GENERAL
OPERATING/WARRANTY
MANUAL

FOR
CHILLER, FREEZER AND
HEATED DISPLAY CABINETS

IMPORTANT

TO BE KEPT WITH YOUR EQUIPMENT

artisan™

EXCELLENCE IN COMMERCIAL REFRIGERATION

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E & OE – All subject to our terms and conditions as included.

SAFETY OPERATING PROCEDURE

REFRIGERATORS AND FREEZERS

DO NOT USE THIS EQUIPMENT UNLESS YOU HAVE BEEN INSTRUCTED IN ITS SAFE USE AND OPERATION.

Non slip footwear must be worn when cleaning or servicing equipment.

Protective gloves must be worn when operating this equipment, including conducting cleaning and maintenance.

PRE-OPERATIONAL SAFETY CHECKS

1. Check workspaces and walkways to ensure that no slip/trip-hazards are present.
2. Check that all fittings and connections are in good condition prior to starting.
3. Ensure ventilation openings are kept clear at all times.
4. Ensure power cord is not damaged.
5. Locate and ensure that you are familiar with the operation of the On/Off switch.
6. Faulty equipment must not be used. Immediately isolate and report faulty equipment.

OPERATIONAL SAFETY

1. Set the refrigerator/freezer to a desired temperature.
2. Turn on the refrigerator/freezer.
3. Allow the refrigerator or freezer to come to equilibrium at the desired temperature.
4. Only suitable foods/drinks are to be stored in this refrigerator/freezer.
5. Ensure items are securely stored in this equipment.
6. Use correct manual handling techniques when loading and unloading this equipment.
7. Do not store flammable substance in refrigerator/freezer.
8. Clean up all liquid spills immediately
9. Ensure doors are left closed.

MAINTENANCE

1. Switch off the equipment and isolate before performing maintenance.
2. Inspect equipment weekly for frost deposits.
3. Do not use mechanical devices or other means to accelerate the defrosting process.
4. Clean equipment according to manufacturer's guidelines.
5. Ensure area around equipment is left clean and all liquid spills are cleaned up.
6. Maintenance is only to be carried out by trained and qualified personnel.

POTENTIAL HAZARDS

• Cold components and product • Liquid Spills • Contamination • Manual Handling • Sharp Edges

IMPORTANT SAFETY INFORMATION

i) Compartments containing works, including sub-base areas, and/or motors, fans, elements, coils, etc., are to be accessed only by trained, qualified personnel.

ii) Cabinet must be plugged into a dedicated power outlet i.e. do not use double adaptors, extension leads, or power boards etc.
If cabinet is provided with a 15 amp or large plug DO NOT change plug, install the right power socket.

iii) Never store flammables, explosives, or any other volatile substances in or around cabinet.

iv) Never hose or flush with water nor allow water to splash on unit, but rather wipe over with warm neutral water.

v) Do not allow children or people with handicaps to use the cabinet without suitable supervision.

vi) The cabinet must always be installed and stored indoors and never exposed to rain or bad weather conditions.

vii) When cabinet not in use, do not place where children play and may get trapped inside. Remove doors, in this instance.

viii) Do not obstruct any vents. (Refer START UP)

ix) Do not overload shelving
(40kg per shelf static load, evenly distributed).

x) When moving cabinet always have cabinet empty and have at least 2 people.

xi) For schools and institutions it is recommended to turn off unit at the power point when closing for holidays.

IMPORTANT

START UP

i) Always make sure cabinet is level and on suitable stable ground.

ii) Remove all packaging from cabinet.

iii) OPEN DOORS to allow cabinet to AIR.

iv) Ensure suitable ventilation (see Ventilation).

v) Set up shelves.

vi) Allow cabinet to sit for 1 hour. If cabinet has been turned on its SIDE for more than ½ hour allow at least 6 hours prior turning on.

vii) Plug cabinet into suitable power outlet and turn on. Some freezers are15 amp.

viii) Cabinet is ALL preset (see SETTINGS CHANGE).
  - ➤ All freezers are set at -20°C to run between -20°C to -16°C.
  - ➤ All chillers are set at 0°C to run between 0°C to 4°C.
  - ➤ All cake fridges are set at 1°C to run between 1°C to 3°C.

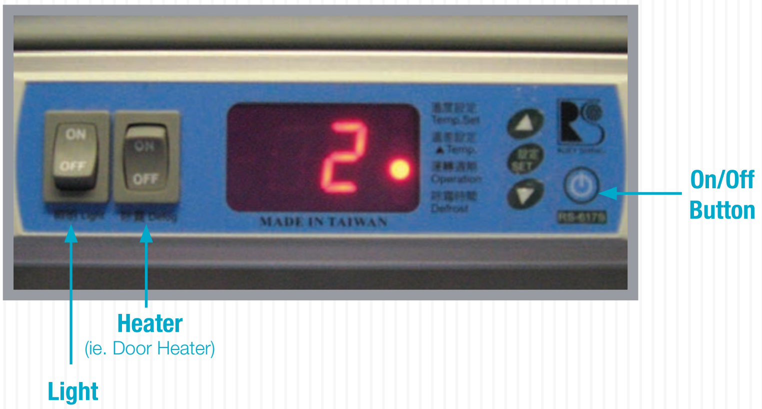
ix) Cabinet would normally take 1 hour to reach temperature, however may take a little longer depending on ambient temperature.

x) Once cabinet has reached set point you can then load cabinet. Always load cabinet with items at a suitable temperature and always keep in mind that an overcrowded or overloaded cabinet will not allow air to circulate.

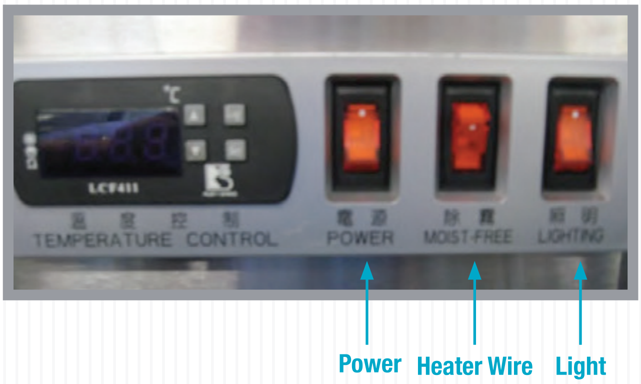
xi) All cabinets are fitted with an on/off switch. This controls power to the cabinet’s parts. Always disconnect from power source whenever cleaning or work is carried out on cabinet.

Also every cabinet is fitted with a further 2 switches; which are:-

STYLE I: ALL UPRIGHT TOP MOUNTED WORKS


On/Off
Button
Heater
(ie. Door Heater)
Light
MADE IN TAIWAN

STYLE II: ALL UNDER BENCH, CAKE DISPLAY AND BOTTOM MOUNT UNITS


TEMPERATURE CONTROL
POWER
MOIST-FREE
LIGHTING
Power
Heater Wire
Light

a) **Heater or Moisture Free**

This button activates the heater wires in the door frame/mullions and in the case of a glass door on the actual glass itself. This produces heat to stop condensation forming or fog on the glass doors or glass panels. We advise to have this turned off unless required as it uses power and creates heat.

b) **Light button**

This button activates the light inside cabinet. Please note in solid door cabinets there is NO light and the switch is not activated. The light switch will also bring on light box light where applicable.

c) **DEI Controller Buttons**

To activate or deactivate press/hold buttons for at least 3 seconds.

VENTILATION

i) To maintain efficiency in power and longevity of cabinet, suitable ventilation is imperative.

a) On all **upright cabinets with condenser mounted on top** a minimum of 300mm clear space must be left above cabinet. In hot/steamy conditions a further 50mm-100mm from rear of cabinet to wall may be nec essary.

On all **bottom mount condenser cabinets** the front grille at base must be left with at least 600mm free airspace, and also a space of at least 100mm must be left at rear of cabinet. If either bottom mount or top mount cabinets are built in to joinery etc. a further 50mm gap to be left on sides. Never remove cabinet's castors or legs.

b) On all **under-bench cabinets** the front grille must be left clear. There are another 2 grilles; 1 on end and 1 on back, if you wish to cover 1 of these the other should have a clear space of at least 200mm. It would be advised to give the covered vent a 25mm gap from wall. While not imperative, it is good practice to allow ventilation underneath cabinet of at least 50mm on condenser end.

c) All **cake displays** are ventilated from the rear. This must be left clear by at least 600mm. If in very hot/steamy environment at least 50mm underneath is good practice.

ii) **Room Ventilation** Self-contained cabinets must only be installed in rooms that are well ventilated or are of sufficient size to dissipate the heat generated by such equipment. You must consider, when shop/institution is closed, as to how good airflow is maintained.

WARNING: ENSURE CABINET IS DISCONNECTED/ UNPLUGGED FROM POWER SOURCE PRIOR CLEANING

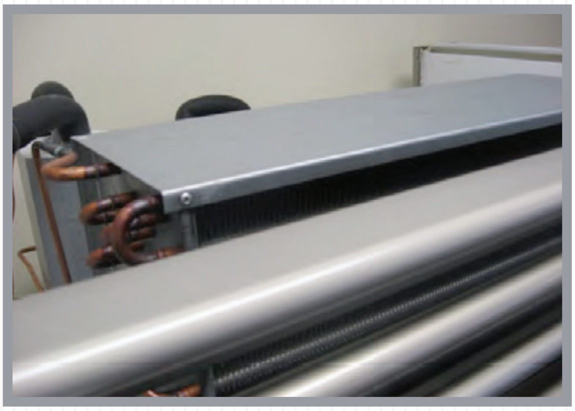
CLEANING

➤ PROTECTIVE GLOVES MUST BE WORN AND CARE TAKEN WHEN CLEANING THIS EQUIPMENT, AS THERE MAY BE SECTIONS OF SHARP METAL. ALSO REFER TO THE 'SAFE OPERATING PROCEDURE ON PAGE 2'.

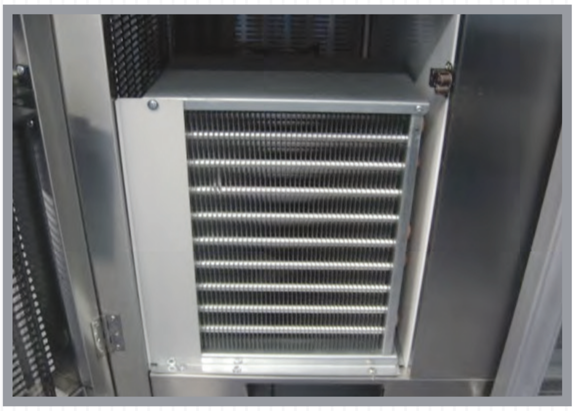
Cleaning the condenser is very important and should be done at least once a fortnight (or more often depending on the environment). Failure to do so will shorten the life of the cabinet and will void warranty.

Cleaning can be done with a vacuum cleaner or brush. Always brush or clean vertically so as not to bend condenser fins.

Where airborne oils, flour and dust may be present, a refrigeration mechanic must conduct a professional clean at least every 4-6 months.



or



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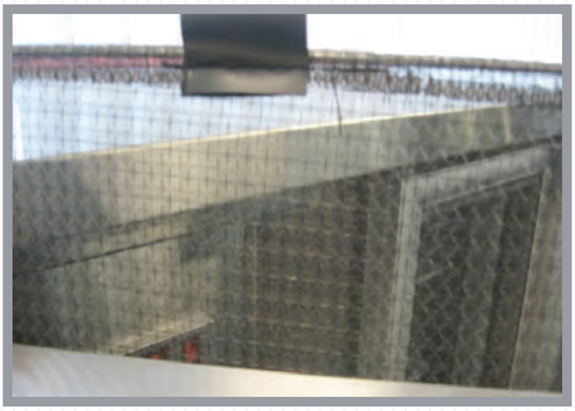


➤ FOR UNDER-COUNTER AND CAKE DISPLAY CABINETS THE CONDENSER SCREEN ALSO NEEDS TO BE CLEANED, AS WELL AS THE CONDENSER

With under-bench and cake displays, they have a removable screen that needs to be pulled out and washed in warm soapy water, dried and re-installed.

You may also need to clean the condenser fins as well.

Door gaskets should be cleaned once a week with mild soapy water followed by a fresh rinse.

Inside and body should be cleaned using mild soapy water. Always wipe dry.

If stainless steel, use an appropriate cleaner, following all instructions.

Never use bleaches, chlorine or any products containing these products as they will cause corrosion.

With all sliding doors, rollers should be kept clean and lubricated with a silicon spray (food grade) or similar.

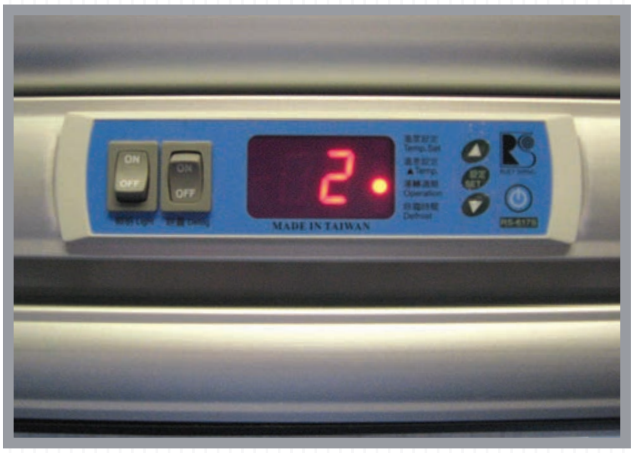
Always be careful with sharp edges, and wear suitable protection to avoid injury.

SETTINGS CHANGE

RS617S, RS815, LCF411 AND LF311

1) The ‘cut out’ or lower set point temperature can be changed.

a) On all top mounted cabinets:


ON
OFF
ON
OFF
2
Temp. Set
Temp.
Operation
Defrost
SET
MADE IN TAIWAN
RS-617S

Press the Set button for 5 seconds.

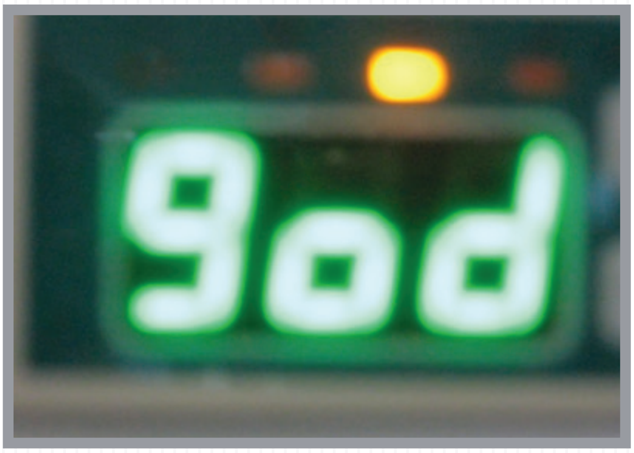
The orange light will go to ‘Temp Set’.
Then the screen will display the temperature set-point.

Change this to the desired temperature using the up & down arrows, and then press ‘Set’ again to confirm the new set-point.

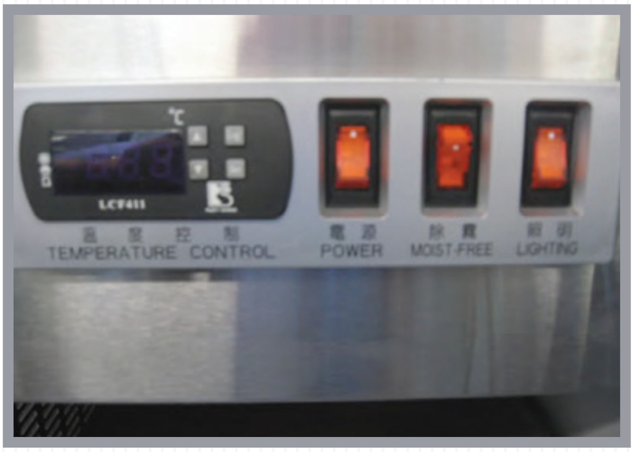
Any other parameter changes should only be made with permission from Artisan Food Equipment or a fully qualified refrigeration mechanic.

Remember all cabinets have a 4°C differential and all cake displays have a 3°C differential.

On all bottom-mounted works, cake display cases and under-counter cabinets, press the small ‘Set’ button and ‘888’ will display on the screen followed by ‘t5’. Press ‘Set’ again and the screen will display the temperature set-point. Change this to the desired temperature using up & down arrows.



Once desired cut-out temperature is selected, press ‘Set’ button again to confirm, and the screen will appear as above, and then display the cabinet temperature.



TROUBLE SHOOTING

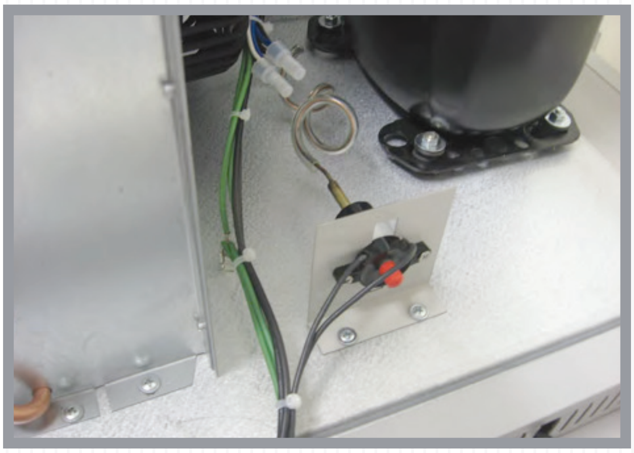
ALL TROUBLE SHOOTING/MAINTENANCE MUST ONLY BE DONE WHILST POWER IS TURNED-OFF AT SOURCE.

Problem: **Cabinet is not working and compressor is cool/ cold.**

Possible causes: Dirty condenser; not enough ventilation to cabinet or room; condenser fan failed; capillary blocked.

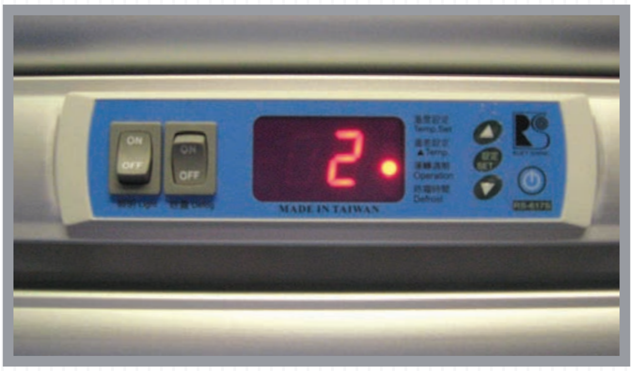
Action: Turn cabinet off at power supply i.e. power point. Clean condenser or remove any obstruction causing not enough ventilation.

Press the Red Re-Set button 3 times.

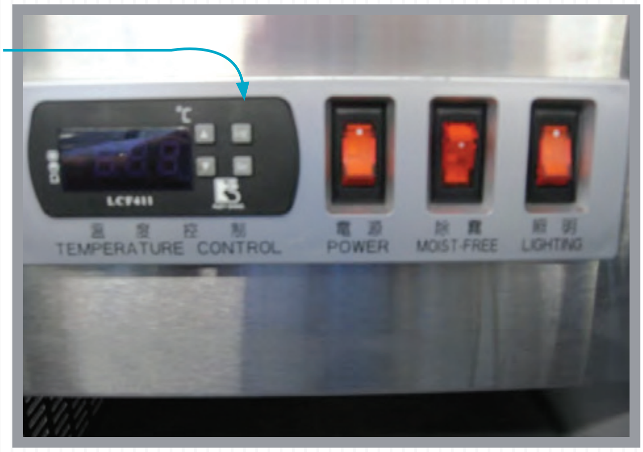


If cabinet goes out again shortly (i.e. within half an hour) contact a technician.

Problem:	**Cabinet not maintaining correct temperature**
Possible Causes:	Check thermostat is set correctly; may have just come out of defrost; check evaporator for ice; dirty condenser; door not closed.
Action:	If ice is on the evaporator press the auto defrost button as shown.



For manual defrost with this controller press the ▲ and ▼ buttons simultaneously for 5 seconds, together at the same time.


Manual Defrost Button
(Log Key)
TEMPERATURE CONTROL
POWER
MOIST-FREE
LIGHTING

If this doesn't work then you may need to empty cabinet and leave off till fully melted. There may not be enough ventilation.

Problem: **Water in cabinet or on floor**

Possible causes: Check condensate hose is securely in black condensate tray at bottom rear; heater wires on frame or door not on; blockage in evaporator tray.

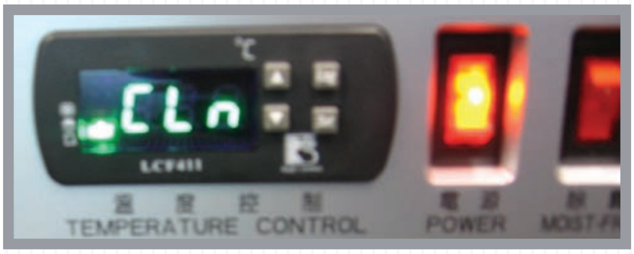
Solution: Secure condensate hose, check evaporator tray for any blockage (for example ice, insects etc.) and if dripping off doors or door frames turn heater wires on. Also cabinet may be running too cold and therefore producing too much condensate. To fix this reduce differential and up temperature.

Problem: **Stale smell or odour in cabinet**

Possible cause: Food or liquid spill; uncovered food.

Solutions: Clean inside of cabinet with a mild detergent and warm water. Cover all food.

Problem: **Alarm sounding and digital screen reading CLn**



Possible cause: This is a reminder to clean the condenser.

Solutions:

1) Clean the filter and/or condenser coil
2) Press the ▼ button for 5 seconds
3) Turn off power to the cabinet at the power point, and then back on again to re-set operation.

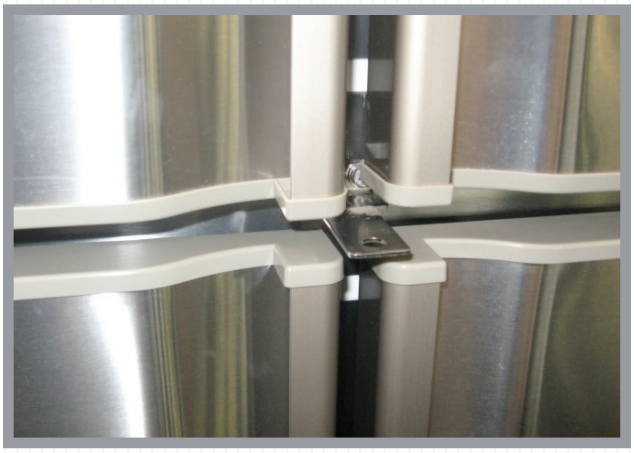
Problem: **Cabinet noisy**

Possible Causes: Loose or rattling condenser cover; loose fan blade

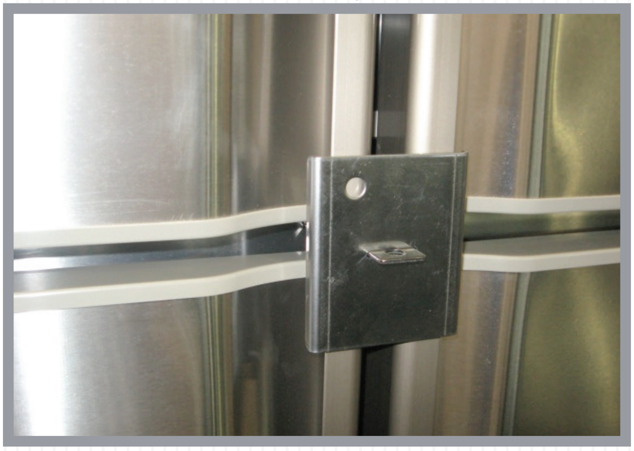
Action: Tighten all screws, check cabinet is level.

LOCKING DEVICE

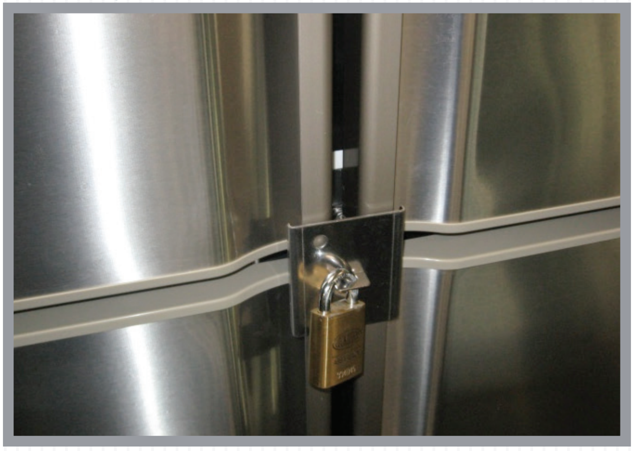
i) Pull locking lever out



ii) Place lock plate over locking lever



iii) Place padlock (supplied by yourself) through hole in locking lever



HEATED DISPLAY CABINETS

(i) All Heated equipment is designed for display purposes only. Therefore all product must be pre-heated to correct temperature PRIOR to placement in the display cabinet.

(ii) **All cleaning, maintenance, temperature changing etc. must be done only when power is disconnected from power source i.e. power point. Always be careful with sharp edges.**

(iii) All cabinets must be plugged into power source NOT into extension lead, double adapter, power board etc.

(iv) It is VERY important that the heated display is cleaned regularly. To do this, firstly disconnect unit from power source and ensure that unit has reached Room temperature, 25°C or less. Then proceed to vacuum clean around fans, elements etc.

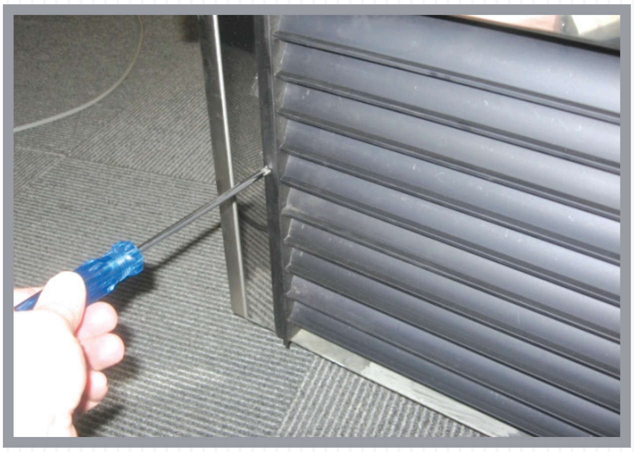
A lightly damp cloth can be used but always allow to dry before turning on.

Never splash water in or around unit.

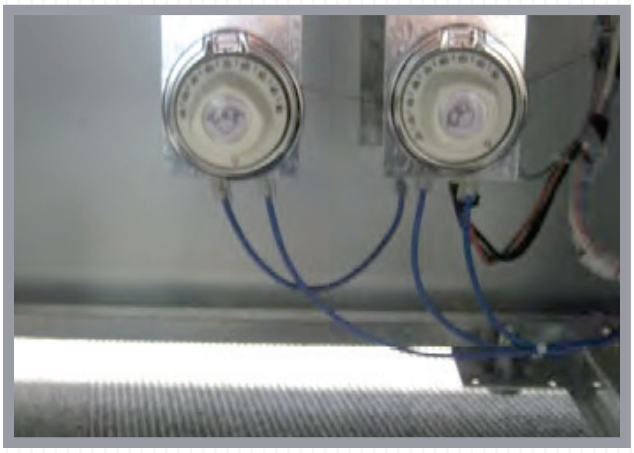
(v) **Changing temp**

(a) This is done by turning unit off at power source (Not just on back of cabinet)

(b) Remove screws on rear panel



- **(c)** Turn knob on dial to new setting. Never set higher than 75°C. Only adjust dial that is not siliconed. **DO NOT remove or adjust siliconed dial.**



(vi) Always have unit checked at least YEARLY by qualified technician to ensure good working order.

CHILLER CONTROLLER

CONTROLLER INSTRUCTIONS FOR UPRIGHT TOP-MOUNT WORKS CHILLER

RS-617S

Button Instruction

UP

1 **Manual defrost / Stop defrost**
Hold ▲ + ▼ for 5 seconds.

2 **Panel parameter lock**
Hold ▲ + 設定SET for 3 seconds. Display “00” for lock status and “33” for unlock status. When locked, only setpoint is able for setting.

3 **Evaporator temperature**
Hold ▲ for one second to display. It will switch back to indoor temperature after 3 seconds. The rest parameter setting can not be changed.

4 **Parameter value increase**
Value increase with ▲ button pressed.

5 **Default setting restore**
Unplug the power line, hold ▲ and 設定SET the plug in to display rS.

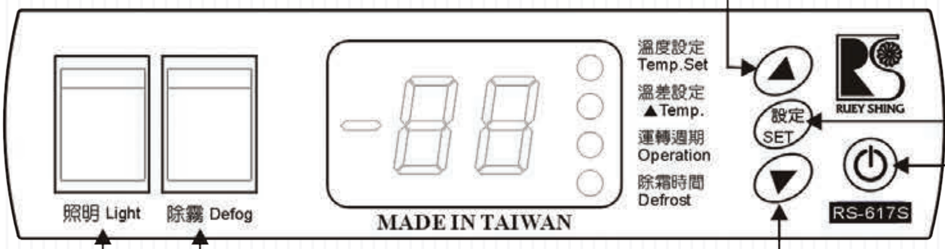
SET

1 **Panel parameter lock**
Same as right side, item 2.

2 **User’s parameter option**
Hold 設定SET for 3 seconds to enter parameter setting. “Temp. Set” is ON. Press 設定SET for one second, the parameter can be adjusted accordingly.

3 **Release quick setting mode**
In quick setting mode, press 設定SET or any other button.

4 **Default setting restore**
Same as left [UP] , item 5.


照明 Light
除霧 Defog
-88
MADE IN TAIWAN
溫度設定 Temp.Set
溫差設定 ▲Temp.
運轉週期 Operation
除霜時間 Defrost
設定 SET
RUEY SHING
RS-617S

Power

ON / OFF
Hold ⏻ for 3 seconds to power ON/OFF

Defog

UP : ON
Down : OFF

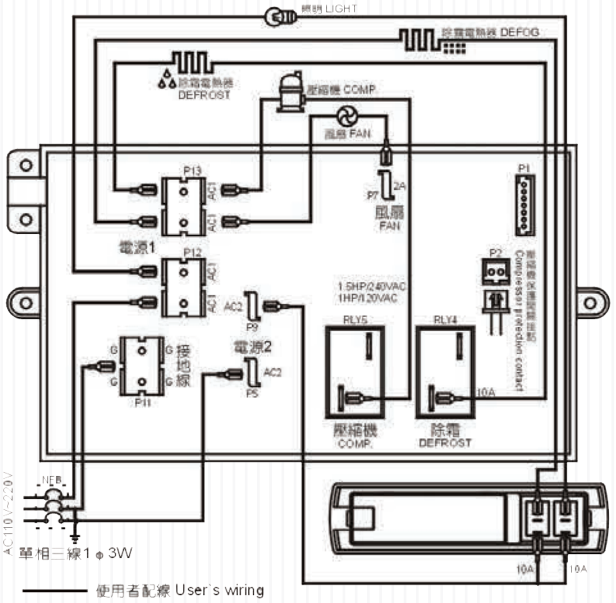
Down

1 **Manual defrost / Stop defrost**
Same as , item [UP] 1.

Light

UP : ON
Down : OFF

Wiring Diagram


照明 LIGHT
除霧電熱器 DEFOG
除霜電熱器 DEFROST
壓縮機 COMP
風扇 FAN
P13
AC1
AC1
電源1
P12
AC1
AC1
AC2
P9
P7
2A
風扇 FAN
P1
P2
壓縮機保護開關接點 Compressor protection contact
1.5HP/240VAC
1HP/120VAC
RLY5
RLY4
10A
壓縮機 COMP.
除霜 DEFROST
G
G
G
G
接地線
P11
電源2
AC2
P5
NFB
AC110V~220V
單相三線1 φ 3W
使用者配線 User`s wiring
10A
10A

- ✻ P1 : Connect with operation panel.
- ✻ Power supply : AC 110V~220V±10% single phase、50/60Hz.
- ✻ Power consumption : Max. 10Watt (Controller only).
- ✻ Reading range : -45°C~45°C±1°C
- ✻ The output contact capacity show in the wiring diagram. Do not over load.
- ✻ If the compressor uses 220V, but the other devices are 110V, connect their common line to #G instead of #AC1

⚠ Before applying power to the unit, always check if the voltage set correctly according to the input voltage.

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1. CAUTION :

1.1 Before wiring, please make sure that power is switched off to prevent from getting electric shock.
1.2 The product should be avoided to install at humid environment.
1.3 To prevent the controller burning out, please make sure the water-proofed procedure is undertaken during installation.
1.4 Please install according to the wiring diagram, in order to avoid incorrect wiring,
1.5 Before supplying the power, please always check if the wiring and input power is connected correctly.
1.6 Please always read this instruction carefully before installation. If the damage is caused of incorrectly wiring, the product would not be guaranteed.

2. SPECIFICATION :

2.1 Dimension:
2.1.1 Front panel size:40mm (H) x 160mm (W) ± 1mm
2.1.2 Mounting hole size:31.5mm (H) x 138mm (W) ± 1mm
2.2 Operating environment:- 5°C ~ 55°C, RH 20% ~ 85% (non–condensing)
Storage environment:- 10°C ~ 55°C, RH 20% ~ 85% (non–condensing)
2.3 Output/Input:
2.3.1 Power supply: AC 110~220V + 10%, single phase 50 / 60Hz
2.3.2 Power consumption: Max. 10 Watts (controller only)
2.3.3 Temperature display range:-45°C~45°C, accuracy ± 1°C
2.3.4 Indoor temperature sensor: NTC, 1.5M (L)
2.3.5 Compressor contact capacity:1.5HP/240VAC, 1.5HP/ 120VAC
2.3.6 Fan contact capacity:2A/250VAC
2.3.7 Capacity of Light switch:7A/250VAC Resistance (Use 187 type connector)
2.3.8 Capacity of Defog switch:7A/250VAC Resistance (Use 187 type connector)

3. FUNCTION :

3.1 Power ON/OFF: Press ⏻ and hold it for 3 seconds to ON/OFF the power.

3.2 Defrost: Press ▲ and ▼ and hold them for 3 seconds to enter defrost mode. Defrost process will be terminated automatically when reaches the defrost time or by pressing again both ▲ and ▼ buttons.

3.3 Lockup parameters: In normal operation mode, press 設定SET and ▼ and hold them for 3 seconds to lock the parameters, as “00” is displayed or to unlock when “33” is displayed. (The parameter cannot be changed once locked, except Set point.)

3.4 User’s parameter setup:
3.4.1 Press 設定SET and hold it for 3 seconds to enter the user’s parameter setup mode, and the Temp. Set LED is on.
3.4.2 Press 設定SET to do parameter setting accordingly.
3.4.3 Use ▲ or ▼ for parameter value adjustment.
3.4.4 If no action within 10 seconds, current parameter will be auto-saved and system returns to normal condition.

3.5 Restore default setting: Under power OFF status, press 設定SET and ▲ , in the meanwhile to re-plug in, it will display **rS**, all of the parameter will be restored to default and operated accordingly.

3.6 Quick setting mode: Under normal status, press ▼ for 1 second and enter to Quick setting mode; then, press ▲ or ▼ to adjust set point directly. If not press any key within 5 seconds or press 設定SET , it will memorize the setting and back to operation mode.

3.7 Functions and Indicators:

Function	Temp. Set	▲Temp.	Operation	Defrost
Set point (indoor)	●	○	○	○
Temp. Discrepency	○	●	○	○
Operation cycle	○	○	●	○
Defrost period	○	○	○	●
Probe calibration (indoor)	●	○	○	○
Compressor delay protection	○	●	○	○
Max. temp. Set point (indoor)	○	○	●	○
Min. temp. Set point (indoor)	○	○	○	●

3.8 Parameter table:

Function	Min.	Max.	Default
Set point (indoor)	Min. set point	Max. set point	5°C
Temp. Discrepency	1°C	10°C	4°C
Operation cycle	0 HR	99 HR	6 HR
Defrost period	0 MIN.	59 MIN.	30 MIN.
Probe calibration (indoor)	-8°C	7°C	0°C
Compressor delay protection	0 MIN.	15 MIN.	3 MIN.
Max. temp. Set point (indoor)	Set temp.	40°C	40°C
Min. temp. Set point (indoor)	-40°C	Set temp.	-40°C

3.9 Compressor:

3.9.1 When indoor temp ≥(setpoint + temp discrepancy), compressor ON.
When indoor temp ≤setpoint , compressor OFF.

3.9.2 Compressor delay starts period is 3 mins. (default)

3.9.3 Even compressor delay period is set as 0 min, when power replug in, there will still be 1 min period delay for protection purpose.

3.9.4 When the indoor sensor is in failure, compressor operates and stopped cyclically for every 15 minutes.
(default setting, cannot be changed)

3.10 Defrost and fan management:

3.10.1 Defrost schedule: when time reaches (operation cycle – defrost period), defrost begin.

3.10.2 When defrost, by schedule or manual, defrost indicator blinking, compressor off and fan runs.

3.10.3 After defrost, fans run, compressor runs according to indoor temp, set point and its discrepancy.

4. ERROR CODES :

4.1 “EE”: Parameter memory failure (Re-plug in and operate as factory default)

4.2 “E1”: Indoor sensor failure (Check if the sensor is well connected or replace a new sensor)

RS-617SE; RS-617SAE Operation Manual

5INS00689

1. CAUTION :

1.1 Before wiring, please make sure that power is switched off to prevent from getting electric shock.
1.2 The product should be avoided to install at humid environment.
1.3 To prevent the controller burning out, please make sure the water-proofed procedure is undertaken during installation.
1.4 Please install according to the wiring diagram, in order to avoid incorrect wiring,
1.5 Before supplying the power, please always check if the wiring and input power is connected correctly.
1.6 Please always read this instruction carefully before installation. If the damage is caused of incorrectly wiring, the product would not be guaranteed.

2. SPECIFICATION :

2.1 Dimension:
  2.1.1 Front panel size: 40mm (H) x 160mm (W) ± 1mm
  2.1.2 Mounting hole size: 31.5mm (H) x 138mm (W) ± 1mm
2.2 Operating environment: -5°C~55°C, RH 20%~95% (non–condensing)
  Storage environment: -10°C~55°C, RH 20%~95% (non–condensing)
2.3 Output/Input:
  2.3.1 Power supply: AC 220V ± 10%, single phase 50 / 60Hz
  2.3.2 Voltage alarm: Low voltage alarm=182VAC ± 10V, High voltage alarm=255VAC ± 10V.
  2.3.3 Power consumption: Max. 10 Watts (controller only)
  2.3.4 Temperature display range: -45°C~99°C, accuracy ± 1°C
  2.3.5 Indoor temperature sensor: NTC, 1.5M (L)
  2.3.6 Compressor contact capacity: 1.5HP/240VAC
  2.3.7 Fan contact capacity: 2A / 220VAC
  2.3.8 Capacity of Light switch: 2A / 220VAC Resistive load. (Be careful with surge current when using LED lamps) (Use 187 type and 250 type connector, only for RS-617SE)
  2.3.9 Defog contact capacity: 2A / 250VAC Resistance (Use 187 type and 250 type connector)
  2.3.10 Alarm output: Built-in buzzer.
  2.3.11 Indicator: Compressor ⚙ Fan ✤ Defrost ❄ Power ⏻
  2.3.12 Switch: Defog switch, Light switch

3. FUNCTION :

3.1 Power ON/OFF: Press ⏻ and hold it for 3 seconds to ON/OFF the power.
  When the POWER turns OFF, the defog will be turned OFF.
3.2 Defrost: press ▲ and ▼ and hold them for 5 seconds to enter defrost mode or stop defrost mode. (The operation cycle not be affected).
3.3 Parameters locked: In normal operation mode, press SET and ▲ and hold for 3 seconds to lock the parameters, as "00" is displayed or to unlock "33" is displayed. The parameter cannot be changed once locked, except temp, setting.
3.4 Buzzer:
  3.4.1 Alarm mute SA=0: When the controller fails, buzzer will beep and display error code. Beep could be turned off by pressing ▼ for 3 seconds.
  3.4.2 Alarm mute SA=1: When the controller fails, buzzer will NOT beep and only display error code.
3.5 Restore default setting: Cut the power supply; press and hold SET and ▲, then re-supply the power. it will display rS, all of the parameter will be restored to default and operated accordingly.
3.6 Quick setting mode: Under the normal status, press and hold the ▼ key for 1 second to enter the quick setting mode. Press ▲ or ▼ key to directly adjust the temp. setting value. If no key is pressed within 5 seconds or directly press the SET key, the parameters will be saved automatically and return to the temperature display.
3.7 Compressor forced start function: Under the normal status, press and hold SET and ▼ for 3 seconds, the compressor would be forced to start.
3.8 User's parameter setup:
  3.8.1 Press SET and hold for 3 seconds to enter the parameter set-up mode. The code "tS" displayed, the indicator flashes.
  3.8.2 When the parameter code is displayed, press ▲ or ▼ to select the parameter code. Press SET to display the parameter value after selection. (please refer to 10. Parameter table for parameter codes and setting range)
  3.8.3 When the parameter value is displayed, press ▲ or ▼ to adjust parameter values. After the setting is complete, press SET to confirm and return to the parameter code, or if no key is pressed within 10 seconds, parameter values would be auto-saved and system returns to normal status.
  3.8.4 Under the parameter locked, the settings cannot be modified, except for tS (Temperature setting).

4. COMPRESSOR

4.1 When indoor temp. ≥ (tS + td). compresssor turns ON. When indoor temp ≤tS, compressor turns OFF.
4.2 After the compressor turns off, the compressor protection time “AC” starts to count. After the compressor protection time is reached, the compressor could be re-started again.
4.3 Even compressor protection period is set as AC=0, when the power re-supply, there will be 1 min delay for protection purpose.
4.4 When the indoor sensor and memory fail, compressor operates and stopped cyclically for every 15 minutes, (default setting, cannot be changed).
4.5 When the input voltage error E3,E4, the compressor stops operating.

5 Defrost: Compressor stopped to defrost
5.1 When defrost, the compressor stopped, but the fan operates, and the defrost indicator flashes.
5.2 When the defrost period is reached or the defrost is manually ended, the system returns to operation mode and the compressor will operate according to the temp change.
5.3 If the defrost “dt” and defrost cycle “df” are changed, it will take effect immediately and be recalculated.
5.4 The defrost cycle “dF’ includes manual defrost period and auto defrost period.
5.5 After the controller is turned off, the defrost cycle and defrost period would be recalculated.
5.6 The first operating cycle does not defrost after power supply.
5.7 Defrost temp. Lock dL=0, the actual indoor temp displays during defrosting.
5.8 Defrost Temp. Lock dL=1:
5.8.1 Defrost Lock Display dd=0, dF displayed during defrost lock status.
5.8.2 Defrost Lock Display dd=1, the temp before defrost displayed during the defrost lock status.
5.8.3 Defrost lock period Lt=0, when indoor Temp. ≤ Setting Temp., the defrost lock status will be unlocked.
5.8.4 The defrost lock period Lt≠0, when defrost lock period is reached, the defrost lock status will be unlocked.
6 Fan:
6.1 Under non- malfuntion status, the fan is off during defrosting or dripping.
6.2 Fan Operation Selection FC=0, and evaporator temp. < fan stop temp., fan is ON.
6.3 Fan Operation Selection FC=0, and evaporator temp. ≥ fan stop temp., fan is OFF.
6.4 Fan Operation selection FC=1, and evaporator temp. < fan stop temp., fan turns ON when compressor starts.
6.5 Fan Operation Selection FC=1, and evaporator temp. ≥ fan stop temp., fan is OFF.
6.6 When the sensor and memory fail, fan and compressor operated and stopped cyclically for every 15 minutes. (default setting, cannot be changed).
6.7 When the input voltage error E3 E4, the fan turns OFF.

7. Defog:
7.1 Defog function is OFF when the controller is OFF or defog switch is Off.
7.2 When the controller is ON and defog switch is ON, if defog cycle gF=0, defog ON/OFF could be controlled by defog switch.
7.3 When the controller is ON and defog switch is ON, if defog cycle gF≠0, the defog function operates according to the defog cycle “gF” and the defog period “gt”.

8. Input voltage:
8.1 When the input voltage higher than AC 255V lasts longer than the High and Low Voltage Alarm Delay “Ud”, high voltage alarm E3 will be activated.
8.2 When the input voltage lower than AC 182V lasts longer than High and Low Voltage Alarm Delay “Ud”, low voltage alarm E4 will be activated.

9. Indoor Temp Lock:
9.1 When the indoor Temp Lock tL=0, the function of indoor temp. lock stops.
9.2 When power on and the indoor temp reaches temp. setting once, the function of indoor temp. Lock starts.
9.3 Under normal operation mode (non-malfunction/defrost/defrost lock), when tL≠0 and indoor temp. detection ≥ (tS + tD), the temp display is locked and indoor temp lock “tL” starts to count.
9.4 When the indoor temp is locked, the indoor temp detection < temp setting “tS” + temp difference “td”, the Indoor Temp Lock would be unlocked immediately.
9.5 When the indoor temp lock “tL” finished, it will unlock. The function of indoor Temp Lock stops until the indoor temp detection <temp. setting “tS” + temp. difference “tD” is detected again.

10. Indicators:
10.1 Compressor : When the compresor is ON, the indicator is ON: when the compressor is protection delay, the indicator is flashing; when the compressor is OFF, the indicator is OFF.
10.2 Fan : When the fan is ON, the indicator is ON; when the fan is OFF , the indicator is OFF.

10.3 Defrost ❄ : Flashing during defrosting and OFF when non-defrost.
10.4 Power ⏻ : The indicator is ON when the power is OFF; and the indicator is OFF when the power is ON.

Function	Min	Max	Default	Description
tS Setpoint (indoor temp.)	LS	HS	5°C	Indoor temp. ≤ setpoint, compressor stops.
td Temp. Difference	1°C	10°C	4°C	Indoor temp. ≥ (tS+td), compressor starts to operate.
dF Defrost Cycle	0 Hr	99 Hr	6 Hr	dF=0; not defrost automatically, it only could defrost manually.
dt Defrost Period	0 Min	59 Min	30 Min	Defrost stops when defrost period finished.
gF Defog Cycle	0 Hr	99 Hr	1 Hr	0: not defog automatically; but defog function according to Power ON/OFF.
gt Defog Period	0 Min	59 Min	15 Min	Defog stops when defog period finished.
AC Compressor Delay Protection	0 Min	15 Min	3 Min	Even AC=0 It still has 1 min delay after power supply.
HS Max. Setpoint	tS	99°C	45°C	To limit the max setpoint.
LS Min. Setpoint	-45°C	tS	-45°C	To limit the min setpoint.
At Temp. Alarm Start Delay	0 Min	99 Min	60 Min	After start-up, the temp alarm would be delayed for a period of time.
AU High Temp. Alarm (indoor temp.)	AL+1	99°C	70°C	Indoor temp. ≥ AU alarm delay starts to count
AL Low Temp. Alarm (indoor temp.)	-45°C	AU-1	-45°C	Indoor temp. ≤ AL alarm delay starts to count
Ad Temp. Alarm Delay Setting	0 Min	99 Min	30 Min	When the delay period finished, the temp. alarm occurs.
Ot Temp. Calibration (indoor temp.)	-8°C	7°C	0°C	Indoor temp. calibration
Ud High and Low Voltage Alarm Delay	0 Min	99 Min	1 Min	Only high low voltage alarm counting would delay 0: no detection
dL Defrost Temp. Lock	0	1	0	0: no locked 1: locked
dd Defrost Locked Display	0	1	0	0: display dF when locked 1: display temp. before defrost when locked
Lt Defrost Locked Period	0 Min	30 Min	0	0: indoor temp. ≤ setpoint unlocked 1~30 min: unlocked according schedule
FC Fan Operation Selection	0	1	0	0: fan continuous operate 1: fan operate with the compressor
SA Alarm Mute	0	1	0	0: not muted when alarm 1: muted when alarm
tL Indoor Temp. Lock	0 Min	60 Min	0	0: not locked 1~60 min: indoor temp. locked

12. Error Code:
12.1 EE: Memory is failure. (Press (SET) and ▲ to restore the default values, and then resupply the power. If it still not work, please send back to factory for inspection).
12.2 E1: Indoor temp sensor failure. (Check whether the sensor is connected or replace the sensor).
12.3 E3: Input voltage is to high. (Please check the input voltage).
12.4 E4: Input voltage is to low. (Please check input voltage).
12.5 UA: High temp alarm, indoor temp ≥ high temp alarm settings. (Please check if the compressor is failure or the wiring is off).
12.6 LA: Low temp alarm indoor temp ≤ low temp alarm settings. (Please check if the compressor contacts are melted).
12.7 When the above errors occur, the buzzer will beep (ON for 1 second / OFF for 1 second).
12.8 Only lighting, defog and buzzer can be set during the controller failure.
12.9 When alarms are activated, alarm contact will be ON.

FREEZER CONTROLLER

CONTROLLER INSTRUCTIONS FOR UPRIGHT TOP-MOUNT WORKS FREEZER

RS-815

Button Instruction

UP

1 **Manual defrost / Stop defrost**
Hold ▲ + ▼ for 5 seconds.

2 **Panel parameter lock**
Hold ▲ + 設定SET for 3 seconds. Display “00” for lock status and “33” for unlock status. When Locked, only setpoint is able for setting.

3 **Evaporator temperature**
Hold ▲ for one second to display. It will switch back to indoor temperature after 3 seconds. The rest parameter setting can not be changed.

4 **Parameter value increase**
Value increase with ▲ button pressed.

5 **Default setting restore**
Unplug the power line, hold ▲ and 設定SET the plug in to display rS.

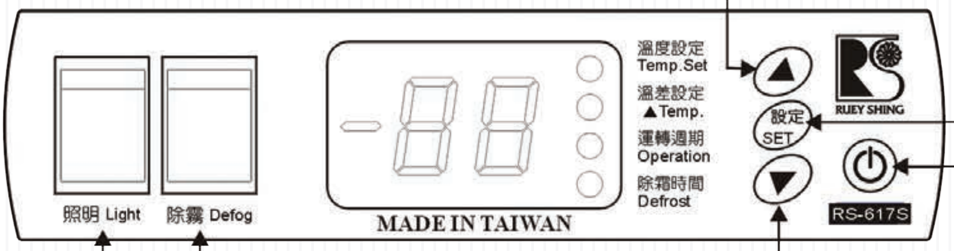
SET

1 **Panel parameter lock**
Same as right side, item ② .

2 **User’s parameter option**
Hold 設定SET for 3 seconds to enter parameter setting. “Temp. Set” is ON. Press 設定SET for one second, the parameter can be adjusted accordingly.

3 **Release quick setting mode**
In quick setting mode, press 設定SET or any other button.

4 **Default setting restore**
Same as left [UP] , item ⑤ .


照明 Light
除霧 Defog
-88
MADE IN TAIWAN
溫度設定 Temp.Set
溫差設定 ▲Temp.
運轉週期 Operation
除霜時間 Defrost
設定 SET
RUEY SHING
RS-617S

Power

ON / OFF
Hold ⏻ for 3 seconds to power ON/OFF

Defog

UP : ON
Down : OFF

Light

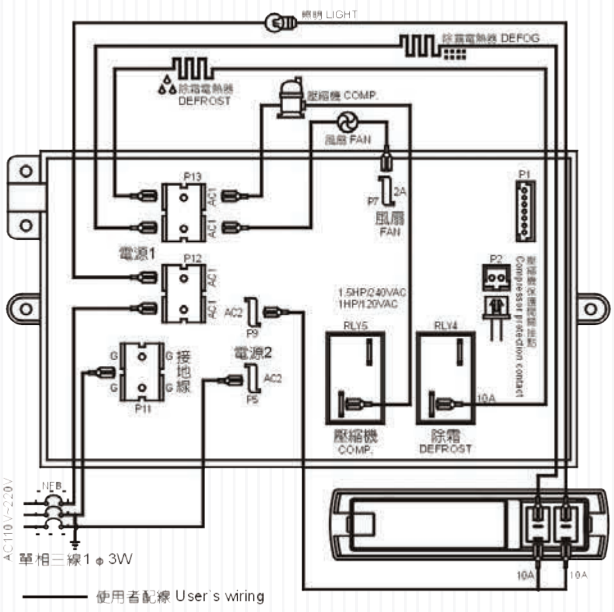
UP : ON
Down : OFF

Down

1 **Manual defrost / Stop defrost**
Same as , item [UP] ① .

2 **OFF buzzer**
Hold ▼ for 3 seconds to power ON/OFF

Wiring Diagram


照明 LIGHT
除霧電熱器 DEFOG
除霜電熱器 DEFROST
壓縮機 COMP.
風扇 FAN
P13
AC1
P1
P7
2A
風扇 FAN
電源1
P12
AC2
P9
1.5HP/240VAC
1HP/120VAC
RLY5
RLY4
P2
壓縮機保護開關接點 Compressor protection contact
G
接地線
P11
電源2
P5
10A
壓縮機 COMP.
除霜 DEFROST
NFB
AC110V~220V
單相三線1φ3W
10A
10A
使用者配線 User’s wiring

- ✻ P1 : Connect with operation panel.
- ✻ Power supply : AC 110V~220V±10% single phase、50/60Hz.
- ✻ Power consumption : Max. 10Watt (Controller only).
- ✻ Reading range : -45°C~45°C±1°C or -45°F~99°F±2°F.
- ✻ The output contact capacity show in the wiring diagram. Do not over load.
- ✻ If the compressor uses 220V, but the other devices are 110V, connect their common line to #G instead of #AC1

⚠ Before applying power to the unit, always check if the voltage set correctly according to the input voltage.

RS-815 Operational Manual

5INSLL20583

1. CAUTIONS :

1.1 Before wiring, please make sure that power is switched off to prevent from getting electric shock.
1.2 The product should be avoided to install at humid environment.
1.3 To prevent the controller burning out, please make sure the water-proofed procedure is undertaken during installation.
1.4 Please install according to the wiring diagram, in order to avoid incorrect wiring,
1.5 Before supplying the power, please always check if the wiring and input power is connected correctly.
1.6 Please always read this instruction carefully before installation. If the damage is caused of incorrectly wiring, the product would not be guaranteed.

2. SPECIFICATION :

2.1 Dimension:
  2.1.1 Front panel size:40mm (H) x 160mm (W) ± 1mm
  2.1.2 Mounting hole size:31.5mm (H) x 138mm (W) ± 1mm
2.2 Operating environment:- 5°C ~ 55°C, RH 20% ~ 95% (non–condensing)
  Storage environment:- 10°C ~ 55°C, RH 20% ~ 95% (non–condensing)
2.3 Output/Input:
  2.3.1 Power supply: AC 110~220V ± 10%, single phase 50 / 60Hz
  2.3.2 Power consumption: Max. 10 Watts (controller only)
  2.3.3 Temperature display range:-45°C ~ 45°C, accuracy ± 1°C (-45°F ~ 99°F , accuracy ±2°F).
  2.3.4 Indoor temperature sensor: NTC, 1.5M (L)
  2.3.5 Evaporator sensor: NTC, 1.5M (L).
  2.3.6 Compressor contact: 1.5HP/240VAC, 1HP/240VAC
  2.3.7 Defrost heater contact: 10A/250VAC Resistance.
  2.3.8 Fan contact: 2A/250VAC
  2.3.9 Capacity of Light switch: 7A/250VAC Resistance (Use 187 type connector)
  2.3.10 Capacity of Defog switch: 7A/250VAC Resistance (Use 187 type connector)
  2.3.11 Alarm output: Build-in buzzer.

3. FUNCTION :

3.1 Power ON/OFF: Press ⏻ and hold it for 3 seconds to ON or switch OFF the controller
3.2 Manual Defrost: Press both keys ▲ and ▼ for 5 seconds to enter or release defrost. (It will not affect operation cycle).
3.3 Lockup parameters: Under normal operation, press both keys SET and ▲ for 3 seconds, and displaying "00" to lock the parameter and displaying "33" to unlock the parameter. The parameter cannot be changed once locked, except Set point.
3.4 Buzzer OFF: Press SET and hold for 3 seconds to switch off the buzzer temprarily when failures occurred.
3.5 Evaporator temperature display: Under normal operation, keep pressing the key ▲ for 1 second to display evaporator temperature, and it will display indoor temperature again after 3 seconds.
3.6 User's parameter setup:
  3.6.1 Press SET and hold it for 3 seconds to enter user's parameter setup mode and LED of Temp. Set is ON.
  3.6.2 Press SET again to select the parameters to be set. (Please ref. to the table of parameter table list 3.11)
  3.6.3 Then, to press ▲ or ▼ for changing the value of the parameters.
  3.4.4 If not press any key within 10 seconds, the setting will be memorized and back to operations mode.
3.7 Restore the default: Under power OFF status, press SET and ▲ , in the meanwhile to re-plug in, it will display **rS**, all of the parameter will be restored to default and operated accordingly.
3.8 Quick setting mode: Under normal status, press ▼ for 1 second and enter to Quick setting mode; then, press ▲ or ▼ to adjust set point directly. If not press any key within 5 seconds or press SET , it will memorize the setting and back to operation mode.
3.9 Compressor:
  3.9.1 When indoor temp ≥ (setpoint + temp discrepancy), compressor ON.
    When indoor temp ≤ setpoint, compressor OFF.
  3.9.2 Compressor delay starts period is 3 mins (default)
  3.9.3 When the indoor temperature sensor is in failure, compressor operates and stopped cyclically for every 15 minutes.

3.10 Functions and Indicators:

Function	Temp. Set	▲Temp.	Operation	Defrost
Set point (indoor)	●	○	○	○
Temp. Discrepency	○	●	○	○
Operation cycle	○	○	●	○
Defrost period	○	○	○	●
Defrost stop temperature	●	○	○	○
Probe calibration (indoor)	○	●	○	○
Compressor delay protection	○	○	●	○
Fan start temp. (Evaporator)	○	○	○	●
Max. temp. Set point (indoor)	●	○	○	○
Min. temp. Set point (indoor)	○	●	○	○

3.11 Parameter table:

Function	Min.	Max.	Default
Set point (indoor)	Min. set point	Max. set point	-15°C / 0°F
Temp. Discrepency	1°C / °F	10°C / F	4°C / °F
Operation cycle	1 hour	99 hours	6 hours
Defrost period	0 min.	59 min.	30 min.
Defrost stop temperature	0°C / 32°F	45°C / 99°F	25°C / 77°F
Probe calibration (indoor)	-8°C / °F	7°C / °F	0°C / °F
Compressor delay protection	0 min.	15 min.	3 min.
Fan start temp. (Evaporator)	-25°C / -15°F	25°C / 80°F	5°C / 41°F
Max. temp. Set point (indoor)	Set temp.	40°C / 90°F	40°C / 90°F
Min. temp. Set point (indoor)	-40°C / -40°F	Set point	-40°C / -40°F

3.12 Defrost: Defrost through both electric heater or hot gas are available. (ref. to item 3.13.1).

3.12.1 Electric heater defrost: Under defrosting, fan and compressor stop operating; electric heater starts (defrost indicator blinks). When defrost terminates, electric heater stops, and compressor will ON until reaching 3 minutes delay.

3.12.2 Hot gas defrost: When defrost, fan and compressor stop operating; after 30 seconds delay, it starts defrosting (and defrost indicator blinks), and compressor will start after another 30 seconds delay (operation indicator ON).

When defrost terminates, compressor stop operating; then defrost will stop output after around 5 seconds delay. Later, compressor will startup after 3 minutes delay.

3.12.3 Stop defrost: When defrost time is up, or evaporator temp. ≥ defrost stop temperature, defrost OFF.

3.12.4 Operation cycle includes defrost; to revise the defrost setting under normal operation status, defrost duration is valid immediately; if revising the defrost setting during defrost period, defrost duration will change after then.

3.13 DIPSW Function: (Open the front panel for setting DIPSW1 ≤ 4 as follows; with their defaults are OFF).

3.13.1 Defrost: DIPSW1 OFF – Electric heater defrost, DIPSW1 ON – Hot gas defrost;

3.13.2 Temp. Unit: DIPSW2 OFF – Temp, unit °C, DIPSW2 ON – Temp, unit°F

3.13.3 Temp. Locked while defrosting:

DIPSW3 OFF – Indoor temperature display normally,

DIPSW3 ON – Indoor temperature display is locked while defrosting; once finishing defrosting, it will re-start to read and display indoor temperature until indoor temperature reach to the set point.

3.13.4 Fan operation: DIPSW4 OFF – Fan keeps operation. DIPSW4 ON – Fan operates according to the compressor. If evaporator temperature>fan start temp. or under defrosting, fan will not operate.

4. ERROR CODES :

4.1 EE: Parameter memory failure. (Please press 設定 SET and ▲ buttons to make the parameters back to default value and re-supply the power. If EE still exists, please send back to factory for inspection.)

4.2 E1: Indoor sensor failure. (Please check the sensor if unconnected or replace a new one.)

4.3 E2: Please move evaporator sensor to proper location, re-supply power after sensor cooling down. If error still happens, replace another one.

4.4 When occurred above failures, the buzzer will buzz with 1 second ON and 1 second OFF.

4.5 Light, defog and alarm are available to set while under failure.

RS-815E; RS-815AE Operation Manual

5INS00688

1. CAUTION :

1.1 Before wiring, please make sure that power is switched off to prevent from getting electric shock.
1.2 The product should be avoided to install at humid environment.
1.3 To prevent the controller burning out, please make sure the water-proofed procedure is undertaken during installation.
1.4 Please install according to the wiring diagram, in order to avoid incorrect wiring,
1.5 Before supplying the power, please always check if the wiring and input power is connected correctly.
1.6 Please always read this instruction carefully before installation. If the damage is caused of incorrectly wiring, the product would not be guaranteed.

2. SPECIFICATION :

2.1 Dimension:
- 2.1.1 Front panel size: 40mm (H) x 160mm (W) ± 1mm
- 2.1.2 Mounting hole size: 31.5mm (H) x 138mm (W) ± 1mm

2.2 Operating environment: -5°C~55°C, RH 20% ~ 95% (non-condensing)
Storage environment: -10°C~55°C, RH 20% ~ 95% (non-condensing)

2.3 Output/Input:
- 2.3.1 Power supply: AC 220V ± 10%, single phase 50 / 60Hz
- 2.3.2 Voltage alarm: Low voltage alarm=182VAC ± 10V, High voltage alarm=255VAC ± 10V.
- 2.3.3 Power consumption: Max. 10 Watts (controller only)
- 2.3.4 Temperature display range: -45°C~99°C, accuracy ± 1°C
- 2.3.5 Indoor temperature sensor: NTC, 1.5M (L)
- 2.3.6 Evaporator sensor: NTC, 1.5M (L)
- 2.3.7 Compressor contact capacity: 1.5HP/240VAC
- 2.3.8 Defrost heater contact: 10A/ 250VAC Resistance
- 2.3.9 Fan contact capacity: 2A/ 220VAC
- 2.3.10 Capacity of light switch: 2A/ 220VAC Resistive load. (Be careful with surge current when using LED lamps) (Use 187 type and 250 type connector, only for RS-617SE)
- 2.3.11 Defog contact capacity: 2A/ 250VAC Resistance. (Use 187 type and 250 type connector)
- 2.3.12 Alarm output: Built-in buzzer
- 2.3.13 Switch: Defog switch, Light switch

3. FUNCTION :

3.1 Power ON/OFF: Press ⏻ and hold it for 3 seconds to ON/OFF the power.
When the POWER turns OFF, the defog will be turned OFF.

3.2 Defrost: Press ▲ and ▼ and hold them for 5 seconds to enter defrost mode or stop defrost mode. (The operation cycle not be affected).

3.3 Parameters locked: In normal operation mode, press SET and ▲ and hold for 3 seconds to lock the parameters, as "00" is displayed. or to unlock when "33" is displayed. The parameter cannot be changed once locked, except temp. setting.

3.4 Buzzer:
- 3.4.1 Alarm mute SA=0: When the controller fails, buzzer will beep and display error code. Beep could be turned OFF by pressing ▼ for 3 seconds.
- 3.4.2 Alarm mute SA=1: When the controller fails, buzzer will NOT beep and only display Error code.

3.5 Evaporator temperature display: Under normal operation, keep pressing the key ▲ for 1 second to display evaporator temperature and it will display indoor temperature again after 3 seconds.

3.6 Restore default setting: Cut the power supply; press and hold SET and ▲, then re-supply the power. it will display rS, all of the parameter will be restored to default and operated accordingly.

3.7 Quick setting mode: Under the normal status, press and hold the ▼ key for 1 second to enter the quick setting mode. Press the ▲ or ▼ key to directly adjust the temp. setting value. If no key is pressed within 5 seconds or directly press the SET key, the parameters will be saved automatically and return to the temperature display.

3.8 Compressor forced start function: Under the normal status, press and hold SET and ▼ for 3 seconds, the compressor would be forced to start.

3.9 User's parameter setup:
- 3.9.1 Press SET and hold it for 3 seconds to enter the parameter setup mode. The code "tS" displayed, the indicator flashes.
- 3.9.2 When the parameter code is displayed, press ▲ or ▼ to select the parameter code. Press SET to display the parameter value after selection. (Please refer to 10. Parameter table for parameter codes and setting range)
- 3.9.3 When the parameter value is displayed, press ▲ or ▼ to adjust parameter values. After the setting is complete, press SET to confirm and return to the parameter code, or if no key is pressed within 10 seconds, parameter values would be auto-saved and system returns to normal status.

3.9.4 Under the parameter locked, the settings cannot be modified, except for tS (temperature setting).

4. COMPRESSOR :

4.1 When indoor temp. ≥ (tS + tD), compressor turns ON. When indoor temp ≤tS, compressor turns OFF.

4.2 After the compressor turns off, the compressor protection time “AC” starts to count. After the compressor protection time is reached, the compressor could be re-started again.

4.3 Even compressor protection period is set as AC=0, when the power re-supply, there will be 1 min delay for protection purpose.

4.4 When the indoor sensor and memory fail, compressor operates and stopped cyclically for every 15 minutes. (default setting, cannot be changed).

4.5 When the input voltage error E3.E4, the compressor stops operating.

5 DEFROST: (electric heater defrost)

5.1 When defrost, the compressor stopped, but the fan operates, and the defrost indicator flashes.

5.2 When defrost, even EVA temp < defrost stopped temp (ds), defrost turns ON.
EVA temp ≥ defrost stopped temp (ds), defrost turns OFF.

5.3 Even reach the defrost period, Electric heater and defrost turns OFF, drop period and defrost locked period begining to count, Fan and compressor still OFF.

5.4 When the defrost period is reached or the defrost is manually ended, the system returns to operation mode and the compressor will operate according to the temp change.

5.5 If the defrost period “dt” and defrost cycle “dF” are changed, it will take effect immediately and be recalculated.

5.6 The defrost cycle “dF” includes manual defrost period and auto defrost period.

5.7 After the controller is turned off, the defrost cycle and defrost period would be recalculated.

5.8 Under malfuntion status, defrost turns OFF.

5.9 The first operating cycle does not defrost after power supply.

5.10 Defrost temp lock dL=0, the actual indoor temp displayed during defrosting.

5.11 Defrost Temp Lock dL=1:

5.11.1 Defrost Lock Display dd=0, dF displayed during defrost lock status.

5.11.2 Defrost Lock Display dd=1, the temp. before defrost display during the defrost lock status.

5.11.3 Defrost lock period Lt = 0, when indoor Temp. ≤ Setting Temp., the defrost lock status will be unlocked.

5.11.4 The defrost lock period Lt≠0, when defrost lock period is reached, the defrost lock status will be unlocked.

6 FAN:

6.1 Under non-malfuntion status, the fan is off during defrosting or dripping.

6.2 Fan Operation Selection FC=0, and evaporator temp. < fan stop temp., fan is ON.

6.3 Fan Operation Selection FC=0, and evaporator temp. ≥ fan stop temp., fan is OFF.

6.4 Fan Operation selection FC=1, and evaporator temp. < fan stop temp., fan turns ON when compressor starts.

6.5 Fan Operation Selection FC=1, and evaporator temp. ≥ fan stop temp., fan is OFF.

6.6 When the sensor and memory fail, fan and compressor operated and stopped cyclically for every 15 minutes. (default setting, cannot be changed).

6.7 When the input voltage error E3.E4, the fan turns OFF.

7. DEFOG:

7.1 Defog function is OFF when the controller is OFF or defog switch is OFF.

7.2 When the controller is ON and defog switch is ON, if defog cycle gF=0, defog ON/OFF could be controlled by defog switch.

7.3 When the controller is ON and defog switch is ON, if defog cycle gF≠0, the defog function operates according to the defog cycle “gF” and the defog period “gt”.

8. INPUT VOLTAGE:

8.1 When the input voltage higher than AC 255V lasts longer than the High and Low Voltage Alarm Delay “Ud”, high voltage alarm E3 will be activated.

8.2 When the input voltage lower than AC 182V lasts longer than the High and Low Voltage Alarm Delay “Ud”, low voltage alarm E4 will be activated.

9. INDOOR TEMP LOCK:

9.1 When the indoor Temp Lock tL=0, the function of indoor temp. lock stops.

9.2 When power on and the indoor temp reaches temp. setting once, the function of indoor temp. Lock starts.

9.3 Under normal operation mode (non-malfunction/defrost/defrost lock), when tL≠0 and indoor temp. detection ≥ (tS + tD), the temp. display is locked and indoor temp. lock “tL” starts to count.

9.4 When the indoor temp. is locked, the indoor temp detection < temp setting “tS” + temp difference “td”, the Indoor Temp. Lock would be unlocked immediately.
9.5 When the indoor temp lock “tL” finished, it will unlock. The function of indoor Temp Lock stops until the indoor temp detection <temp. setting “tS” + temp. differenace “td” is detected again.

10. INDICATORS:

10.1 Compressor : When the compressor is ON, the indicator is ON; when the compressor is protection delay, the indicator is flashing; when the compressor is OFF, the indicator is OFF.
10.2 Fan : When the fan is ON, the indicator is ON; when the fan is OFF, the indicator is OFF.
10.3 Defrost ❄ : Flashing during defrosting and OFF when non-defrost.
10.4 Power ⏻ : The indicator is ON when the power is OFF; and the indicator is OFF when the power is ON.

Function	Min	Max	Default	Description
tS Setpoint (indoor temp.)	LS	HS	5°C	Indoor temp. ≤ setpoint, compressor stops.
td Temp. Difference	1°C	10°C	4°C	Indoor temp. ≥ (tS+td), compressor starts to operate.
dF Defrost Cycle	0 Hr	99 Hr	6 Hr	dF=0; not defrost automatically, it only could defrost manually.
dt Defrost Period	0 Min	59 Min	30 Min	Defrost stops when defrost period finished.
Ds Defrost Stop Temperature	-45°C	99°C	25°C	Even EVA temp. ≥ Defrost stopped temp., defrost will stop.
Dr Drop Period	0 Min	15 Min	3 Min	When defrost stopped, drop period beginning to count.
Ft Fan Stop Temperature	-45°C	99°C	5°C	Even EVA temp. ≥ Fan stopped temp., fan will stop.
gF Defog Cycle	0 Hr	99 Hr	1 Hr	0: not defog automatically; but defog function according to Power ON/OFF.
gt Defog Period	0 Min	59 Min	15 Min	Defog stops when defog period finished.
AC Compressor Delay Protection	0 Min	15 Min	3 Min	Even AC=0 It still has 1 min delay after power supply.
HS Max. Setpoint	tS	99°C	45°C	To limit the max setpoint.
LS Min. Setpoint	-45°C	tS	-45°C	To limit the min setpoint.
At Temp. Alarm Start Delay	0 Min	99 Min	60 Min	After startup, the temp alarm would be delayed for a period of time.
AU High Temp. Alarm (indoor temp.)	AL+1	99°C	70°C	Indoor temp. ≥ AU alarm delay starts to count
AL Low Temp. Alarm (indoor temp.)	-45°C	AU-1	-45°C	Indoor temp. ≤ AL alarm delay starts to count
Ad Temp. Alarm Delay Setting	0 Min	99 Min	30 Min	When the delay period finished, the temp. alarm occurs.
Ot Temp. Calibration (indoor temp.)	-8°C	7°C	0°C	Indoor temp. calibration
Ud High and Low Voltage Alarm Delay	0 Min	99 Min	1 Min	Only high low voltage alarm counting would delay 0: no detection
dL Defrost Temp. Lock	0	1	0	0: no locked 1: locked
dd Defrost Locked Display	0	1	0	0: display dF when locked 1: display temp. before defrost when locked
Lt Defrost Locked Period	0 Min	30 Min	0	0: indoor temp. ≤ setpoint unlocked 1~30 min: unlocked according schedule
FC Fan Operation Selection	0	1	0	0: fan continuous operate 1: fan operate with the compressor
SA Alarm Mute	0	1	0	0: not muted when alarm 1: muted when alarm
tL Indoor Temp. Lock	0 Min	60 Min	0	0: not locked 1~60 min: indoor temp. locked

12. ERROR CODE:

12.1 EE: Memory is failure. (Press (SET) and (▲) to restore the default values, and then resupply the power. If it still not work, please send back to factory for inspection).
12.2 E1: Indoor temp. sensor is failure. (Check whether the sensor is connected or replace the sensor).
12.3 E2: Please move evaporator sensor to proper location, re-supply power after sensor cooling down. If error still happens, replace another one.
12.4 E3: Input voltage is too high. (Please check the input voltage).
12.5 E4: Input voltage is too low. (Please check input voltage).
12.6 UA: High temp. alarm, indoor temp ≥ high temp. alarm settings. (Please check if the compressor is failure or the wiring is off).
12.7 LA: Low temp. alarm indoor temp ≤ low temp. alarm settings Please check if the compressor contacts are melted).
12.8 When the above errors occur, the buzzer will beep (ON for 1 second / OFF for 1 second).
12.9 Only lighting, defog and buzzer can be set during the controller failure.
12.10 When alarms are activated, alarm contact will be ON.

MICRO-PROCESSOR TEMPERATURE CONTROL

CONTROLLER INSTRUCTIONS FOR, UNDERBENCH CHILLERS, BOTTOM MOUNT CHILLERS & CAKE FRIDGES RS-411E

1. CAUTIONS :

1.1 Before wiring, please make sure that power is switched off to prevent from getting electric shock.
1.2 The product should be avoided to install at humid environment.
1.3 To prevent the controller burning out, please make sure the water-proofed procedure is undertaken during installation.
1.4 Please install according to the wiring diagram, in order to avoid incorrect wiring.
1.5 Before supplying the power, please always check if the wiring and input power is connected correctly.
1.6 Please always read this instruction carefully before installation. If the damage is caused of incorrectly wiring, the product would not be guaranteed.

2. SPECIFICATION :

2.1 Dimension:
    2.1.1 Front panel size:36.2mm (H) x 84.2mm (L) ± 1mm
    2.1.2 Mounting size:33mm (H) x 72mm (W) x 85mm (D) ± 1mm
2.2 Operating temperature: -5°C ~ 55°C, < 90% RH (non–condensing)
2.3 Storage environment: -10°C ~ 65°C, < 90% RH (non–condensing)
2.4 Power voltage: AC100/240V ± 10%, single phase 50 / 60Hz. (Depending on the transformer)
2.5 Power consumption: Max. 6 watts (Not include each output contacts)
2.6 Temperature display range:
    2.6.1 -40°C ~ 70°C, within ± 19°C: resolution 0.5°C, others: 1°C, tolerance ± 1.0°C
    2.6.2 -40°F ~ 158°F, resolution 1°F, tolerance ± 2°F
2.7 Input/Output:
    2.7.1 Compressor output contact capacity : 1.5HP / 250Vac
    3/4HP / 125Vac
    10A / 250Vac. / 125Vac Resistive load
    2.7.2 Fan contact capacity : 1/4HP / 250Vac / 125Vac
    5A / 250Vac / 125Vac resistive load
    2.7.3 Indoor sensor: NTC, length 1.5m (If you need other length of sensor, please purchase additionally)
    2.7.4 Condenser sensor: NTC, length 1.5m
    2.7.5 Compressor pressure alarm contact (PA)
    2.7.6 External connect monitor: length 3m

3. FUNCTION :

3.1 Button operation:
    3.1.1 In normal condition (Except **E1.E2.E3.EE.IA,PA**), press **[SET]** button for 3 seconds to enter setup mode, the monitor will show **“tS”**
    3.1.2 When the required parameter is shown, press **[▲]** or **[▼]** to choose parameter code the order is as follows: **“tS”, “td”, “dF”, “dt”, “AU”, “AL”, “HS”, “LS”, “Ad”, “AC”, “Cr”, “CS” , “Ot” “dS”, “Ft”, “dr”, “dO”, “FC”, “dL”, “Ut”, “PS”, “OU”.**
    3.1.3 After choosing the required parameter code, press **[SET]** to enter parameter value and press **[▲]** or **[▼]** to adjust values.
    3.1.4 If you want to set **“PS”** as the fifth parameter, the operation is as below:
        3.1.4.1 In the normal condition, press **[SET]** for 3 seconds to enter setup mode **“tS”**
        3.1.4.2 Press **[▲]** or **[▼]** and after choosing **“PS”** code - press **[SET]** code to show the set the parameter.
        3.1.4.3 Press **[▲]** or **[▼]** to choose the fifth parameter code.
        3.1.4.4 Press **[SET]** or wait for 15 seconds to memory, After showing **“rS”**, the controller will restart and show the parameter group.
    3.1.5 After amending the parameter, press **[SET]** to return to the showing of parameter code and memory the am endment of parameter value.
    3.1.6 If no more command is given within 15 seconds or after choosing **“OU”**, it will save the amended parameter automatically and return to the showing of indoor temperature.
    3.1.7 After changing the unit selection **“Ut”**, the controller will reset automatically and turn back to default setting.
    3.1.8 Rapid set point mode:
        3.1.8.1 In the normal condition (except **E1.E2.E3.EE.IA.PA**), press **[▼]** button for 3 seconds to enter the quick temperature setting mode, meanwhile, the value of setting temperature flickers.
        3.1.8.2 In this condition can press **[▲]** or **[▼]** button to adjust the temperature value **“tS”** directly.

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3.1.8.3 If no more command is given within 5 seconds or press **[SET]** button, parameter will be saved automatically and return to indoor temperature showing.

3.2 Function:

3.2.1 Operation of compressor:

3.2.1.1 When indoor temperature ≤ “tS”, compressor OFF: when indoor temperature ≥ (**“tS”**, **“td”**), compressor On: If the time of AC delay doesn’t arrive, compressor OFF.

3.2.1.2 When the compressor stops, it starts to count the time of AC.

3.2.1.3 When the power supply, the compressor will delay at least one minutes to start. (When AC=0)

3.2.1.4 During defrost time, please refer to Manual 3.2.2 about the defrost operation.

3.2.1.5 Break down operation: When **E1,E2,E4,EE,** the compressor starts according to **“Cr”** time and operates automatically according to **“CS”** stopped time.

3.2.2 Manual defrost:

3.2.2.1 Calculation of defrost:

3.2.2.1.1 When the controller turns on, the first defrost period will not defrost. The defrost will be re-calculated and start on the second period. (for example: if **“dF”** sets 6 hours, the cycle of defrost will be started on the 6th hour.)

3.2.2.1.2 When the time arrives **“dF”** the defrost mode starts (defrost automatically): if it is already in the manual defrost condition, the defrost time will not be recalculated.

3.2.2.1.3 Defrost manually (in normal mode, press **[▲]** and **[▼]** button for 3 seconds in the meantime) can enter/end the defrost mode manually. It will not affect the calculation of defrost cycle.

3.2.2.1.4 If the controller breaks down or alarms, the defrost cycle will not be affected.

3.2.2.1.5 After amending **“dF”**, the new setting value will be loaded in next cycle: after amending **“dt”**, **“dt”** becomes effectively, if you miss to set the defrost during the defrost automatically cycle or **“dt”** setting, it will be loaded in next cycle.

3.2.2.2 Defrost operation:

3.2.2.2.1 Parameters **“dO”** and **“dr”** works in this RS-411.

3.2.2.2.2 Power-off defrost applies on RS-411.

3.2.2.2.3 When defrost begins, it starts to calculate “dt”. Compressor is OFF,
Fan is On.

3.2.2.2.4 When indoor temp. ≥ “dS” during defrost period, defrost ends immediately.

3.2.2.2.5 When **“dt”** time ends - defrost Off.

3.2.2.3 End of defrost: When **“dt”** time ends - it returns to normal operation mode.

3.2.2.4 Defrost temp. locked(**“dL”**).

3.2.2.4.1 When **“dL”=0**, after entering the defrost mode, indoor temperature shows normally.

3.2.2.4.2 When **“dL”=1**, after entering the defrost mode, indoor temperature reaches the entered defrost temperature : After finishing defrost, if indoor temperature detection ≤ set point (**“tS”**) it will restore to show the normal indoor temperature.

3.2.3 Fan operation:

3.2.3.1 Parameter **“Ft”** works in RS-411.

3.2.3.2 During the defrost time, fan On.

3.2.3.3 Fan select **“FC”=0**, the compressor will ON/OFF.

3.2.3.4 Fan select **“FC”=1**, fan operates continually ON.

3.2.4 Memory shut down: When the shut down happens during the operation, after power restores, the system will operate refer to the parameter value before shut down. (the memory doesn’t include the defrost condition/cycle).

3.2.5 Indoor temperature compensation: Showing temperature = indoor detective temperature + probe calibration (**“Ot”**).

3.2.6 Temperature alarm:

3.2.6.1 When indoor temperature is higher than **“AU”** (UA/indoor temperature alternant glisten) or lower than **“AL”** (La/indoor temperature alternant glisten), it starts to calculate the alarm delay (**“Ad”**), after delay protection ends, the alarm starts (condition : after turn on the machine, the temperature alarm function appears only if indoor temperature has been reached to set temperature).

3.2.6.2 Board temperature alarm : when the board temperature ≥ 95°C, the controller closes the output contact compulsorily and show **“tA”** the alarm starts immediately : waiting until the board temperature ≤ 75°C, the alarm removed.

3.2.6.3 Condenser temperature alarm : when the condenser temperature ≥ **“Ct”**, the controller closes the output contact compulsorily and show “**CA**/indoor temp.” alternant glisten : waiting until the condenser temperature ≤ **“Ct”**., the **“CA”** alarm removed.

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3.2.7 Set point temperature alarm: You can adjust **“HS”** and **“LS”** to restrict set point temperature range to avoid set point temperature excess the range of compressor ability or to cause over temperature by setting mistaken.

3.2.8 Output alarm:

3.2.8.1 When it happens the temperature alarm **“UA”,”LA”**, it starts to calculate alarm delay time (**“Ad”**), when **“Ad”** time finished, the alarm starts.

3.2.8.2 When alarm failure (**E1.E2.E3.E4.EE.PA.CA.tA**), it starts alarm immediately.

3.2.9 Temp. Display:

3.2.9.1 Evaporator temp. Display: In normal mode - press **[▲]** button for 3 seconds can switch to show evaporator temp. 3 seconds.

3.2.9.2 Condenser temp. Display: In normal mode - press **[▲]** button for 6 seconds can switch to show condenser temp. 3 seconds.

3.2.10 operate compulsorily:

3.2.10.1 In normal mode - press **[LOG]** for 3 seconds to enter/remove operation compulsorily.

3.2.10.2 Under the condition, compressor On/ fan On and shows FF/indoor temperature alternate blink : if indoor temp. ≤ **“tS”**, it ends the compulsory operation.

3.2.10.3 In the period of Compulsory operation, it will not enter defrost mode.

3.2.11External connection display : Connect the display can show indoor temperature/compressor, defrost, fan condition and failure alarm condition.

3.3 LED indicators :

3.3.1 Compressor indicator

3.3.1.1 The LED is illuminated constantly when compressor is operating.

3.3.1.2 The LED is blinking when compressor is in delay protection/stand by.

3.3.1.3 The LED is off when the compressor is Off or in defrost mode.

3.3.2 Defrost indicator: When the LED is illuminated constantly during defrost period, the power-off defrost will be active.

3.3.3 Fan indicator: When fan works the indicator illuminates, when fan stops the indicator goes out.

3.4 Parameter lock :

3.4.1 In normal condition (Except **E1.E2.E3.E4,EE,IA,PA**) - press **[SET]** + **[▼]** button 3 seconds can lock **“LC”** parameter/unlock **“UL”** (if it shows **“Lt”**, it means there still have one lock) : after locking, only set point **“tS”** can be adjusted, other parameter can’t be changed.

3.4.2 In normal condition (Except **E1.E2.E3.E4,EE,IA,PA**) - press **[SET]** + **[▼]** button 6 seconds can lock entirely **“Lt”** parameter/unlock **“UL”** : after locking, all parameter can’t be changed.

3.4.3 It means already unlocked when it shows **“UL”**.

3.4.4 Power cut down will not affect the lock status : after restore the power, lock condition can still be remained.

3.5 Failure/Alarm :

3.5.1 Indoor temperature sensor failure, **“E1”** blinks and starts the failure operation.

3.5.2 Board temperature sensor failure, **“E3”** blinks and closes the output contact.

3.5.3 Condenser temperature sensor failure, **“E4”** blinks and starts the failure operation.

3.5.4 Memory failure, **“EE”** blinks and returns to default value, the failure operation starts : if **“EE”** can’t be deleted after supplying power again, it means the memory is broken. It needs to be repaired by our company.

3.5.5 High temperature (indoor) alarm shows **“UA”** and alternate with indoor temperature.

3.5.6 Low temperature (indoor) alarm shows **“LA”** and alternate with indoor temperature.

3.5.7 Compressor High-low pressure alarm shows **“PA”** and alternate with indoor temperature, close all output contacts.

3.5.8 Condenser temperature alarm shows **“CA”** and alternate with indoor temperature, close all output contacts.

3.5.9 Board temperature alarm shows **“tA”** and alternate with indoor temperature, close all output contacts.

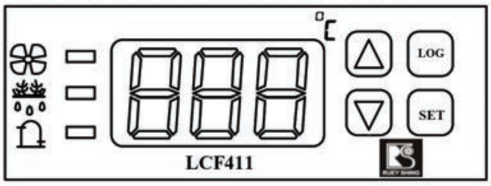
3.6 Return default value : press **[▲]** + **[▼]** button to supply power, after showing **“rS”** 3 seconds, it will turn on the machine again and start to operate.

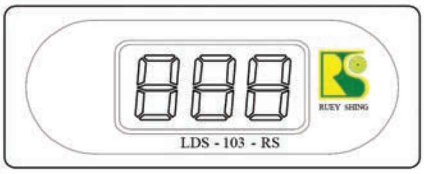
Code	Function	Range(°C)		Unit	Default															Range (°F)		Unit	°F Default value	Description
		Min	Max		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Min	Max			
tS	**Setpoint**	**LS**	**HS**	°C	**2**	**3**	**15**	**-18**	**-19**	**-25**	**0**	**-19**	**-25**	**-25**	**-40**	**4**	**-25**	**-19**	**-4**	**LS**	**HS**	°F	**0**	**Compressor stops when it reaches the setpoint.**
td	**Temp. Differential**	**0.5**	**10**	°C	**4**	**3**	**2**	**4**	**3**	**3**	**4**	**4**	**4**	**4**	**4**	**4**	**3**	**3**	**3**	**1**	**20**	°F	**7**	**Compressor will start to operate when the temp. =TS + td**
dF	**Defrost cycle**	**0**	**99**	**hr**	**2**	**2**	**0**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**4**	**0**	**6**	**6**	**0**	**99**	**hr**	**6**	**Set the interval between defrost cycles.**
dt	**Defrost period**	**1**	**55**	**min**	**15**	**15**	**1**	**30**	**5**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**1**	**4**	**15**	**1**	**55**	**min**	**30**	**To control Defrost time. Defrost is terminated when defrost time ends.**
AU	**Max. temp. for alarm**	**AL+0.5**	**70**	°C	**8**	**9**	**21**	**-12**	**-13**	**-19**	**6**	**-13**	**-19**	**-19**	**-34**	**10**	**-19**	**-13**	**2**	**AL+1**	**158**	°F	**10**	**When indoor temp.≥AU, the alarm will be active.(This function is available after room temp. reaches setpoint once.)**
AL	**Min. temp. for alarm**	**-40**	**AU-0.5**	°C	**-4**	**-3**	**9**	**-24**	**-25**	**-31**	**-6**	**-25**	**-31**	**-31**	**-40**	**-2**	**-31**	**-25**	**-10**	**-40**	**AU-1**	°F	**-11**	**When indoor temp.≤AU, the alarm will be active.(This function is available after room temp. reaches setpoint once.)**
HS	**Max. setpoint**	**tS**	**70**	°C	**7**	**8**	**20**	**-13**	**-14**	**-20**	**5**	**-14**	**-20**	**-20**	**-35**	**9**	**-20**	**-14**	**1**	**tS**	**140**	°F	**9**	**To limit the max. setpoint**
LS	**Min. setpoint**	**-40**	**tS**	°C	**-3**	**-2**	**10**	**-23**	**-24**	**-30**	**-5**	**-24**	**-30**	**-30**	**-40**	**-1**	**-30**	**-24**	**-9**	**-40**	**tS**	°F	**-10**	**To limit the min. setpoint**
Ad	**Alarm delay**	**0**	**60**	**min**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**0**	**60**	**min**	**15**	**When alarm acts, the time delay for buzzer. (Except E1.E2.E3.EE.,tA)**
AC	**Compressor delay protection**	**0**	**30**	**min**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**30**	**min**	**0**	**Interval time between compressor stop operation and restart as a compressor protection.**
Cr	**Compressor operation period under any failure**	**0**	**60**	**min**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**0**	**60**	**min**	**15**	**Compressor operation time when EE.E1 and E2 occurs.(When Cr=0, compressor is continuously Off)**
CS	**Compressor termination period under any failure**	**0**	**60**	**min**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**0**	**60**	**min**	**15**	**Compressor stop time when EE.E1 and E2 occurs.(When Cr=0, compressor is continuously On)**
Ot	**Probe calibration**	**-12**	**12**	°C	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-24**	**24**	°F	**0**	**Indoor temp. Calibration.**
dS	**Defrost stop temp.**	**0**	**70**	°C	**10**	**10**	**0**	**20**	**10**	**10**	**10**	**12**	**12**	**8**	**12**	**10**	**0**	**10**	**10**	**32**	**158**	°F	**68**	**When evaporatior temp.≥dS, defrost is terminated to avoid the damage of the storage.**
Ft	**Fan motor stop temp.**	**0**	**70**	°C	**15**	**15**	**15**	**15**	**5**	**15**	**15**	**5**	**5**	**5**	**5**	**15**	**15**	**5**	**15**	**32**	**158**	°F	**59**	**Fan stop temperature.(To prevent heat into cabinet)**
Ct	**Condenser protection temp.**	**20**	**60**	°C	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**68**	**140**	°F	**122**	**Drop time after the defrost period**
dr	**Drop period**	**0**	**60**	**min**	**0**	**0**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**2**	**2**	**0**	**0**	**2**	**0**	**0**	**60**	**min**	**0**	**Drop time after the defrost period**
dO	**Defrost mode**	**0**	**1**	**-**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**-**	**0**	**When dO=0, defrosting ny heater. When dO=1, defrosting by hot gas.**
FC	**Fan mode**	**0**	**1**	**-**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**-**	**1**	**When FC=0, fan operates according to compressor. When FC=1, fan operates continuously.**
dL	**Indoor Temp. Lock up**	**0**	**1**	**-**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**-**	**1**	**When dL=0, Cabinet temp. Shows normally during defrost period. When dL=1, cabinet temp. Is locked and fixed.**
Cd	**Condenser temperature detection**	**0**	**1**	**-**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**-**	**1**	**0: Off 1:On**
Ut	**Temperature unit**	°C	**°F**	**-**	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	**°F**	**-**	**°F**	**Set temp. Unit, after changing, it shows“rS” and restarts the machine.**
PS	**Parameter group**	**1**	**15**	**-**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**1**	**15**	**-**	**4**	**Choose parameter groups.**
OU	**Exit**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**Exit setting mode.**

MICRO-PROCESSOR TEMPERATURE CONTROL

CONTROLLER INSTRUCTIONS FOR, UNDERBENCH CHILLERS, BOTTOM MOUNT CHILLERS & CAKE FRIDGES LCF-411-RS+LDS-103

PANEL





TECHNICAL DATA

Power supply	85V~265V/AC/50~60HZ	**Temperature range**	-50˚C~+80.0˚C
Display	Seven segment LED	**Working temperature**	-15˚C~+70˚C
Mounting	Snap-in	**Accuracy**	±1˚C
Fit-in size	70*28*64mm^3	**Resolution**	0.1˚C
	53*26.5mm^2	**Maximum output rating**	(1)
Compressor	30A/250V (Resistance load)		

SYSTEM PARAMETER TABLE

No.	Symbol	Description	Range	Default
1	**tS**	Compressor stop temperature	-50°C ~+80.0°C	+2.0°C
2	**td**	Differential temperature for compressor restart	+0.1°C ~+ 15.0°C	+4.0°C
3	**Sd**	Compressor start-up delay time	0 ~15 Min.	2 Min.
4	**di**	Defrost interval	0 ~ 24 Hr.	4 Hr.
5	**dd**	Defrost duration	0 ~ 60 Min.	20 Min.
6	**CL**	Condenser cleaning interval	0 ~ 250 day	0 day
7	**tA**	Sensor calibration	-10°C ~+ 10.0°C	0.0°C

LOCK SYSTEM PARAMETER TABLE

No.	Symbol	Description	Range	Default
1	**Lo**	Parameters protection	y:lock / n:unlock	y
2	**tH**	The upper temperature limit	tS ~ +80.0°C	+50.0°C
3	**tL**	The lower temperature limit	-50°C ~ tS	-50°C
4	**AH**	High temperature alarm	tS~ +80.0°C	+50.0°C
5	**Ht**	Alarm when the temperature is higher than AH setting continuously over this duration	0~180Min	90Min
6	**AL**	Low temperature alarm	-50°C ~ tS	-30°C
7	**Lt**	Alarm when the temperature is lower than AL setting continuously over this duration	0~180Min	60Min
8	**tC**	Defrost cycle is counted by hour or 15 min	ti : hour /CP :15 min	ti

Note: When parameter LO is set to "y" , the parameter "tS" will be the only parameter which can be shown on display. No other parameters can be modified until LO is set back to "n".

SELF TEST FUNCTION ERROR CODE

Error Code	Description
E1H	Sensor shorted or temperature higher than +80.0-
E1L	Sensor opened or temperature lower than -50-
AH	High temperature alarm
AL	Low temperature alarm

OPERATION SYSTEM PARAMETER SETTING

A. System parameter setting

1. Press **[SET]** key, the display flashes pattern **“888”**, then shows the symbol of the first system parameter **“tS”**, this means the controller entering the parameter modifying phase, can press **[▲]** or **[▼]** key to choose other parameters(**“td”** or **“di”**) that is going to be adjust, Two keys **[▲]** or **[▼]** is used as **“scroll up and scroll down key”**. During each parameter item in display, Press **[SET]** key, the display shows value of each parameter, can push **[▲]** or **[▼]** key to modify setting value. Press the **[SET]** key, then modify the next parameter. Each choosing **“tS”**, **“td”**, **“Sd”**, **“di”**, **“dd”**, **“tA”** is available.

2. If there is no any key was pushed during thirty seconds, the controller jump into function of setting.

3. After power **[ON]** the compressor is delaying for protecting (power on delay **“sd”**). If you want to bypass the delay time and start immediately, then you can push **[▼]** key display shows **“Fon”**. The controller then forces compressor to start up immediately.

4. When sensor shorted or broken, the display shows error code until system recover.

5. Press **[Log]** key, the displays flashes **“dEf”**, the controller go into defrost immediately.

LOCK SYSTEM PARAMETER SETTING

1. Press **[SET]** key for three seconds, the display begins flashing pattern **“888”**. While flashing, press both **[▲]** or **[▼]** keys together until display shows **“LO”** (which means into parameters lock). Press **[SET]** again, the modified value would be showed. At this time, press **[▲]** or **[▼]** to lock by choosing **“y”** or to unlock by choosing **“n”**.

2. After select system parameters to unlock push **[SET]** key, the display shows pattern **“tH”** can press **[▲]** or **[▼]** key to move to the next parameter. Press **[SET]** key, the display flashes pattern set value, can press **[▲]** or **[▼]** key to increase or decrease the value by one unit, push the **[SET]** key, the controller goes to modify the next parameter, finally; that the setting procedure is finished.

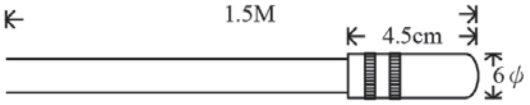
FUNCTION KEYS

△ ▽	Increase/ Decrease	To increase or decrease one unit
SET	Set	Request for setting the parameter
LOG	Defrost	Manual defrost

LED INDICATORS

	Green	Lamp flash, compressor start up delay Lamp on, compressor running
❄	Red	Lamp flash, system defrosting

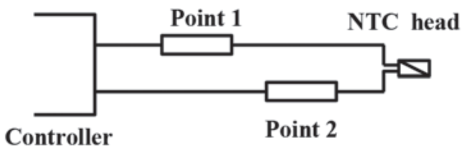
SENSOR DESCRIPTION

Isolation wire NTC sensor with BLACK VC/1.5M/4.5cm 6 metal head	

✻ Lengthen your NTC sensor probe. Please pay attention on below.

1 Off the system power.

2 To avoid short circuit, the connection points should be interleaved, as shown rig

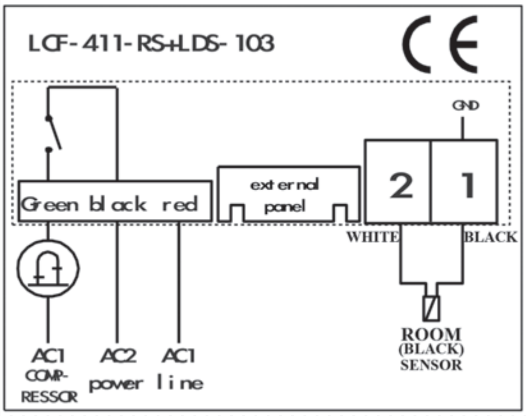


✻ Notes

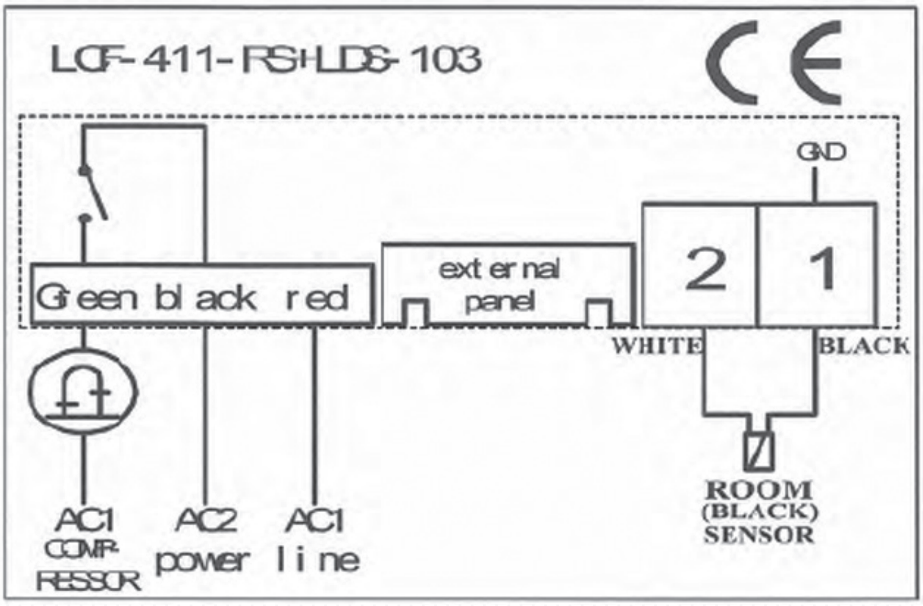
1 When NTC black sensor is in error status, system stop.

2 When the room temperature is continuously higher than AH, (you can adjust between tS to 50°C) and the time is over than Ht minutes, the buzzer start to buzz, until the room temperature down lower than AH. The buzzer would start again when the same situation occurred, and this is a alarm to system condition.

WIRING DIAGRAM


LCF-411-RS+LDS-103
GND
Green black red
external panel
2
1
WHITE
BLACK
ROOM (BLACK) SENSOR
AC1 COMP-RESSOR
AC2 power
AC1 line

★ Room Sensor [black wire] need to connect to PIN 1 for ground purpose.


LCF-411-RS+LDS-103
GND
Green black red
external panel
2
1
WHITE
BLACK
ROOM (BLACK) SENSOR
AC1 COMP-RESSOR
AC2 power
AC1 line

REFRIGERATION SYSTEM CONTROLLER

CONTROLLER INSRUCTIONS FOR UNDERBENCH FREEZERS
& BOTTOM-MOUNT FREEZERS RS-311E

1. CAUTIONS :

1.1 Before wiring, please make sure that power is switched off to prevent from getting electric shock.
1.2 The product should be avoided to install at humid environment.
1.3 To prevent the controller burning out, please make sure the water-proofed procedure is undertaken during installation.
1.4 Please install according to the wiring diagram, in order to avoid incorrect wiring.
1.5 Before supplying the power, please always check if the wiring and input power is connected correctly.
1.6 Please always read this instruction carefully before installation. If the damage is caused of incorrectly wiring, the product would not be guaranteed.

2. SPECIFICATION :

2.1 Dimension:
2.1.1 Front panel size:36.2mm (H) x 84.2mm (L) ± 1mm
2.1.2 Mounting size:33mm (H) x 72mm (W) x 85mm (D) ± 1mm
2.2 Operating temperature: -5°C ~ 55°C, < 90% RH (non–condensing)
2.3 Storage environment: -10°C ~ 65°C, < 90% RH (non–condensing)
2.4 Power voltage: AC100/240V ± 10%, single phase 50 / 60Hz. (Depending on the transformer)
2.5 Power consumption: Max. 6 watts (Not include each output contacts)
2.6 Temperature display range:
2.6.1 -40°C ~ 70°C, within ± 19°C: resolution 0.5°C, others: 1°C, tolerance ± 1.0°C
2.6.2 -40°F ~ 158°F, resolution 1°F, tolerance ± 2°F
2.7 Input/Output:
2.7.1 Compressor output contact capacity : 1.5HP / 250Vac
3/4HP / 125Vac
10A / 250Vac. / 125Vac Resistive load
2.7.2 Defrost contact capacity (heater/4-way value) : 5A/250Vac / 125Vac resistive load
2.7.3 Fan contact capacity : 1/4HP / 250Vac / 125Vac
5A / 250Vac / 125Vac resistive load
2.7.4 Indoor sensor: NTC, length 1.5m (If you need other length of sensor, please purchase additionally)
2.7.5 Condenser sensor: NTC, length 1.5m
2.7.6 Evaporator sensor : NTC, length 1.5m
2.7.7 Compressor pressure alarm contact (PA)
2.7.8 External connect monitor: length 3m

3. FUNCTION :

3.1 Button operation:
3.1.1 In normal condition (Except **E1.E2.E3.EE.IA,PA**), press **[SET]** button for 3 seconds to enter setup mode, the monitor will show **"tS"**
3.1.2 When the required parameter is shown, press **[▲]** or **[▼]** to choose parameter code the order is as follows: **"tS", "td", "dF", "dt", "AU", "AL", "HS", "LS", "Ad", "AC", "Cr", "CS" , "Ot" "dS", "Ft", "dr", "dO", "FC", "dL", "Ut", "PS", "OU".**
3.1.3 After choosing the required parameter code, press **[SET]** to enter parameter value and press **[▲]** or **[▼]** to adjust values.
3.1.4 If you want to set **"PS"** as the fifth parameter, the operation is as below:
3.1.4.1 In the normal condition, press **[SET]** for 3 seconds to enter setup mode **"tS"**
3.1.4.2 Press **[▲]** or **[▼]** and after choosing **"PS"** code - press **[SET]** code to show the set the parameter.
3.1.4.3 Press **[▲]** or **[▼]** to choose the fifth parameter code.
3.1.4.4 Press **[SET]** or wait for 15 seconds to memory, After showing **"rS"**, the controller will restart and show the parameter group.
3.1.5 After amending the parameter, press **[SET]** to return to the showing of parameter code and memory the am endment of parameter value.
3.1.6 If no more command is given within 15 seconds or after choosing **"OU"**, it will save the amended parameter automatically and return to the showing of indoor temperature.
3.1.7 After changing the unit selection **"Ut"**, the controller will reset automatically and turn back to default setting.
3.1.8 Rapid set point mode:
3.1.8.1 In the normal condition (except **E1.E2.E3.EE.IA.PA**), press **[▼]** button for 3 seconds to enter the quick temperature setting mode, meanwhile, the value of setting temperature flickers.
3.1.8.2 In this condition can press **[▲]** or **[▼]** button to adjust the temperature value **"tS"** directly.

RS-311E Operational Manual

3.1.8.3 If no more command is given within 5 seconds or press **[SET]** button, parameter will be saved automatically and return to indoor temperature showing.

3.2 Function:

3.2.1 Operation of compressor:

3.2.1.1 When indoor temperature ≤ “tS”, compressor OFF: when indoor temperature ≥ (**“tS”**+**“td”**), compressor On: If the time of AC delay doesn’t arrive, compressor OFF.

3.2.1.2 When the compressor stops, it starts to count the time of AC.

3.2.1.3 When the power supply, the compressor will delay at least one minutes to start. (When AC=0)

3.2.1.4 During defrost time, please refer to Manual 3.2.2 about the defrost operation.

3.2.1.5 Break down operation: When **E1,E2,E4,EE,** the compressor starts according to **“Cr”** time and operates automatically according to **“CS”** stopped time.

3.2.2 Manual defrost:

3.2.2.1 Calculation of defrost:

3.2.2.1.1 When the controller turns on, the first defrost period will not defrost. The defrost will be re-calculated and start on the second period. (for example: if **“dF”** sets 6 hours, the cycle of defrost will be started on the 6th hour.)

3.2.2.1.2 When the time arrives **“dF”** the defrost mode starts (defrost automatically): if it is already in the manual defrost condition, the defrost time will not be recalculated.

3.2.2.1.3 Defrost manually (in normal mode, press **[▲]** and **[▼]** button for 3 seconds in the meantime) can enter/end the defrost mode manually. It will not affect the calculation of defrost cycle.

3.2.2.1.4 If the controller breaks down or alarms, the defrost cycle will not be affected.

3.2.2.1.5 After amending **“dF”**, the new setting value will be loaded in next cycle: after amending **“dt”**, **“dt”** becomes effectively, if you miss to set the defrost during the defrost automatically cycle or **“dt”** setting, it will be loaded in next cycle.

3.2.2.2 Defrost operation:

3.2.2.2.1 Electrical heating defrost : **dO=0**.

3.2.2.2.1.1 During the defrost mode, dt time starts to calculate, compressor Off, fan Off, electrical heater On - and defrost light On.

3.2.2.2.1.2 When the temperature of evaporator ≥ **“dS”** (during the defrost mode), electrical heater Off, the delay protection is 25 seconds : until the temperature of evaporator < **“dS”** - the delay protection ends - electrical heater On.

3.2.2.2.1.3 When **“dt”** time ends - electrical heater Off.

3.2.2.2.2 Hot gas defrost : **dO=1**

3.2.2.2.2.1 When it starts to defrost, dt time starts to calculate, compressor Off, fan Off, after 30 seconds the four way valve On, and than after 30 seconds, compressor On.

3.2.2.2.2.2 When the temperature of evaporator ≥ **“dS”** during the defrost cycle, compressor Off, enter to 1 minute delay protection : until evaporator temperature <”dS”, the delay protection ends, compressor On.

3.2.2.2.2.3 When “dt” time ends, compressor Off, after 30 seconds the four way valve Off.

3.2.2.3 End of defrost :When **“dt”** time ends - it starts to calculate the drop period (**“dr”**) (If **dO=1** and **AC=0**, it enters to compressor protection for 30 seconds), after drop period ends, it returns to normal operation mode : When the drop period not finish, compressor operates.

3.2.2.4 Defrost temp. locked (**“dL”**)

3.2.2.4.1 When **“dL”=0**, after entering the defrost mode, indoor temperature shows normally.

3.2.2.4.2 When **“dL”=1**, after entering the defrost mode, indoor temperature reaches the entered defrost temperature : After finishing defrost, if indoor temperature detection ≤ set point (**“tS”**) it will restore to show the normal indoor temperature.

3.2.3 Fan operation:

3.2.3.1 During the defrost time, fan Off.

3.2.3.2 When evaporator temperature ≥ fan stopper temp. (“Ft”), fan Off.

3.2.3.3 When the drop period not finish, fan Off.

3.2.3.4 Fan select **“FC”=0**, the compressor will ON/OFF refer to fan.

3.2.3.5 Fan select **“FC”=1**, fan operates continually ON.

3.2.4 Memory shut down: When the shut down happens during the operation, after power restores, the system will operate refer to the parameter value before shut down. (the memory doesn’t include the defrost condition/cycle).

3.2.5 Indoor temperature compensation: Showing temperature = indoor detective temperature + probe calibration (**“Ot”**).

3.2.6 Temperature alarm:

3.2.6.1 When indoor temperature is higher than **“AU”** (UA/indoor temperature alternant glisten) or lower than **“AL”** (La/indoor temperature alternant glisten), it starts to calculate the alarm delay (**“Ad”**), after delay protection ends, the alarm starts (condition : after turn on the machine, the temperature alarm function appears only if indoor temperature has been reached to set temperature).

3.2.6.2 Board temperature alarm : when the board temperature ≥ 95°C, the controller closes the output contact compulsorily and show **“tA”** the alarm starts immediately : waiting until the board temperature ≤ 75°C, the alarm removed.

3.2.6.3 Condenser temperature alarm : when the condenser temperature ≥ **“Ct”**, the controller closes the output contact compulsorily and show **“CA**/indoor temp.” alternate glisten : waiting until the condenser temperature ≤ **“Ct”**., the **“CA”** alarm removed.

3.2.7 Set point temperature alarm: You can adjust **“HS”** and **“LS”** to restrict set point temperature range to avoid set point temperature excess the range of compressor ability or to cause over temperature by setting mistaken.

3.2.8 Output alarm:

3.2.8.1 When it happens the temperature alarm **“UA”**,**”LA”**, it starts to calculate alarm delay time (**“Ad”**), when **“Ad”** time finished, the alarm starts.

3.2.8.2 When alarm failure (**E1.E2.E3.E4.EE.PA.CA.tA**), it starts alarm immediately.

3.2.9 Temp. Display:

3.2.9.1 Evaporator temp. Display: In normal mode - press **[▲]** button for 3 seconds can switch to show evaporator temp. 3 seconds.

3.2.9.2 Condenser temp. Display: In normal mode - press **[▲]** button for 6 seconds can switch to show condenser temp. 3 seconds.

3.2.10 operate compulsorily:

3.2.10.1 In normal mode - press **[LOG]** for 3 seconds to enter/remove operation compulsorily.

3.2.10.2 Under the condition, compressor On/ fan On and shows FF/indoor temperature alternate blink : if indoor temp. ≤ **“tS”**, it ends the compulsory operation.

3.2.10.3 In the period of Compulsory operation, it will not enter defrost mode.

3.2.11 External connection display : Connect the display can show indoor temperature/compressor, defrost, fan condition and failure alarm condition.

3.3 LED indicators :

3.3.1 Compressor indicator

3.3.1.1 The LED is illuminated constantly when compressor is operating.

3.3.1.2 The LED is blinking when compressor is in delay protection/stand by.

3.3.1.3 The LED is off when the compressor is Off or in defrost mode.

3.3.2 Defrost indicator:

3.3.2.1 The LED is illuminated constantly when 4-way valve / electrical heater On or Power-of defrost during defrost period.

3.3.2.2 The LED is blinking when heater: compressor Off or electrical heater Off Evaporator temp.

3.3.3 Fan indicator: When fan works the indicator illuminates, when fan stops the indicator goes out.

3.4 Parameter lock :

3.4.1 In normal condition (Except **E1.E2.E3.E4,EE,IA,PA**) - press **[SET]** + **[▼]** button 3 seconds can lock **“LC”** parameter/unlock **“UL”** (if it shows **“Lt”**, it means there still have one lock) : after locking, only set point **“tS”** can be adjusted, other parameter can’t be changed.

3.4.2 In normal condition (Except **E1.E2.E3.E4,EE,IA,PA**) - press **[SET]** + **[▼]** button 6 seconds can lock entirely **“Lt”** parameter/unlock **“UL”** : after locking, all parameter can’t be changed.

3.4.3 It means already unlocked when it shows **“UL”**.

3.4.4 Power cut down will not affect the lock status : after restore the power, lock condition can still be remained.

3.5 Failure/Alarm :

3.5.1 Indoor temperature sensor failure, **“E1”** blinks and starts the failure operation.

3.5.2 Evaporator temperature sensor failure, **“E2”** blinks and starts the failure operation.

3.5.3 Board temperature sensor failure, **“E3”** blinks and closes the output contact.

3.5.4 Condenser temperature sensor failure, **“E4”** blinks and starts the failure operation.

3.5.5 Memory failure, **“EE”** blinks and returns to default value, the failure operation starts : if **“EE”** can’t be deleted after supplying power again, it means the memory is broken. It needs to be repaired by our company.

3.5.6 High temperature (indoor) alarm shows **“UA”** and alternate with indoor temperature.

3.5.7 Low temperature (indoor) alarm shows **“LA”** and alternate with indoor temperature.

3.5.8 Compressor High-low pressure alarm shows **“PA”** and alternate with indoor temperature, close all output contacts.

3.5.9 Condenser temperature alarm shows **“CA”** and alternate with indoor temperature, close all output contacts.

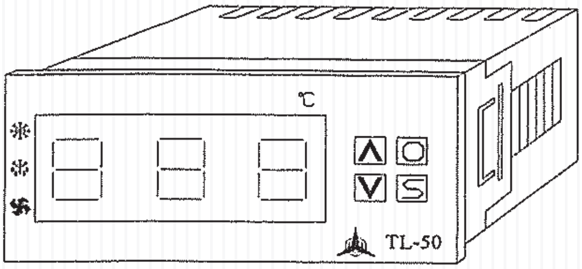
3.5.10 Board temperature alarm shows **“tA”** and alternate with indoor temperature, close all output contacts.

3.6 Return default value : press **[▲]** + **[▼]** button to supply power, after showing **“rS”** 3 seconds, it will turn on the machine again and start to operate.

Code	Function	Range(°C)		Unit	Default															Range (°F)		Unit	°F Default value	Description
		Min	Max		1	2 (Chiller)	3	4 (Freezer)	5	6	7	8	9	10	11	12	13	14	15	Min	Max			
tS	**Setpoint**	**LS**	**HS**	°C	**2**	**3**	**15**	**-18**	**-19**	**-25**	**0**	**-19**	**-25**	**-25**	**-40**	**4**	**-25**	**-19**	**-4**	**LS**	**HS**	**°F**	**0**	**Compressor stops when it reaches the setpoint.**
td	**Temp. Differential**	**0.5**	**10**	°C	**4**	**3**	**2**	**4**	**3**	**3**	**4**	**4**	**4**	**4**	**4**	**4**	**3**	**3**	**3**	**1**	**20**	**°F**	**7**	**Compressorwillstarttooperatewhenthe temp. =TS + td**
dF	**Defrost cycle**	**0**	**99**	**hr**	**2**	**2**	**0**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**4**	**0**	**6**	**6**	**0**	**99**	**hr**	**6**	**Set the interval between defrost cycles.**
dt	**Defrost period**	**1**	**55**	**min**	**15**	**15**	**1**	**30**	**5**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**1**	**4**	**15**	**1**	**55**	**min**	**30**	**TocontrolDefrosttime.Defrostisterminated when defrost time ends.**
AU	**Max. temp. for alarm**	**AL+0.5**	**70**	°C	**8**	**9**	**21**	**-12**	**-13**	**-19**	**6**	**-13**	**-19**	**-19**	**-34**	**10**	**-19**	**-13**	**2**	**AL+1**	**158**	**°F**	**10**	**When indoor temp. ≥ AU, the alarm will be active.(Thisfunctionisavailableafterroom temp. reaches setpoint once.)**
AL	**Min. temp. for alarm**	**-40**	**AU-0.5**	°C	**-4**	**-3**	**9**	**-24**	**-25**	**-31**	**-6**	**-25**	**-31**	**-31**	**-40**	**-2**	**-31**	**-25**	**-10**	**-40**	**AU-1**	**°F**	**-11**	**When indoor temp. ≤ AU, the alarm will be active.(Thisfunctionisavailableafterroom temp. reaches setpoint once.)**
HS	**Max. setpoint**	**tS**	**70**	°C	**7**	**8**	**20**	**-13**	**-14**	**-20**	**5**	**-14**	**-20**	**-20**	**-35**	**9**	**-20**	**-14**	**1**	**tS**	**140**	**°F**	**9**	**To limit the max. setpoint**
LS	**Min. setpoint**	**-40**	**tS**	°C	**-3**	**-2**	**10**	**-23**	**-24**	**-30**	**-5**	**-24**	**-30**	**-30**	**-40**	**-1**	**-30**	**-24**	**-9**	**-40**	**tS**	**°F**	**-10**	**To limit the min. setpoint**
Ad	**Alarm delay**	**0**	**60**	**min**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**0**	**60**	**min**	**15**	**Whenalarmacts,thetimedelayforbuzzer. (Except E1.E2.E3.EE.,tA)**
AC	**Compressor delayprotection**	**0**	**30**	**min**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**30**	**min**	**0**	**Interval time between compressor stop operation and restart as a compressor protection.**
Cr	**Compressor operation periodunderany failure**	**0**	**60**	**min**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**0**	**60**	**min**	**15**	**Compressor operation time when EE.E1 andE2occurs.(WhenCr=0,compressoris continuously Off)**
CS	**Compressorter-mination period underanyfailure**	**0**	**60**	**min**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**0**	**60**	**min**	**15**	**CompressorstoptimewhenEE.E1andE2 occurs.(WhenCr=0,compressoriscontin-uously On)**
Ot	**Probe calibration**	**-12**	**12**	°C	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-24**	**24**	**°F**	**0**	**Indoor temp. Calibration.**
dS	**Defrost stop temp.**	**0**	**70**	°C	**10**	**10**	**0**	**20**	**10**	**10**	**10**	**12**	**12**	**8**	**12**	**10**	**0**	**10**	**10**	**32**	**158**	**°F**	**68**	**Whenevaporatiortemp.≥dS,defrostister-minatedtoavoidthedamageofthestorage.**
Ft	**Fan motor stop temp.**	**0**	**70**	°C	**15**	**15**	**15**	**15**	**5**	**15**	**15**	**5**	**5**	**5**	**5**	**15**	**15**	**5**	**15**	**32**	**158**	**°F**	**59**	**Fanstoptemperature.(Topreventheatinto cabinet)**
Ct	**Condenser protectiontemp.**	**20**	**60**	°C	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**68**	**140**	**°F**	**122**	**Drop time after the defrost period**
dr	**Drop period**	**0**	**60**	**min**	**0**	**0**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**2**	**2**	**0**	**0**	**2**	**0**	**0**	**60**	**min**	**0**	**Drop time after the defrost period**
dO	**Defrost mode**	**0**	**1**	**-**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**-**	**0**	**When dO=0, defrosting ny heater. When dO=1, defrosting by hot gas.**
FC	**Fan mode**	**0**	**1**	**-**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**-**	**1**	**When FC=0, fan operates according to compressor. When FC=1, fan operates continuously.**
dL	**Indoor Temp. Lock up**	**0**	**1**	**-**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**-**	**1**	**WhendL=0,Cabinettemp.Showsnormally duringdefrostperiod.WhendL=1,cabinet temp. Is locked and fixed.**
Cd	**Condenser temperature detection**	**0**	**1**	**-**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**-**	**1**	**0: Off 1:On**
Ut	**Temperatureunit**	°C	**°F**	**-**	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	**°F**	**-**	**°F**	**Settemp.Unit,afterchanging,itshows“rS” and restarts the machine.**
PS	**Parametergroup**	**1**	**15**	**-**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**1**	**15**	**-**	**4**	**Choose parameter groups.**
OU	**Exit**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**Exit setting mode.**

CONTROLLER INSTRUCTIONS FOR BLAST FREEZER TL5-66E

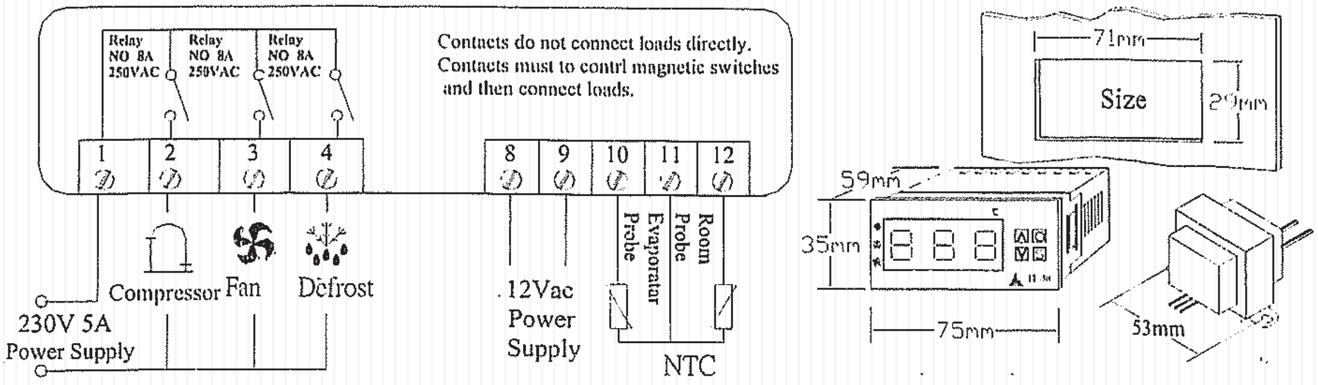
1. PRODUCT:



2. PARAMETERS LIST:

Para Metro	Operating mode	Range	Default
E1	Set Point	-50°C ~ +50°C	-20°C
E2	Differential	1°C ~ 25°C	3°C
E3	Minimum set point	-50°C ~ dl	-30°C
E11	Outputs activation delay at start up	0 ~ 30 (min.)	0 (min.)
E12	Interval between defrost cycles	0 ~ 120 (hr.)	4 (hr.)
E13	Length for defrost	0 ~ 120 (min.)	25 (min.)
E14	Defrost termination temperature	-40°C ~ +50°C	30°C
E17	Drain time	0 ~ 120 (min.)	2 (min.)
E18	Fan operating mode	0= runs with the compressor; 1= continuous mode	1
E19	Fan start temperature	-20°C ~ +50°C	15°C
E20	Fan delay after defrost	0 ~ 120 (min.)	2 (min.)
E21	Thermostat probe calibration	-12°C ~ +12°C	0°C
E22	Evaporator probe calibration	-12°C ~ +12°C	0°C

3. CONNECTION, FITTING SIZE:


Relay NO 8A 250VAC
Relay NO 8A 250VAC
Relay NO 8A 250VAC
Contacts do not connect loads directly.
Contacts must to contrl magnetic switches and then connect loads.
1
2
3
4
8
9
10
11
12
Compressor
Fan
Defrost
230V 5A Power Supply
12Vac Power Supply
Evaporator Probe
Room Probe
NTC
71mm
Size
29mm
59mm
35mm
75mm
53mm

4. INSTRUCTIONS

[▲] : Increase	**S** : For entering values and displaying set points
[▼] : Decrease	**O** : Manual defrost

4.1 Significations of the L.E.D.

LED	❄	❄	❆	❄ + ❆
Status	ON	Flashing	ON	Two lights flashing at the same time
Function	Compressor enabled (Relay = On)	Programming phase	Defrost enabled	Programming phase (under parameters program setting)

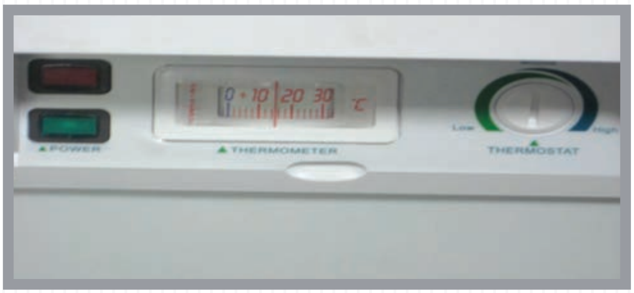
4.2 Displaying set temperature:
   4.2.1. By pressing and releasing the **“S”** key, the set point will be displayed for 5 seconds.
4.3 Displaying evaporator temperature:
   4.3.1 By pressing and releasing the **“O”** key, the set point will be displayed for 5 seconds.
4.4 Changing set temperature:
   4.4.1 Hold down **“S”** key about 3 seconds so that the ❄ **LED** starts to flash.
   4.4.2 As the **LED** starts to flash, release the **“S”** key and use the **[▲]** or **[▼]** key to increase or decrease the desired temperature respectively. Press the **“S”** key again to store the new value. The **LED** will flash 3 times to indicate a successful setting of a new value.
4.5 Manual Defrost:
   4.5.1 Hold **“O”** key for at least 10 seconds, as the ❆ **LED** lights up, the defrosting procedure is being carried out. Note that the defrosting process can only be carried out when the temperature is under the set point of **E14**.
4.6 Locking and Unlocking the keyboard:
   4.6.1 The Function: When the keyboard lock is enabled, the “OFF” message will be displayed for a few seconds before the keys are locked, when unlocked, the **“Pon”** message will appear. Once locked, only the set point “d1” display is available.
   4.6.1 The Method: When the keyboard is unlocked, press and hold the **[▲]** + **[▼]** keys simultaneously for 6 seconds to lock it. Repeat the action to unlock the keyboard while it is locked.
4.7 Changing a parameter’s value:
   4.7.1 When the **“S”** key is held pressed for 10 seconds, the **“E1”** parameter list will be displayed shortly after the flashing of both ❄ and ❆ **LEDs.** Press the **“S”** key to enter the list **“E1”** and use the **[▲]** and **[▼]** keys to increase or decrease the value respectively. Press the **“S”** key again after changing, the screen will flash three times to indicate the successful storing of the new value. Following the flashing the **“E2”** parameter list will be shown, repeat the above steps to set the parameter’s value. **“E3”** will be displayed after **“E2”** is modified and so on through to **“E22”**. It is also possible to browse through the parameters’ list by using the **[▲]** and **[▼]** keys when **“E1”** is displayed and may then be modified accordingly. This provides a faster alternative if only a specific value is needed to be changed. The screen will automatically display the current temperature after 8 seconds if no buttons being pressed.

5. ALARM SIGNALS

MESSAGE MODE	CAUSE	OPTIONS
P1 Flashing	Thermostat probe failure	Alarm output ON; Compressor output according to **“E24”** and **“E25”**
P2 Flashing	Evaporator probe failure	Alarm output ON; Other outputs unchanged; End defrost is timed

CHEST FREEZERS

(i)



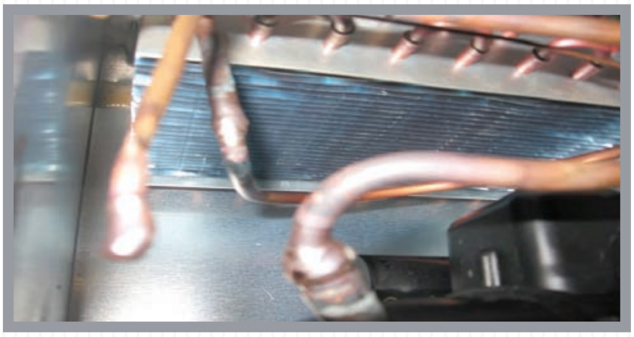
(a) The top red light means the temperature is high i.e. above 0°C

(b) The lower green light means the unit is plugged into power and there is power to the unit.

(c) When the Dial 'Thermometer' is on the Blue Numbers this means a minus number (less than 0°C). When on the red this means a plus number (more than 0°C)

(d) The thermostat can be adjusted with low meaning warmest and high meaning colder

(ii)



This shows a small condenser which can be accessed from side panel. ENSURE ALL power off and DISCONNECTED and give a clean once every while depending on ambient conditions i.e., dust, open-front door of shop/canteen etc.

(iii) Unit will build up with ice over time and when needed turn unit off to melt ice. NEVER USE HOT WATER or TOOLS (such as scrappers) to remove Ice as this **WILL** damage inside skin.

(iv) Never use Chlorine or other strong detergents with salt to clean inside as this will oxidize inside skin.

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Phone 1300 278 472 **Fax** 1300 278 482 **Email** sales@artisangroup.net.au

WARRANTY FOR HEATED & REFRIGERATED SHOWCASES RETAIL WARRANTY

This warranty is only available to the end-user of the equipment who has brought the equipment directly from Artisan Food Equipment. Further, this warranty is only available to the original purchaser of the equipment.

This warranty dates from despatch of equipment by us ex our Sydney works.

All goods manufactured by us are warranted against defective workmanship and/or material(s).

Where faulty manufacture is accepted by us, we will provide LABOUR AND PARTS FOR TWELVE (12) MONTHS, all subject to conditions hereunder. The warranty covers the repair and/or replacement at our factory of all part(s) found to be defective due to faulty workmanship and/or materials.

Specifically excluded from the warranty are: light bulbs and tubes, heater wires, castors, transformers, glass and finish, door handles; closing devices; springs for both hinging and sliding doors; castors; electrical and electronic components and consequential damages. Although we reserve the right to insist that units are returned to out factory (i.e. freight both ways at your cost) we reserve the right to provide “on-site” free service (labour) for your approved warranty claims during the first twelve (12) months in our normal service areas.

We shall not be liable for any direct, indirect or consequential loss howsoever and whatsoever arising.

During the twelve (12) months of the above warranty, no arrangement whatsoever can be made for anyone to provide warranty service to the goods except Artisan Food Equipment and with their express and written approval.

No other party or person whatsoever is authorised to make arrangements on behalf of or/and at the expense of Artisan Food Equipment.

Warranty is voided if normal operational maintenance and cleaning is not carried out as per our “Operating Instruction” and/or accepted standard procedures for such equipment.

Further, the following are excluded from warranty:-

- Remote work units even if condenser is provided
- Damage to the units caused by accident, misuse or Acts of God
- Damage resulting from failure of electrical power or water supply or inadequate ventilation
- Transportation or travelling costs when the units are outside Artisan Food Equipments normal service areas
- Repairs when the unit has been attended other than by service personnel authorised by Artisan Food Equipment
- Costs due to inaccessibility of equipment
- Overtime rates; call-out fees or out-of-hours penalty rates
- Consequences of any controller parameters that have been changed without authorisation
- Any equipment used in a mobile/dynamic environment, i.e. on boats or in vehicles; warranty is not available

Artisan does not guarantee that any service to be performed under this warranty will be carried out within any particular time limit.

During this time of warranty, the customer must maintain the equipment by qualified technicians as set out in the warranty at customer’s expense.

All repairs must be organised/authorised by Artisan Food Equipment by a works order number supplied. Failure to do this will result in non payment of work and void warranty.

IMPORTANT RESPONSIBILITIES OF CABINET OPERATORS

- Correct and consistent power supply
- No direct sunlight on units
- Product to go into cabinet at desired holding temperature
- Max. ambience: 40°C & 60% R.H. – unless otherwise advised or stated on cabinet.
- Do not turn off at power switch regularly
- Observe all details and instructions in MANUAL
- Have a qualified mechanic check/clean unit every 3 months (your account)
- Follow cleaning and operating procedures, set out in manual, on a daily, weekly and regular basis as specified
- Level Floor
- Cabinet to be at correct temperature before being loaded
- Water quality is the responsibility of the owner/operator and any part affected will not be covered by warranty

FAILURE TO PERFORM THE ABOVE (ON YOUR OWN ACCOUNT) WILL VOID WARRANTY AND PERFORMANCE PARAMETERS OF YOUR UNIT

CLEANING PROCEDURES

Always disconnect from power source firstly, and be careful with sharp edges.
Cleaning procedures are very important; carefully follow the manual.
DO NOT hose or splash water in, or about, your cabinet.
DO NOT use bleaches, chlorine, etc. use only mild detergents.
The drains are only for condensate (not waste).
*Clean carefully. Wiping out areas and ensuring drain lines are clear and clean.

BLOCKED DRAINS AND DAMAGE TO ANY COMPONENT CAUSED BY BLOCKED DRAINS WILL NOT BE COVERED BY WARRANTY

TERMS AND CONDITIONS OF QUOTATION/SALE AND/OR SUPPLY
ARTISAN™ FOOD EQUIPMENT PTY LTD

1. These Terms and Conditions of Sale apply (unless otherwise previously agreed in writing) to this contract and all sales contracts, and all hire, loan and supply contracts and/or arrangements with the customer. An acceptance of an order by us is and shall always be deemed to be an acceptance of these Conditions of Sale by us and the customer, notwithstanding any consistency which may be introduced in the customer's order of acceptance.

2. We reserve the right to vary our selling prices and terms without notice and prices charged will be those ruling at the date of order.

3. Unless otherwise agreed in writing, payment for the goods shall be made to us upon order of goods and any costs incurred through action taken by us to recover monies due for payment, including but not limited to debt collecting costs, shall be paid by the customer.

4. **A.** The customer expressly acknowledges and agrees that we are not liable for any advice given by ourselves or our agents or employees in relation to the suitability for any purpose of goods or materials or services supplied by us and all such advice relied upon is at the customer's risk.
B. Your placement of order is your authority to allow us to register (P.P.S.R.) our financial interest & first priority over all goods supplied by us until paid for in full.

5. We shall not be liable to the customer whatsoever for any defect, loss, damage or delay caused by strikes, lock-outs, break-down of plant, Government interference, earthquake, civil commotion, force majeure, or any other cause beyond our control.

6. At our discretion, the customer shall be liable to pay interest on any monies due and payable to us such as interest to be charged to the customer's account. The rate of interest shall be 2% per month, or part thereof. The interest shall commence to accrue at the expiration of the period allowed to the customer for the payment of accounts as defined in Clause 3.

7. For goods hire, loaned, rented or leased from us the conditions on the separate sheet headed "HIRING AGREEMENT" shall be deemed to be included in these "Terms and Conditions of Sales" in all respects.

8. The terms and conditions shown in our Price List(s) and Quotation form(s) shall be deemed to be included herein in their entirety.

9. GST is applicable at the current rate and is an extra cost.

10. Sizes are nominal only and are subject to the lengths of our standard sections, etc.

11. Methods of construction, finish, style, components and all details are to our discretion in all respects.

12. Colours, anodizing, materials, fabrics, glazing, etc., will be the nearest commercially available (in all and any respects) to that selected or offered.

13. **A.** Warranty is only as offered by the manufacturer and to the extent offered by same and obtainable without any cost or legal action by ourselves. Subject to the terms and conditions of the warranty statement a conditional warranty is available as separately advised to you. Explicit details of any relevant warranty will be provided with the goods; subject to service, care and usage requirements.
B. We shall not be liable for any direct, indirect or consequential loss howsoever and whatsoever arising.
C. Warranty is null & void unless payment for the goods and any associated and/or subsequent services have been paid for in full.

14. We shall not be liable for any direct, indirect or consequential loss howsoever and whatsoever arising.

15. Any Council/Authority/Code/Landlord etc., compliance and/or approval is to customer's responsibility in all respects.

16. All site fixing, cutting, drilling etc., (at installation) is to other's responsibility in all respects including the protection/making good of all surfaces.

17. Complete responsibility and care for the goods passes to you ex our works. The transportation of the goods (and any installation) is to be to and by your instructions. However, in the absence of any notice to the contrary we will arrange for same to your account and responsibility in all respects. Insurance etc., is to be arranged by yourselves, as the goods are your total responsibility even though transport and/or installation is by us, or by arrangements made by us, on your behalf. Upon receipt of goods they must be inspected by the purchaser, who must report anything adverse, to the relevant contact at our head office, by close of business time on day of delivery.

18. The title in the goods shall only pass from us (to the purchaser) upon our receipt of full payment for the goods and any transport and/or installation, etc., works arranged, or done by us.

19. All plans, sketches and drawings supplied by us are covered by their copyright in all respects. No use, copy, transfer or provision to other parties, is to be made of these details without our express permission

20. Your acceptance of any of our plans, sketches, recommendations, suggestions, etc., and/or their execution by ourselves or by others (as approved) does not give or imply any warranty, undertaking or liability whatsoever, by us, as to their suitability, benefit, advantage or otherwise to yourself, or any other party, in any connection whatsoever or howsoever arising.

21. Warranty is only as offered by the manufacturer and to the extent offered by same and obtainable without any cost or legal action by ourselves. Explicit details of any relevant warranty will be provided with the goods; subject to service, care and usage requirements.

22. Goods cannot be returned for credit.

23. If any of the provisions of the contract are unlawful or invalid under any applicable statute or rule of law, they are to that extent to be deemed omitted.

24. Acceptance by you of goods constitutes a contract which shall be deemed to be made in Sydney N.S.W. and governed by the relevant laws of N.S.W.

25. Your offered order affirms your acceptance of all of the above conditions in their entirety.

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ABN 60 903 427 859

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GENERAL OPERATING/WARRANTY MANUAL

FOR
CHILLER, FREEZER AND
HEATED DISPLAY CABINETS

artisan™

EXCELLENCE IN COMMERCIAL REFRIGERATION

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