ULVAC

SUPER TRAP TEMPERATURE CONTROLLER STC-1C series

Instruction Manual

STC-1C

STC-1C(INV)

Export Control Policy

We recommend that ALL customers be sure to follow all rules and regulations such as Foreign Exchange and Foreign Trade Law when exporting or reexporting our products.

D/N.MFST10CE,2022DR08 **ULVAC CRYOGENICS INCORPORATED**

Introduction

Thank you for choosing our products. This instruction manual gives information and precautions on handling, installation, operation, and maintenance of the product.

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. To ensure proper use of this product, read this instruction manual carefully and keep this manual close at hand so that you can use for reference during operation.

If you purchased our other products and/or optional devices with this product, read relevant instruction manuals carefully.

1. About the personnel who are involved in handling our products

All personnel involved in handling our products should take a general safety education and training that is officially accepted in the country where our product is used. The personnel are also required to have specialized knowledge/skills and qualification on the electricity, the machinery, the cargo handling, and the vacuum. Especially, the personnel should be familiar with handling a cryopump in order to use it safely. Since we offer a training session (which is subject to fees) as needed for people who use cryopumps for the first time, please do not hesitate to contact our Service Engineering Division to join the training session.

2. Warranty

2.1 Gratis warranty period and Warranty coverage

【Gratis warranty period】

Note that an installation period of less than one year after installation in your company or your customer's premises or a period of less than 18 months (counted from the date of production) after shipment from our company, which is shorter, is selected.

【Coverage】

(1) Failure diagnosis

As a general rule, diagnosis of failure should be done on site by customer. However, ULVAC CRYOGENICS or our service network can perform this service for an agreed fee upon the customer's request. There will be no charge if the cause

of the breakdown is found to be a fault of ULVAC CRYOGENICS.

(2) Damage during transportation

When damage by delivery/transportation is admitted, the product will be repaired free of charge within the range of the guarantee expressed in the sales contract.

(3) Breakdown repairs

There will be a charge for breakdown repairs, replacements and on-site visits for the following seven conditions. In those cases the cost shall be your own expense even though the product is within the warranty period.

① Breakdowns due to improper storage or handling, careless accident, software or hardware design by the customer.
② Breakdowns due to modifications of the product without consent of the manufacturer.
③ Breakdowns due to maintenance of the product without authentic parts or breakdowns resulting from using the product outside the specified specifications of the product.
④ Breakdowns due to contamination or corrosion caused by user's use conditions.
⑤ Breakdowns due to natural disasters (such as fire, earthquake, flood, lightning, salt damage, and so on) , environmental pollution, irregular voltage, and /or usage of undesignated power source.
⑥ Breakdowns that are outside the terms of warranty.
⑦ Consumables and/or replacement service.

Since the above services are limited to within Japan, diagnosis of failures, etc are not performed abroad. If you desire the after service abroad, please contact ULVAC CRYOGENICS and consult us for details in advance.

2.2 Exclusion of opportunity loss from warranty liability

Regardless of the gratis warranty term, compensation to opportunity losses incurred to your company or your customers by failures of ULVAC CRYOGENICS products and compensation for damages to products other than ULVAC CRYOGENICS products and other services are not covered under warranty.

2.3 Repair period after production is discontinued

ULVAC CRYOGENICS shall accept product repairs for seven years after production of the product is discontinued.

3. Service Form

After the products are delivered, please fill out the following information in the blanks. If you have any questions or technical problems, please feel free to contact the nearest Customer Support Center or headquarters. Please refer to "Service Network".

Cryopump／Super trap Model	: _____
Cryopump／Super trap Serial No.	: _____
Refrigerator Model	: _____
Refrigerator Serial No.	: _____
Compressor Model	: _____
Compressor Serial No.	: _____
Temperature controller／Thermal display Model	: _____
Temperature controller／Thermal display Serial No.	: _____
Option Part Model	: _____
Optional Part Serial No.	: _____

4. Notes for repair and maintenance requests

We may decline your request for the repair or the maintenance of our products if you refuse to give us information about the presence of the hazardous substance and/or contaminant.

Also, please be aware that we do not accept liability for damages by the contaminant, which might be caused during transportation to our office or the nearest customer support center. To avoid such accident, please pay careful attention to packing of the product

5. In case of breakdown and accident

When breakdown or accident occurs, we may ask for keeping the product on site as it is or retrieving the product to investigate its cause. Also we may ask for reporting the detailed process and/or the operating condition. When unidentified malfunction was generated, please contact our Service Engineering Division or

the nearest customer support center with reference to the chapter of Service Network. We ask for cooperation about the above.

6. General Precautions

(1) It is strictly prohibited to duplicate, open, and transfer this instruction manual or any of its parts to a third person without written permission from ULVAC CRYOGENICS.

(2) Information in this document might be revised without a previous notice for the specification change and the improvement of the product.

(3) If you have any questions or comments on this document, please do not hesitate to contact us. The phone numbers of local customer support centers are listed at the end of this manual.

Safety Considerations

Our products have been designed to provide extremely safe and dependable operation when properly used. Following safety precautions must be observed during normal operation and when servicing them.

WARNING **A warning describes safety hazards or unsafe practices which could result in severe injury or loss of life.**

CAUTION **A caution describes safety hazards or unsafe practices which could result in personal injury or equipment damage.**

Toxic gas or chemicals used.
There is a risk of severe injury upon contact.

Corrosive chemicals used.
There is a risk of severe injury upon contact.

Flammable gas used.
There is a danger of fire or burn injury.

Explosive gas used.
There is a risk of fire or explosion.

Hazardous voltage .
Electric shock may cause severe injury or loss of life.

Hot heating part present.
There is a risk of burn injury.

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FIGURES

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SHIPPING LIST

Our product has been fully inspected before shipment. However, please make sure that there is no shortage of delivered items by checking the table below, product name, and there is no damage by checking the external view of the products. STC-1C series has the name of product on the front of its body. Be sure that the product is exact specifications of your order. Please inform us the name of product and serial number when you inquire us about the product.

Item	Quantity
Super trap temperature controller STC-1C Series	1
Fixed clamp (Refer to section.5, chart 5-1)	2
Power Cable (Refer to section.5, chart 5-1)	1
Conversion adapter (Refer to section.5, chart 5-1)	1※1
Optional cables (Refer to section.5, chart 5-1)	1
Instruction Manual	1

※ 1 This conversion adapter comes with STC-1C series' in the only case Super trap refrigerator is two phase motor, and is delivered with the condition the conversion adapter connected with the main body of STC-1C series.

Inspection and Adjustment of STC-1C series

Please contact our technical service department when inspection and/or adjustment of STC-1C series are needed. No circuit or any other parts of this product may be changed and/or adjusted in any shape or form in any circumstances. Note that any inspection, check, adjustment and repair caused by such change and/or adjustment will be only accepted at your expense even if it is within the warranty period.

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Disposal Considerations

Disposal of our products must be done in accordance with applicable national and local laws and regulations.

WARNING

The cryopumps or cryocoolers may contain residue of hazardous substances resulting from actual use. Contact your safety supervisor and follow the instructions to remove such toxic substances before disposing.

We provide Safety Data Sheet (SDS) of our products upon your request.
Please contact us if necessary.

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1. Features and Types

1.1. Features

Super Trap Temperature Controller STC-1C series can display the temperature of 80K panel by means of connecting K thermocouple mounted on our CRYO-T Super Trap series, and can adjust the temperature of 80K panel within the range of setting temperature by means of turning the trap refrigerator power ON and OFF. The appearance of STC-1C series is shown on Figure 1-1 below.

This series has two types: STC-1C and STC-1C (INV). The main difference between them is how to control refrigerator power. STC-1C is a relay control method: it is connected between the compressor unit and the refrigerator, and turn refrigerator power line ON and OFF by relay. On the other hand, STC-1C (INV) is an inverter control method: it controls On command of refrigerator with the inverter mounted on the compressor as an optional. Figure 1-2 below shows types of STC-1C series.

Figure 1-1 The appearance of STC-1C series

1.2. Types

STC-1C(□)

Control method for refrigerator power

Undescribed = relay control method

INV = inverter control method

Figure 1-2 Types of STC-1C series

2. Specifications

- Dimensions ..... 96mm(W) x 96mm(H) x 238mm(D)
  (Refer to the external dimensions for the details)
- Weight 1.6kg
- Input Power Source..... Single-phase 100VAC - 220VAC±15%　50Hz/60Hz
  (Note: Attached power source cable is for AC100V only.)
- Power Consumption 30W
- Operating Environment..... Ambient Temperature : -10°C - 40 °C (No freezing.)
  Ambient Humidity : Below 80%RH(No condensation.)
  Ambient Altitude : Below 1000m
- Input..... TC-IN
  K thermocouple input
  REF-IN
  Refrigerator(Cold head)power input :
  144VAC - 240VAC (50Hz - 80Hz)
- Output..... R-T, HI-TEMP, READY
  Relay contact output : 24VDC MAX 1A
  REF-OUT
  Relay output three-phase 144VAC-240VAC MAX 2A
  TC-OUT
  K thermocouple output
  (Note: Not insulated from TC-IN. Insulation must be done referring to Section 7 in case of using it.)
- Insulation Resistance..... DC 500V　20MΩ or more
- Withstand Voltage ..... One minute at 1000VAC between input terminal and earth terminal.
- Display ..... 4 digit 7 segment Display
  Display range : 45K - 400K
  Display accuracy : 400K - 123K ±0.5%FS
  123K - 73K ±3%FS
  <73K Out of K thermocouple accuracy range

CAUTION

- Do not heat the Super Trap exceeding 70°C(340K).
  High temperature over 70°C may cause a damage to the Super Trap.
- If you use STC-1C series with Heater mounted on the Super Trap, be sure to install a timer device for the Heater in your equipment, or install thermocouple for overheat prevention to avoid any damage to the Refrigerator of the Super Trap.

3. Component Descriptions

3.1. STC-1C

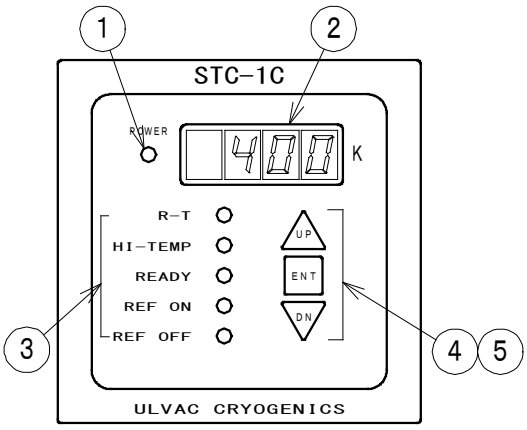


Table 3-1 STC-1C Component Descriptions

	Name	Description	
①	POWER	The lamp lights up when powered ON.	
②	7-SEGMENT DISPLAY	Normal Mode	Displays the temperature of 80K panel.
		Parameter Setting Mode	Displays the set value. (Refer to section 9.1)
③	Status LED		
	・R-T	The LED lamp lights up when contact outputs on the rear terminal board. Refer to section 8 for operation and section 9.2 for factory default value.	
	・HI-TEMP		
	・READY		
	・REF ON	The LED lamp lights up when the refrigerator is ON.	
	・REF OFF	The LED lamp lights up when the refrigerator is OFF. (Note: The LED lamp doesn't light when the compressor unit is suspended.)	
④	[UP]/[DN]	Used when change the parameter setting. Refer to "parameter setting method" of section 9.1 for the details.	
⑤	ENT		

3.2. STC-1C(INV)

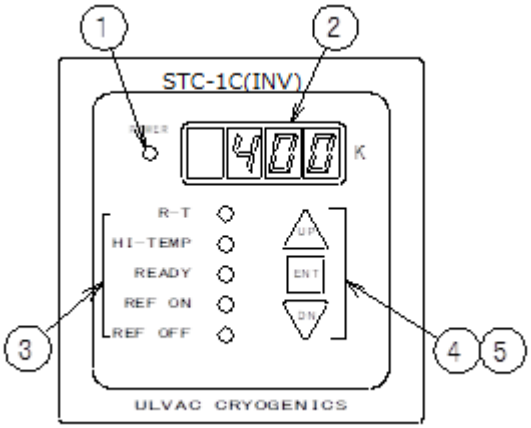


Table 3-2 STC-1C(INV) Component Descriptions

	Name	Description	
①	POWER	The lamp lights up when powered ON.	
②	7 -SEGMENT DISPLAY	Normal Mode	Displays the temperature of 80K panel.
		Parameter Setting Mode	Displays the set value. (Refer to section 9.1)
③	Status LED		
	・R-T	The LED lamp lights up when contact outputs on the rear terminal board. Refer to section 8 for operation and section 9.2 for factory default value.	
	・HI-TEMP		
	・READY		
	・REF ON	The response varies depending on the inverter type. FR-E720series: Lights at the temperature that the refrigerator unit is turned ON while the compressor unit is in operation. FR-D720series : Lights at the temperature unit is turned ON while the compressor unit is in normal condition(*1).	
	・REF OFF	The response varies depending on the type of the inverter to connect. FR-E720 series: Lights at the temperature that the refrigerator unit is turned OFF while the compressor unit is in operation. FR-D720series: Lights at the temperature unit is turned OFF while the compressor unit is in normal condition(*1).	
④	[UP]/[DN]	Use these buttons to change parameter values. Refer to section 9.1 ”Parameter setting“ for detail.	
⑤	ENT		

(*1) “Normal condition” refers to the state that the compressor unit is in operation and both the compressor unit and the inverter have no alarm.

4. Connector specifications

4.1. STC-1C

The drawing on the right and table 4-1 show compatible connector types for STC-1C and explanations of the pins

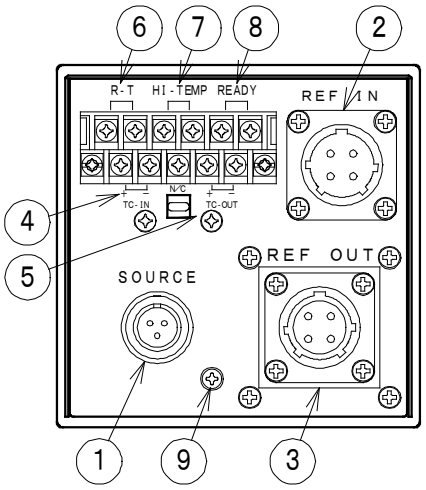


Table 4-1 Connectable plug types and descriptions of pins(STC-1C)

No.	Name	Connectable plug type	Pin No.	Descriptions
①	SOURCE	PRC03-12A10-3AF10.5 (TAJIMI)	1	L:Power source input (Single-phase 100VAC～220VAC)
			2	N:Power source input (Single-phase 100VAC～220VAC)
			3	E:Earth
②	REF IN	NJC-204-PF(NANABOSHI)	1	R:Refrigerator power source input
			2	S:Refrigerator power source input
			3	T:Refrigerator power source input
			4	E Earth:
③	REF OUT	NJC-204-PM(NANABOSHI)	1	R:Refrigerator power source output
			2	S:Refrigerator power source output
			3	T:Refrigerator power source output
			4	E:Earth
④	TC-IN	Round type crimping terminal ϕ3 (width 6mm or less)	+	K Thermocouple input (+)
			-	K Thermocouple input (-)
⑤	TC-OUT	Same as above	+	K Thermocouple output (+)
			-	K Thermocouple output (-)
⑥	R-T	Same as above	Relay contact output: 24VDC MAX1A (Refer to section 8 for operation.)	
⑦	HI-TEMP			
⑧	READY			
⑨	FG	Same as above	Frame grand	

4.2. STC-1C(INV)

Following drawing and table 4-2 show compatible connector types for STC-1C (INV), and explanations of pins

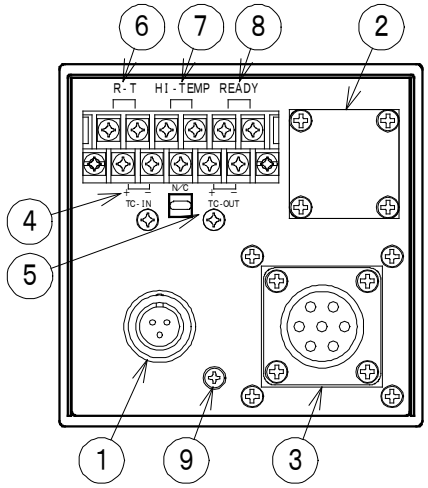


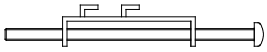
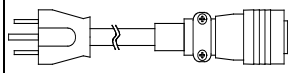
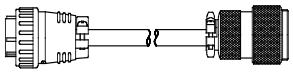
Table 4-2 Connectable plug types and descriptions of pins(STC-1C(INV))

No.	Name	Connectable plug type	Pin No.	Descriptions
①	SOURCE	PRC03-12A10-3AF10.5 (TAJIMI)	1	L：Power source input (Single-phase 100VAC～220VAC)
			2	N： Power source input (Single-phase 100VAC～220VAC)
			3	E：Earth
②	—	—	—	
③	INV ON/OFF	NCS-257-P(NANABOSHI)	1	R：COMP Operation signal (200VAC) input
			2	S：COMP Operation signal (200VAC) input
			5	SD：Refrigerator ON signal output
			6	STF：Refrigerator ON signal output
④	TC-IN	Round type crimping terminal φ3 (width 6mm or less)	+	K Thermocouple input (+)
			-	K Thermocouple input (-)
⑤	TC-OUT	Same as above	+	K Thermocouple output (+)
			-	K Thermocouple output (-)
⑥	R-T	Same as above	Relay contact output：24VDC MAX 1A (Refer to section 8 for operation.)	
⑦	HI-TEMP			
⑧	READY			
⑨	FG	Same as above	Frame grand	

5. Accessories or Optional cable

Table 5-1 shows accessories in case that you do not specify cables.

Table 5-1 STC-1C series accessories

	Item	Type	Appearance	Manufacturer	Usage	Quantity
①	Clamp	—			For fixing main body	2
②	Electrical cable	GP-HS01	 3 pin,female	ULVAC CRYOGENICS	For SOURCE (100VAC only)	1 (3m)
②	Conversion adapter※1	U type		ULVAC CRYOGENICS	3 phase →2 phase connector For conversion	1 (30cm)

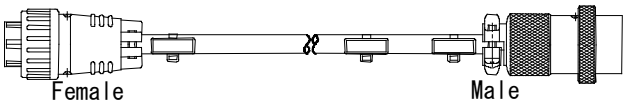
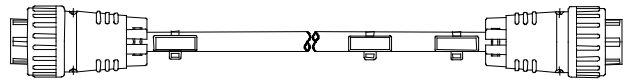
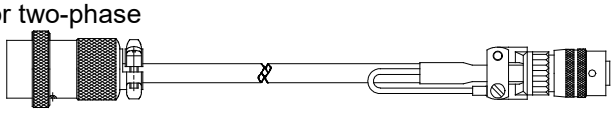
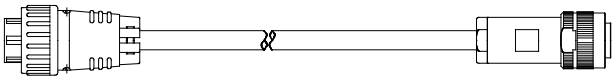
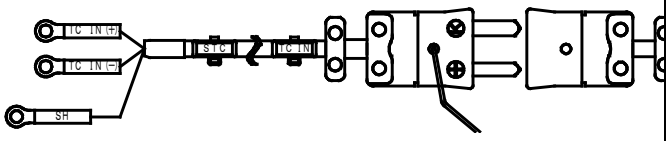
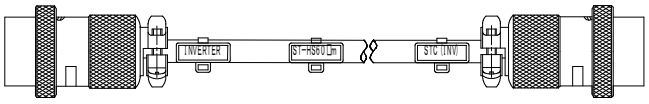
※1This conversion adapter is provided in case that the refrigerator motor of super trap is two-phase specification.

CAUTION

The above electrical cable is for 100VAC only. Do not input 200VAC.
In case that you input 200VAC, inquire us for available 200VAC electrical cables.

If you purchase our system, you may designate cables as optional.
Refer to table 5-2 for optional cables, and section.7 for wiring.

Table 5-2 Optional cables

No.	Item	Type	Appearance	Intended model
①	REF IN cable	ST-HS22	For two-phase 	STC-1C
		ST-HS23	For three-phase 	
②	Refrigerator power cable	—	For two-phase 	STC-1C, STC-1C(INV)
		—	For three-phase 	
③	K Thermocouple cable	ST-HS10		STC-1C, STC-1C(INV)
④	Inverter control cable	—		STC-1C (INV)

When you purchase our system, check with our sales representative about the cable

6. Installation

6.1. Installation site

○ Install STC-1C series in the site under proper usage environment.

CAUTION

Avoid using STC-1C series in these places.

- Where flammable gas, corrosive gas, oil mist and particles that can deteriorate electrical insulation are generated, or are abundant.
- Where the temperature is below 0°C or above 40°C.
- Where the relative humidity is 80%RH or below dew point.
- Where highly intense vibration or impact is generated or transferred.
- Near high voltage power lines or where inductive interference can affect the operation of the product.

6.2. Installation

Please see panel cut dimensions of figure 6-1 below, and machine the mounting hole on your cabinet panel. Insert STC-1C series from the front panel into the interior of the mounting hole completely, and fix it with two clamps.

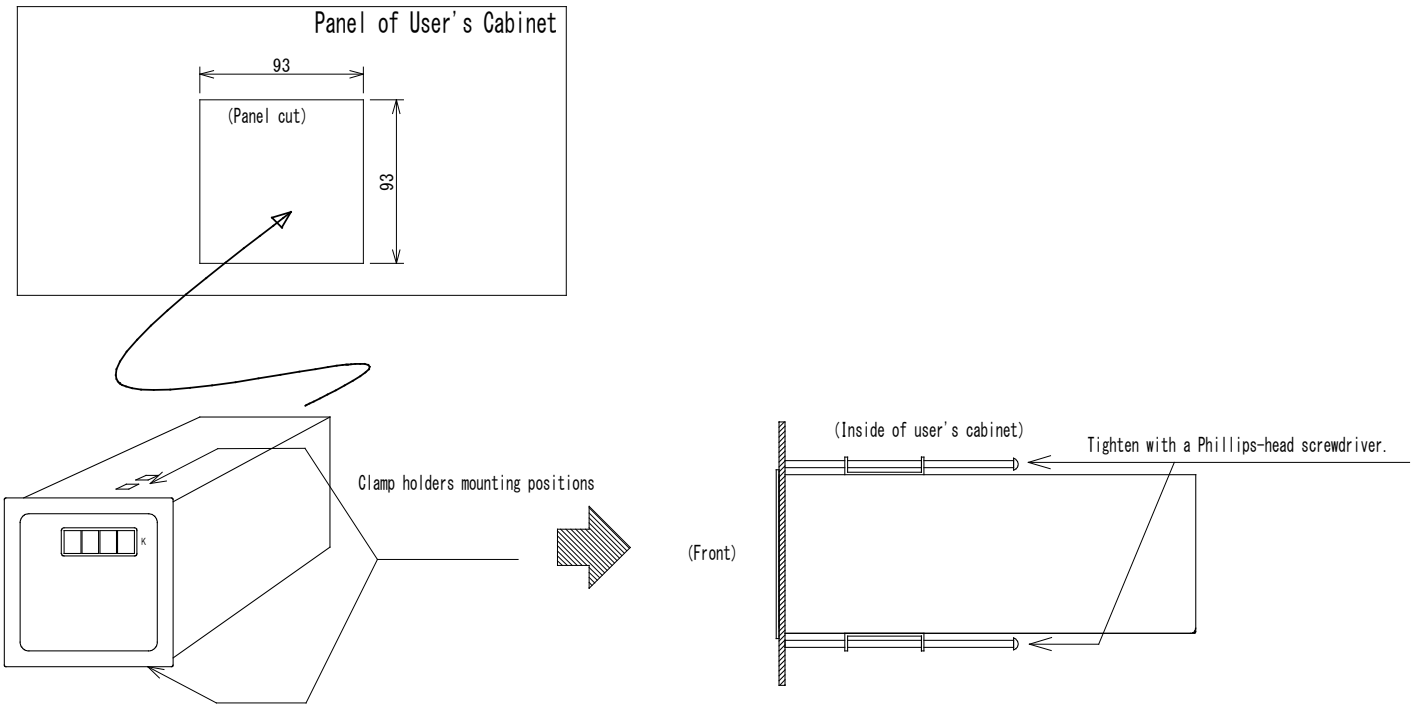


Figure 6-1 Panel cut dimensions and installation method

CAUTION

Over-tightening of the clamp may cause deformation or detachment of the front panel.
Tighten the clamps with the prescribed torque.
Recommended tightening torque = 0.5N・m - 0.8N・m

WARNING

●Be sure to use the STC-1C series controller, attaching in your equipment panel.
In order to prevent electrical shock, attach the provided safety cover to the controller so that the user cannot directly touch the input-output terminal.

7. Wiring

After the installation STC-1C series, wiring operation should be done referring to Figure 7-1, 7-2, and according to following instructions.

WARNING

- Always disconnect this product from any power source during wiring operation to prevent electrical shock.
- Avoid touching the wired terminal and charged devices while supplying power.

CAUTION

- Connect the power cable to the AC power source with a protective earth terminal. If you use the extension cord without a protective earth terminal, protective grounding becomes invalid.
- When connecting the plug type connector to STC-1C series, confirm that it is all the way seated. When unplugging, pull the plug. Do not pull the cable.
- When connecting a wire to the terminal, use the round crimping terminal with insulating sleeve. If the crimping terminal such as “Y” crimping terminal is used, the terminal may comes off, and may lead to electrical shock.

CAUTION

- Conduit Requirements for STC-1C series wiring

  To prevent interference during the operation, there should be a separate conduit for each signal line, control line and AC power line. Especially signal line of STC-1C series must be in separate conduit from other equipments or AC power lines or control lines for other equipments. Otherwise, STC-1C series operation will be interfered.

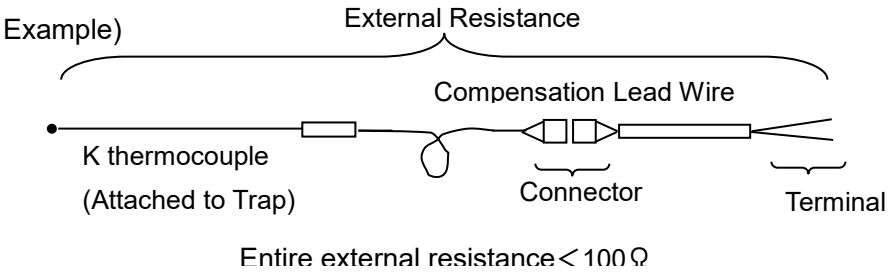
  If separate conduits cannot be supplied, keep enough distance (generally 300mm or more) between different wirings. It is effective to prevent interference.

CAUTION

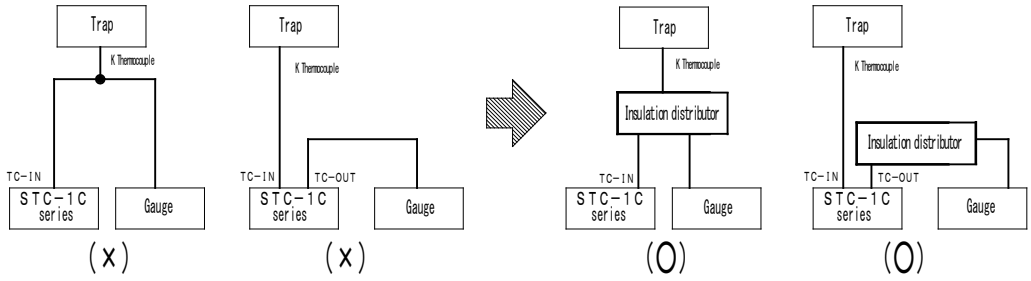
●K thermocouple

①For thermocouple input, use the compensation lead wire with shield which is effective for electric noise.

②The external resistance should be less than 100Ω.



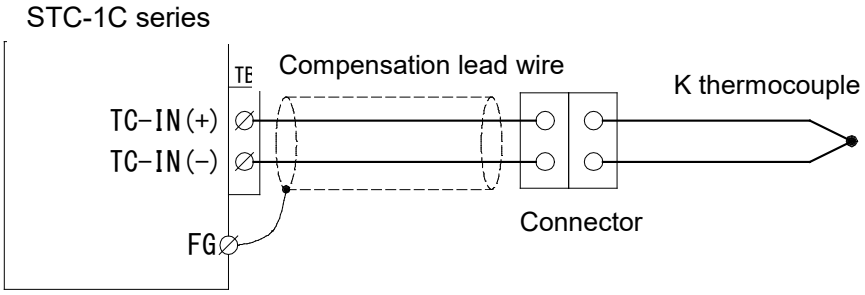
③If you connect several gauges for one K thermocouple in parallel or connect a controller to TC-OUT of STC-1C series, STC-1C series may display inaccurate temperature.
In this case, be sure to install an insulation distributor in proper place as shown below.



CAUTION

●How to connect the shield wire of the compensating lead wire

When using the compensating lead wire as the extension of the type K thermocouple, connect the shield wire of the compensating lead wire to the FG terminal. (Refer to section 4.)



Since the thermocouple supplied is shielded, the shield line will be grounded when mounting it on a trap. Therefore, when connecting the thermocouple to STC-1C series directly, without using a compensation lead wire, do not connect the shield wire to the FG terminal.

CAUTION

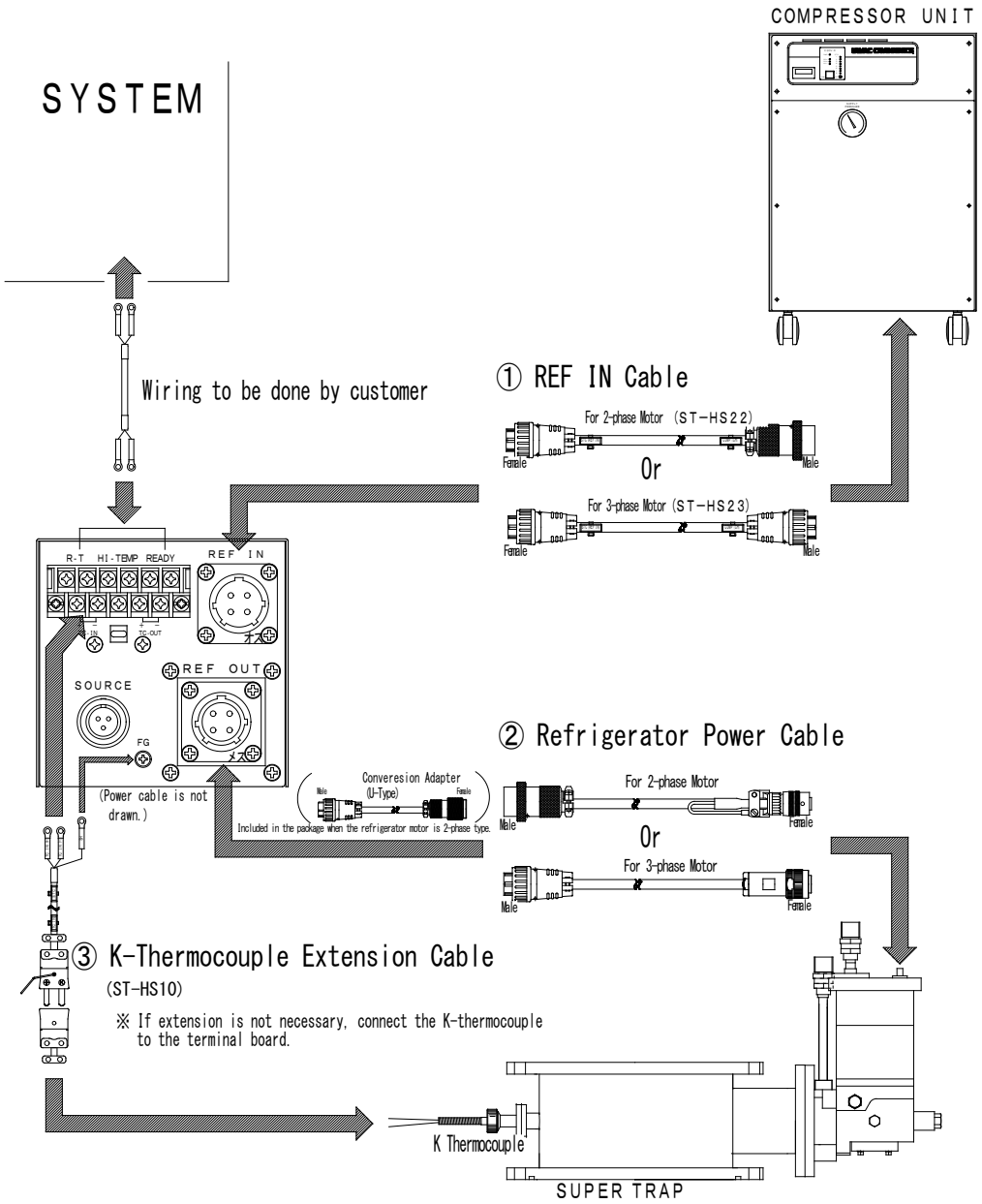
For lead-free soldering, be sure to use soldering iron and tip that are lead-free use ONLY. Also, DO NOT mix the lead-free solder with the lead eutectic solder.

It may decrease the lifetime of soldering connection.
It is recommended to indicate the type of soldering for appropriate maintenance.
The character strings listed below are recommended indication for each soldering.

Lead eutectic solder	SnPb	or	SP
Lead-free solder (Sn-Ag)	SnAgCu	or	SAC
Lead-free dolder (Sn-Cu)	SnCuNi	or	SCN

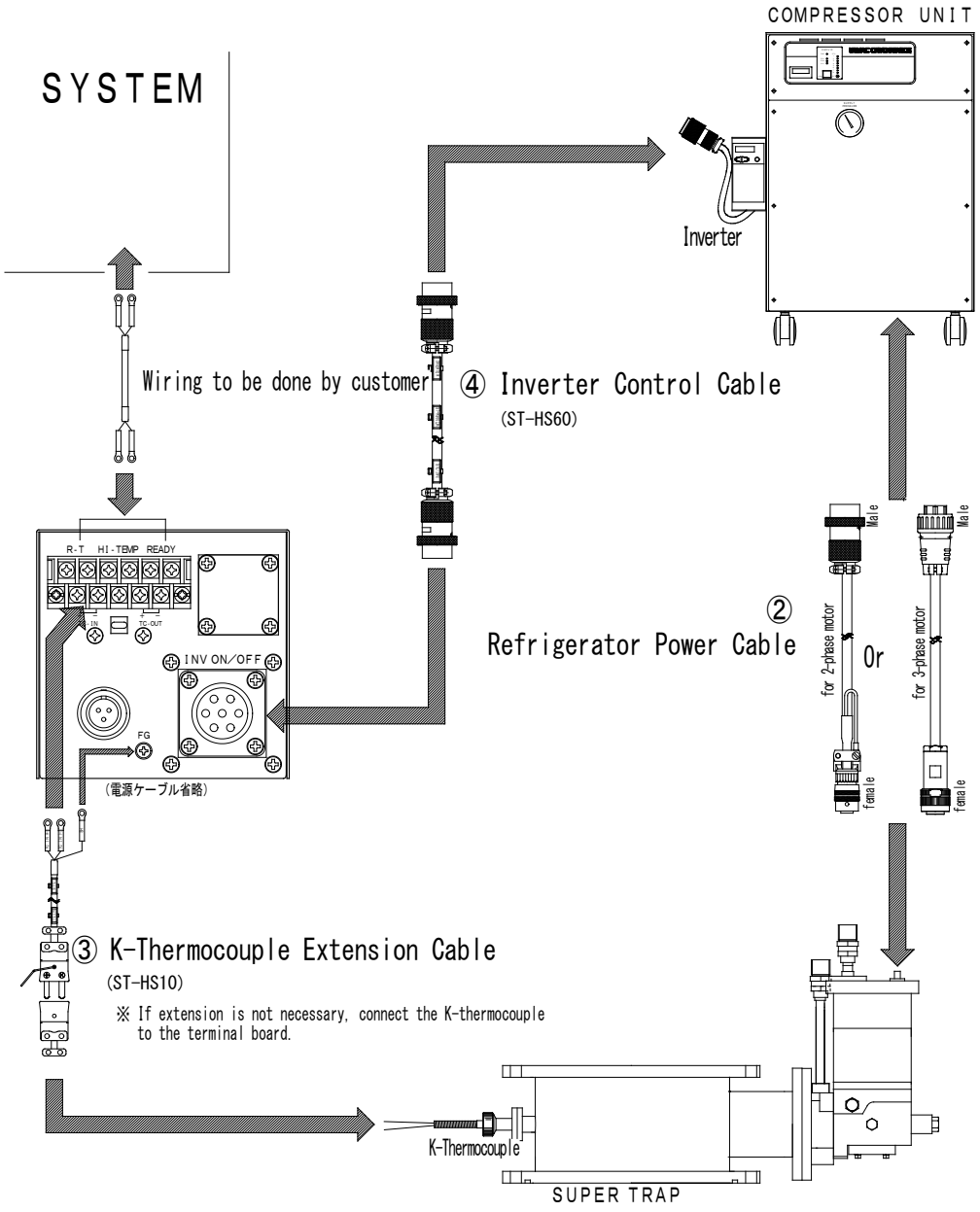
CAUTION

●After wiring, make sure that wiring has been done correctly. If difference signal has been connected, damage to STC-1C series may result. Also, make sure that the input power is within the allowable range.



	Name	Types	Remarks
①	REF IN cable	ST-HS22	for 2-phase refrigerator motor
		ST-HS23	for 3-phase refrigerator motor
②	Refrigerator power cable	—	for 2-phase refrigerator motor
		—	for 3-phase refrigerator motor
③	K Thermocouple cable	ST-HS10	(for extending K Thermocouple)

Figure 7-1 STC-1C optional cables wiring



	Name	Type	Remarks
②	Refrigerator power cable	—	for 2-phase refrigerator motor
		—	for 3-phase refrigerator motor
③	K Thermocouple cable	ST-HS10	(for extending K Thermocouple)
④	Inverter control cable	ST-HS60	

Figure 7-2 STC-1C(INV) optional cables wiring

8. Operation

Table 8-1 Operation

Step	Operation	Status of STC-1C series
1	Turn on STC-1C series.	POWER LED will light up. The temperature of 80K panel will be shown in 7segment display.
2	Start up the compressor unit.	The refrigerator is ON till READY LED will light up. After READY LED lights up, the temperature will be controlled between REF OFF set value and REF ON set value. Refer to Figure 8-1.
3	Turn off the compressor unit when operation to stop.	The refrigerator is OFF.

Table 8-2 Description of contact output operation

	Description
R-T	Outputs signal when the temperature is above R-T set value. (Initial value at our factry:293K)
HI-TEMP	Outputs signal when the temperature is above READY set value. (Initial value at our factry:130K)
READY	Outputs signal after the temperature has reached REF OFF set value. (Initial value at our factry:90K)

Please refer to Figure 8-1.

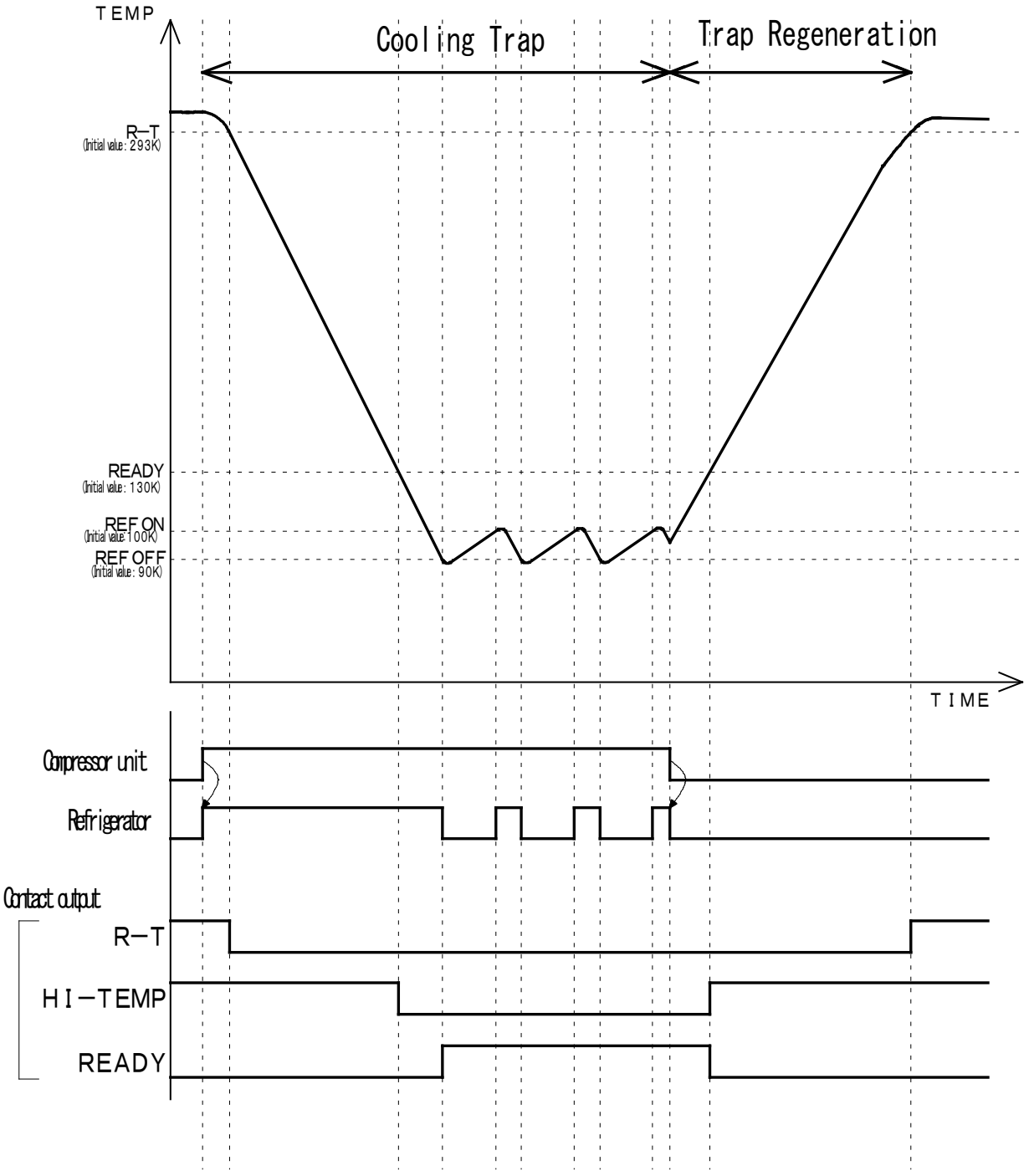


Figure 8-1 STC-1C series operation

9. Parameter setting

9.1. Procedure to Set Parameters

Key	Description
UP	Press UP key in the setting mode to increase the set value.
ENT	Press ENT key for one second to move the setting mode. and,used to fix the value in the setting mode.
DN	Press DN key in the setting mode to decrease the set value

◎Parameter setting method

① Press ENT key for one second

② Press ENT key to select parameter to set

→ LED : The selected parameter LED flashes

CEL : The cell displays parameter (The cell flashes)

③ Press UP or DN key to change the setting value

④ Press ENT key untill returning to the initial screen, then parameter setting mode is completed.

R-T → READY→ REF ON→REF OFF → Returning to the initial screen

◎The function to inhibit the parameter setting(Key operation lock)

Press UP and DN keys at the same time for 5 seconds to inhibit the parameter change.

→ in 7 segment display, [on] will be displayed for two seconds.

Press UP and DN keys again at the same time for 5 seconds to unlock the function.

→in 7 segment display, [oFF] will be displayed for 2 seconds.

9.2. Initial setting

The factory default settings are shown in the table below.

Table 9-1 Parameter factory setting value

Command	Discription	Factory default value	Recommended setting range※1
R-T	ROOM TEMP(room temperature) Outpus the signal when the temperature is above the set value.(Refer to section 8)	293K	273～300K
READY※2, ※3	The temperature that completes cooling trap Outputs the signal when the temperature is below the set value.(Refer to section 8)	130K	60～130K※4
REF ON	The temperature that refrigerator starts running during temperature control	100K	45～130K※4
REF OFF	The temperature that refrigerator stop running during temperature control	90K	45～130K※4

※1Make sure to use the preset value of each parameter within the recommended setting ranges shown in the above table, although the setting values can be changed from 0 to 300K.

※2 The “READY” display lights up actually after the trap temperature reaches below the REF OFF set value following the cooling completion temperature shown in the above table. (Refer to the Table 8-2)

※3 Use the READY output signal in conjunction with the answerback signal of the refrigerator.

※4Setting value must be [READY > REF ON > REF OFF] in case of changing preset value.

CAUTION

The temperature control relay endures electrically until its ON/OFF count reaches approximately 300,000. If the temperature control range (the value range between REF ON and REF OFF) is extremely narrow, ON/OFF count of the temperature control relay may exceed 300,000 in several months. Note that this may result in contact welding of the temperature control relay.

Table 9-2 Guideline for relay ON/OFF count

Temperature control range	ON/OFF count per hour	Total ON/OFF count when the equipment is continuously operated for one year
10K	Approx. 4/ h	Approx. 35,000/ year
5K	Approx. 12/ h	Approx. 100,000/ year
1K	Approx. 120/ h	Approx. 1 million/ year

The above values are just guidelines. Actual electrical endurance varies depending on thermal load on the equipment. It is recommended to replace the relay before its ON/OFF count reaches 300,000. For relay replacement, please contact our service engineer or CS center near you.

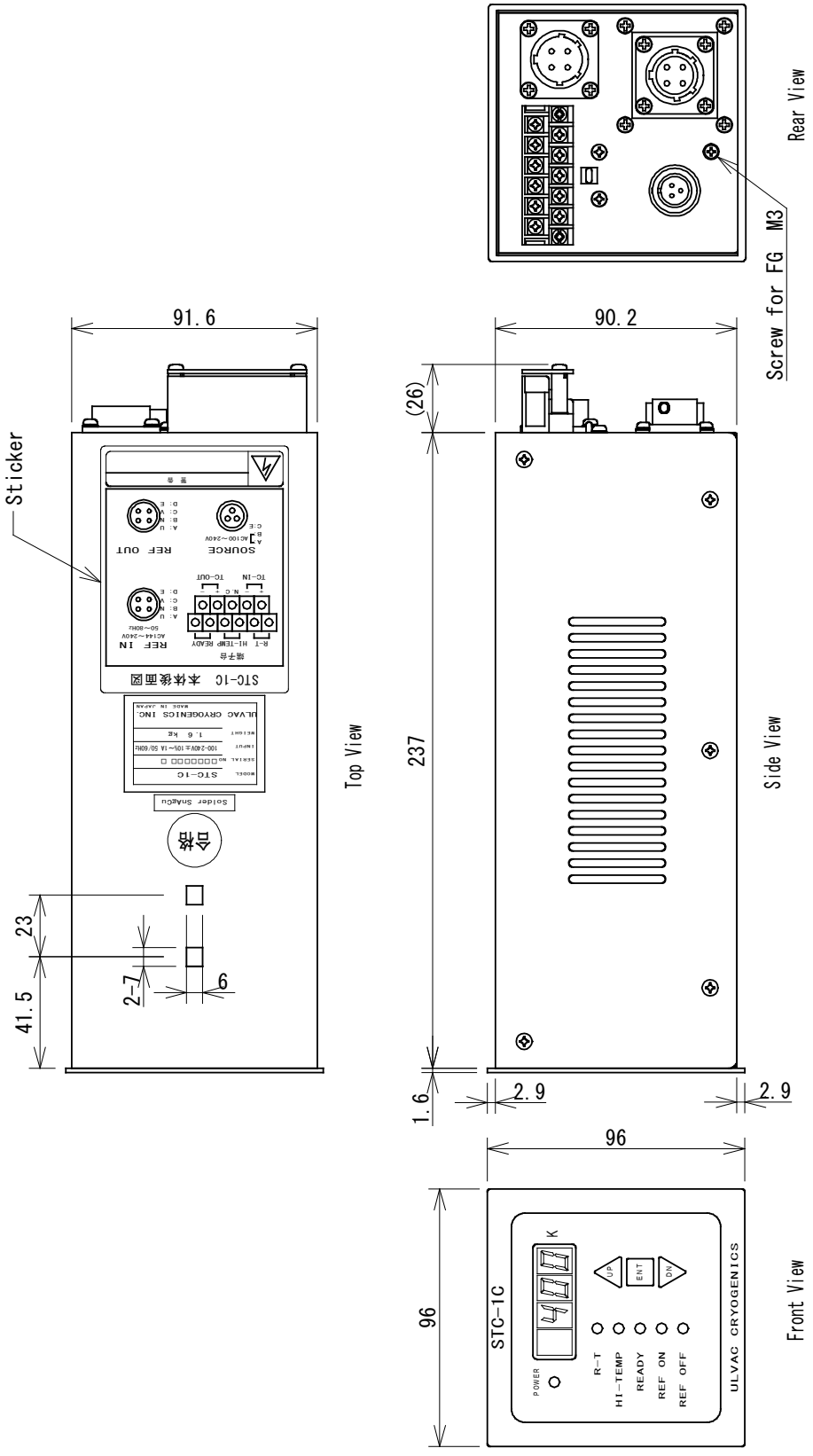
10. Troubleshooting

Table 10-1 Troubleshooting list

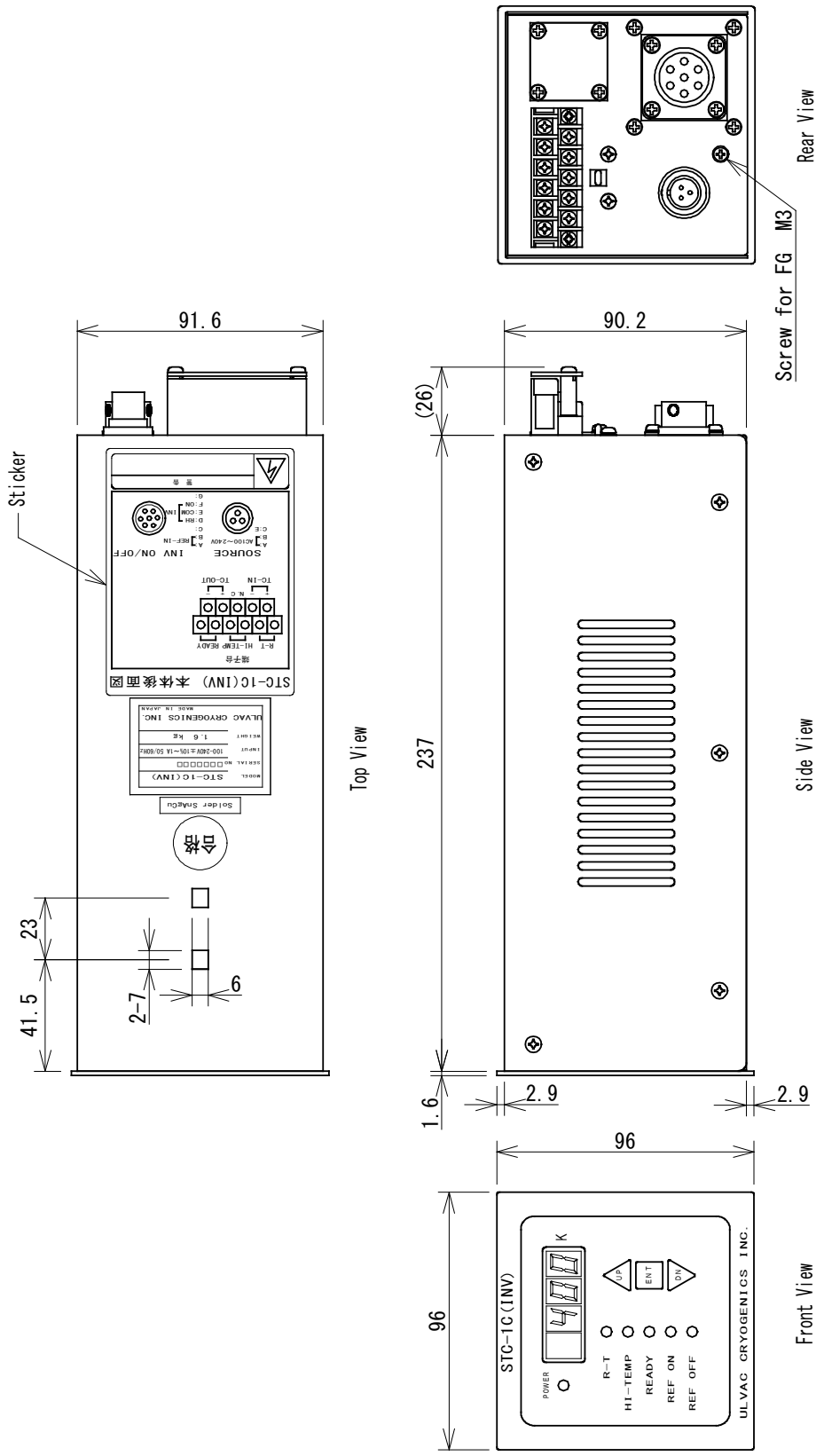
Problems	Possible causes	Action
Refrigerator unit does not start running.	Input power cable, refrigerator power cable, inverter control cable are not connected.	Connect cables correctly referring to section 7.
	Contact failure of the above-mentioned cables.	Reconnect cables correctly.
	Failure of compressor	Refer to the instruction manual of the compressor unit.
	Failure of refrigerator	Refer to the instruction manual of the trap.
	Fault of internal circuit	Contact our customer support.
The display shows [400K] and does not move.	K thermocouple and its cable line are not connected.	Connect K thermocouple and its cable line correctly referring to section 7.
	Disconnection of K thermocouple	Replace K thermocouple.
The indicated temperature has reached to the room temperature or above. (Around 340K)	[+] and [−] of K thermocouple are wired opposite way.	Wire them correctly again.
	Interference of heater or other heat source.	Cut off all heater source immediately. (The allowable highest temperature of the refrigerator is 340K)
Not be able to set the parameter. (Key control is not available.)	The function to inhibit the parameter setting is [on].	Press [UP] and [DN] keys at the same time for 5 seconds to release the function. (Refer to section 9)

CAUTION

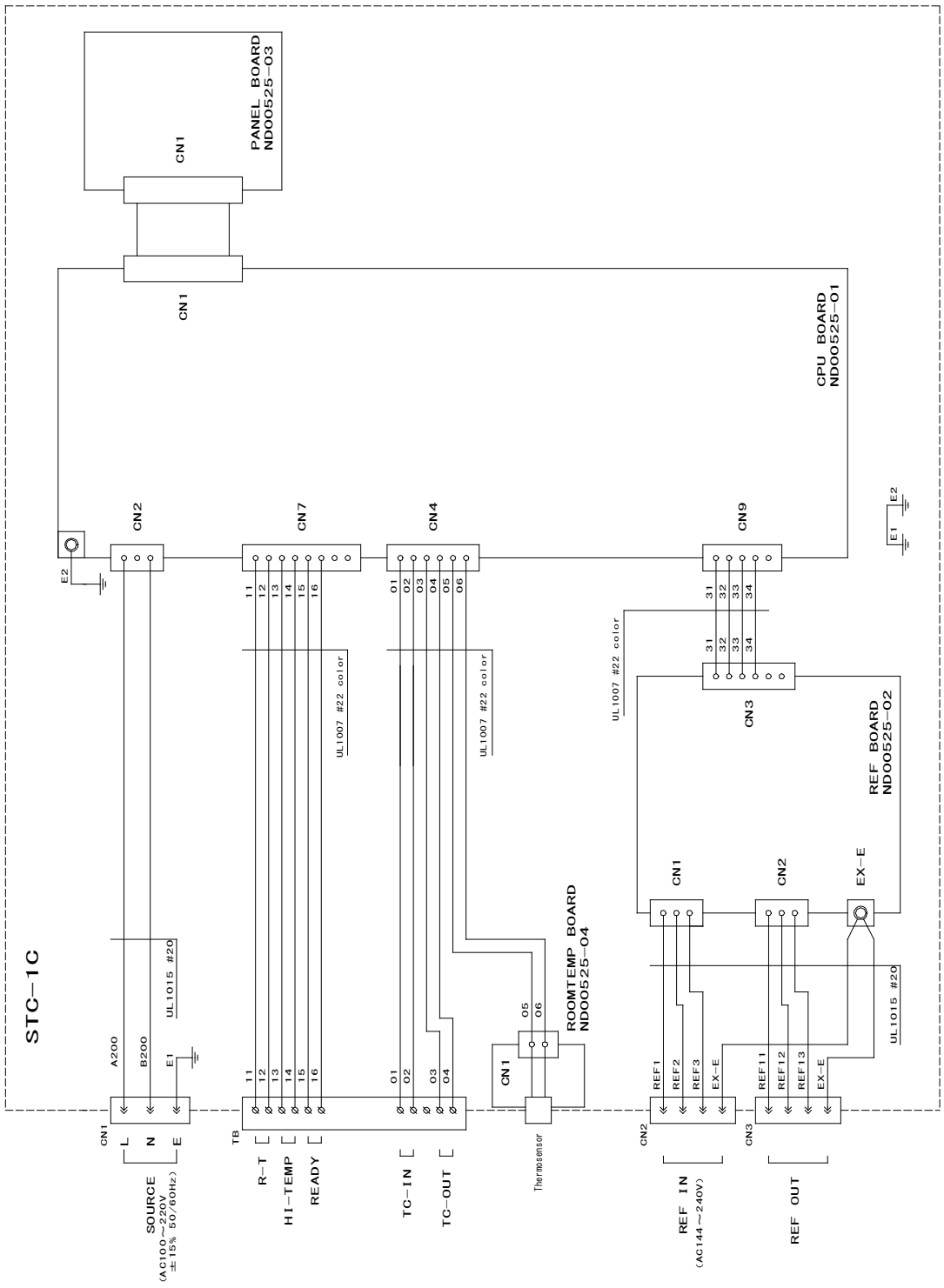
Maintenance and repair must be performed only by qualified maintenance personnel.
DO NOT remove the cover of the product.



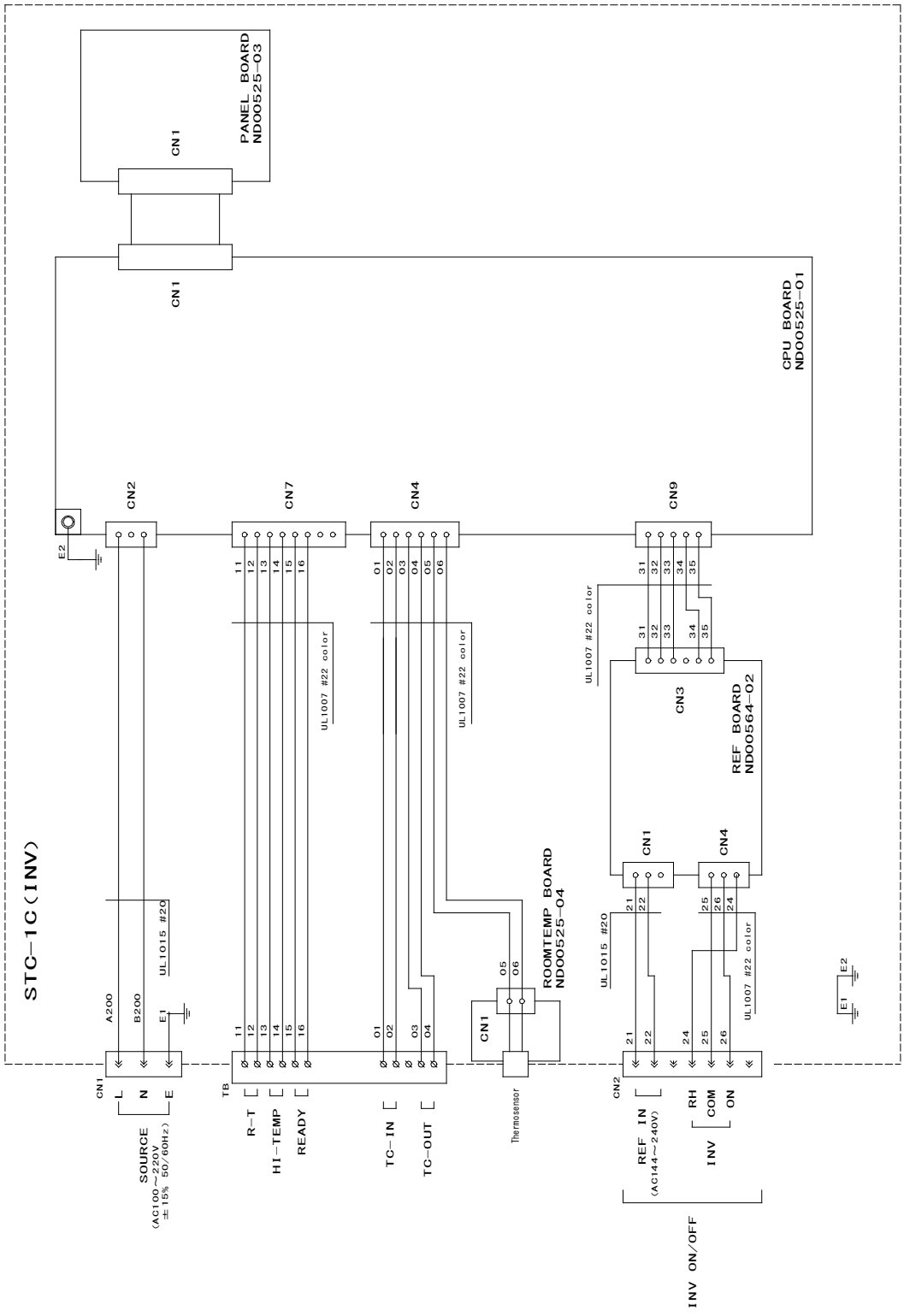
Appended Figure.1 STC-1C external dimensions drawing



Appended Figure.2 STC-1C (INV) external dimensions drawing



Appended Figure.3 STC-1C electric wiring diagram



Appended Figure 4 STC-1C (INV) electric wiring diagram

SERVICE NETWORK

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Revision History

Date	Revision No.	Contents
2008-06-5	2008.06	First edition
2008-06-11	2008JE01	The product name on the cover has been amended.
2009-06-22	2009JE02	“Introduction” has been revised. UCN address has been changed. “SERVICE NETWORK” has been revised.
2010-06-24	2010JE03	Notes have been added.
2012-06-18	2012JE04	“SERVICE NETWORK” has been revised.
2013-07-02	2013JU05	“SERVICE NETWORK” has been revised.
2013-11-08	2013NR06	“Introduction” has been revised. “SERVICE NETWORK” has been revised.
2018-03-06	2018MH07	“SERVICE NETWORK” has been revised.
2022-12-22	2022DR08	“3. Component Descriptions” Descriptions on STC-1C(INV) has been added. “8. Operations” Table 8-1 has been modified.

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