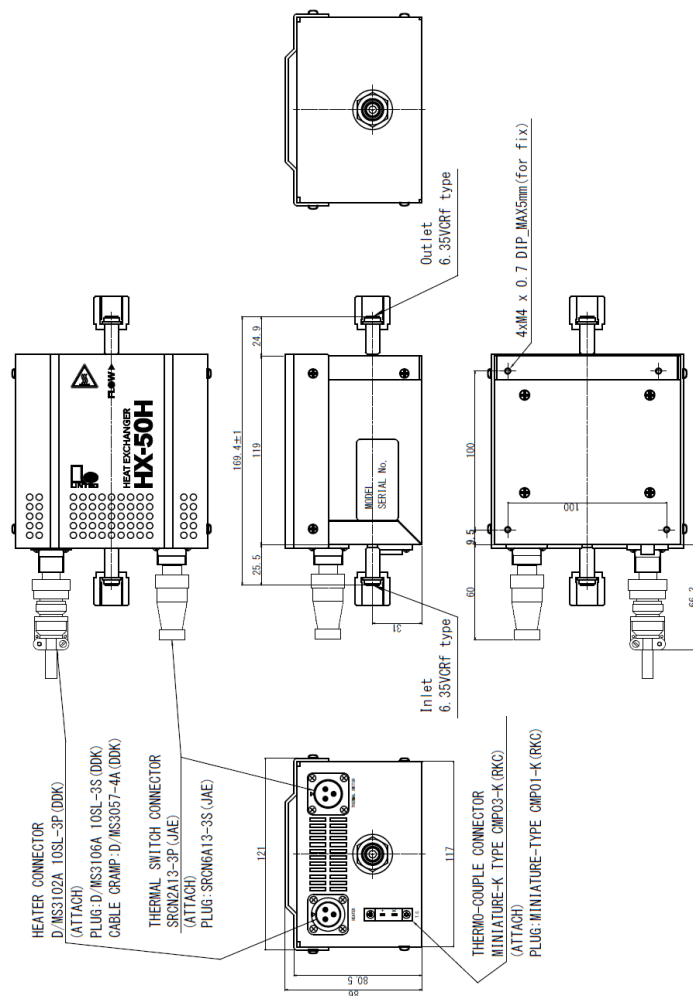
## 4. Specification / Dimensions

### (1) Specification

Product name	Heat Exchanger	
Model	HX-0051H-44TK2NL05T35NNN	HX-0051H-44TK2NL06T35NNN
Flow rate range(N2)	20SLM	
Pressure loss(N2)	40kPa (20SLM,300°C, Outlet pressure under atmosphere)	
Withstand pressure(gauge)	1 MPa(G)	
Leak integrity(external)	Less than 5.0×10 <sup>-10</sup> Pa·m <sup>3</sup> /sec (He)	
Operating condition	Continuous operation	
Operating temperature	15 to 50°C (Without dew condensation)	
Maximum operating temperature	300°C	
Recommended temperature control method	PID control	
Material exposed to gas	Stainless steel 316L	
Fitting	Inlet: 6.35mm (1/4") VCR female type Outlet: 6.35mm (1/4") VCR female type	
Heater	120V 400W 100V 277W	240V 400W 200V 277W
Power	AC100V to AC120V	AC200V to AC240V
Thermocouple	K Type 1pc	
Thermal switch Specification (Note1)	350°C±20°C OPEN Electric rating: AC 125V/6A 250V/4A Min: 0.1A	
Mounting position	Free	
Weight	Approximately 2kg	
Standard accessories	Thermocouple connector : CMP01-K (RKC) Heater connector (Cable clamp) : D/MS3057-4A (DDK) Heater connector (Plug) : D/MS3106A 10SL-3S (DDK) Thermal switch connector (Plug) : SRCN6A13-3S (JAE)	

Note1) Specifications for thermal switch. Actual operation may vary depending on operating temperature.

### (2) Dimensions



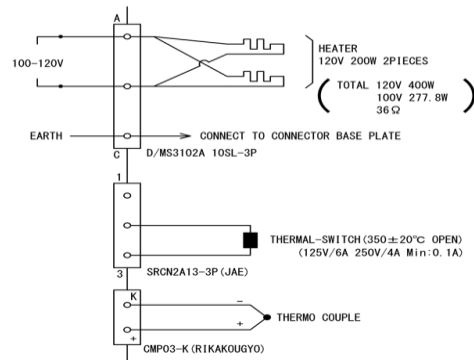
## 5. Ordering information

<u>HX</u>	<u>-0051H</u>	<u>-44</u>	<u>TK2</u>	<u>N</u>	<u>L**</u>	<u>T35</u>	<u>NNN</u>
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]

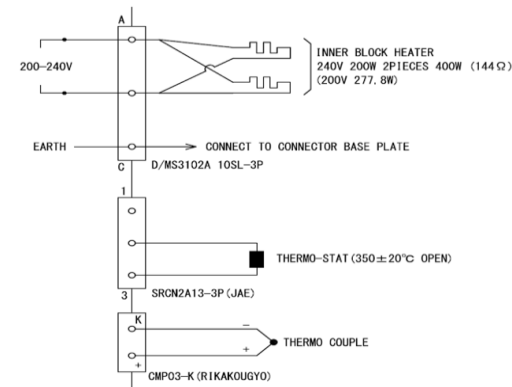
- [1] Heat Exchanger  
 [2] Series  
 [3] Fitting size... 44: IN,6.35mm OUT,6.35mm  
 [4] Fitting type... TK2:VCR [IN: female, OUT: female]  
 [5] Internal treatment... N:No polish(※ Standard), E:EP(※ Option)  
 [6] Heater type... L05:AC120V 400W, L06:AC240V 400W  
 [7] Thermal switch active temperature... T35:350°C±20°C  
 [8] Option... NNN: Standard specification
- ※Notation other than NNN means customer options. The specification will be different from this specification sheet, please refer to specific specification sheet please notice that the pin assignment may be different as well.

## 6. Connection

Model: HX-0051H-44TK2NL05T35NNN



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### (1) Heater connector

Equipped Connector : D/MS3102A 10SL-3P (DDK)  
 Applicable Connector: D/MS3106A 10SL-3S (DDK)  
 Cable clamp : D/MS3057-4A (DDK)

Pin No.	Signal name
A	120V 400W, 240V 400W
B	
C	CASE GND

### (2) Thermal switch connector

Equipped Connector : SRCN2A13-3P (JAE)  
 Applicable Connector: SRCN6A13-3S (JAE)

Pin No.	Signal name
1	N.C.
2	Thermal switch
3	

### (3) Thermocouple connector

Equipped Connector : CMP03-K (RKC Instrument Inc.)  
 Applicable Connector: CMP01-K (RKC Instrument Inc.)

Pin No.	Signal name
K	Thermocouple (right) (-)
+	Thermocouple (right) (+)

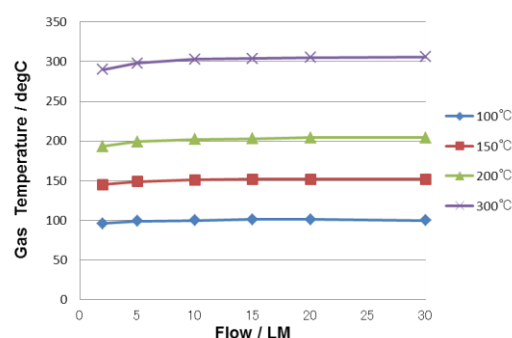
## 7. Technical Data

The graph below shows estimation of the nitrogen gas temperature trend with data obtained from our heat exchanger (Model: HX-0051H). Please be advised that the stated estimation trend is **NOT** applicable to cases where gas type other than nitrogen is used, and/or operation under a different condition is performed.

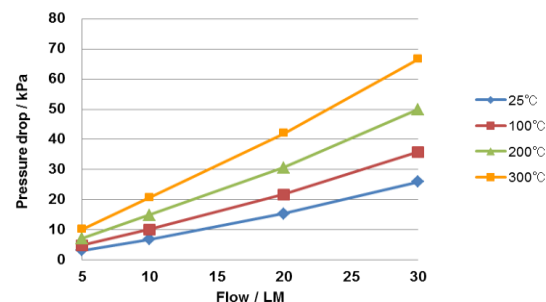
[ Measurement conditions ]

- HX set temperature:100,150,200,300°C
- Gas: N2
- Room temperature:20°C
- Pressure at outlet side: Atmospheric pressure

### (1) Outlet gas temperature of HX



### (2) Pressure loss



## 8. Operation

- Please prepare temperature control unit. 120V/400W or 240V/400W heaters are used. Please confirm the power and capacity. Please take care with respect to the heater capacities. In addition, a temperature control unit with a built-in safety mechanism is recommended for the temperature control point. As the built-in thermocouple is a K type, please select a unit which is compatible with this type of thermocouple.
- Please be sure to use a safety device such as a circuit breaker to prevent surge currents and short circuits.
- Please be careful to attach this device in the direction of the gas flow. In order to prevent a decrease in the gas temperature after heat exchange has taken place please heat the piping between the gas outlet and the next piece of machinery.
- This device has a built-in 350°C thermal switch.
- The heater can be affected by humidity during storage. Ensure that insulation resistance is above 20MΩ. If the insulation resistance drops, dry the HX and ensure that insulation resistance is above 20MΩ.
- Supply power, set the temperature to the desired value using the temperature control unit and allow 60 minutes for the device to stabilize after the set temperature has been reached. Even though the temperature control unit display temperature may be stable the temperature of the body of the device is not. In order to achieve good heat exchange efficiency please allow this device to stabilize before use.

## 9. Product Warranty

### (1) Period

This product is guaranteed for a period of 1 year from the date of shipment. Repairs are free of charge for any failure occurring in normal use.

### (2) Scope

Warranty coverage is restricted to this product only. Any other damage caused by this product is not covered.

### (3) The following repairs are not covered by the warranty:

- Failure caused by product of the fluid used
- Failure caused by misuse (including careless operation), or by incorrect repair or modification.
- Failure cause by falling or dropping after purchase
- Failure caused by fire, earthquake, flood, lightning, or other natural disasters

Even if the warranty period is still in effect, repair service may not be provided in the following cases.

- The product is returned with fluid remaining inside, and safety cannot be confirmed
- When the kind of fluid or gas used on the product is unclear

This instruction manual is subject to revision without notice.

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