

Vaporizer Unit Instruction Manual

VU-0430N Series

Safety Precautions

WARNING Incorrect handling can cause serious injury or death.

- Before connecting the fittings, check that no damage or defects are found on the fittings. Make connections properly and make sure that a leak test is conducted before actual operation to prevent liquid and gas from leaking into the atmosphere.
- DO NOT apply any corrosive fluid to materials exposed to liquid and gas. Corrosion may cause liquid or gas to leak into the atmosphere. Please confirm the physical properties of liquid or gas before using.
- This device is not designed as an explosion-proof structure. DO NOT use this device in a place where explosion-proof structures are required. Doing so may cause fire or explosion.
- Prepare temperature controller unit when operating Vaporizer/Heat Exchanger and do not set the temperature over than maximum operating temperature. Wiring temperature setting may cause fire or destruction of the device. It is recommended to add abnormal overheating detector if necessary.
- This device must be earthed before use. Otherwise, there is the risk of electric shock.
- Thermal switch is equipped in Vaporizer/Heat Exchanger to prevent overheating. However, the operating temperature of thermal switch would vary due to operating conditions and ambient temperature.
- Attach/remove connector and terminals, please make sure that power supply turning off. It may cause fire or shock hazard.

CAUTION Incorrect handling can cause medium or slight injury or may cause damage to, or loss of, facilities or equipment.

- Observe the precautions listed in the **WARNING** (above).
- Not using the voltage can cause fire, damage to sensors or malfunction or cause electric shock.
- This device is not designed to be waterproof. DO NOT locate this product outdoors or in a place where it may be splashed with water. Doing so may cause fire, trouble or malfunction of this product.
- DO NOT modify this product. It may cause fire or other problems.
- A warm-up period of 60 minutes is recommended after reaching the set temperature. Otherwise, the output gas temperature will be low.
- 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.
- Depends on the character of the liquid and process condition, the temperature of tube, carrier gas, and the VU, also the flow rate of carrier gas should be set properly.
- Please use Helium (He) to pressure liquid. It easily lead to bubbles if use N₂, Ar, O₂, etc, that have higher than Helium (He) solubility to pressure.
- Regular maintenance is recommended for the steady use of this product. This product uses a seal material made from the Kalrez®, in order to reduce leakage, Changing the seals annually is recommended. The maintenance cycle changes according to precursor type and operating conditions, so please consult about the maintenance cycle for the steady use of this device.

1. Introduction

This instruction manual explains the basic operation of Vaporizer unit VU-0430N Series (Hereafter called "VU"). Please read through this manual carefully to become familiar with the features of this device.

2. Features

The VU has the following features.

- By using the VU in combination with the liquid mass flow meter (Hereafter called "LM") and the gas mass flow controller (Hereafter called "MFC"), precise flow control and effective vaporization can be assured.
- Maximum operating temperature of 200°C.
- Compact size

3. Specification/ Dimensions

(1) Specification

Product name		Vaporizer
Model name		VU-0430N
Rated power supply voltage and heater capacity	Vaporizer model: D01	Inner AC 120V 80W Outer AC 120V 100W
	Vaporizer model: D02	Inner AC 240V 225W Outer AC 240V 400W
Thermal switch (Note1)		230±10°C OPEN
Thermal switch connection method		Outer block: 1piece, Inner block: 1piece Direct connection (125V/15A, 250V/10A)
Operating primary pressure		150 to 300 kPa(G)
Operating secondary pressure		Less than 25 kPa(G)
Pressure Limit (Gauge pressure)		1MPa(G)
Leak integrity (External Leak)		Less than 5.0×10 ⁻¹⁰ Pa·m ³ /sec (He)
Fittings	Precursor inlet	3.2mm (1/8") VCR Male
	Carrier gas inlet	6.35mm (1/4") VCR Male
	Gas outlet	6.35mm (1/4") VCR Female
Thermocouple for temperature controller		K Type × 2pieces
Recommended temperature controller		PID control type
Wetted materials		StainlessSteel316L, Au, Ni-Co, Polyimide or PEEK
Mounting direction		Piping line: horizontal. Power supply connector: vertical and up. (Please confirm the outline dimension drawing)
Standard accessories	Thermocouple connector	CMP01-K(RKC) × 2pieces
	Heater/Thermal switch connector	SRCN6A16-7S (JAE) × 1piece
	LM-VU connect cable	CC-LV-3-3M × 1piece

Note1) The temperature of thermal switch may be different from the temperature of a point of controlling of VU.

(2) Dimensions

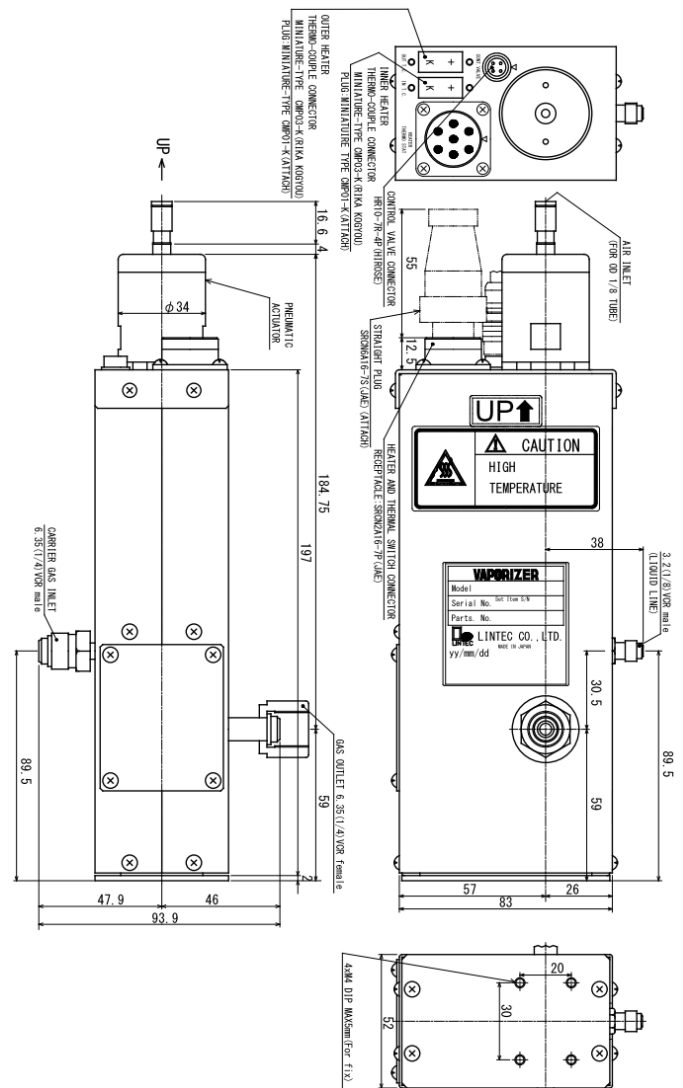


Fig1. External dimensions and components

4. Ordering Information

VU-0430N - A CL - 02 P N N D01 T23 NNN
 [1] [2] [3] [4] [5] [6] [7] [8] [9] [10]

- [1] Series model: VU: Vaporizer VU Series
 [2] Valve type
 A: Control valve and Shut-off valve all-in-one
 F: Shut-off valve all-in-one
 [3] Carrier gas
 CL: Carrier gas-less type 01: Carrier gas type 1
 02: Carrier gas type 2 03: Carrier gas type 3
 [4] Capillary
 02: Capillary type 2 03: Capillary type 3
 [5] Valve
 P: Polyimide E: PEEK
 [6] Seal
 N: Au
 [7] Internal surface treatment
 N: No treatment M: Electrical polishing(EP)
 [8] Heater
 D01: AC100 to 120V D02: AC200 to 240V
 [9] Thermal switch
 T23: 230±10°C
 [10] Option
 NNN: Standard specifications
 ※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.

5. Electrical Connection

(1) Heater / Thermal switch connector

Mounted connector : SRCN2A16-7P (JAE)

Pair connector : SRCN6A16-7S (JAE)

Pin No.	Signal name
1,2	Inner block heater power supply
3,4	Outer block heater power supply
5	Case Gnd.
6,7	Thermal switch

(2) Thermocouple connector

Mounted connector : CMP03-K (RKC Instrument Inc.)

Pair connector : CMP01-K (RKC Instrument Inc.)

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

(3) LM-VU connect cable

Mounted connector : HR10-7R-4P (73)

Pair connector : HR10-7P-4S (73)

Pin No.	Signal name
1	Valve control signal
2	Valve control signal (-15VDC)
3,4	N.C.

6. Connection diagram

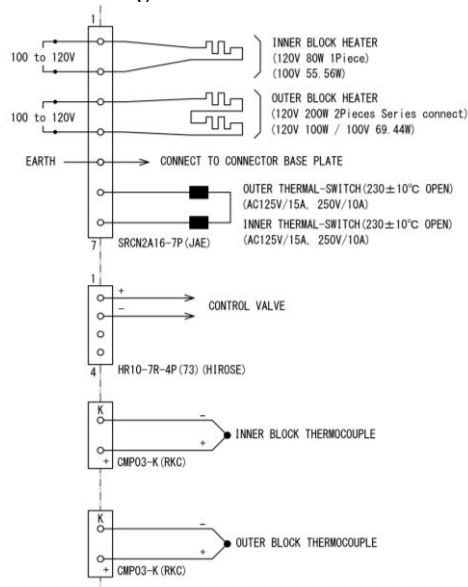


Fig2. Connection diagram (Heater specifications: D01: 120V)

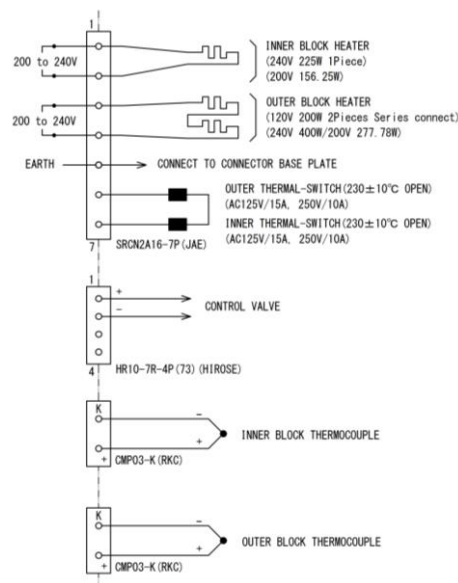


Fig3. Connection diagram (Heater specifications: D02: 240V)

7. Preparation and Operational Procedure

- Check the liquid type, and attach the VU fittings in the direction of the fluid flow.
- Prepare a MFC for carrier gas (including power indicator and cable) and connect it to the carrier gas lines.
- Attach filters to liquids and carrier gases lines.
- Prepare temperature control units and connect to the VU and outlet tubing heaters.
- Electrical connections should be made correctly, taking account of power source voltage, polarity and capacity.
- Supply power to the LM and the MFC, and warm-up for 30 minutes. Please turn on the VU heaters and confirm that the temperature has reached the set temperature after a period of 90 minutes.
- Check that there are no leaks from the fittings using a helium (He) leak detector.
- Evacuate and purge the tubing line, the LC and the VU to remove moisture, thoroughly.
- Thermal switch may work by temperature overshoot in the first operation. Please adjust PID by auto turning.
- When using a liquid mass flow meter and carrier gas mass flow controller together with this device to control and introduce liquid, vaporized gas will be transported from the outlet.
- Please use helium (He) to pressure liquid (To lower the possibility of generating bubbles).
- It is necessary to set the VU, line and carrier gas temperature as well as carrier gas flow rates to appropriate values in order to meet the liquid physical properties and process conditions.

8. Product Warranty

(1) Period

This product is guaranteed for a period of 1 year from the date of shipment. Defects are repaired according to the following regulations.

(2) Scope

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

(3) Disclaimer facts

The following repairs are not covered by the warranty.

- Failure caused by by-product of liquid or gas used.
- Failure caused by misuse (including careless operation), 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.

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

This instruction manual is subject to revision without notice.

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