Air Conditioning & Heat Pump Products

Technical Training

Single Mini Split 9,000-24,000 Btu

Flexi-Multi 19,000-31,000 Btu

Single Mini Split 26,000-42,000 Btu

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Sanyo offers a wide variety of Technical Service Training

Hands-On Service Training (Kennesaw Facility):
Come to our Georgia facility and train on live ECO-i & Mini-Split equipment

On-Demand Videos train at your leisure:

- ECO-i installation & commissioning
- Troubleshooting the 3 way solenoid
- ECO-i maintenance controller
- ECO-i service (3 parts)
- Mini split installation & service
- How to display room temperature on a wired remote controller
- Dismantling the “K” wall mounted unit.
- PAC installation & service
- Installing a STK-RCS-7TWSUA wired remote controller

Webinar Classes:

- How to use the RCS-TM80BG as a service tool.
- Mini Split & Flexi Multi Installation
- ECO-i Installation
- ECO-i Commissioning
- EC0-i Service

Online Dealer Certification Courses:

- ECO-i installation, Commissioning & Service
- Mini Split & Flexi Multi Installation & Service

You will be required to take and pass an on-line test after the class to become a Sanyo Dealer

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SANYO Dealer Network: Certification on Demand

On our website main page click on the training tab then the Online Dealer Certification Courses tab

SANYO now offers comprehensive training classes all on-line, that can be taken at your own pace. By successfully completing the 3 consecutive courses, you can become a certified gold, silver or bronze SANYO HVAC dealer.

ECO-i Installation Course:

This training course focuses on Sanyo's ECO-i Multi Split Variable Flow Refrigerant (VRF) system. Upon completion of this course participants should have attained the required skills to properly configure and install the ECO-i system.

ECO-i Commissioning:

This training course focuses on Sanyo's ECO-i Multi Split Variable Flow Refrigerant (VRF) system. Upon completion of this course participants should have attained the required skills to properly configure and commission the ECO-i system.

ECO-i Service:

This training course focuses on Sanyo's ECO-i Multi Split Variable Flow Refrigerant (VRF) system. Upon completion of this course participants should have attained the required skills to properly configure a system, install the system, commission the system and to conduct in depth service, troubleshooting and diagnostics.

Mini Split and Flexi Multi Installation & Service:

This training course provides the participants with an overview of Sanyo's R-410a one-to-one split and Flexi Multi products including installation requirements, unit specifications, operating characteristics and a detailed review of service and troubleshooting procedures.

Mini Spilt Models 26-4272R:

This training course provides the participants with an overview of Sanyo's R-410a one-to-one Pac (26K - 42K BTU) products including installation requirements, commissioning procedures, operating characteristics and a detailed review of service and troubleshooting procedures.

SANYO HVAC CONTACT INFO

TECHNICAL SUPPORT:

HVAC.SERVICE@SNA.SANYO.COM

WEBSITE:

WWW.US.SANYO/HVAC.COM

NOTE: Service, installation, user guides and submittals can be obtained through our website.

Product Overview:

- Sanyo's product line offers environmentally friendly 0 ozone depletion potential, R410a refrigerant.
- All models meet and exceed Federal DOE guidelines for energy efficiency, 13+S.E.E.R

Caution for Installation:

- Higher Pressure (R410a is 1.6 times higher than R22.)
- Compressor oil is different.
- R410a uses Polyvinyl Ether Oil (Synthetic fluid)
- Different gauge-manifold, charge hose, etc., must be used for R410a.
- Near-Azeotrope Type Refrigerant
- Only charge the refrigerant in liquid form.
- New refrigerant piping is required for all R410a installs.

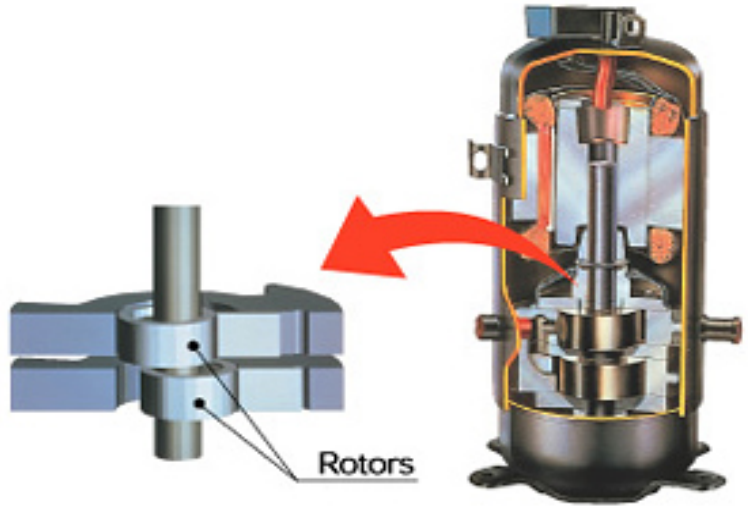
5/16" Service Ports:

Service ports are different then on R22 systems. Sanyo R410a systems have 5/16" male flare fittings. Adaptor must be used when using 1/4" hoses. These adaptors (5/16" ffl x 1/4" mfl) are available from the following manufacturers:

- Ritchie Part Number 19173
- Ritchie Part Number 93825(Ball Valve)
- JB Industries Part Number QC-S5

What is an Inverter Air Conditioner?

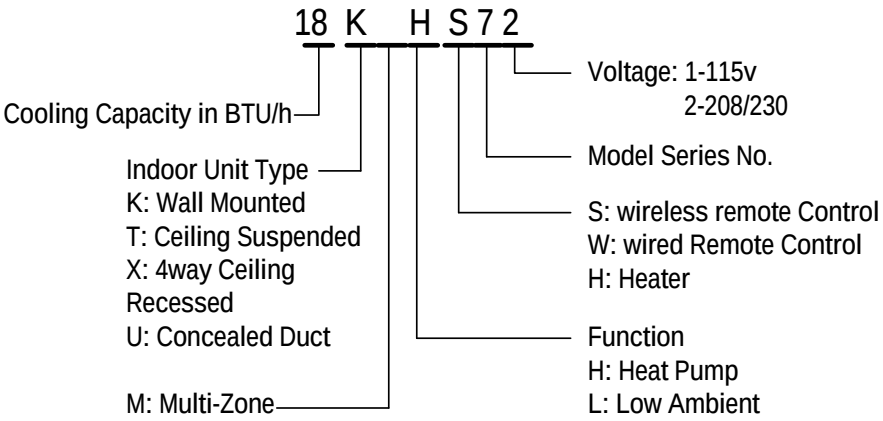
- Unlike a standard air conditioner which uses a constant fixed speed compressor, the DC inverter controlled compressor will always start at it's minimum revolutions and slowly speed up to meet current system demand. This greatly reduces the power surge needed at start up.
- This is obtained by converting incoming AC power to DC power, thereby making it possible to accurately control the systems capacity. When the maximum capacity is not required, the compressor revolution is decreased.
- This means the power decreases too, which results in increased system efficiency with reduced operating electrical costs.
- Variable speed inverter driven compressors provide a range of capacities and are listed with minimal, nominal and maximum capacities



- The compressor starts at a minimum frequency of 23% of maximum capacity
- Allows for low superheat of 0-5 degrees
- Allows for greater utilization of the evaporator
- The Sanyo Inverter is a true DC compressor

Model Number by System:

System:
18KHS72

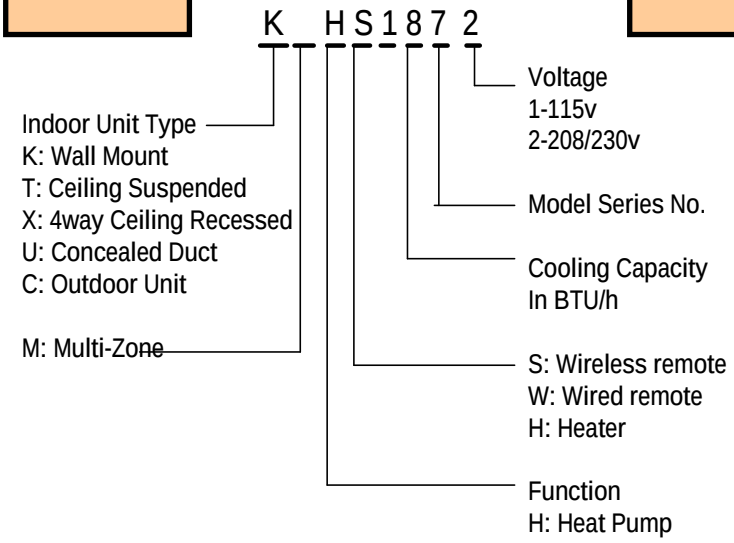


Model Number by Component:

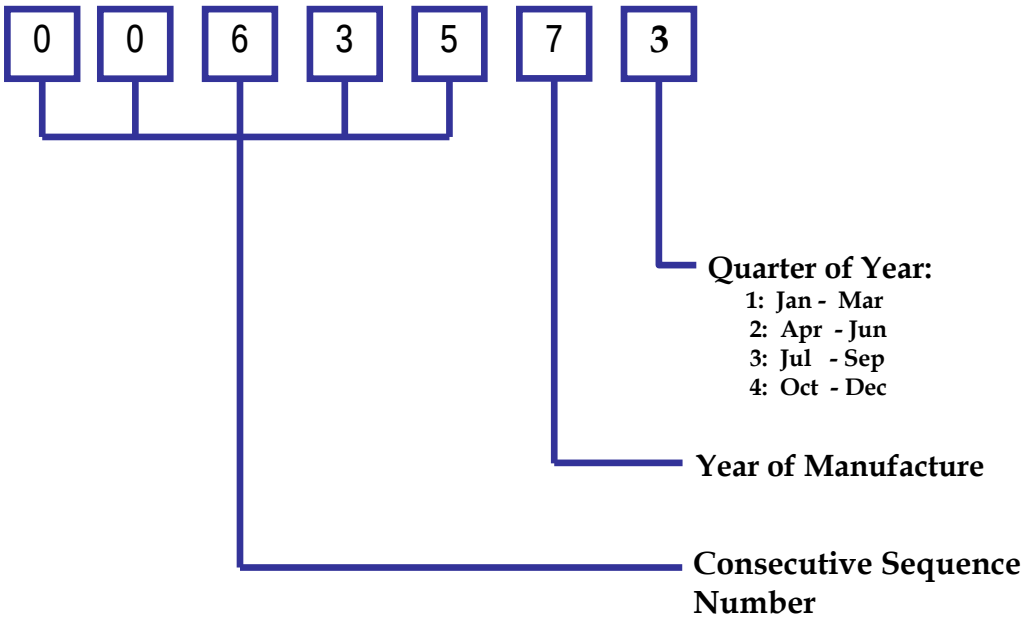
Component:
KHS1872 / CH1872

Indoor Unit

Outdoor Unit



Serial number Identification:

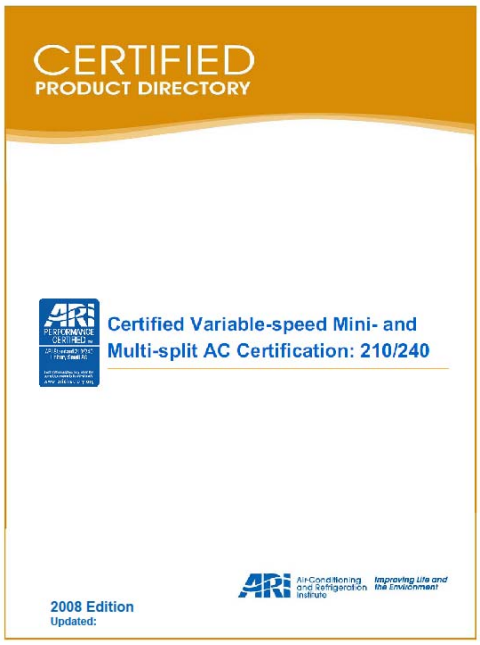


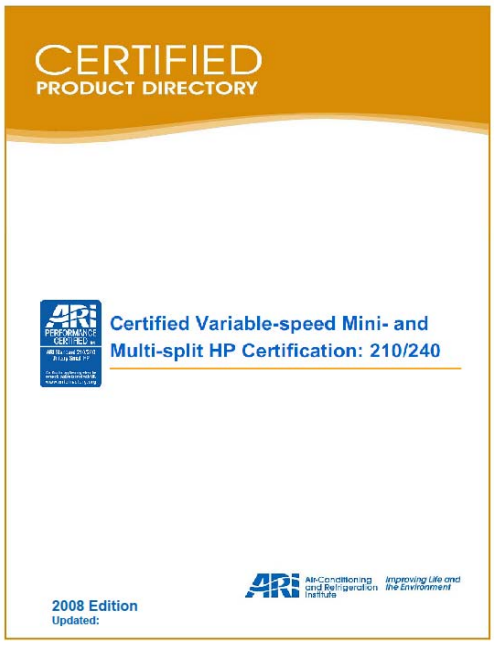
Warranty Policy:

After September 1, 2009:
Standard warranty on Single Split and Flexi-Multi Systems is 7 years compressor & 5 years functional parts. The new extended warranty is in effect for Sanyo ducted and ductless split system installed on or after Sept 1 2009

Before September 1, 2009:
All R22, ECOI, Single and Flexi-Multi Systems split models installed before Sept 1 2009 remain 6 years compressor & 1 year on functional parts.

Certifications
http://www.ahridirectory.org



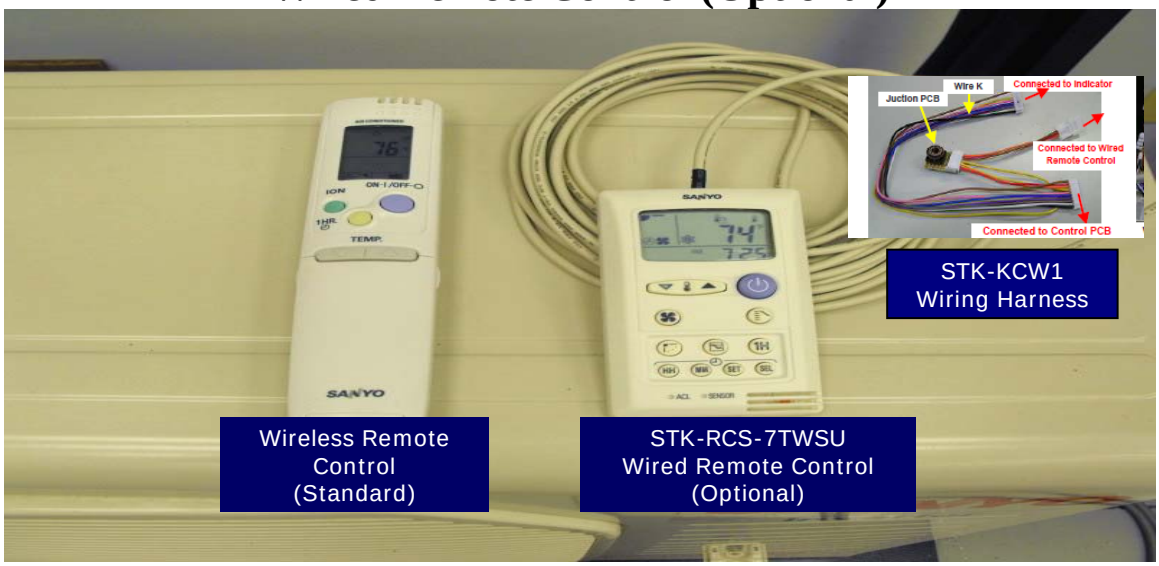


Sanyo Products meet or exceed all major regulating agencies equipment standards of performance and compliance.

RAC Product Lineup: R410a, Single Zone, Inverter (16-20 SEER)

	Type	9,000 BTU 16 SEER	12,000 BTU 17 SEER	18,000 BTU 20 SEER	24,000 BTU 17 SEER
K Series Wall Mounted  	Single Cooling *Cooling to 50 deg f	09KS71	12KS71	18KS72	24KS72
	Single Cooling *Low ambient cooling to 0 deg f	09KLS71	12KLS71	18KLS72	24KLS72
	Heat Pump Cooling & Heating to 0 Deg f	09KHS71	12KHS71	18KHS72	24KHS72
X Series Ceiling recessed  	**Type**	12,000 BTU 17 SEER	18,000 BTU 20 SEER		
	Single Cooling *Cooling to 50 deg f	12XS71	18XS71		
	Single Cooling Low ambient Cooling to 0 Deg f	12XLS71	18XLS71		
	Heat Pump Cooling & Heating to 0 Deg f	12XHS71	18XHS71		

Wireless Remote Control (Standard)
Wired Remote Control (Optional)



Flexi Multi Product Lineup:R410a, Multi Zone, Inverter, (14.8-16.8 SEER)

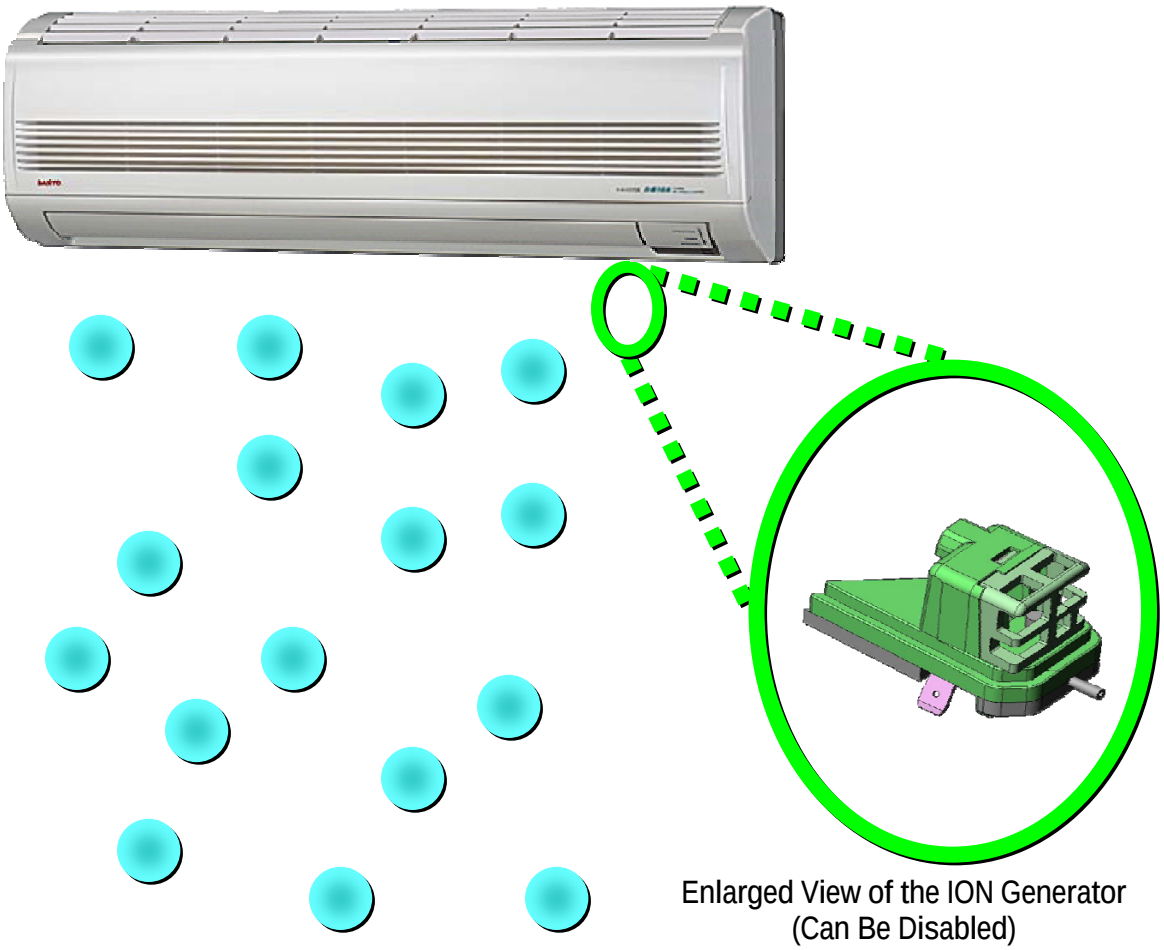
K Series Wall Mounted 	Type	7,000BTU	9,000BTU	12,000BTU	18,000BTU	24,000BTU
	Cooling Only	KMS0772	KMS0972	KMS1272	KMS1872	KMS2472
	Heat Pump	KMHS0772	KMHS0972	KMHS1272	KMHS1872	KMHS2472
X Series Ceiling Recessed 	Type	9,000BTU	12,000BTU	18,000BTU		
	Cooling Only	XMS0972	XMS1272	XMS1872		
	Heat Pump	XMHS0972	XMHS1272	XMHS1872		

Outdoor Units  Minimum of Two Indoor Units Required	Type	19,000BTU	24,000BTU	31,000BTU
	Cooling Only	CM1972	CM2472	CM3172
	Cooling Low Ambient	CLM1972	CLM2472	CLM3172
	Heat Pump	CMH1972	CMH2472	CMH3172

Wireless Remote Control (Standard)
Wired Remote Control (Optional)

Negative Ion Generator

While operating, this unit generates negative ions that freshen up the conditioned space.



Enlarged View of the ION Generator
(Can Be Disabled)

Operating Range 9,000-24,000 BTU Single Mini Splits

Operating Range Limits Based On Outdoor Temperature (Degrees F)								
	Design Outdoor Operating Range				Cooling Cut-Off		Heating Cut-Off	
Model	Cooling		Heating		Min. Outdoor	Max. Outdoor	Min. Outdoor	Max. Outdoor
	Min.	Max.	Min.	Max.				
CH0971	0F DB	115F DB	0F DB	75F DB 65F WB	-4 DB	*3	-8 DB	122F DB
CH1271								
CH1872								
CH2472								
C0971	50 DB		N/A	N/A	50 DB		N/A	N/A
C1271								
C1872								
C2472								
CL0971	0F DB				-4 DB			
CL1271					-4 DB			
CL1872					-8 DB			
CL2472					-13 DB			

- **All RAC systems stop operating in temperatures below Cut-Off –Temperature.**
- **Operation below Operating Range is out of warranty.**
- ***3 No maximum temperature cut-out.**

Operating Range for the Flexi-Multi Series

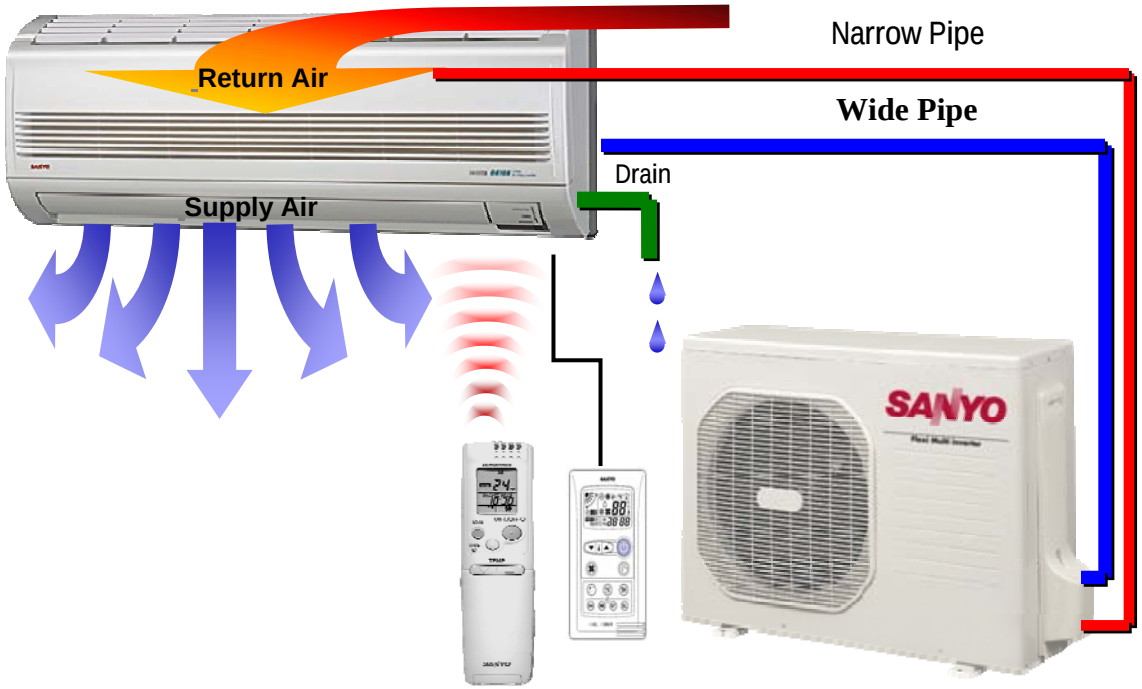
Operating Range Limits Based On Outdoor Temperature (Degrees F)								
	Design Outdoor Operating Range				Cooling Cut-Off		Heating Cut-Off	
Model	Cooling		Heating		Min. Outdoor	Max. Outdoor	Min. Outdoor	Max. Outdoor
	Min.	Max.	Min.	Max.				
CMH1972	↑ 67 DB ↓	-4 DB	0F DB	75F DB 65F WB	↑ 55F DB ↓	N/A	-8 DB	*4
CMH2472								
CMH3172								
CM1972			N/A	N/A			N/A	N/A
CM2472								
CM3172								
CLM1972	*1				*2			
CLM2472								
CLM3172								

***1: 32F DB: Combined with KMS1872 and/or KMS2472 / 23F DB: When combined only with KMS0772, KMS0972 and/or KMS1272.**

***2: 28F DB: Combined with KMS1872 and/or KMS2472 19F DB: When combined only with KMS0772, KMS0972 and/or KMS1272.**

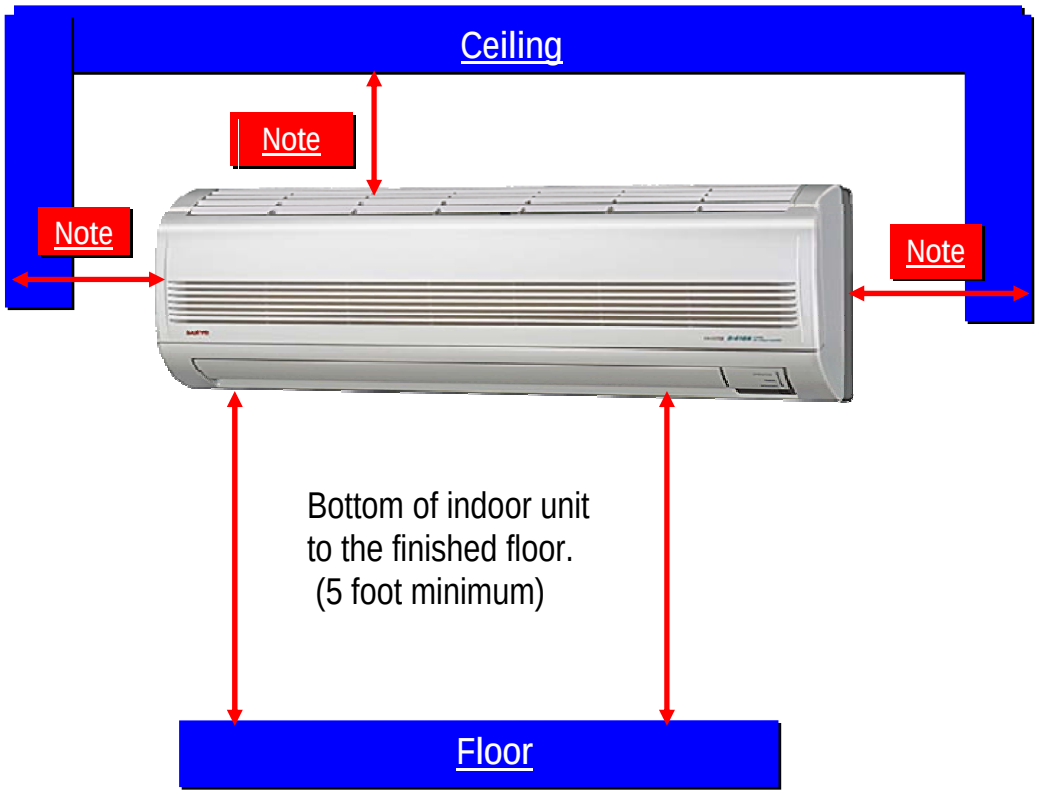
***4: No maximum temperature cut-out**

Basic System Layout



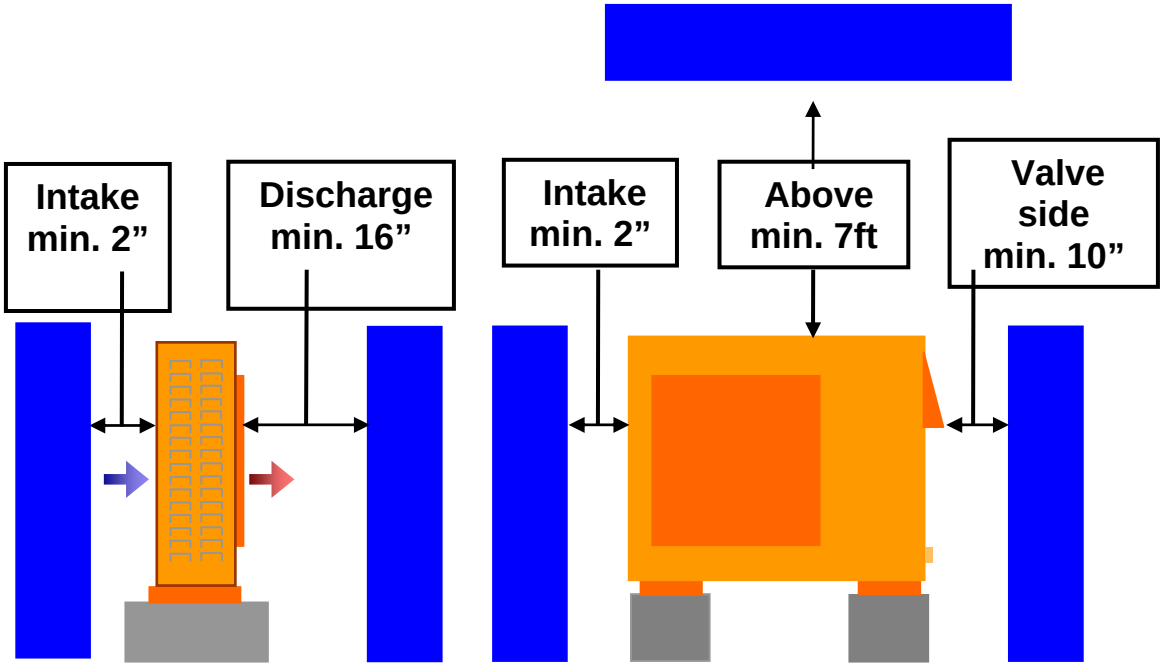
- ¾” PVC adaptor provided for the condensate drain
- Wireless remote control (Standard)
- Wired remote control (Optional)

Indoor Unit Site Selection
("K" Series Wall Mounted)



Installation clearances vary depending on the size and model of the unit being installed. Always refer to the installation manual for proper unit clearances.

Site Selection
(Outdoor Unit)

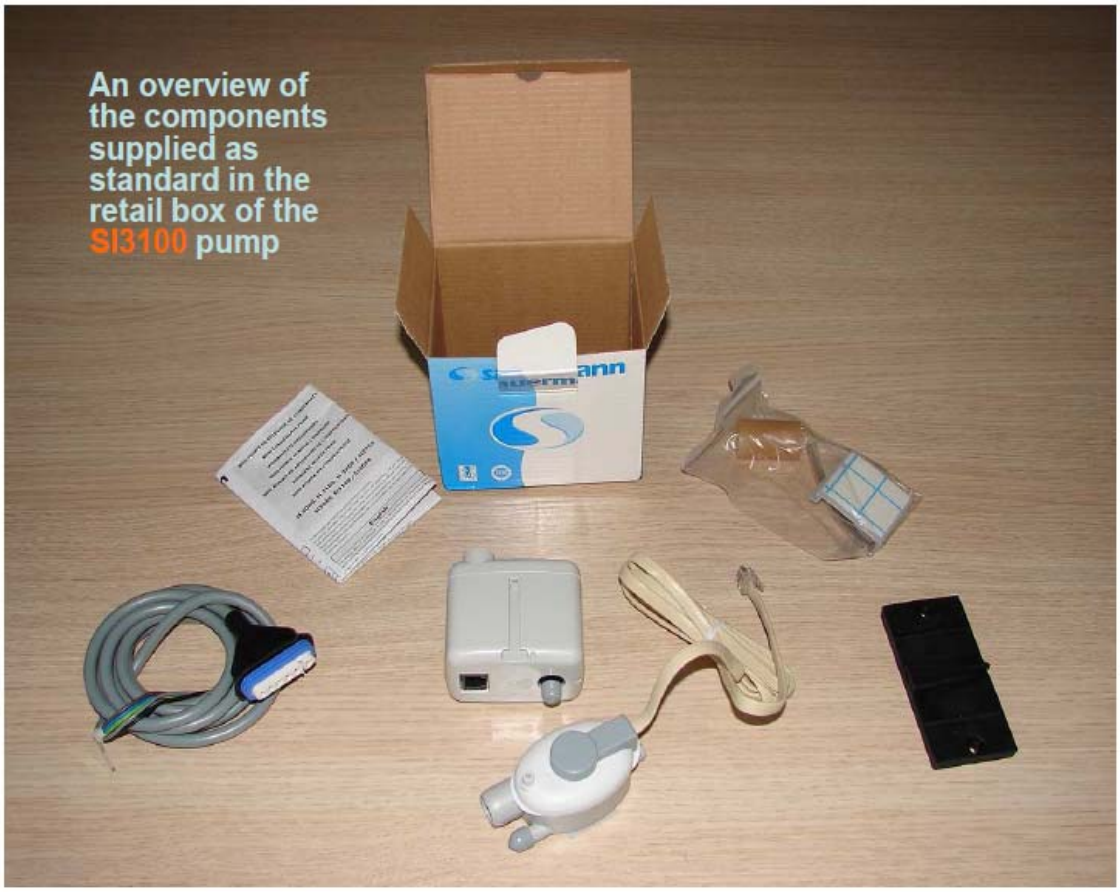


(Minimum Clearances Shown)

Always leave room for service and cleaning when selecting the installation site.

Condensate Pump
(Installation and Wiring)

Example of the Sauermann 3100 Series



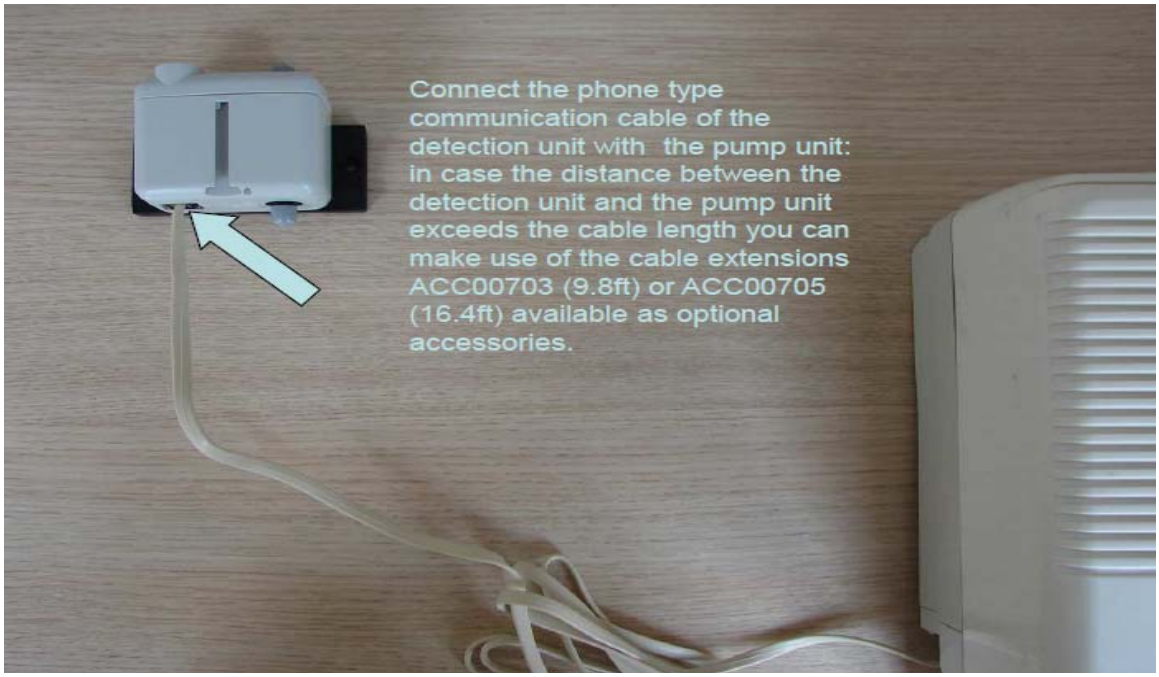
The above condensate pump is an after market item. **Sanyo does not manufacture or warranty these items.** The installer may choose the pump of his/her personal choice.

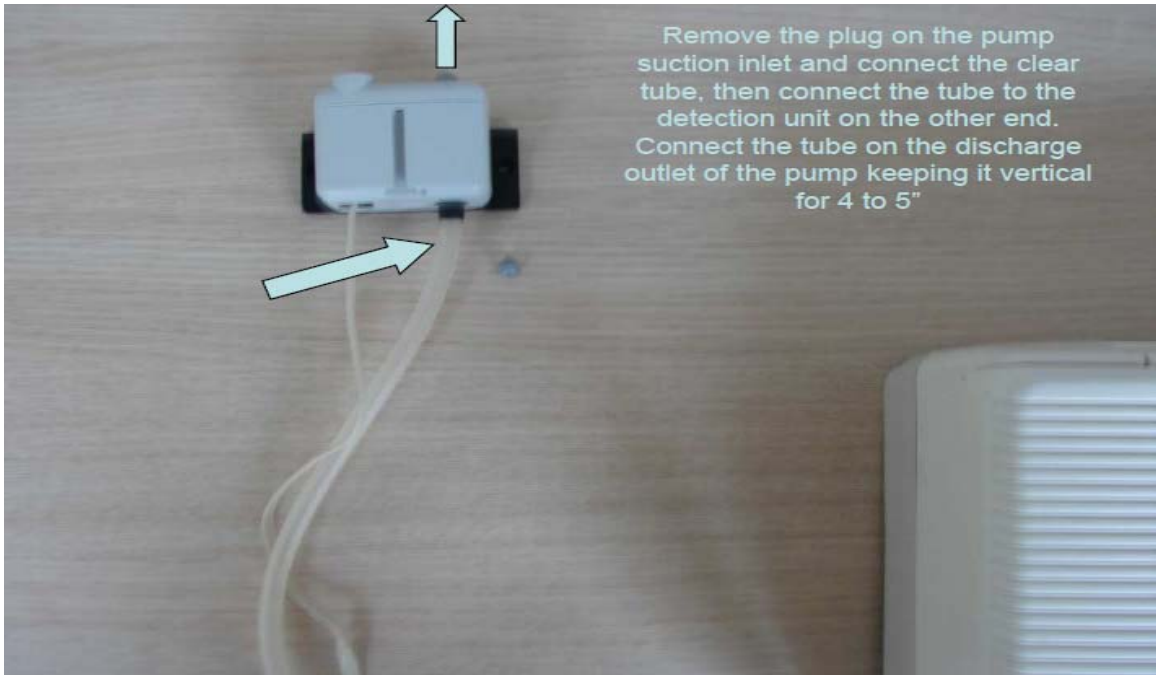
Mounting the Receiver
(Float Safety Switch)

First place the self-adhesive support that holds the detection unit

Attach the condensate hose before mounting the self-adhesive support to insure proper location and attach the supplied air bleeder hose

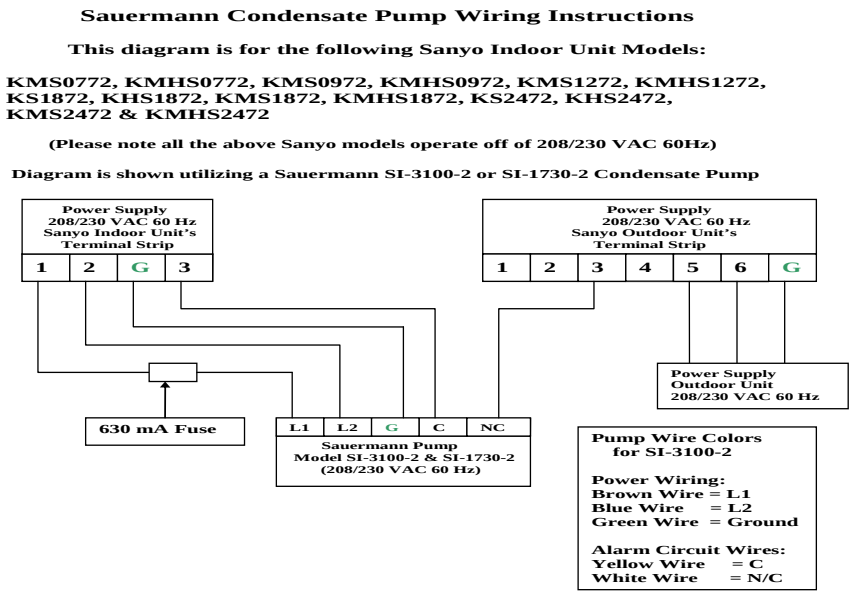
Mounting the Condensate Pump





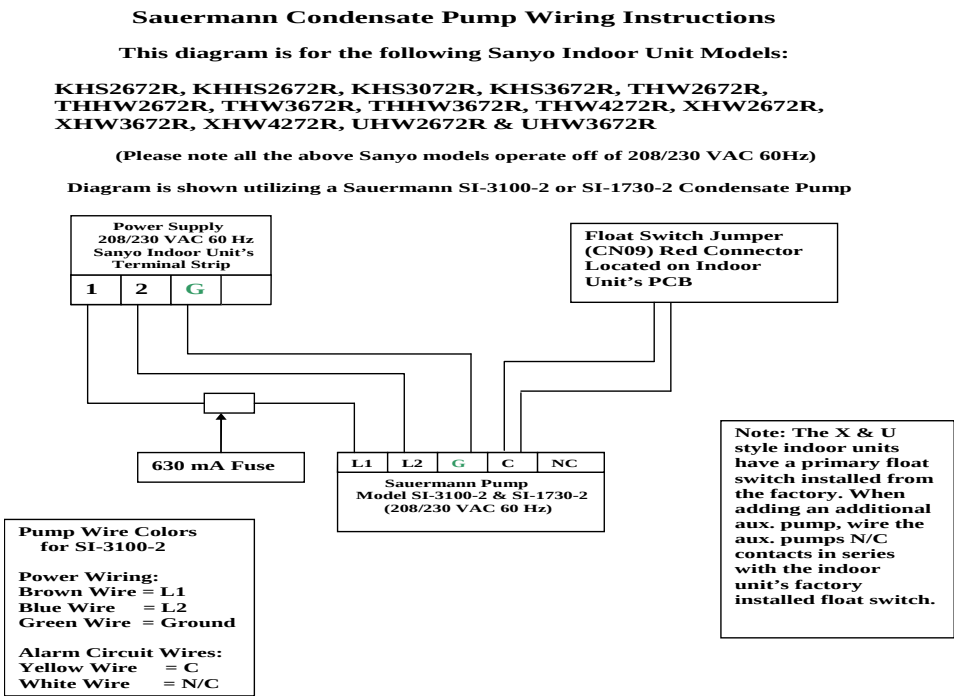
Keep into account the maximum distance between the pump and the detection unit (vertical suction-head) refer to installation manual. Clear tubing available as an optional accessory. (Inner diameter 0.24")

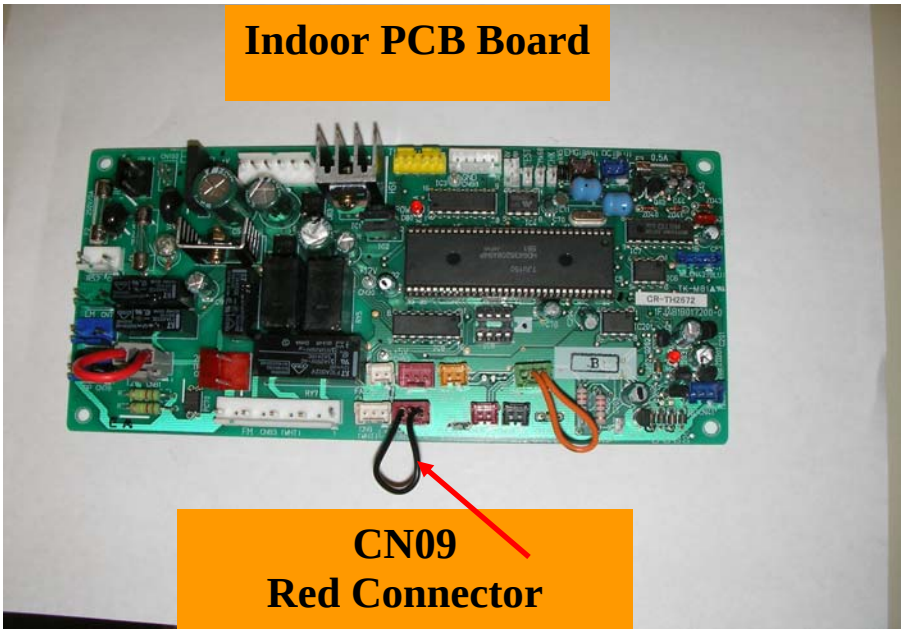
Condensate Wiring for RAC 9,000-24,000 BTU



- Land the power wires from the pump to terminals 1 & 2 on the indoor unit.
- Break line 3 on the indoor unit for the safety switch wiring.

Condensate wiring for a PAC product (26,000-42,000 BTU)





- Cut the **CN09** connector and wire the safety through this connection on the indoor circuit board.

The Following Models are Equipped With Built in Drain Pumps

- **XHX models: Four Way Supply Ceiling Recessed**
- **UHX models: Concealed Duct (Low Static Models)**
- **All of the above models have built in float switches**

<u>These pumps have a limited vertical lift as shown</u>

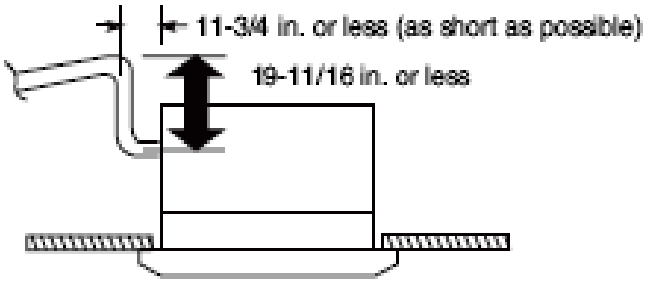
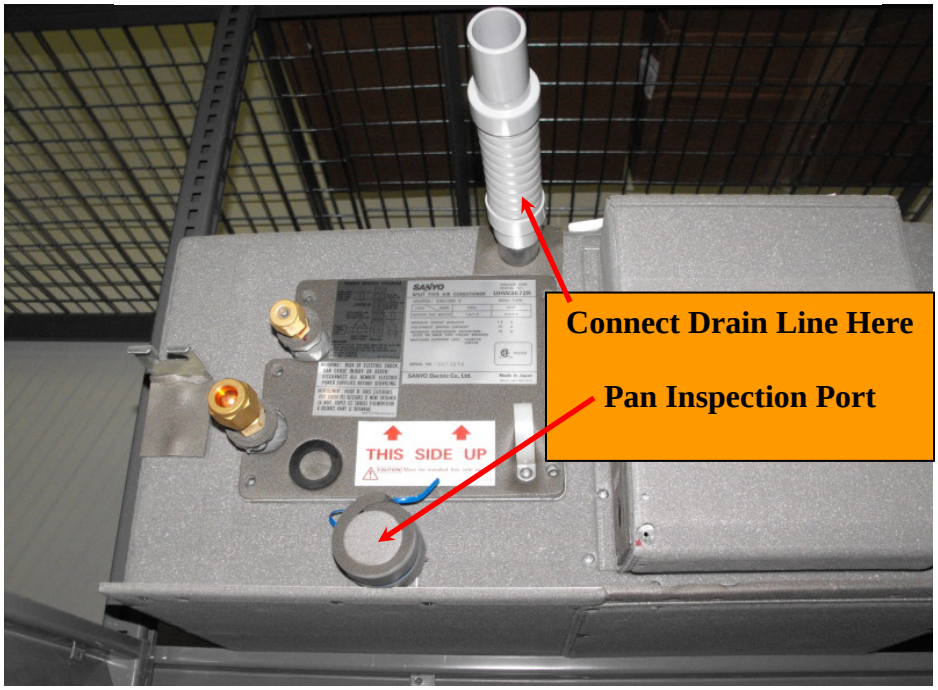


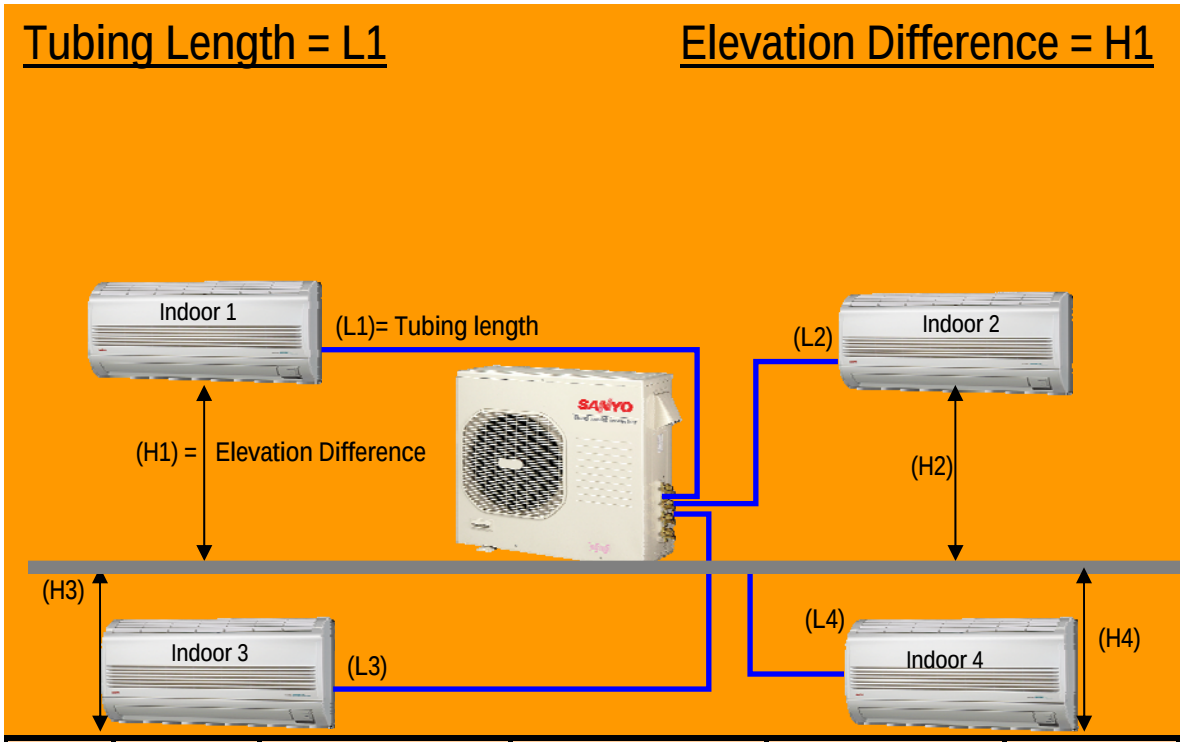
Fig. 3-9



RAC 9,000-24,000 Btu
Flexi-Multi 19,000-31,000 Btu

Tubing, Sizes, & Elevation Difference Refrigerant Charge Adjustment & Insulation Chart								
SYSTEM MODEL	PIPE O.D (Inches)		MAX LENGTH (Ft) BETWEEN INDOOR & OUTDOOR	MAX VERTICAL SEPARATION BETWEEN INDOOR &		REFRIGERANT "PRE-CHARGED" LENGTH	R-410a ADDITIONAL CHARGE (Oz./Ft)	PIPE INSULATION DETAILS
	NARROW PIPE	WIDE PIPE		OUTDOOR ABOVE	INDOOR ABOVE			
09KS71	1/4	3/8	50	23	23	25	0.16	Insulate both refrigerant pipes. 1/2 " insulation recommended
09KLS71								
09KHS71								
12KS71			65					
12KLS71								
12KHS71								
18KS72		1/2	98	49	49		0.27	
18KLS72								
18KHS72								
24KS72		5/8	131			33		
24KLS72								
24KHS72			98					
CM1972	1/4	3/8	82' per unit 150' all units	50	50	150	N/A	
CLM1972								
CMH1972								
CM2472	1/4	3/8=7,9,12 1/2=18,000	82' per unit 200' all units	50	50	150	0.22	
CLM2472								
CMH2472								
CM3172	1/4	3/8=7,9,12 1/2=18,000 5/8=24,000	100' per unit 230' all units	50	50	150	0.22	
CLM3172								
CMH3172								

Tubing Limitations:
(Flexi-Multi Systems)



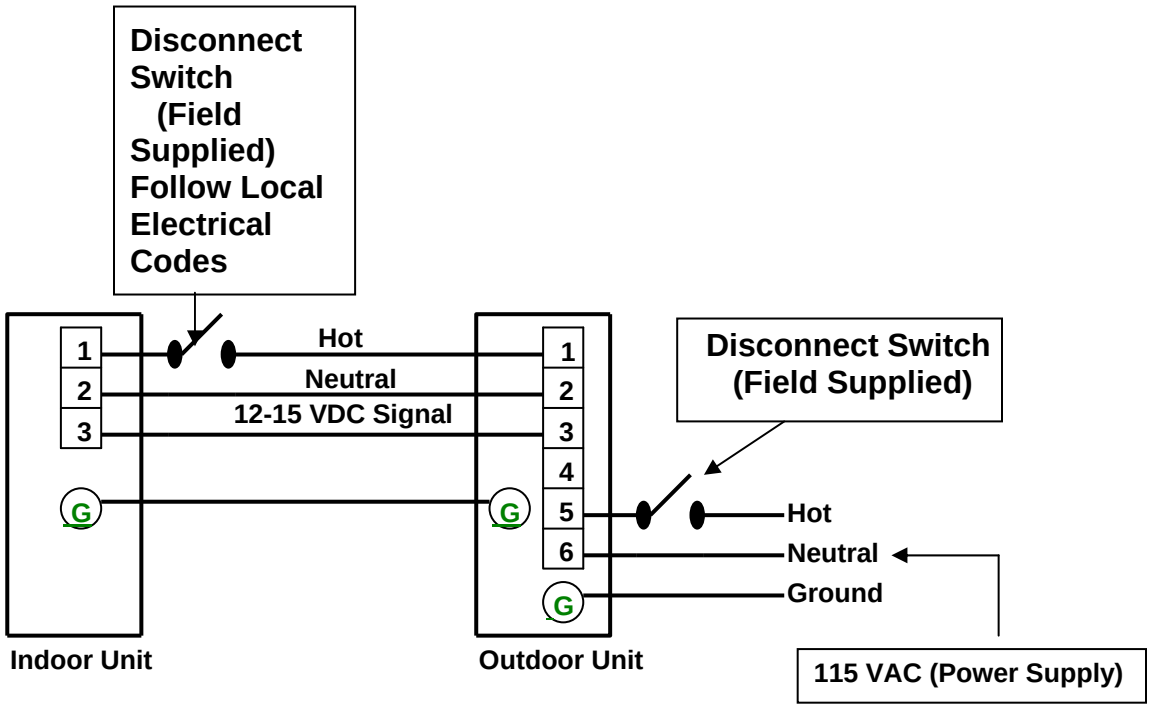
Model	Max. Allowable Tubing Length Per Unit (ft.)	Max. Allowable Total Tubing Length at Shipment Unit Pre-Charged Length (L1+L2+L3) or (L1+L2+L3+L4) (ft.)	Limit of Total Tubing Length Exceeding Pre-Charged Length Maximum Piping Length (L1+L2+L3) or (L1+L2+L3+L4) (ft.)	Limit of Elevation Difference (H1, H2, H3, H4) (ft.)		Required Amount of Additional Refrigerant (Oz. / ft.
				Outdoor Unit Above	Indoor Unit Above	
CMH1972	82	150 (L1+L2+L3)	150 (L1+L2+L3)	50	50	N/A
CMH2472	82	150 (L1+L2+L3+L4)	200 (L1+ L2+ L3+L4)	50	50	0.22 Oz. / ft.
CMH3172	100	150 (L1+L2+L3+L4)	200 (L1+ L2+ L3+L4)	50	50	0.22 Oz. / ft.

RAC Single Split System (A/C & HP)

Typical Installation Wiring For:

C-CL0971, CH0971, C-CL1271 & CH1271

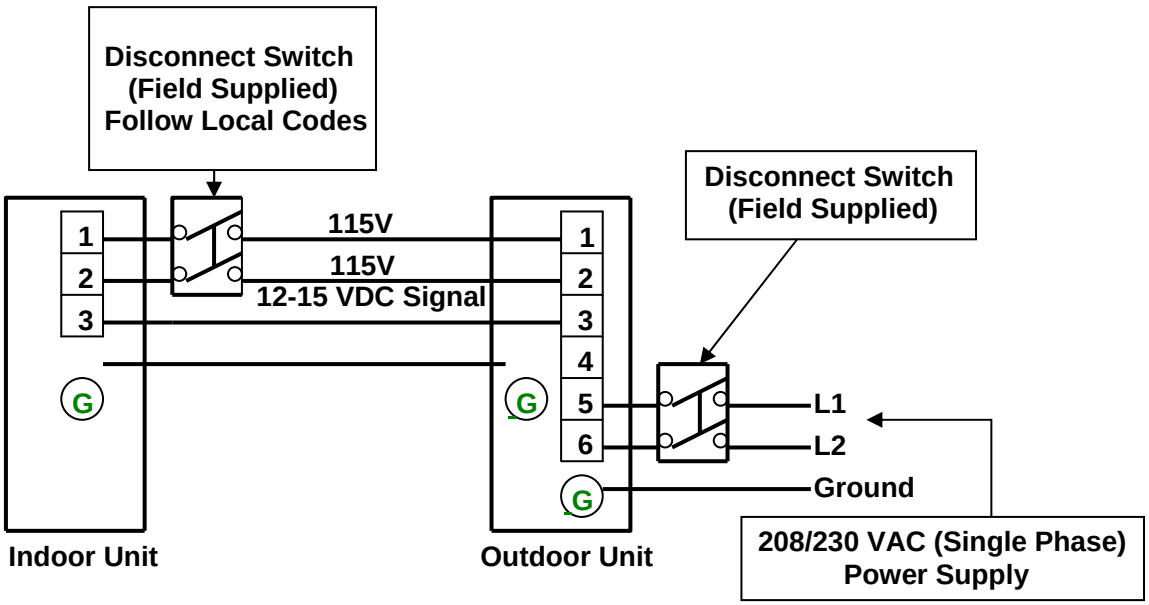
- Note: The 9,000 & 12,000 BTU models in a single split combination require a 115 volt power supply.
- Installation wiring for 115 volt single split systems.
- Disconnect switch is field supplied.
- Indoor disconnect not required. Follow local codes.
- 14 gauge wire minimum



RAC Single Split System
(A/C & HP)

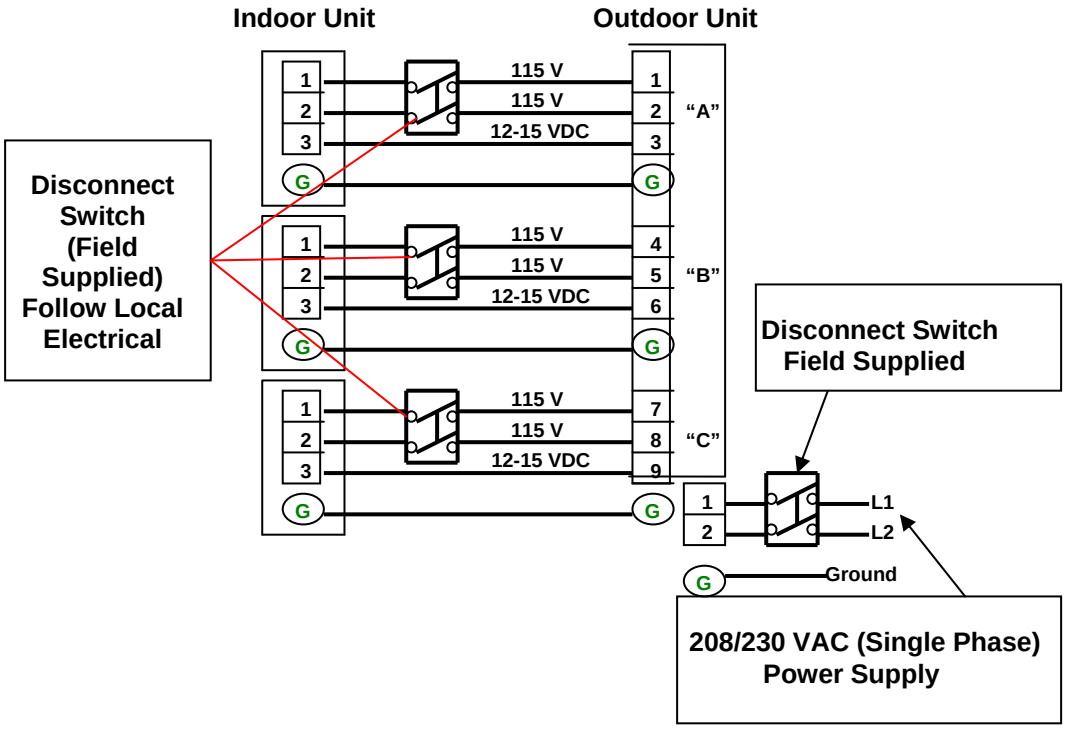
Typical Installation Wiring For:
C-CL1872, CH1872, C-CL2472 & CH2472

- Installation wiring for the 230 volt single split systems.
- These 230 volt systems are polarity sensitive.
- Disconnect switch is field supplied.
- Indoor disconnect not required. Follow local codes.
- 14 gauge wire minimum.



Flexi-Multi
(Cooling Only & HP)
Typical Installation Wiring For:
CM-CLM-CMH, 1972, 2472, 3172

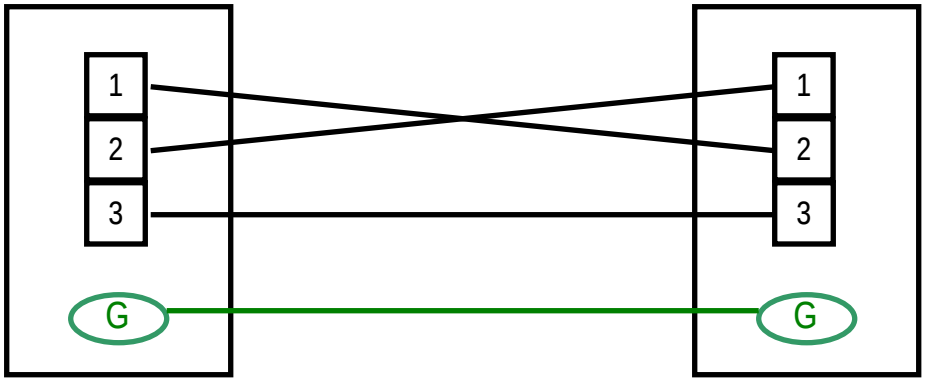
- Installation wiring for the 230 volt multi split systems.
- These 230 volt systems are polarity sensitive.
- Disconnect switch is field supplied.
- Indoor disconnect not required. Follow local codes.
- 14 gauge wire minimum.



Typical Mis-Wiring
(RAC systems 9,000-24,000)

Example: The wires landed on terminals 1 & 2 from the indoor unit to the outdoor unit are crossed.

1. You just completed the installation and powered the system.
2. You turn the indoor unit on with the wireless remote control.
3. The operation light **instantly** starts blinking.

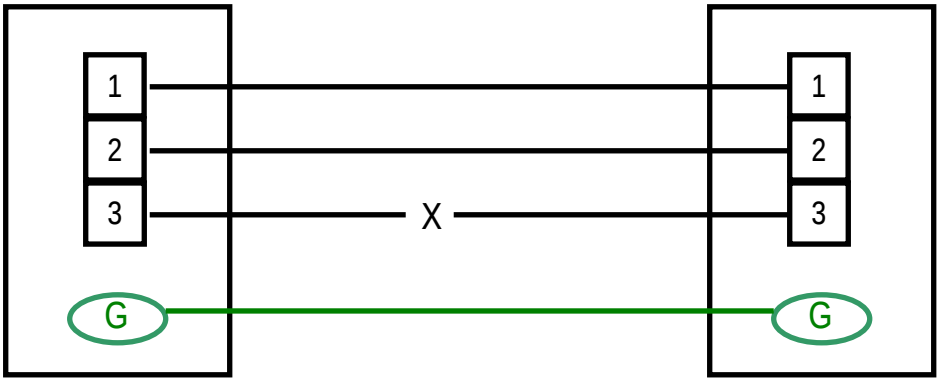


The operation light should always be steady on when the unit is running. Blinking means there is a fault.

Typical Mis-Wiring
(RAC systems 9,000-24,000)

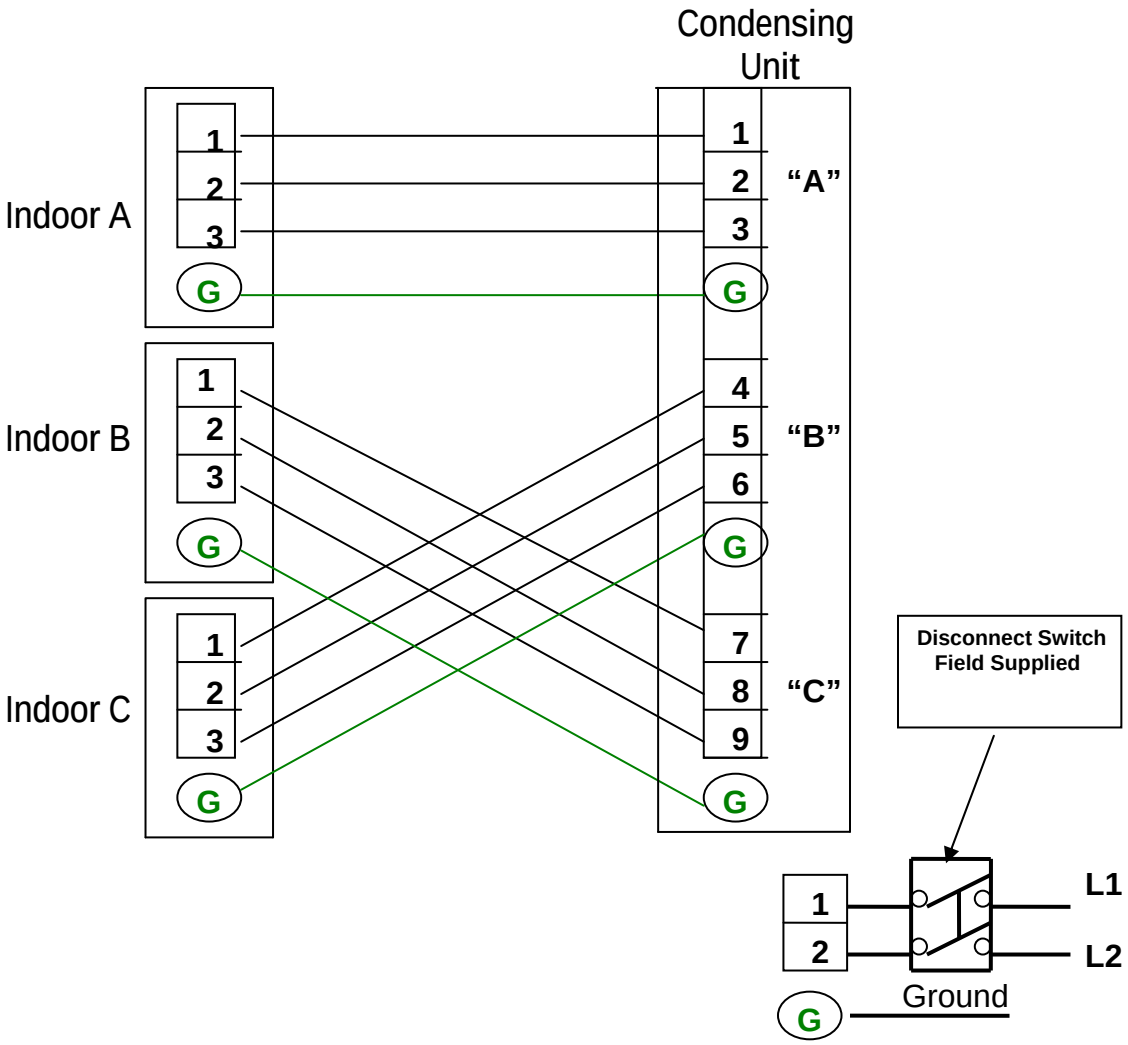
Example: The wire landed on terminal 3 is open or shorted.

- Is there a condensate pump installed. If properly installed the safety switch wiring should be landed on terminal three. Determine if the pump has failed
- Proper voltage reading at the indoor & outdoor units between terminals 2 & 3 should be 12-15v DC.



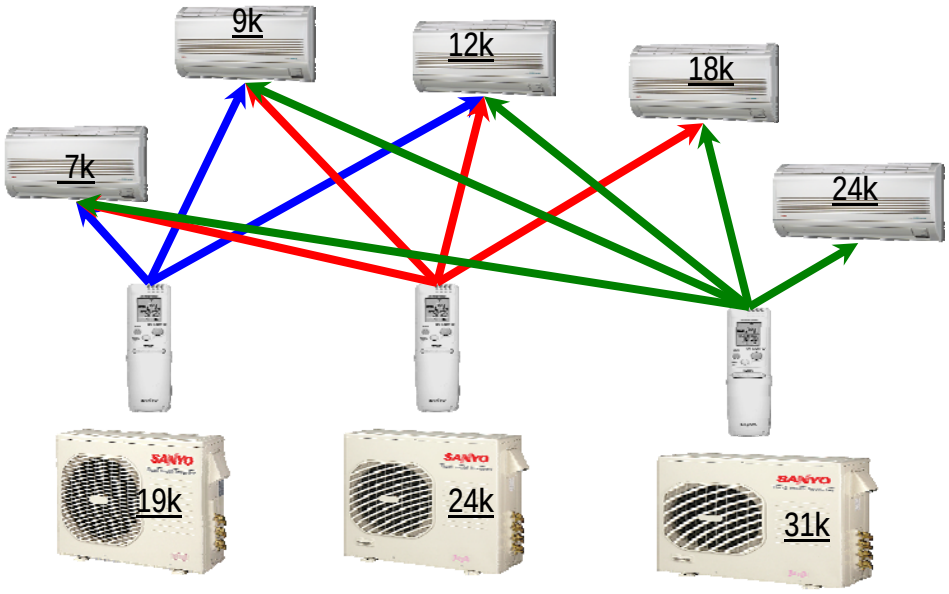
Typical Mis-Wiring
(Flexi-multi systems)

1. Keep track of the wiring for each circuit. A to A, B to B, C to C
2. Keep track of the piping. Piping circuit A to wiring circuit A and so on for all the circuits.
3. This illustration displays the most common wiring / piping mistake made on the Flexi-Multi systems.



Flexible Combinations
(Systems designed for each job)

- Maximum Connecting Capacity of 130 %
- Minimum of two indoor units required



New Ceiling mounts available 2010

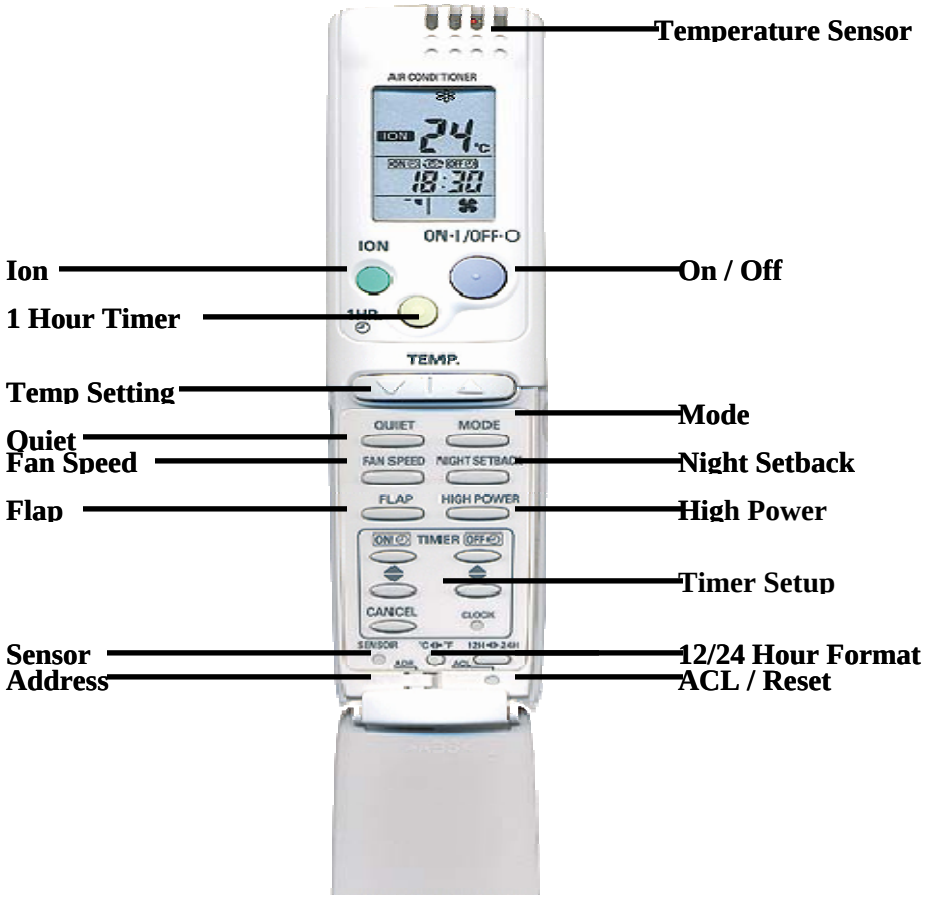
Ceiling recessed and wall mounts can be mixed and matched

Distribution Header
(CM2472, CLM2472 and CMH2472)

Any combination can be used on any circuits A, B, C, or D to a maximum of THREE indoor unit's total

- The 24,000 BTU series is designed for THREE indoor units maximum.
- Any of the four ports can be used in any combination but only **Three** circuits **Maximum.**
- The "1/2 "circuit is for larger BTU indoor units.
- CM, CLM, CMH1972= 3 indoor unit's maximum
- CM,CLM,CMH2472= 3 indoor unit's maximum
- CM, CLM, CMH3172= 4 indoor unit's maximum

Wireless Remote Controller



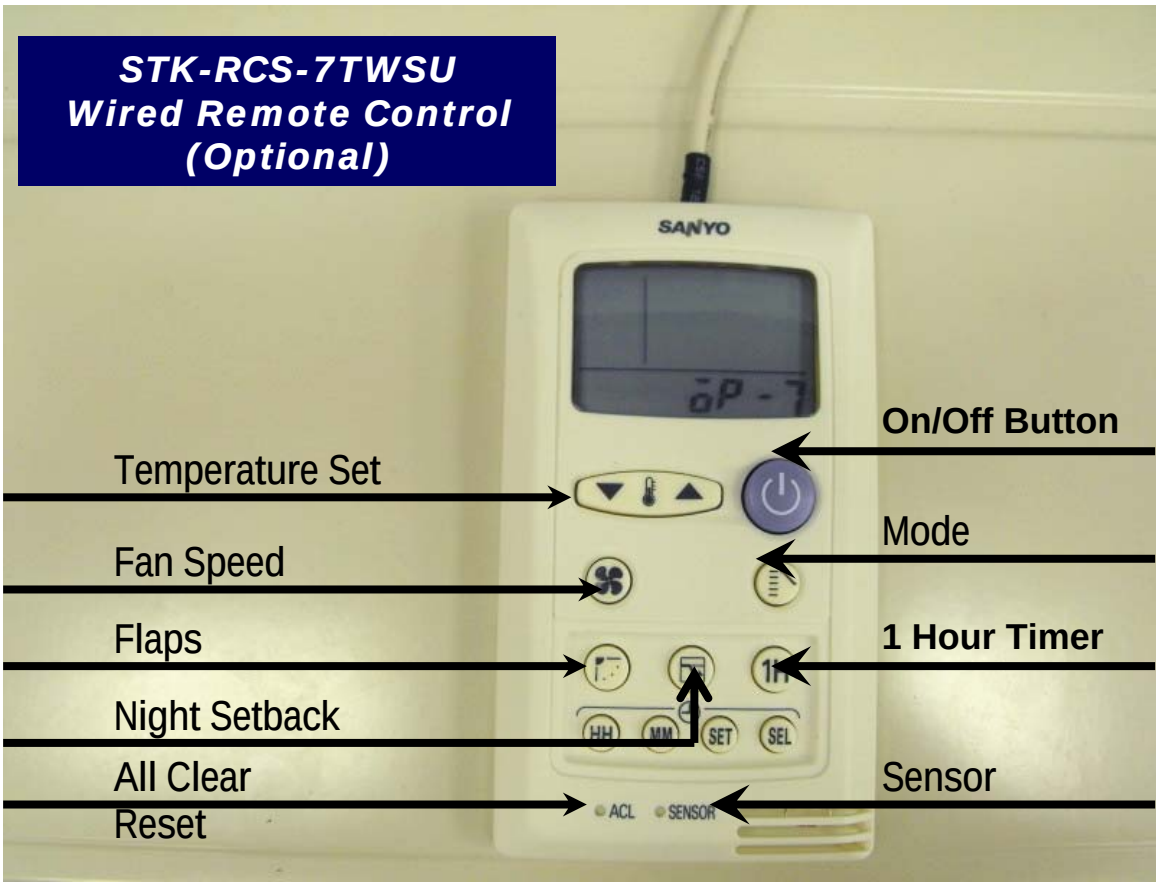
- **The remote control when in the "ON" state transmits a signal every 5 minutes**
- **The remote control will restart the unit after a power interruption.**
- **It is important to locate the remote in an area where the signal can be received by the indoor unit.**
- **Once a signal is transmitted a "low tone beep" should be heard at the indoor unit.**
- **Once the outdoor unit has been started in heating or cooling there is a 5 minute minimum run time.**
- **There will also be a 3 minute delay on startup of the outdoor unit.**
- **Occasionally lighting can affect the signal.**
- **Maximum Distance From the Indoor Unit is 26 Feet**

Occasionally lighting can affect the signal.

Page 4 of the installation manual states:

- Install the indoor unit more than 1 meter (3.3’) away from electronic devices such as televisions, radios, telephones, etc.
- Electrical noise from these may affect operation.
- Change the batteries to the remote every 6 months. Press the ACL button when new batteries are installed

Wired Remote Controller



The STK-KCW1 Wiring harness is necessary to convert a “K” model from wireless to a wired remote control.

The “X” series ceiling recessed models are factory wired and the wiring harness is not needed.

Address Setting of the Remote Control Unit

The address can be set in order to prevent interference between remote controllers when two indoor units are installed near each other. Turn one of the units “OFF”.

How to Change the Address:
The address is normally set to “A”

Break the address-setting tab marked “A” This is permanent. Remote will always be addressed to “B”

Remote control address is automatically set to “B”

Press and hold the 1 HOUR TIMER, ION and ACL buttons. Release the ACL then the ION and 1 HOUR TIMER buttons

Confirm that OP-1 is blinking in the display

Press the 1HOUR TIMER button twice and confirm that OP-7 is blinking in the display

Address Setting of the Remote Control Unit

Press the ON/OFF button while pointing at the indoor unit until you hear an audible “beep”: (approximately 5 times)

Remote and indoor unit are now addressed to “B”. Press the ACL button to return remote to normal operation.

- Make sure the indoor unit that is not to be re-addressed has been powered off
- Once the tab has been broken off the remote controller is permanently addressed to **“B”.**
- The indoor unit’s address can be changed to **“A” & “B”** and back with the remote as long as there is a remote with the tab intact.
- All remotes are factory set to the **“A”** setting.

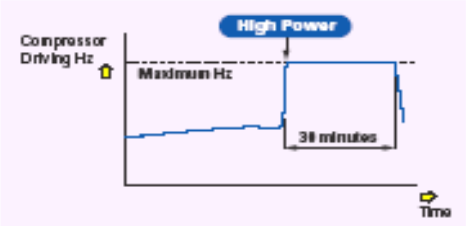
Wireless Remote Controller Functions

Night Setback Mode for Cooling and Heating

Cooling and DRY Mode: With the Night Setback Mode, the air conditioner automatically raises the setting temperature 2°F after 30 minutes, and then another 2°F after the next 30 minutes.
Heating Mode: With the Night Setback Mode, the setting temperature is automatically lowered 4°F after 30 minutes, and then another 4°F after the next 30 minutes. This saves energy without sacrificing comfort and is ideal for gentle cooling and heating.

High Power Mode

The unit operates at maximum capacity by pressing a High Power Mode button.



Automatic Restart Function after Power Failure

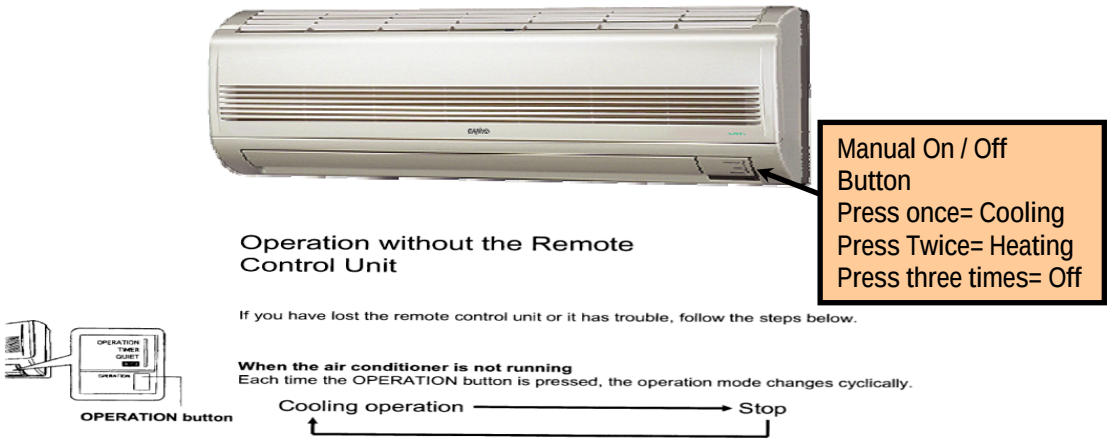
This feature allows the system to automatically resume operation at its preset program, after power is restored from a power failure.

1-hour OFF Timer

1H Timer

When this button is pushed either while the unit is operating or while it is stopped, the unit will operate for one hour and then switch off automatically.

Wireless Remote Controller Functions
(Without The Remote Control)



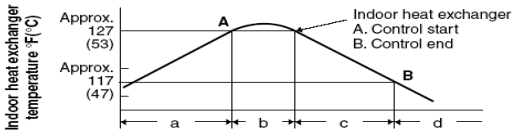
- Will maintain room temperature -4 degrees in the cooling mode.
- Will maintain room temperature +4 degrees in the heating mode
- Fan speed and flap are set to the auto mode

Protective Functions

9-2. Protective Functions

■ Overload prevention during heating

During HEAT operation, the temperature of the indoor heat exchanger is used to control the frequency and lessen the load on the compressor before the protective device is activated.

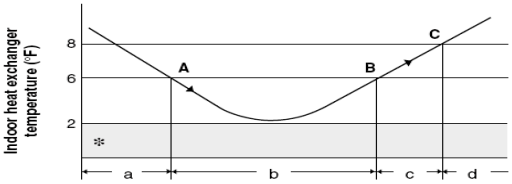


a. Area: Automatic capacity control
b. When Point A has been exceeded, the operation frequency is reduced by a certain proportion.
c. Area: Frequency increase is prohibited.
d. At Point B and below, overload prevention is ended and control is the same as in the a area.

■ Freeze prevention

During COOL or DRY operation, freezing is detected and operation is stopped when the temperature of the indoor heat exchanger matches the conditions below.

1. Freeze-prevention operation is engaged when the temperature of the indoor heat exchanger is below 43°F(6°C).
2. Restart after freeze-prevention operation occurs when the temperature of the indoor heat exchanger reaches 46°F(8°C) or above.

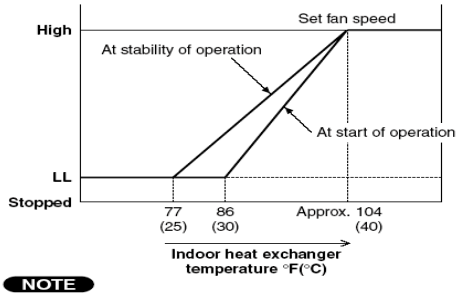


a. Area: Automatic capacity control
b. When the temperature drops below Point A, the operation frequency is reduced by a certain proportion.
c. Area: Frequency increase is prohibited.
d. When the temperature reaches Point C or above, freezing prevention is ended and control is the same as in the a area.

* When the temperature drops to below 4°F(2°C) (continuously for 2 minutes or longer), the compressor stops. Once the freeze condition is detected, the air conditioner will work less than the maximum frequency until it is turned off.

■ Cold-air prevention during heating

During heating, the fan speed is set to "LL" (very low) or stopped. As the temperature of the indoor heat exchanger rises, the fan speed is changed to the set speed.

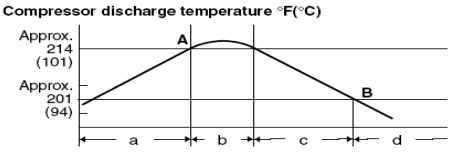


NOTE

- The fan speed is forcibly changed to "LL" beginning 30 seconds after the thermostat turns OFF.
- At stability of operation refers to operation when the room temperature has approached the set temperature.
- When HEAT operation starts, the indoor fan is stopped until the temperature of the indoor heat exchanger reaches 68°F(20°C) or higher, or until the room temperature reaches 59°F(15°C) or higher.

■ Compressor discharge temperature control

This function controls the operation frequency to prevent the compressor discharge temperature from rising more than a specified temperature.



a. Area: Automatic capacity control.
b. When the temperature rises above Point A, the operation frequency is reduced at a specified rate.
c. Area: Further frequency increase is prohibited.
d. When the temperature falls below Point B, prevention of a rise in frequency is released and the air conditioner operates as in a area.

* The compressor will stop if the temperature of the compressor discharge exceeds 248°F(120°C) due to shortage of gas or other reason.

Before Servicing Safety Reminders

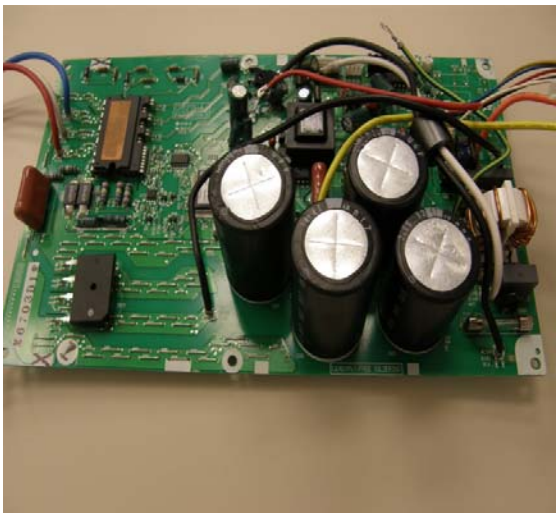
- High capacity electrolytic capacitors are used inside the outdoor unit controller (inverter). They retain an electrical charge even after the power is turned OFF, and some time is required for the charge to dissipate.

- Be careful not to touch any electrified parts before the control circuit board **Power Lamp** (Red) goes **Off**.

- If the outdoor board is normal, approximately 180 seconds will be required for the charge to dissipate.

- However, allow at least 30 minutes for the charge to dissipate if it is thought there might be a problem with the circuit board

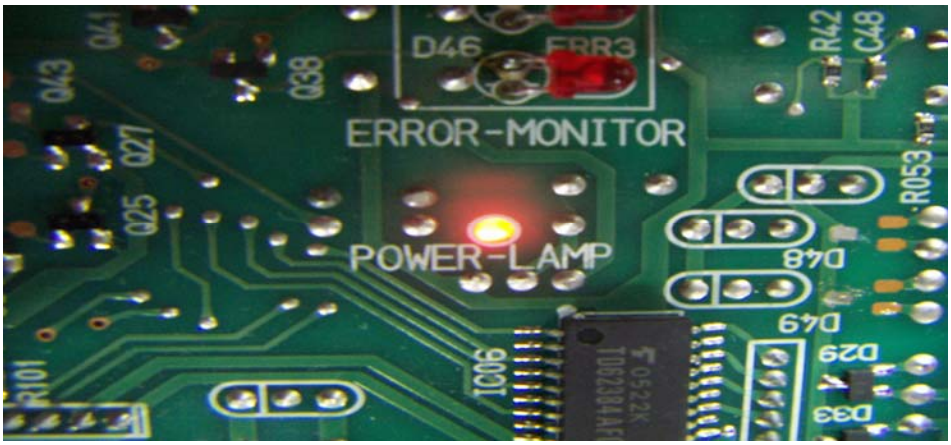
- For example, if the outdoor control circuit board fuse has blown, it will take approximately **30 minutes for the capacitors to dissipate fully.**



- Wait until the **"POWER LAMP"** goes out before servicing the system

Troubleshooting
(RAC 9,000- 24,000 BTU)

- Verify the correct voltage at terminals 1 & 2 of the indoor unit. This will be 115v or 208v/230v depending on the model. **Note:** They are polarity sensitive between the indoor and outdoor units.
- If a “C” model condenser is utilized is it below 50 degrees outside ambient? Cooling is locked out at 50 degrees on “C” models.
- Is the indoor unit generating a 12-15v DC signal going out to the condenser on terminals 2 & 3 when the unit is calling for heating or cooling?
- Has a condensate pump been wired into the indoor unit. If properly installed the safety circuit will open upon pump failure and shut the system down.
- Is the operation light “blinking” on the indoor unit? This is indicating a faulted condition. To determine the problem with the system it must be put into a self-diagnostic mode. The procedure is on the inside of the front cover of the indoor unit.
- Verify the interconnecting wires which run from the outdoor to the indoor unit. Make sure none of these wires are grounded.
- On the 9,000-24,000 Btu models there is a power lamp which will be illuminated if the outdoor PCB is powered up. If not lit check the fuses on the PCB board.



Troubleshooting
(RAC 9,000- 24,000 BTU)

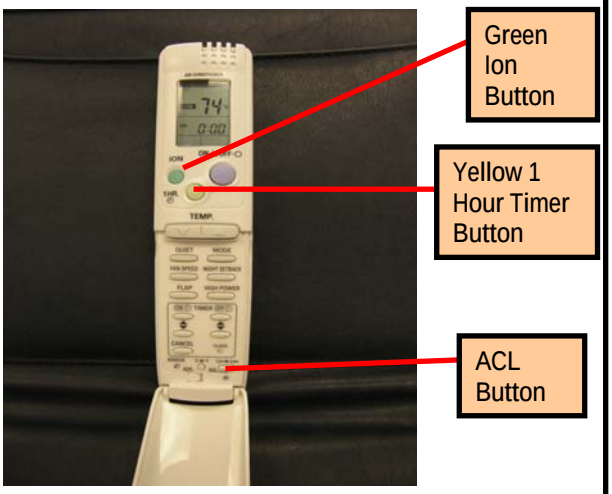
First thing to check at the jobsite

- Check the indoor unit for operation
- Is there a display on the remote control
- Does the remote control operate the indoor unit
- Is the operation light a steady on or is it blinking
- Check the model of the condenser. Remember a C only model locks out at 50 degrees for cooling. CL is low ambient operation down to 0 degrees.

Operation Light blinking means there is a fault

Method of Self-Diagnostics
(How to Retrieve Diagnostic Codes)

The Diagnostic Buttons



Using two fingers hold the ION and 1Hour Timer buttons down together

With a pen press the ACL button down while holding the ION and 1 Hour Timer buttons down

Release the ACL button first then release the ION and 1 Hour Timer buttons

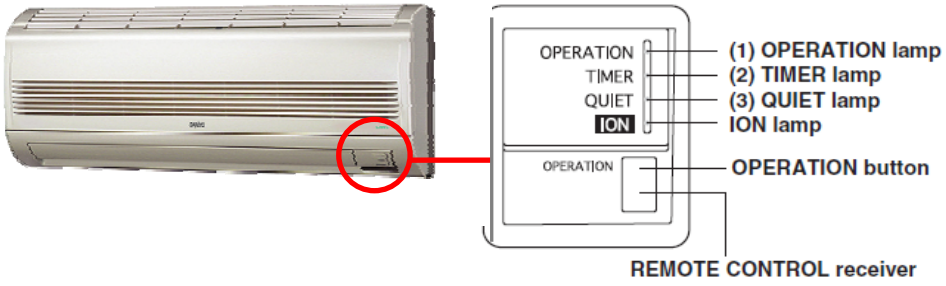
OP-1 is now flashing in the display. Press the 1 Hour Timer button once and release

Method of Self-Diagnostics

(How to Retrieve Diagnostic Codes)

OP-3 is flashing on the display. The remote is ready for diagnostics.

Press the ON/OFF button once while pointing the remote at the indoor unit

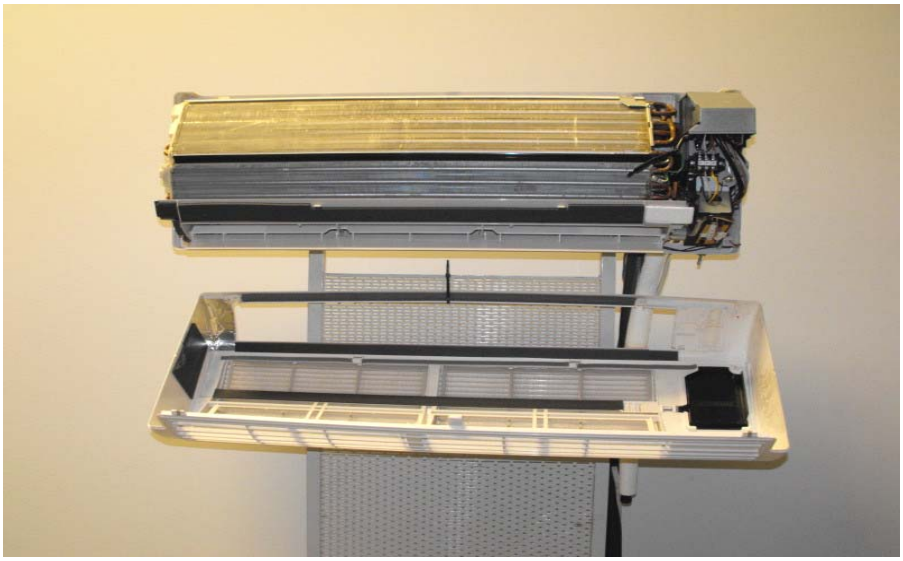


- The indoor unit is capable of retaining 3 error codes in its memory.
- It will display the most recent error code first and each code every 5 seconds with a beep between codes
- It will beep several times when all the codes have been displayed
- Watch the **Operation, Timer, and Quiet lights.** Are they On, Off or Blinking
- Match the codes in the service manual.
- Press the ACL button when finished to return remote to normal function.

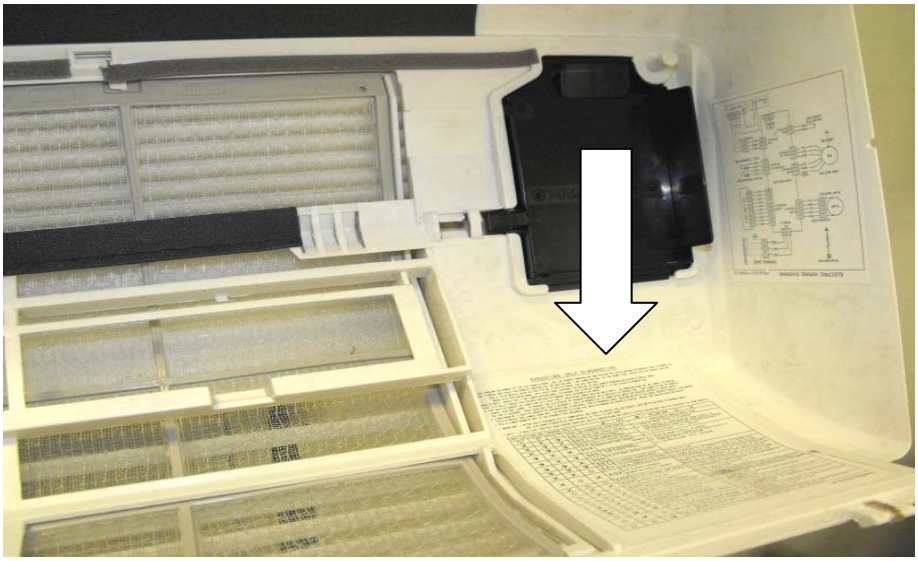
Method of Self-Diagnostics
(How to Retrieve Diagnostic Codes)

Indication on Indoor Unit				KEY CODE OFF= X ON = ○ BLINKING = ●	
Quiet (3)	Timer (2)	Operation (1)	Code	Diagnostic Items	Diagnostic contents
X	X	●	S01	Room temperature sensor failure	(1)Sensor open circuit or short circuit (2) Contact failure at the connector or open circuit at the crimping connection (short-circuit detection only for the humidity sensor) (3)Indoor/Outdoor circuit board failure
X	●	X	S02	Indoor heat exchanger sensor failure	
X	●	●	S03	Humidity sensor failure	
●	X	X	S04	Compressor temperature sensor failure	(1)Sensor short circuit or open circuit (2)Contact failure at the connector or open circuit at the crimping connection (3)Outdoor circuit board failure
●	X	●	S05	Outdoor heat exchanger sensor failure	
●	●	X	S06	Outdoor air temperature sensor failure	
●	●	●	S07	Outdoor electrical current detection failure	Outdoor circuit board failure
X	X	○	E01	Indoor/Outdoor communication failure(serial communication)	(1) Mis-Wiring (2) AC power failure (3) blown fuse (4) Powe relay failure (5) Indoor outdoor circuit board failure
X	○	X	E02	(1) HIC circuit failure (2) Power Tr (transistor) circuit failure	(1) HIC or power Tr failure (2) Outdoor fan does not turn (3) Instantaneous power outage (4) Service valve not opened (5) Outdoor fan blocked (6) Continous overload operation (7) Compressor failure (8) Outdoor circuit board failure
X	○	○	E03	Outdoor unit external ROM (OTP data) failure	(1) External ROM data failure (2) Outdoor circuit board failure
○	X	X	E04	Peak current cut-off	(1) Instantaneous power outage (2) HIC or power transistor failure (3) Outdoor circuit board failure
○	X	○	E05	(1) PAM circuit failure (2) Active circuit failure	(1) Outdoor circuit board failure (2) Outdoor power supply voltage failure
○	○	X	E06	Compressor discharge overheat prevention activated	(1) Electric expansion valve failure (2) Capillaries choked (3) Shortage of refrigerant (4) Continous overload operation (5) Outdoor fan does not rotate (6) Outdoor circuit board failure
○	○	○	E07	Indoor fan operating failure	(1) Fan motor failure (2) Contact failure at the connector (3) Indoor circuit board failure
●	●	○	E08	(1) 4 way valve switching failure (2) Indoor zero cross failure	(1) 4 way valve failure (heat pump only) (2) Outdoor circuit board failure
●	○	●	E09	No refrigerant protection	(1) Service valve not opened (2) Shortage of refrigerant
●	○	○	E10	Dc compressor drive circuit failure	(1) Open phase (2) Outdoor circuit board failure
○	●	●	E11	Outdoor fan operating failure	(1) Fan motor failure (2) Contact failure at connector (3) Outdoor circuit board failure
○	●	○	E12	(1) Outdoor system communications failure (2) Outdoor high pressure switch SW (3) OLR operation (4) Outdoor power supply open phase (5) Outdoor coil freezing	(1) Mis wiring (2) Blown fuse (3) Power relay failure (4) Open phase (5) Outdoor circuit board failure (6) Compressor failure
○	○	●	E13	Freeze prevention operation activated	(1) Indoor fan system failure (2) Shortage of refrigerant (3) Low temperature operation

Forgot Your Service Manual?



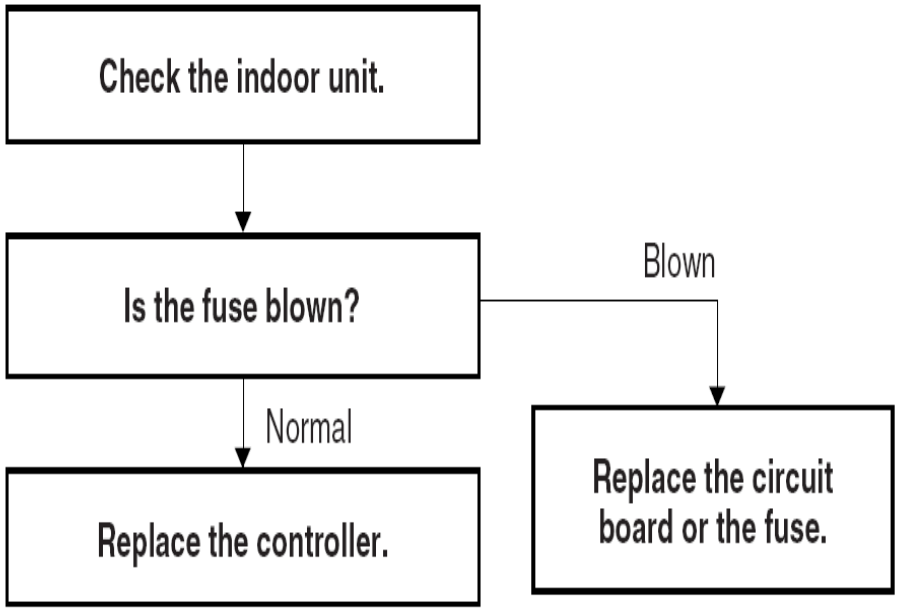
Remove the Front Cover



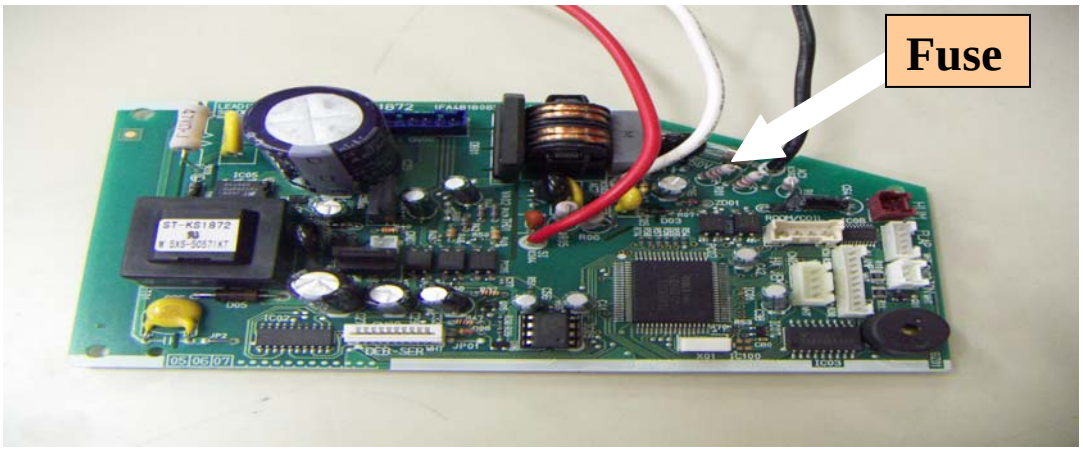
Inside the cover are the error codes
procedure & wiring schematic

Self-Diagnostics Function
(Will Not Operate)

(2) If the self-diagnostics function fails to operate



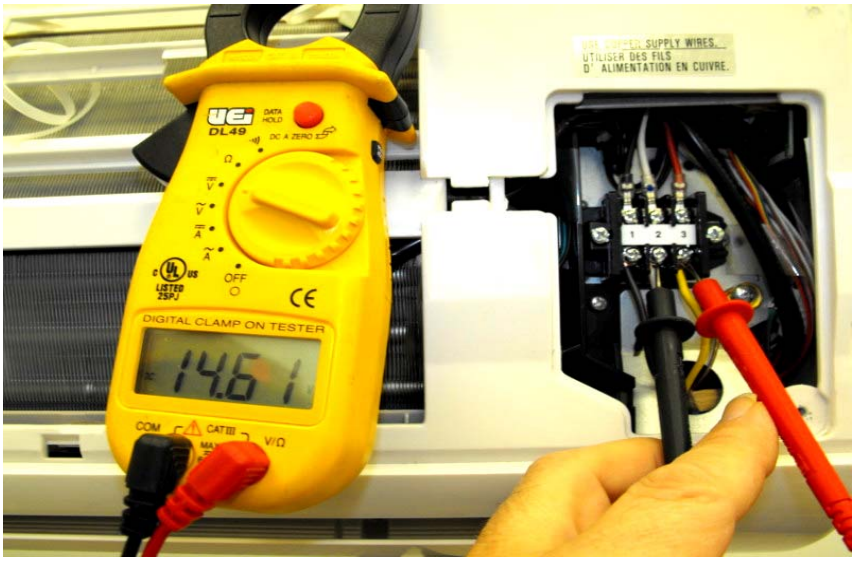
- No Indicator illumination and the indoor fan does not rotate
- Check the power voltage
- Check voltage at terminal 1 & 2 of the indoor unit for proper voltage



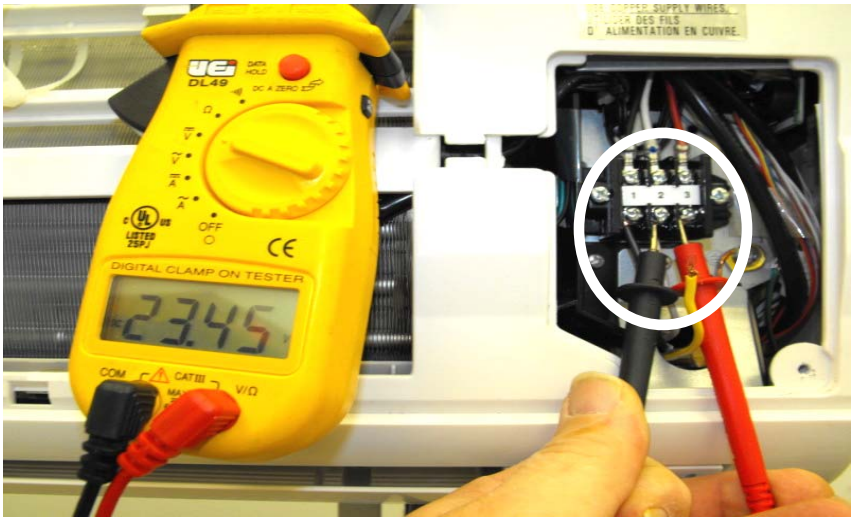
Checking the Indoor Unit

Verify line voltage between terminals 1 & 2=115 / 208 / 230 AC

Check for 12-15v DC voltage between terminals 2 & 3. If the voltage does not match up go to the next step. If the voltage is correct: Was the model a C or CL series.



Remove the wire landed on terminal 3. Check for 23-24v DC between terminals 2 & 3. This is the default voltage for the board. Correct voltage present then check the outdoor unit

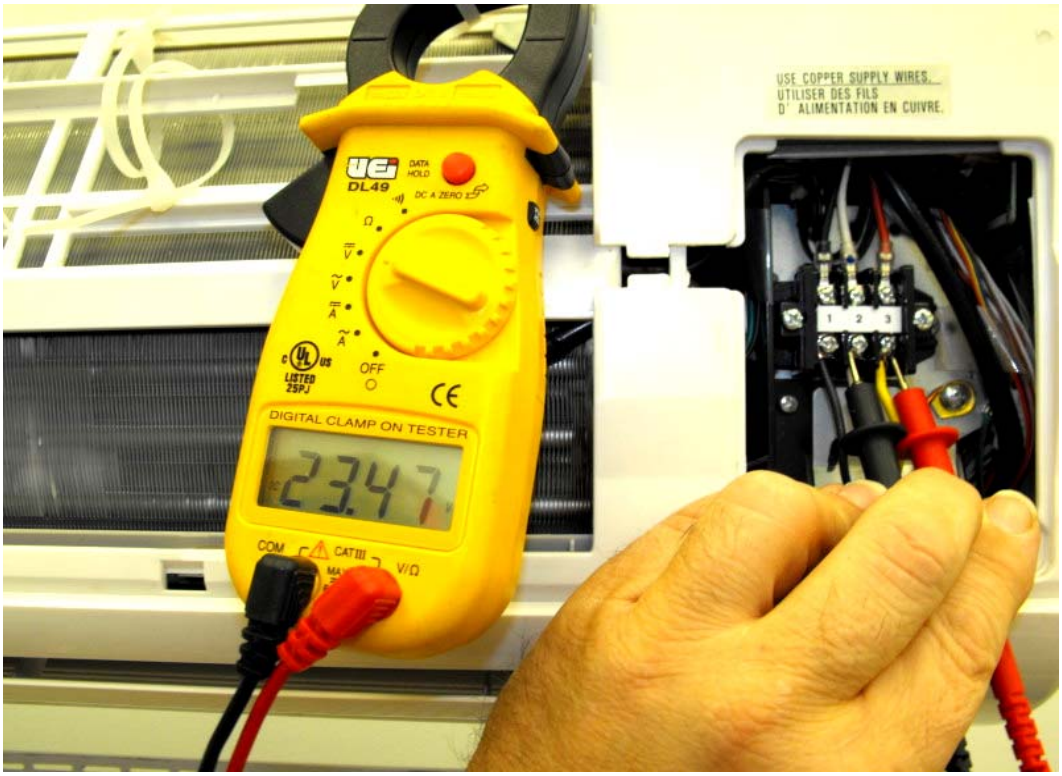


Checking the Indoor Unit

Example:

What two possible problems come to mind here?

- Voltage between lines 1 & 2= 115v AC
- Voltage between lines 2 & 3= 23.47v DC



- Line 3 is open or broken

- Possible condensate pump in the line and the safety switch is open

Checking the Indoor & Outdoor Units (Test/T-Run)

9-3. Checking the Indoor and Outdoor Units

(1) Checking the indoor unit

No.	Control	Check items (unit operation)
1	Use the remote controller to operate the unit in "TEST run" mode. To determine whether the mode is currently in "TEST run" mode, check the 4 indicator lamps on the unit. If all 4 are blinking, the current mode is "TEST run."	• The rated voltage must be present between inter-unit wirings 1 and 2. • Connect a 5 k ohm resistor between inter-unit wirings 2 and 3. When the voltage at both ends is measured, approximately 12 to 15V DC must be output and the multimeter pointer must bounce once every 8 seconds. Or instead of measuring the voltage, you can insert an LED jig and check that the LED flickers once every 8 seconds.

● If there are no problems with the above, then check the outdoor unit.
● For the "Test run" procedure, refer to the Appendix B "Installation Instructions".

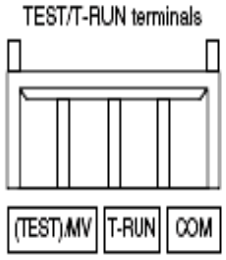
(2) Checking the outdoor unit

No.	Control	Check items (unit operation)
1	Apply the rated voltage between outdoor unit terminals L and N.	• The control panel LED (red) must illuminate.
2	Short-circuit the outdoor unit COM terminal to the T-RUN terminal.	• The compressor, fan motor and 4-way valve must all turn on.

● If there are no problems with the above, then check the indoor unit.

● Using the TEST/T-RUN terminals

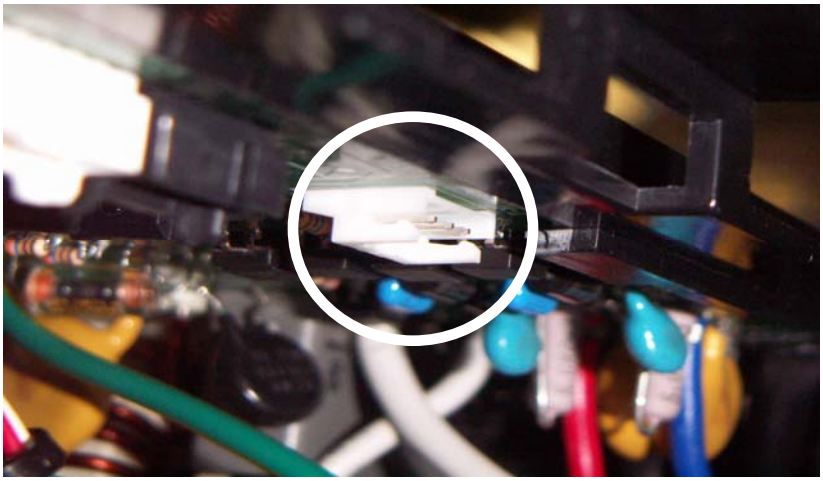
T-RUN : Test run (compressor and fan motor turn ON).
TEST/MV : Compresses time to 1/60th (accelerates operation by 60 times faster than normal).



- The Test / T-Run function ignores inter-unit wiring and the indoor unit

Testing Of Outdoor Unit PCB

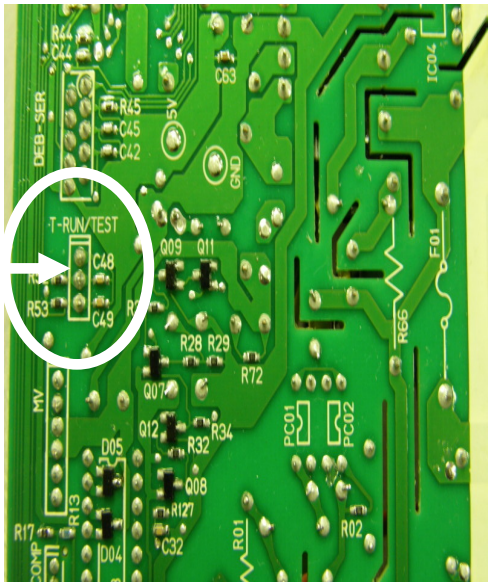
Short-circuit the <u>T-RUN</u> terminal
to The <u>COM</u> terminal of <u>TEST/T-RUN</u> terminal.



Remove plastic cover to the main PCB board. Look for the T-RUN/TEST on the edge of the board.

Common Terminal

Use a screwdriver and short between Common and C48. The compressor, fan and 4 way valve will turn on.



- The compressor, fan motor, and 4-way valve must turn **<u>ON.</u>**
- This function will not work on a “C” model and the outdoor temperature is below 50 degrees.

Serial Communication Error
(Identification Procedure)

If the lamps on the main body show the following conditions after the completion of self-diagnostics, a communication error between the indoor unit and outdoor unit might be considered.
In such a case, identify the breakdown section by using the following procedure.

NOTE Refer to "Method of Self-Diagnostics" for the self-diagnostics procedure.

Lamp / Condition	Quiet (3)	Timer (2)	Operation (1)
E01	×	×	☼
E12	☼	◑	☼

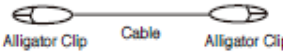
× : Off
◑ : Blinking
☼ : Illuminated

< Before the Operation >

WARNING For terminal strip short circuit work or inter-unit wiring removal, turn off the power to avoid an electric shock.
Release the terminal strip short circuit after the completion of self-diagnostics.

CAUTION Do not perform the short-circuit work between any other terminals except for specified ones on the specified terminal strip. If such work is performed between the incorrect terminals, the unit might be broken.

< Convenient Tool for Short-Circuit Work (for example) >



< Check Items before Troubleshooting Serial Communication Start >

After confirming that the following errors do not exist, start the "Troubleshooting Serial Communication" in "Condition: E01 and E12".

1. Mis -wiring (inter-unit cable, etc.)
2. AC power failure
3. Blown fuse
4. Power Relay failure
5. Outdoor Fan Motor failure (defective insulation, etc.)
6. Reactor failure (defective insulation, etc.)
7. High-Pressure Switch failure
8. Overload Relay failure
9. Magnetic Coil failure (defective insulation, short-circuit, etc.)
10. Compressor failure (defective insulation, etc.)

(3-1) Condition: E01

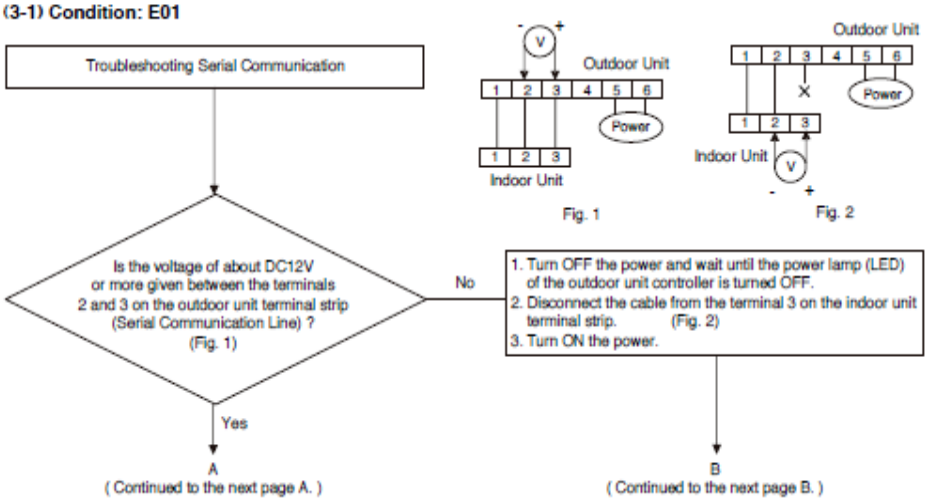
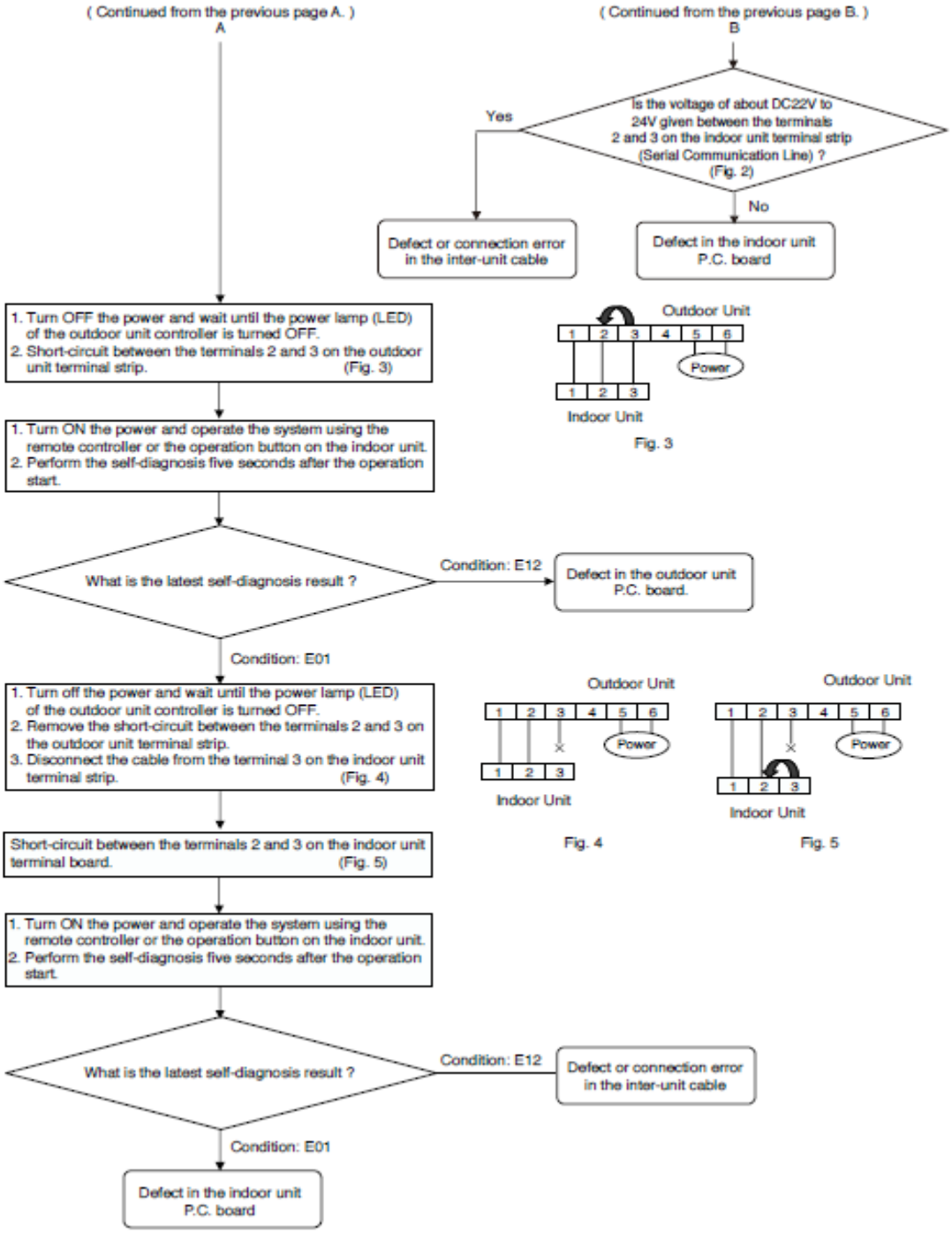


Fig. 1

Fig. 2

Serial Communication Error
(Identification Procedure)



Serial Communication Error
(Identification Procedure)

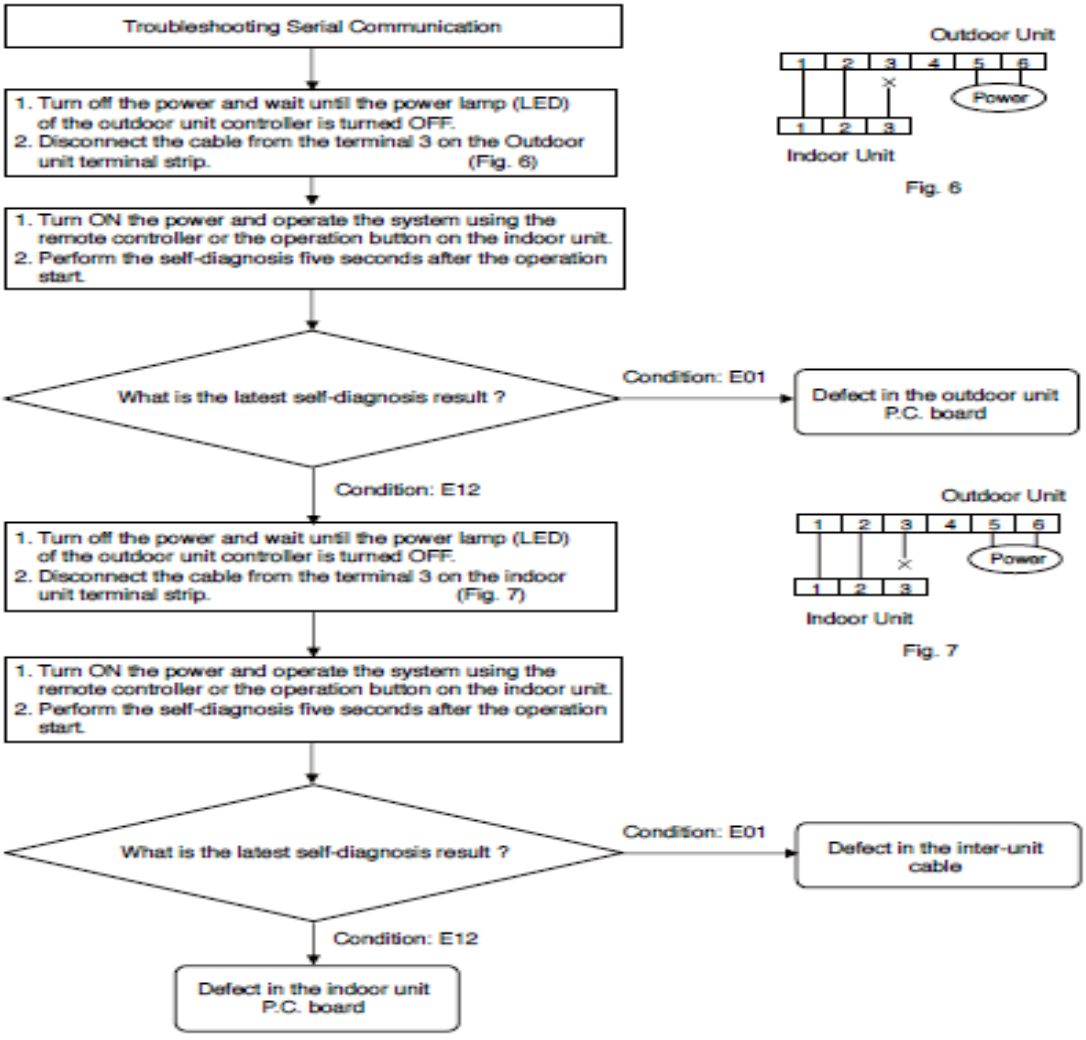
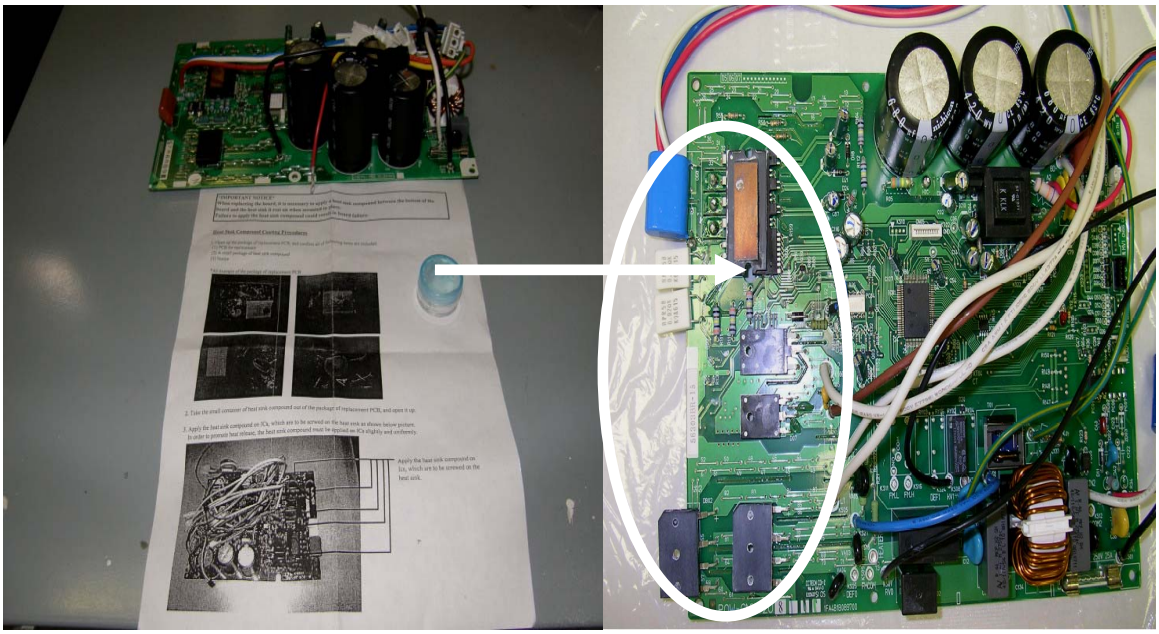


Fig. 6

Fig. 7

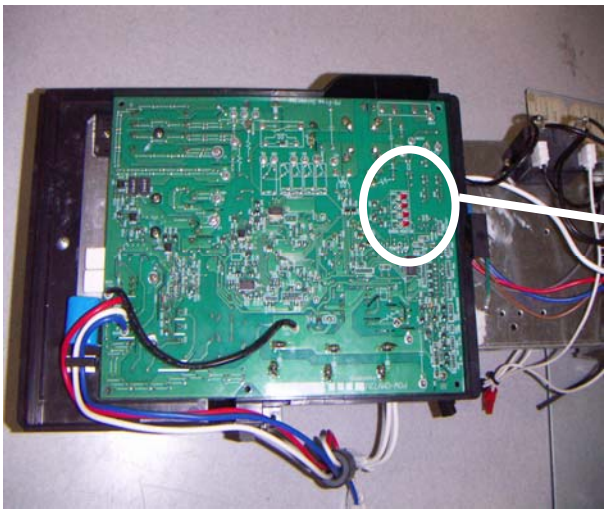
Procedure for Replacing
(The Outdoor Board)

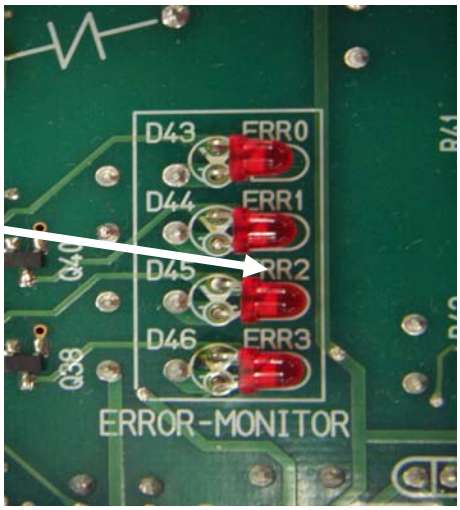


- When replacing the outdoor board it is necessary to re-apply heat sink compound.
- This compound is applied to the heat dissipating pads on the circuit board.
- **Do not use the whole container. Apply a THIN layer only.**
- **Instructions** and **heat sink paste** should be in the box with the replacement board
- If the paste is not included it can be purchased at any electronics store.

Flexi-Multi
(Outdoor PCB Error Lamps)

In Normal Operation These Error Lamps Should Not Be Lit.





ERROR MONITOR LAMP				ERROR CONTENTS ON= ● OFF= ○
ERR 0	ERR 1	ERR 2	ERR 3	
●	○	○	●	Sensor for compressor discharge temperature
○	●	○	●	Sensor for heat exchanger temperature
●	○	○	○	Sensor fro branch pipe A (Narrow tube)
○	●	○	○	Sensor fro branch pipe B (Narrow tube)
●	●	○	○	Sensor fro branch pipe C (Narrow tube)
○	○	●	○	Sensor fro branch pipe D (Narrow tube)
●	●	○	●	Outdoor temperature sensor
●	○	●	○	Sensor for branch pipe A (Wide tube)
○	●	●	○	Sensor for branch pipe B (Wide tube)
●	●	●	○	Sensor for branch pipe C (Wide tube)
○	○	○	●	Sensor for branch pipe D (Wide tube)
○	○	●	●	HIC trouble (Current, temperature)
○	●	●	●	Actuation of compressor over load relay
●	○	●	●	Actuation of freeze protection function
●	●	●	●	Outdoor unit error detail of error message indicate on ondoor LED

Troubleshooting Chart

Flexi-Multi, Single Heat Pump, Single Cooling, Single Cooling Low Ambient

Trouble Diagnosis of each part

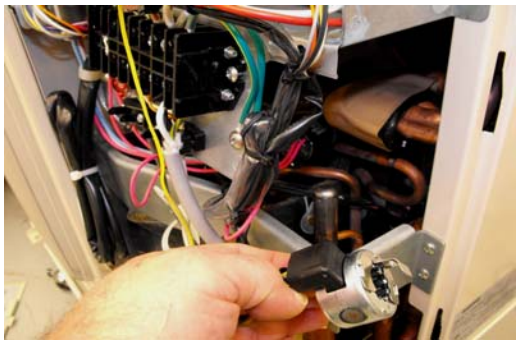
		Indoor Unit				OUTDOOR UNIT									OTHERS		No. of inspection points	
Problems / Inspection Points		Indoor unit does not operate	Operation lamp blinking	Operation lamp does not illuminate	Indoor fan does not turn	Outdoor unit does not operate	Outdoor fan does not turn	4-way valve does not operate	The compressor (only) does not operate	The compressor stops on occasion	The compressor speed does not increase	The outdoor air temp sensor is high but defrost operation occurs	Defrost operation does not occur	The electric expansion valve does not operate	Does not cool or cooling performance is inadequate	Does not heat or heating performance is inadequate		
Self diagnostics check			0		0	0	0		0									
INDOOR UNIT	Indoor controller (control unit)	0	0	0	0	0												
	Indoor fan motor		0		0													
	Room temperature sensor		0															
	Heat exchanger temperature sensor		0		0													
	Inter-unit cable		0			0	0	0	0	0	0							
	Switch circuit board	0		0														
OUTDOOR UNIT	Outdoor control circuit board		0		0	0	0	0	0	0	0						1	1
	Diode module		0			0												
	HIC		0			0												
	Electrolitic capicitor		0			0											1	1
	Fuse		0			0											2	2
	Compressor		0			0	0	0	0	0	0						3	3
	Compressor protective sensor		0			0			0	0							4	4
	Outdoor fan motor		0			0	0			0		0						
	4-way valve							0									5	5
	Coil thermistor		0			0						0	0				6	6
	Electric expansion valve													0	0	0	7	7
	Branch tubing temperature sensor		0														8	8

- For details about the inspection points, refer to the inspection points for each part.
- **Inspection points:** Read across from left to right
- **Problems:** Read down from top to bottom
- **Example:** Indoor unit does not operate. Check controller and indoor circuit board

Checking the EEV
(Electronic Expansion Valve)

Refco Part Number SVOM-18

Remove the EEV coil



Place the tool over the EEV stem

- Rotate 5 revolutions CW to close valve.
- Start unit and measure temp difference across EEV.
- Then rotate 5 revolutions CCW to open valve while system is running.
- Operation is normal if temperature changes.

Checking the coil resistance

Single Zone (6 wire)

Check resistance between:

- Gray to Yellow
- Gray to Orange
- White to Black
- White to Red

OK if 46 +/- 4 Ohm on each

Flexi-Multi (5 wire)

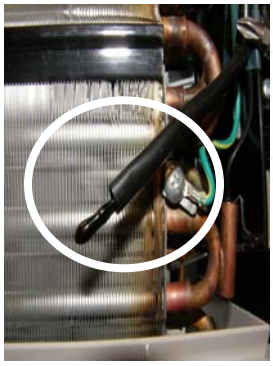
Check resistance between:

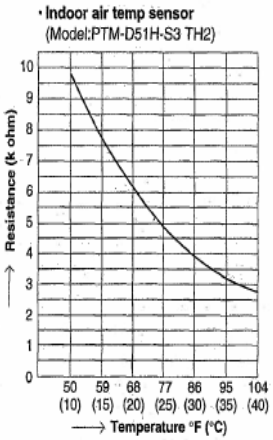
- Gray to Yellow
- Gray to Orange
- Gray to Black
- Gray to Red

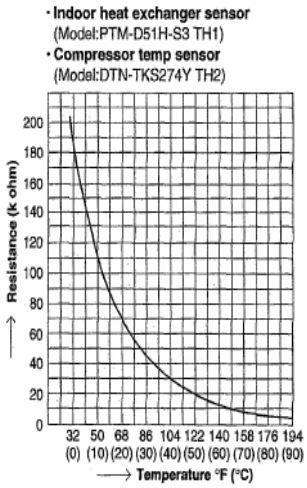
OK if 46 +/- 4 Ohm on each

Thermistor Values

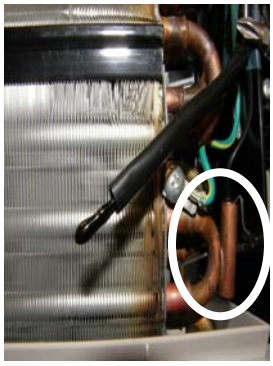
Indoor air temperature sensor



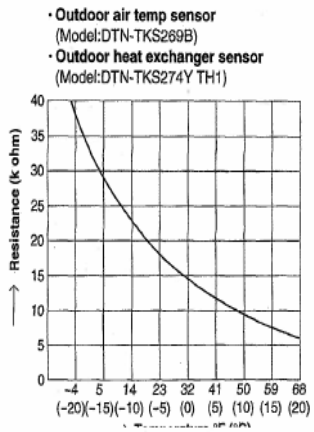




Indoor heat exchanger sensor



Outdoor air temperature sensor



- All resistances shown in “K” ohm values
- Sensor errors will display as “S” codes through diagnostics.
- **Example:** S01= Room temperature sensor failure

Before Calling Sanyo Technical Support
(Check the items on this list)

RAC Troubleshooting Procedures
For 9-24,000 BTU mini splits and all Flexi Multi.

1- <u>No Light on Outdoor Board</u>

A- Check Power Supply.

B- Check the fuse on board. If the fuse is soldered in, by pass it with an in line fuse holder until the short is located, this includes checking ohms on all components. Ohm terminals 1, 2 and 3 to ground. Visually check board and for any other possible shorts. If the fuse was good or bad, proceed to the next steps.

C- Ohm reactor. It should be (.3-.4 ohms).

D- Turn the power off and wait for it to dissipate. Disconnect the fan motor, compressor, crank case heater and the expansion valve from the board. If it is a flexi model, disconnect the expansion valve board. Turn the power on and check if the board light is on. If it isn't, the board is bad. If it is, one of the components is bad and ohms need to be checked.

- **Check the fan motor to ground.**
- **Check through the compressor windings and to ground. Mega ohm the windings because we have seen the DC compressors run (for a short time) when they are partially grounded.**
- **Check the crank case heater.**
- **Check the expansion valve. Ohm from the grey wire to the other wires in the expansion valve connector and you should read 46+ or minus 4 ohms.**
- **On Flexi models visually check the expansion board and ohm any expansion valves that plug into it.**

E- Plug each component back in one at a time until the light starts flashing or the light goes out and you have most likely found the bad component. Remember to turn the power off and let it dissipate each time before plugging another component back in.

2- Flashing light on Outdoor Board

- **Follow steps A-D in section 1 (No light on the outdoor board) and power the unit with the fan, compressor, crankcase heater and expansion valve disconnected.**

- **Once you have a solid light, plug each component back in one at a time. Remember to cycle the power and let it dissipate each time.**

- **If you plug the fan motor in and this cause's the light to flash it could be the board or the motor. There is no way to tell which one is bad. I would suggest ordering both parts and plugging the motor in first, to see if this resolves the problem since it is the easiest to check.**

3- No Lights On at the Indoor Unit

- **Check power supply at terminals 1 and 2. Is there a condensate pump with an open safety switch? If you have power and the unit will not respond to the remote proceed to next check.**

- **Check fuse on board. If the fuse on the board is blown, check all components that plug into the board. Verify that 220 volts was not run to a 110 volt unit.**

- **Try to start the unit with the manual (push button) on off button located in the bottom right hand corner (K models). If this does not work, change the board and the receiver.**

- **If the unit starts with the button, check the remote for proper addressing. Try resetting the remote by pushing the ACL button for 3-4 seconds.**

- **You can test the remote to see if it is sending a signal with an AM radio. Hold the remote next to the turned on AM radio and push one of the buttons on the remote. If you hear interference through the radio's speaker, the remote is working. Try it in several locations on the radio before condemning the remote.**

- **If the remote checks good but the unit will still not respond to it, replace the board and the receiver.**

4- Flashing lights on the Indoor Unit.

- **If this is a new installation, check polarity of the field installed inter connecting wires between terminals 1, 2 and 3 at the indoor and outdoor units. Also check for polarity issues caused by a work box, disconnects or a condensate pump.**

- **If an indoor or outdoor board has been changed, verify that the power wires that go to terminals 1, 2, and 3 are landed correctly. There is a schematic inside the covers of both units.**

- **There might be an error code. Use the remote to put the unit into self diagnostic mode and retrieve the error code. The procedure is explained on the back of the indoor unit's cover. It is also in the service manual which can be down loaded at our web site.**

- **If there are communication codes, disconnect the field wire at terminal 3 of the indoor unit and check for 22-26 volts DC between terminal 3 and 2 (not the wire and 2). If there is no voltage, replace the indoor board. If the voltage checks good connect the wire back up and proceed to the next step.**

- **Disconnect the wire at the number 3 terminal of the outdoor unit and check for the same voltage between the wire and terminal 2 of the outdoor unit. Note that if this is a flexi model it might not be labeled as terminal 3 but, it is the third wire going to the indoor unit you are troubleshooting. If the voltage checks the same, the outdoor board is causing the problem. If the voltage is higher, or lower, replace the interconnecting (14/3 with ground) field wiring.**

Other Items for Troubleshooting

- **If the indoor unit is running, has a steady green light, and will not cool. It is most likely locked out on low ambient**
- **If you are having intermittent problems, verify the power supply is not pulled from a 3 phase panel.**
- **Check for voltage on the ground wire of your power supply.**
- **Verify the 3 wires that go from the board to 1, 2 and 3 are landed properly if board/boards have been changed.**
- **If an outdoor board has been changed, verify that ALL the screws that hold the board down are in place and tight.**
- **Ohm the crank case heater, it should read between 700-1500. This heater can short out the circuit board.**

PAC Product

Professional Air Conditioning

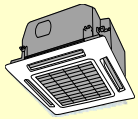
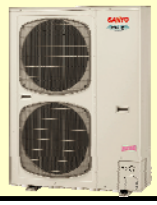
26,000-42,000 Btu Models

Product Line-Up
(Outdoor units)

	26,000BTU	30,000BTU	36,000BTU	42,000BTU
Appearance				
Capacity C/H (BTU)	Cooling/Heating 26,000/30,800	Cooling/Heating 30,000/34,800	Cooling/Heating 33,500/37,400	Cooling/Heating 39,500/48,000
Dimensions (inches) Weight (lbs)	H 30-11/16 x W 37 X D 13-3/8 128 lbs	H 30-11/16 x W 37 X D 13-3/8 143 lbs		H 48-15/32 x W 37 X D 13-3/8 220 lbs
Power Supply	Single phase 208-230 V, 60Hz			
Operation Range	Cooling 0° F ~ 109° F Heating 5° F ~ 75° F			
Production	DALLIAN SANYO Air Conditioner Co., Ltd.			

- All PAC systems are Low Ambient & rated to 0 degrees out door temperature.

Product Line-Up
(Indoor units)

Indoor Unit	26,000BTU	30,000BTU	36,000BTU	42,000BTU
K 	SC HP	SC HP	SC HP	
T 	SC HP		SC HP	SC HP
X 	SC HP		SC HP	SC HP
U 	SC HP		SC HP	
Outdoor unit DC Inverter DC Fan motor				

- All Systems Are Low Ambient 0 degrees outdoor temperature

KHS Models
(Wall Mounted)

RCS-TM80BG
Wired remote control
(Optional)

RCS-SH1UA
Wireless remote control
(standard)

Cooling and heat pump capable

- **Sleek Design**
- **Easily serviceable**
- **Low operating sound**
- **Wireless remote control (Included)**
- **Wired remote control (Optional)**

THW Models
(Ceiling Suspended)

RCS-TM80BG
Wired remote control
(Standard)

RCS-SH80UA
Wireless Remote Control kit
(Optional)

Cooling and Heat Pump Capable

- Fresh air capability
- Wired remote (Included)
- Wireless remote (Optional)
- Low operating sound

XHW Models
(Ceiling Recessed)

12,000 & 18,000 Btu Models Available
True 2 ft. X 2 ft. Footprint

RCS-TM80BG
Wired remote control
(Standard)

RCS-SH80UA
Wireless remote control kit
(Optional)

Cooling and Heat Pump Capable

- Wired remote (Include
- Wireless remote (Optional)
- Adjustable 4 way air discharge
- Fresh air capability [Plenum Required]
- Remote ducting (Optional)
- Built in condensate pump (10” lift)

UHW Models
(Concealed Duct)

RCS-TM80BG
Wired remote control
(Standard)

RCS-SH80UA
Wireless remote control kit
(Optional)

Cooling and heat pump capable

- Twenty Five (25') MAXIMUM duct run per outlet
- Wired remote (Included)
- Wireless remote (Optional)
- Ducted model [8"] with convertible return opening

Operation Range
(26,000-42,000 Btu Models)

Cooling & Low Ambient Model

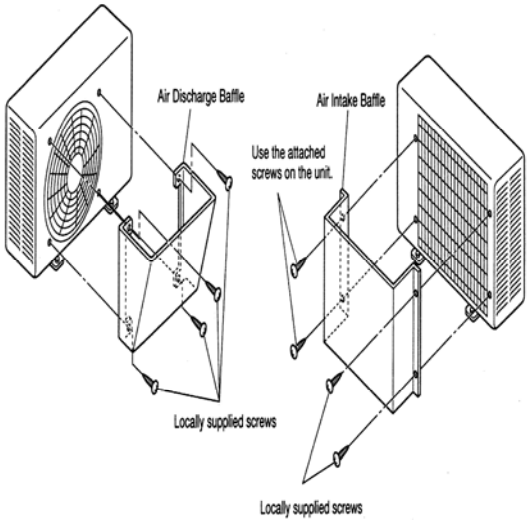
	Temperature	Indoor Air Intake Temp.	Outdoor Air Intake Temp.
Cooling	Maximum	95°F DB / 71°F WB	109°F DB
	Minimum	67°F DB / 57°F WB	0°F DB

Heat Pump Unit

	Temperature	Indoor Air Intake Temp.	Outdoor Air Intake Temp.
Cooling	Maximum	95°F DB / 71°F WB	109°F DB
	Minimum	67°F DB / 57°F WB	0°F DB
Heating	Maximum	80°F DB / 67°F WB	75°F DB / 65°F WB
	Minimum	-°F DB / -°F WB	5°F WB

For windy locations Sanyo recommends a wind baffle installed on the outdoor unit for low ambient operation.

The dimensions for the wind baffles can be found in the installation manual.



Sanyo Wind Baffle Part # WIND-B1

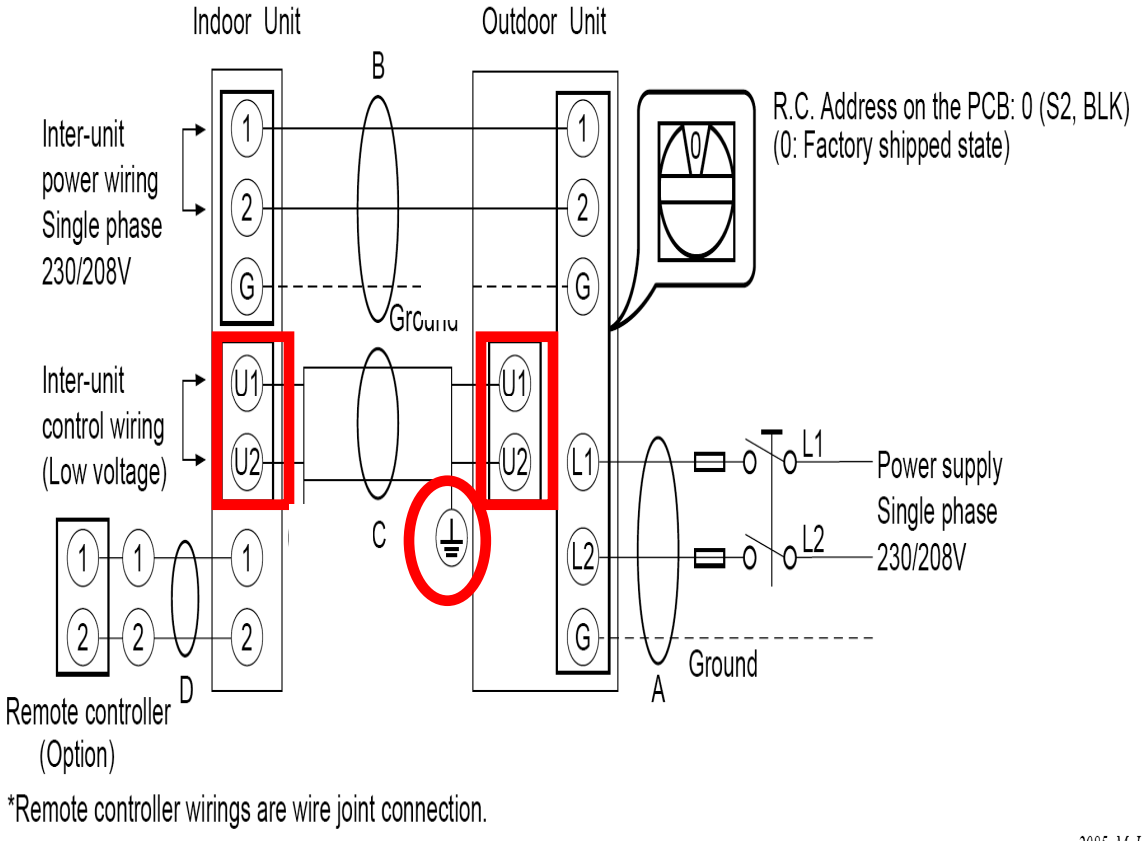
Tubing sizes, Length and Elevation Difference Refrigerant Charge, Adjustment & Insulation Chart.

SYSTEM MODELS	OD TUBE SIZE (inches)		MAXIMUM LENGTH ft. OF TUBING BETWEEN IN/OUTDOOR	MAXIMUM ELEVATION DIFFERENCE (ft) BETWEEN IN/OUTDOOR		MAXIMUM LENGTH (ft) OF TUBING AT SHIPMENT	REQUIRED ADDITIONAL REFRIGERANT OZ/FT	INSULATION BOTH TUBES
	NARROW	WIDE		OUTDOOR ABOVE	OUTDOOR BELOW			
26KS72R	3/8	5/8	165'	100'	50'	100'	R401A 0.43oz.	Both Tubes seperately 1/2 inch insulation
26TS72R								
26XS72R								
26US72R								
26KH72R								
26TH72R								
26XH72R								
26UH72R								
26KHH72R								
26THH72R								
30KS72R								
30KH72R								
36KS72R								
36TS72R								
36XS72R								
36US72R								
36KH72R								
36TH72R								
36XH72R								
36UH72R								
36THH72R								
42TS72R								
42XS72R								
42TH72R								
42XH72R								

No additional compressor oil charge is necessary

Electrical wiring
(26,000-42,000 BTU Systems)

Dual or single point line voltage



18/2 shielded wire is required and
must be <u>grounded at one end</u>

Recommended
(Wire length and diameter)

Outdoor Unit

* AWG = American Wire Gauge

Model Name	(A) Power Supply	Trade Size of Conduit	MOP (Fuse or HACR type circuit breaker)	Power Supply Terminal Base		Trade Size of Conduit
				Capacity	Max. Wire Diameter	
CH2672R	AWG #12 Max. length 64 ft.	3/4 in.	30 A	50 A	AWG #6	1-1/4 in.
CH3072R	AWG #10 Max. length 92 ft.	3/4 in.	35 A (230/208 V)	50 A	AWG #6	1-1/4 in.
CH3672R	AWG #10 Max. length 92 ft.	3/4 in.	35 A (230/208 V)	50 A	AWG #6	1-1/4 in.
CH4872R	AWG #10 Max. length 81 ft.	3/4 in.	40 A	50 A	AWG #6	1-1/4 in.

Model Name	(A) Power Supply	Trade Size of Conduit	MOP (Fuse or HACR type circuit breaker)	Power Supply Terminal Base		Trade Size of Conduit
				Capacity	Max. Wire Diameter	
C2672R	AWG #12 Max. length 76 ft.	3/4 in.	25 A	50 A	AWG #6	1-1/4 in.
C3072R	AWG #10 Max. length 99 ft.	3/4 in.	30 A (230/208 V)	50 A	AWG #6	1-1/4 in.
C3672R	AWG #10 Max. length 99 ft.	3/4 in.	30 A (230/208 V)	50 A	AWG #6	1-1/4 in.
C4872R	AWG #10 Max. length 81 ft.	3/4 in.	35 A	50 A	AWG #6	1-1/4 in.

Follow local electrical codes

Remote Controller
(Options)

1. Timer remote controller
(RCS-TM80BG)

2. System controller
(SHA-KC64UG)

3. Wireless remote controller
(RCS-SH1UA, RCS-SH80UA-WL, RCS-BH80UA-WL)

4. Simple remote
RCS-KR1AGB

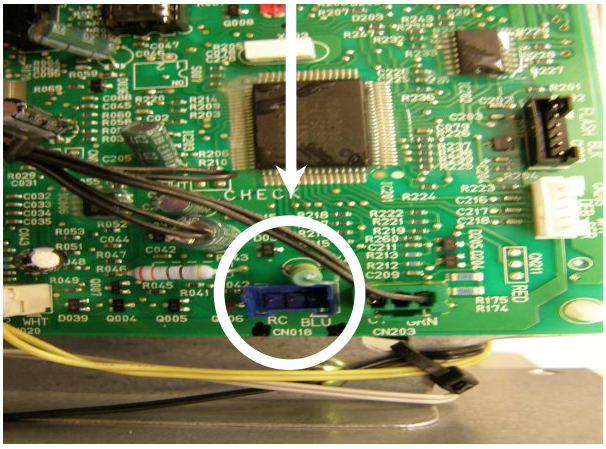
RCS-TM80BG
(Functions)

- On/Off
- Mode selection
  - cooling, heating, dry, auto, fan
  - Auto changeover
- Set temperature
  - Cooling/Dry: 64 to 86
  - Heating: 61 to 86
- Fan speed: Auto, low, high, high-high
- Air direction
- 7 day programmable (6 events/day)
- Controls up to 8 indoor units
- Main or sub on same unit or group

Using the RCS-TM80BG
(Monitoring, diagnostic & EPROM setting)

Sanyo connector part # 623-178-5082

Wire nut black and white from the RCS-TM80BG to the connector



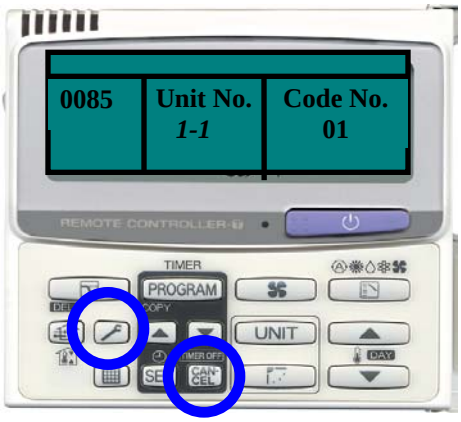
Plug the male end of the connector into the female connector marked "RC" on the outdoor circuit board. The "RC" connector on the indoor can be used for applications with only wireless remote control.

Monitoring Indoor & Outdoor
(Sensor Temperatures)

- The LCD display changes to sensor temperature, Unit no. and code no.
- Use the Temp Setting Keys to scroll through codes (Sensor Address)
- For group control press the Unit key to the address of the unit to monitor
- To monitor the outdoor sensors plug the connector into the "RC" jack on the outdoor circuit board and follow the above procedure.
- Press the Wrench key to return to normal display when finished

Sensor Temperature Relationship Table

Location where sensor is installed	Sensor address	Sensor type	Sensor address	Sensor type
Indoor unit	01	Remote controller temperature	06	Discharge temperature sensor
	02	Indoor unit intake temperature	07	—
	03	Indoor unit heat exchanger temperature (E1)	08	Indoor unit electronic expansion valve position
	04	—	09	—
	05	Indoor unit heat exchanger temperature (E3)		
Outdoor unit	0A	Discharge temperature 1	12	Input power current
	0b	Discharge temperature 2	13	CT1
	0C	High-pressure sensor temperature	14	CT2
	0d	Heat exchanger gas 1	15	—
	0E	Heat exchanger liquid 1	16	—
	0F	Heat exchanger gas 2	17	Detected reservoir tank temperature
	10	Heat exchanger liquid 2	18	Detected oil temperature
	11	Outside air temperature	19	—



Example:

Code 1, Refrigerant Circuit 1, Unit 1.
Remote controller temperature of 85 degrees

Monitoring Indoor & Outdoor
(Error codes)

•Press the **"Set"** and the button that looks like a **"Wrench"** together for 4 seconds or more.

•Use the temperature **"Up & down Arrows"** to scroll through the 8 codes in the outdoor memory. There are up to 4 codes stored on the indoor memory

•Code 1 is the newest and 4 is the oldest code that the unit has faulted out on.

•Refer to your error code list in the service manual for code explanations and course of action for repairs.

•To clear all codes press the "**Cancel Button".**

•Press the button that looks like a **"Wrench"** to exit trouble history.

•Install RC plug back into the outdoor / indoor unit and install the remote back in place.

Indoor and Outdoor
(EPROM settings)

Indoor EPROM settings

Item code	Item	Setting data					
		No.	Description	No.	Description	No.	Description
10	Type	0000	1-Way Air Discharge Semi-Concealed	0001	4-Way Air Discharge Semi-Concealed		
				0005	Concealed-Duct	0006	Concealed-Duct High Static Pressure
		0007	Ceiling-Mounted	0008	Wall-mounted		
11	Indoor unit capacity	0000	disabled	0001	22	0002	25
		0003	28	0004	32	0005	36
		0006	40	0007	45	0008	50
		0009	56	0010	63	0011	71
		0012	80	0013	90	0014	100
		0015	112	0016	125	0017	140
		0018	160	0020	200	0021	224
		0023	280				
12	System address (Outdoor unit)	0001	Unit No. 1 (Outdoor unit system (outdoor unit) address is "1".)				
		0002	Unit No. 2 (Outdoor unit system (outdoor unit) address is "2".)				
		0003	Unit No. 3 (Outdoor unit system (outdoor unit) address is "3".)				
		≀	≀				
		0030	Unit No. 30 (A setting which exceeds this number of units is not possible.)				
		0099	System (outdoor unit) address is undefined. (In this case, the system (outdoor unit) address must be set.)				
13	Indoor unit address	0001	Unit No. 1				
		0002	Unit No. 2				
		0003	Unit No. 3				
		≀	≀				
		0064	Unit No. 64 (A setting which exceeds this number of units is not possible.)				
		0099	Indoor unit address is undefined. (In this case, the indoor unit address must be set.)				
14	Group address	0000	Individual (indoor units where group control wiring has not been connected)				
		0001	Main unit (one of the indoor units where group control is in effect)				
		0002	Sub units (all indoor units other than the main unit where group control is in effect)				
2E	T10 terminal	0000	HA terminal (At time of shipment)				
		0001	Used for OFF reminder				

Outdoor EPROM settings

5. Outdoor unit maintenance remote control

List of Item Codes

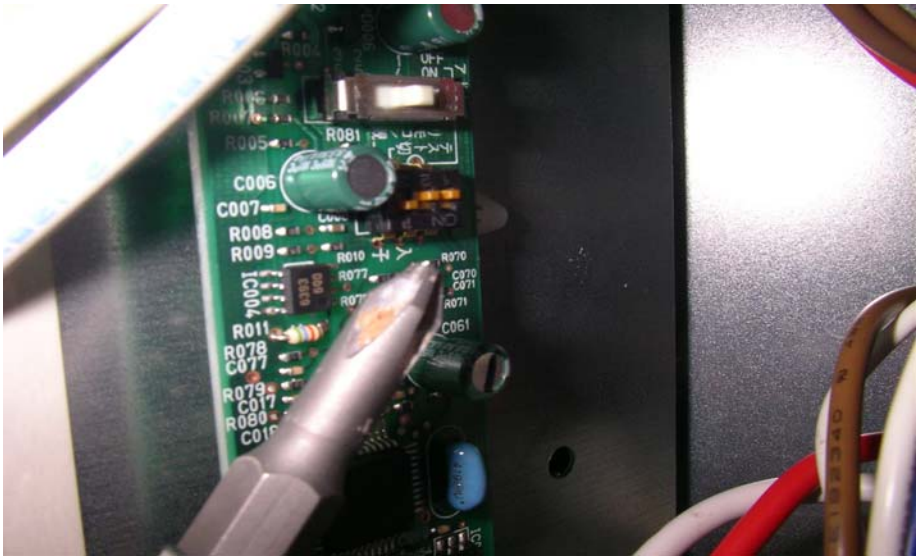
Item code	Parameter	
80	Refrigerant type	407 = R407C 22 = R22 410 = R410A
81	Outdoor unit capacity*	0 = Disabled 80 : 26 type 112 : 30, 36 type 140 : 42 type
82	Control system schedule	Do not set
83	Control system schedule	Do not set
84	3-phase or single-phase	0 = 3-phase 1 = single-phase
85	Power frequency	Do not set
86	Control system schedule	Do not set
87	Control system schedule	Do not set
88	Control system schedule	Do not set
89	Crank case heater control	0 = No 1 = Yes
8A	Control system schedule	Do not set
8b	Control system schedule	Do not set
8E	Control system schedule	Do not set

(*) Figures represent the capacity data for each model.

For a complete listing of the eprom codes download a service manual from www.us.sanyo/hvac.com

Wireless Remote Controller
(Switch Setting)

- RCS-SH1UA Wireless Remote Control for “K” style indoor units have a built-in receiver installed.
- (26-42,000 BTU Models)
- Dip switch setting must be changed when wireless remote is utilized.



- To Allow Wireless Control of Wall Mounted PAC Series
  - Locate SW101 on the indoor PCB
  - Setting for wired remote
    - DIP 1, 2 = Off
    - DIP 3 = On
  - Setting for wireless remote
    - DIP 1, 2, 3 = Off

Commissioning the system
(Initial Startup)

Reset Procedure for Auto Address Failure on the 26,000 Btu to 42,000 Btu Models

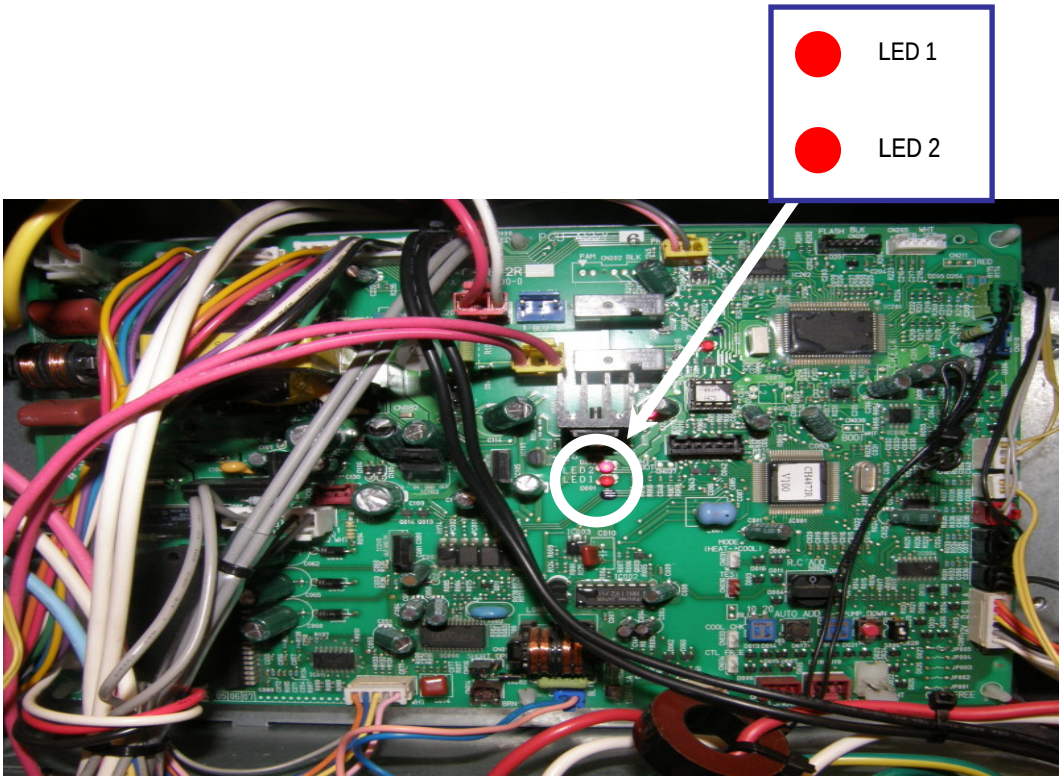
- When determining if an auto address failure has taken place you will need to look at the indicator lamp assembly.
- This lamp assembly will be located on the indoor unit's receiver, which receives and transmits the signal from the remote controller to the indoor units PCB assembly.
- The green "Operation Lamp" will be "Blinking" indicating that a fault has taken place and no operation of either the indoor or outdoor unit will be possible.
- When a wired remote controller is utilized where no receiver is needed, then the error code will be shown on the display screen of the remote.
- All "Error Codes" can be located in the troubleshooting section of the service and technical manual.

Operation Light "Blinking"

Errors will be displayed on the remote
Example: P22=Outdoor fan failure

Reset Procedure for Auto Address Failure
(26,000 Btu to 42,000 Btu Models)

- When utilizing the wireless type remote it will be necessary to go to the outdoor units PCB assembly and locate the two lamps on the main board marked "LED 1 & LED 2". These are the error lamps.
- The lamps will blink a certain way indicating what type of failure has taken place with the units.
- For example both lamps blinking together simultaneously are indicative of an "Auto Address Failure".
- If the lamps are blinking separately you must count the number of blinks on each lamp to determine the precise code.



Probable Causes

Auto address failure or communication errors

- Indoor and outdoor units not powered within 6 minutes at initial startup.
- The communication (U1 & U2) line is broken.
- A good communication line should ohm out at around 100 ohm's at the indoor and outdoor units U1 & U2 terminals

Indoor unit at U1 & U2 communication line

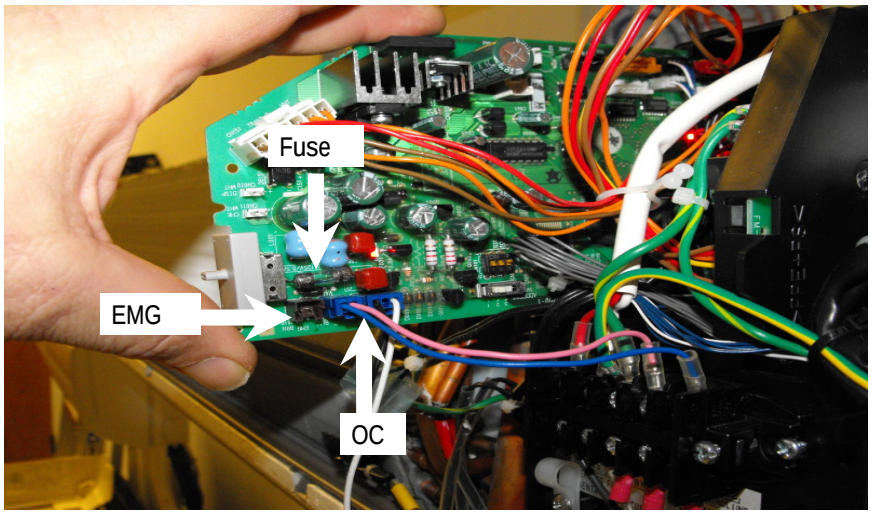
Outdoor unit at U1 & U2 communication line

Probable Causes

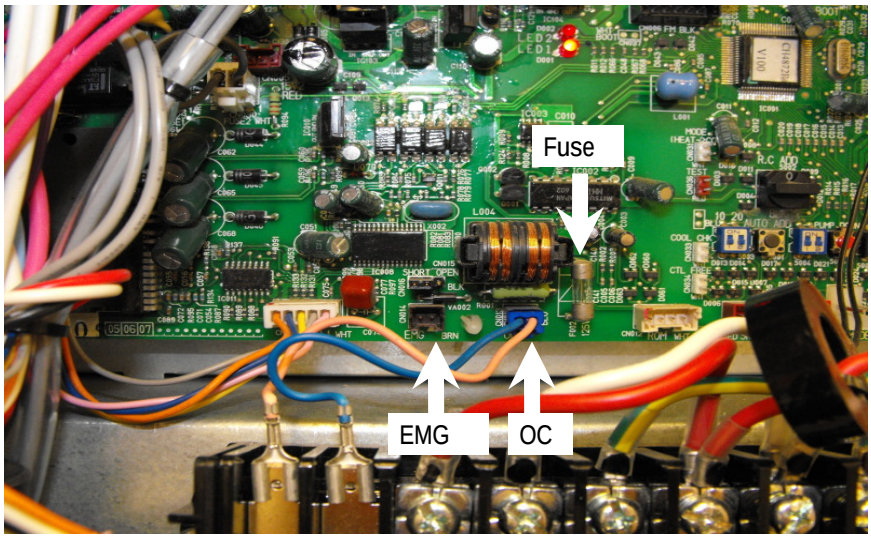
Auto address failure or communication errors

The probable cause of a blown fuse is line voltage has been applied to the U1 & U2 communication line

At the indoor circuit board even if 100 ohm's is detected on the U1 & U2 line then check the fuse. If the fuse is bad then move the molex plug from the OC to the EMG socket.



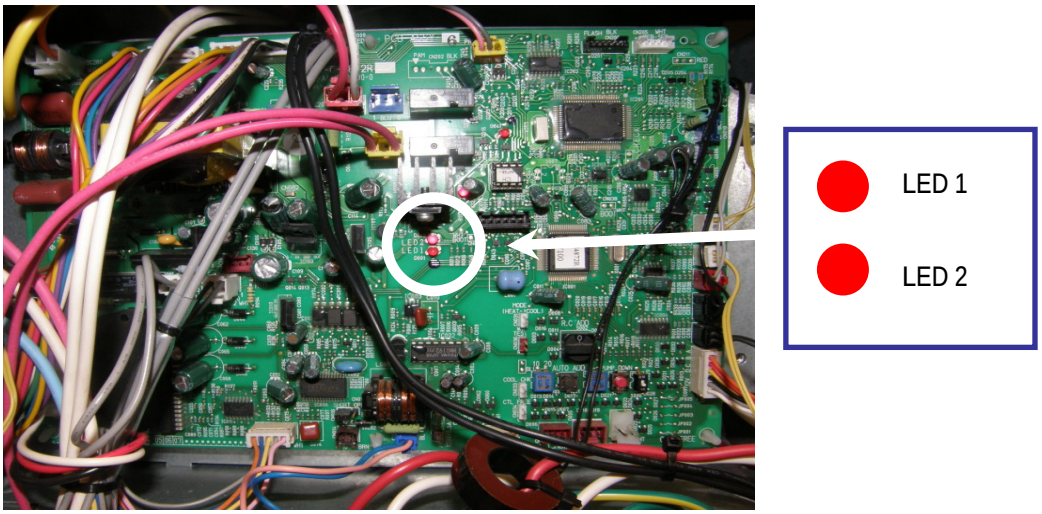
At the outdoor circuit board if 100 ohm's not detected on the U1 & U2 line then check the fuse. If the fuse is bad then move the molex plug from the OC to the EMG socket.



Reset Procedure for Auto Address Failure (26,000-42,000 BTU Models)

- At the outdoor unit's circuit board if the lamps are blinking separately count the number of blinks on each lamp to determine the precise code.

- If the lamps are blinking simultaneously this is an auto address failure



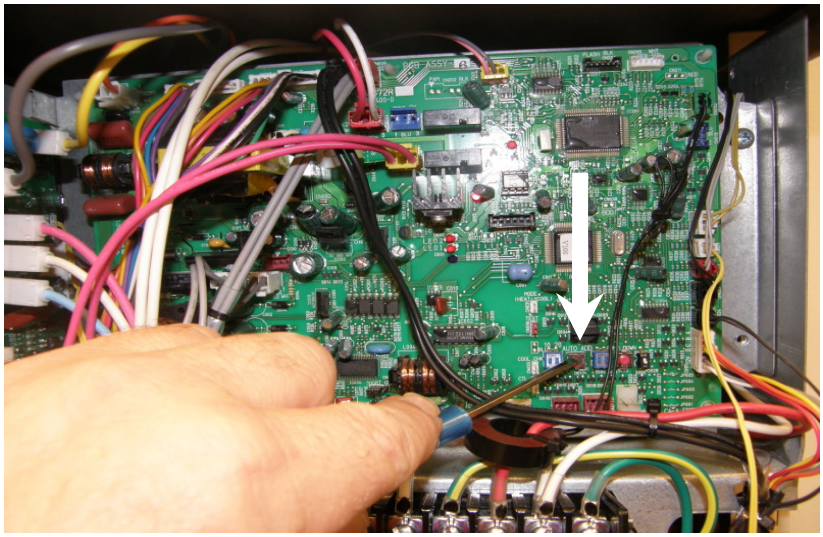
Alternate blinking during alarms key:

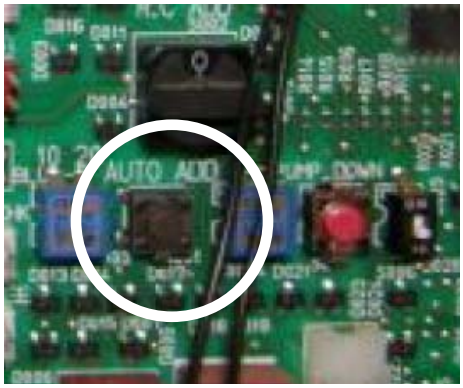
LED 1 blinks M times, then LED 2 blinks N times. The cycle repeats.

M=2: P alarm 3:= H alarm 4:= E alarm 5:= F alarm 6:= L alarm
N= alarm number

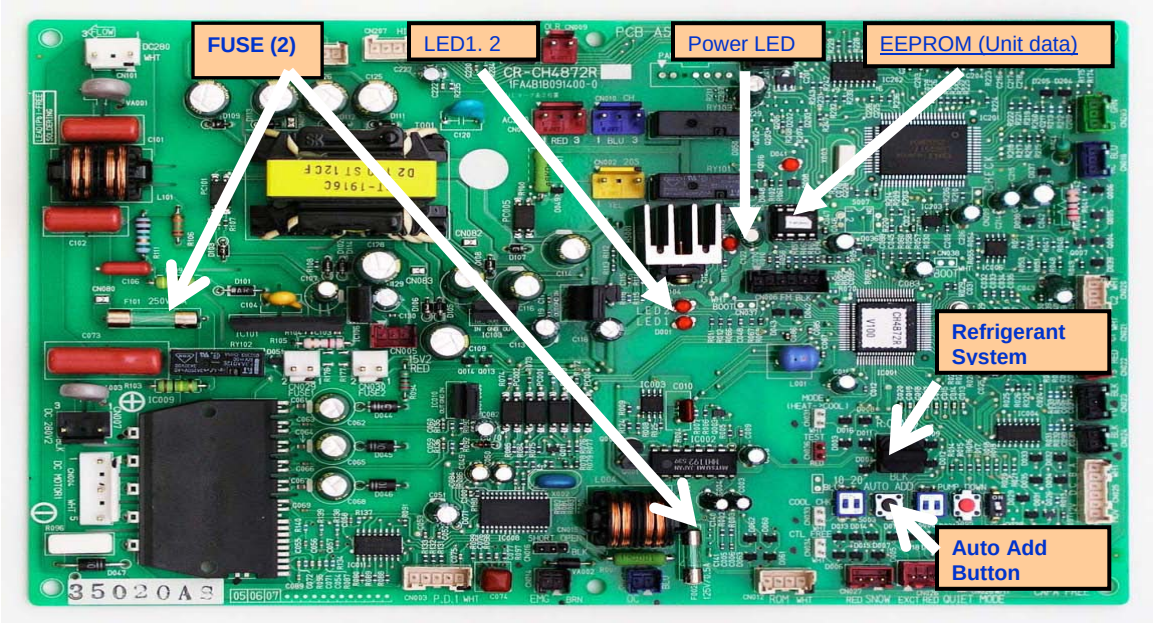
Reset Procedure for Auto Address Failure (26,000-42,000 BTU Models)

- When re-addressing the indoor and outdoor units, you must first go to the outdoor units PCB assembly and locate the "Black Button" marked "Auto Add".
- First shut off the outdoor units power by de-energizing the disconnect switch and waiting for the lamps on the board to go completely out.
- Then re-energize the circuit and then push in the "Black Button" for approximately four seconds or until the lights marked "LED 1 and LED 2" start alternating back and forth.
- Eventually, these two lamps should go completely off if the auto addressing process was successful. Please note this can take several minutes to complete.





Outdoor Circuit Board



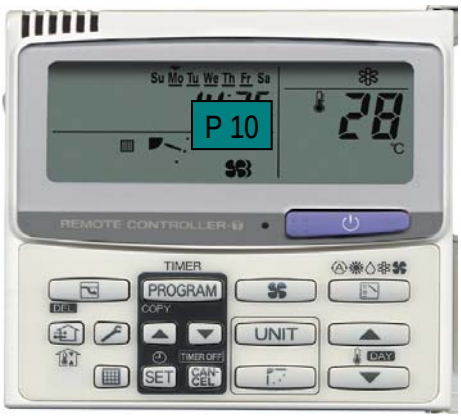
Troubleshooting

(26,000- 42,000 BTU Models)

- If no operation of indoor or outdoor units exist always check terminals 1 & 2 of the indoor unit to verify 208/230v is present.
- Check the indoor & outdoor boards to verify that the red power led is illuminated. If the light is not lit, check the power transformer for secondary voltages: (2 red wires= 14.8vac) (2 brown wires= 14.8vac) 2 orange wires= 20vac)
- If all voltages are confirmed with no operation then proceed to the outdoor unit. On the outdoor main pcb board check the led lights marked 1 & 2. Both lamps should be off in normal operation.
- If they are lit this represents an error code. If they are both blinking together this represents an auto-address failure. Power the system down and wait until all led's go completely out.
- Press and hold the black button marked **"auto add"** for 5-10 seconds until led's 1 & 2 start alternating blinking. Release the button. The system is now addressing. This process can take up to 5 minutes or more. If both lights go completely out the system is now addressed.

Meaning of Alarm Messages
(Wired Remote vs. Wireless)

Wired remote codes show in the display
P10 Code= Float switch open



Wireless remote codes leave more possibilities. Watch the Operation, Timer & Standby Lights. Are they alternating or blinking on the indoor unit. The same P10 code on the wired remote has three possibilities with the wireless remote.
P01, P09 or P10

Meaning of Alarm Messages

- Wired Remote: Code is on the display of the remote
- Wireless: Blinking/Alternating lights on indoor unit

ON: ○ Blinking: ☼ OFF: ●

Possible cause of malfunction			Wired remote control display	Wireless remote controller receiver display		
				Operation	Timer	Standby
Serial communication errors Mis-setting	Remote controller is detecting error signal from indoor unit	Error in receiving serial communication signal (Signal from main indoor unit in case of group control) Outdoor system address, indoor system address, or indoor unit individual/main/sub setting is not set (Automatic address setting is not completed) Auto address is not completed	E01	☼	●	●
		Error in transmitting serial communication signal	E02			
	Indoor unit is detecting error signal from remote controller (and system controller)		E03			
	Improper setting of indoor unit or remote controller	Indoor unit address setting is duplicated	E08			
		Remote controller setting is duplicated	E09			
	Indoor unit is detecting error signaled from signal option	Error in transmitting serial communications signal	E10			
		Error in receiving serial communications signal	E11			
	Automatic address setting failed	Starting auto address setting is prohibited This alarm message shows that the auto address connector CN100 is shorted while other RC line is executing auto address operation.	E12	●	●	☼
		Indoor unit capacity too low	E15			
		Indoor unit capacity too high	E16			
		No indoor units connected	E20			
	Setting error	Main unit duplication in simultaneous-operation multi control (detected by outdoor unit)	E14			
	Indoor unit is detecting error signaled from outdoor unit	Error in receiving serial communications signal	E04			
		Error in transmitting serial communications signal	E05			
	Outdoor unit is detecting error signaled from indoor unit	Error in receiving serial communications signal (including unit quantity verification failure)	E06			
		Error in transmitting serial communications signal	E07			
	An indoor unit detected trouble in the signal from another indoor unit	Error in transmitting serial communications signal	E17	☼	●	●
		Error in receiving serial communications signal	E18			
	Communications trouble between units	Communications failure with MDC	E31	●	●	☼
Mis-setting	Setting error	Indoor unit group settings error	L01	☼ Simultaneously	●	☼ Simultaneously
		Indoor/outdoor unit type mismatch	L02			
		Main unit duplication in group control (detected by indoor unit)	L03			
		Outdoor unit address duplication (system address)	L04	☼ Simultaneously	○	☼ Simultaneously
		Group wiring connected for independent indoor unit	L07			
		Address not set or group not set	L08	☼ Simultaneously	●	☼ Simultaneously
		Indoor unit capacity not set	L09			
		Outdoor unit capacity not set or setting error	L10	☼ Simultaneously	○	☼ Simultaneously
		Miswiring in group control wiring	L11			
		Indoor unit type setting error (capacity)	L13			

Continued

Meaning of Alarm Messages

Possible cause of malfunction			Wired remote control display	Wireless remote controller receiver display		
				Operation	Timer	Standby
Ceiling panel connection failure			P09			
Activation of protective device	Indoor protection	Fan protective thermostat	P01	●	☼	☼
		Float switch	P10	Alternately		
	Outdoor protection	Discharge temperature trouble	P03			
		High pressure switch or compressor motor thermal protector is activated.	P04			
		Open phase detected, AC power trouble	P05			
		No gas	P15			
		4-way valve locked	P19	☼	●	☼
		High cooling load	P20	Alternately		
		Outdoor fan trouble	P22			
		Inverter compressor trouble (HIC PCB)	P26			
		Inverter compressor trouble (MDC)	P29			
		Simultaneous-operation multi control trouble	P31			
		Compressor current failure (overload)	H01	●	☼	●
Thermistor fault	Thermistor open circuit • Short circuit (Indoor)	Indoor heat exchanger temperature sensor (E1)	F01			
		Indoor heat exchanger temperature sensor (E2)	F02	☼	☼	●
		Indoor temperature sensor	F10	Alter.		
	Thermistor open circuit • Short circuit (outdoor)	Discharge temperature (TD)	F04			
		Outdoor heat exchanger temperature (C1)	F06			
		Outdoor heat exchanger temperature (C2)	F07	☼	☼	○
		Outdoor air temperature (TO)	F08	Alter.		
		Intake temperature (TS)	F12			
		Indoor EEPROM error	F29	☼	☼	●
				Simul.		
		Outdoor EEPROM error	F31	☼	☼	○
				Simul.		

Meaning of Alarm Messages

	LED 1	LED 2	Remarks
Power ON sequence			
1. No communication from indoor units in system	○	○	If it is not possible to advance to 3, repeats 1 → 2. At 3, changes to normal control.
2. Communication received from 1 or more indoor units in system	●	●	
3. Regular communication OK (Capacity and unit quantity match)	●	●	
Normal operation	○	☼	Displayed during automatic address setting 1 and initial communication. After these are completed, alarm F31 is displayed.
EEPROM error (F31)			
Pre-trip (insufficient gas)	☼(0.25/0.75)	●	P03
Pre-trip (P20)	☼(0.75/0.25)	●	
Pre-trip (other)	☼	●	
Alarm	**Alternate blinking during alarms** LED 1 blinks M times, then LED 2 blinks N times. The cycle then repeats. M = 2: P alarm 3: H alarm 4: E alarm 5: F alarm 6: L alarm N = Alarm No. * Refer to "1. Examples of alarm display" below.		
Insufficient gas indicator	☼	●	
Refrigerant recovery mode	☼	●	
Automatic address setting			
Automatic address setting in progress	☼	☼	Blinking alternately
Automatic address setting alarm (E15)	☼(0.25/0.75)	☼(0.25/0.75)	Blinking simultaneously
Automatic address setting alarm (E20)	☼(0.75/0.25)	☼(0.75/0.25)	Blinking simultaneously
Automatic address setting alarm (Other than E15 and E20)	☼	☼	Blinking simultaneously

○ : **ON**

☼ : **Blinking (0.25/0.75)** indicates that the lamp illuminates for 0.25 seconds, and then is OFF for 0.75 seconds. Unless otherwise indicated, the blinking is (0.5/0.5).

● : **OFF**

(3) Examples of alarm display (other than E15, E16, and E20)

Alarm / Display	LED 1 ← Alternately → LED 2	
P03	☼ (Blinks 2 times)	☼ (Blinks 3 times)
P04	☼ (")	☼ (Blinks 4 times)
P05	☼ (")	☼ (Blinks 5 times)
P31	☼ (")	☼ (Blinks 31 times)
H01	☼ (Blinks 3 times)	☼ (Blinks 1 times)
•	•	
E04	☼ (Blinks 4 times)	☼ (Blinks 4 times)
•	•	
F07	☼ (Blinks 5 times)	☼ (Blinks 7 times)
•	•	
L13	☼ (Blinks 6 times)	☼ (Blinks 13 times)
•	•	

Note:
This table shows example alarms. Other alarms may also be displayed.

Meaning of Alarm Messages

Remote controller alarm display	Alarm contents	Judgment condition	Clear condition	Judgment and correction
P03	Abnormal discharge temperature • Discharge temp. detected at or above the specified value.	Stops when temp. exceeds 232 °F.	Recovery at restart	1. Check refrigerant cycle (gas leak). 2. Electronic control valve trouble 3. Check tubing sensor (TD).
P04	High pressure switch is activated. Compressor motor thermal protector is activated.	Stops when pressure exceeds 600 psi. Stops when temp. exceeds 230 °F.	Recovery at restart	1. Check the high pressure switch connector is securely connected. 2. Check the ourdoor unit heat exchanger is not clogged (cooling operation). 3. Check the indoor unit air filter has not become clogged (heating operation)
P05	Missing phase detected. (CT disconnected or AC power trouble)	Current value sent from MDC on outdoor unit control PCB is low. No AC power input for 3 minutes or longer: pre-trip - 5	Recovery at restart	1. Check R/S/T power. 2. Check inverter control PCB. 3. Check outdoor unit control PCB.
P15	Insufficient gas level detected.	The following conditions continue for 1 minute. • Discharge temp. is 203 °F or higher. • Electronic control valve is at step 480. • Current value from MDC is 2.0 A or less.	Recovery at restart	Check refrigerant cycle (gas leak).
P19	4-way valve locked • Judgment occurs after compressor has been ON for 5 minutes.	Indoor heat exchanger temp. drops although compressors are ON in heating mode: [min(E1, E2)] ≤ 50 °F. Indoor heat exchanger temp. rises although compressors are ON in cooling mode: E2 ≥ 104 °F.	Recovery at restart	1. Check 4-way valve. 2. Check 4-way valve wiring. 3. Check outdoor unit control PCB.
P20	High-pressure protection trouble	If MAX (C1,C2) is 142°F or higher, the compressor stops one. The compressor restarts three time, and if the temperature does not decrease to less than 142°F, the alert "P20" is displayed.	Recovery at restart	1. Refrigerant cycle overload operation 2. Outdoor coil temperature sensor C1 or C2
P22	Outdoor unit fan motor trouble • Inverter protection circuit was activated, or lock was detected, at outdoor unit fan motor.	Inverter stops after alarm is detected	Recovery at restart	1. Position detection trouble 2. Overcurrent protection circuit at outdoor unit fan motor was activated. • Check outdoor unit control PCB. • Refer to outdoor unit fan judgment methods.
P26	Inverter protection circuit was activated, or G-Tr short-circuit (short time: 0.8 s or less) in inverter control	Inverter stops after alarm is detected. Alarm is output when inverter stops (pre-trip) consecutively 4 times.	Recovery at restart	1. Stops immediately when restarted. • Layer short in the compressor 2. Check inverter control PCB. • Wiring trouble

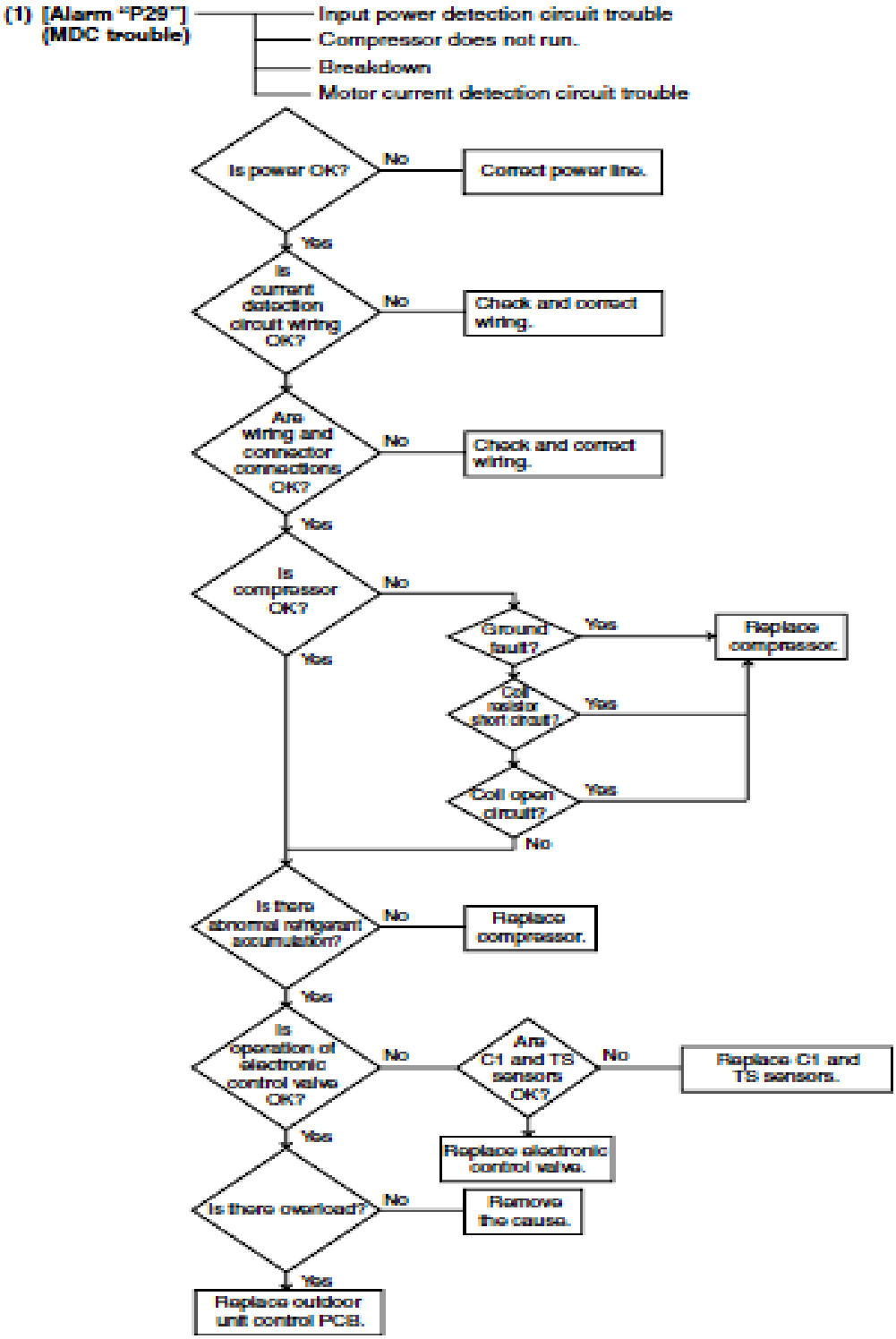
Meaning of Alarm Messages

Remote controller alarm display	Alarm contents	Judgment condition	Clear condition	Judgment and correction
P29	Current detection circuit trouble • AC current value is high even when compressor is stopped.	Inverter stops after alarm is detected. Alarm is output when inverter stops (pre-trip) consecutively 4 times.	Recovery at restart	1. Stops immediately when restarted. • Layer short in the compressor 2. Check inverter control PCB. • Wiring trouble
	Compressor motor output trouble, Inverter compressor trouble, MDC trouble	Inverter stops after alarm is detected.	Recovery at restart	1. Refrigerant cycle trouble, overload operation 2. Loose screws and contact failure between HIC control PCB and radiating plate 3. Cooling failure of radiating plate 4. Check outdoor unit PCB wiring.
	Compressor does not run. (Overcurrent protection circuit activates after a certain period of time following compressor start.)	Inverter stops after alarm is detected.	Recovery at restart	1. Compressor trouble (locked, etc.) • Replace the compressor. 2. Compressor wiring trouble (missing phase)
	Compressor breakdown • Starts to operate but operating frequency drops and compressor stops.	Inverter stops after alarm is detected.	Recovery at restart	1. Check power voltage: AC 203 V ±20 V or 230 V ± 23 V. 2. Refrigerant cycle overload operation 3. Check AC current detection circuit.
	Inverter control PCB position detection circuit trouble	Inverter stops after alarm is detected.	Recovery at restart	Position detection circuit is activated even when the compressor 3P connector is disconnected and the compressor operated. • Replace the inverter control PCB.
F04	Disconnection, open circuit, or short circuit in discharge temp. sensor (TD)	26, 30, 36 MODEL: Sensor detection trouble (194°F or higher when 15 minutes have elapsed after compressor stopped). (Open circuit) 42 MODEL: Sensor detection trouble (194°F or higher when 60 minutes have elapsed after compressor stopped). (Open circuit)	Automatic recovery	1. Check discharge temp. sensor (TD). 2. Check outdoor unit control PCB.
F06	Disconnection, open circuit, or short circuit in outdoor heat exchanger temp. sensor (C1)	Open circuit or short circuit	Automatic recovery	1. Check outdoor heat exchanger temp. sensor (C1). 2. Check outdoor unit control PCB.
F07	Disconnection, open circuit, or short circuit in outdoor heat exchanger temp. sensor (C2)	Open circuit or short circuit	Automatic recovery	1. Check outdoor heat exchanger temp. sensor (C2). 2. Check outdoor unit control PCB.
F08	Disconnection, open circuit, or short circuit in outdoor air temp. sensor (TO)	Open circuit or short circuit	Automatic recovery	1. Check outdoor air temp. sensor (TO). 2. Check outdoor unit control PCB.
F12	Disconnection, open circuit, or short circuit in intake temp. sensor (TS)	Open circuit or short circuit	Automatic recovery	1. Check intake temp. sensor (TS). 2. Check outdoor unit control PCB.

Meaning of Alarm Messages

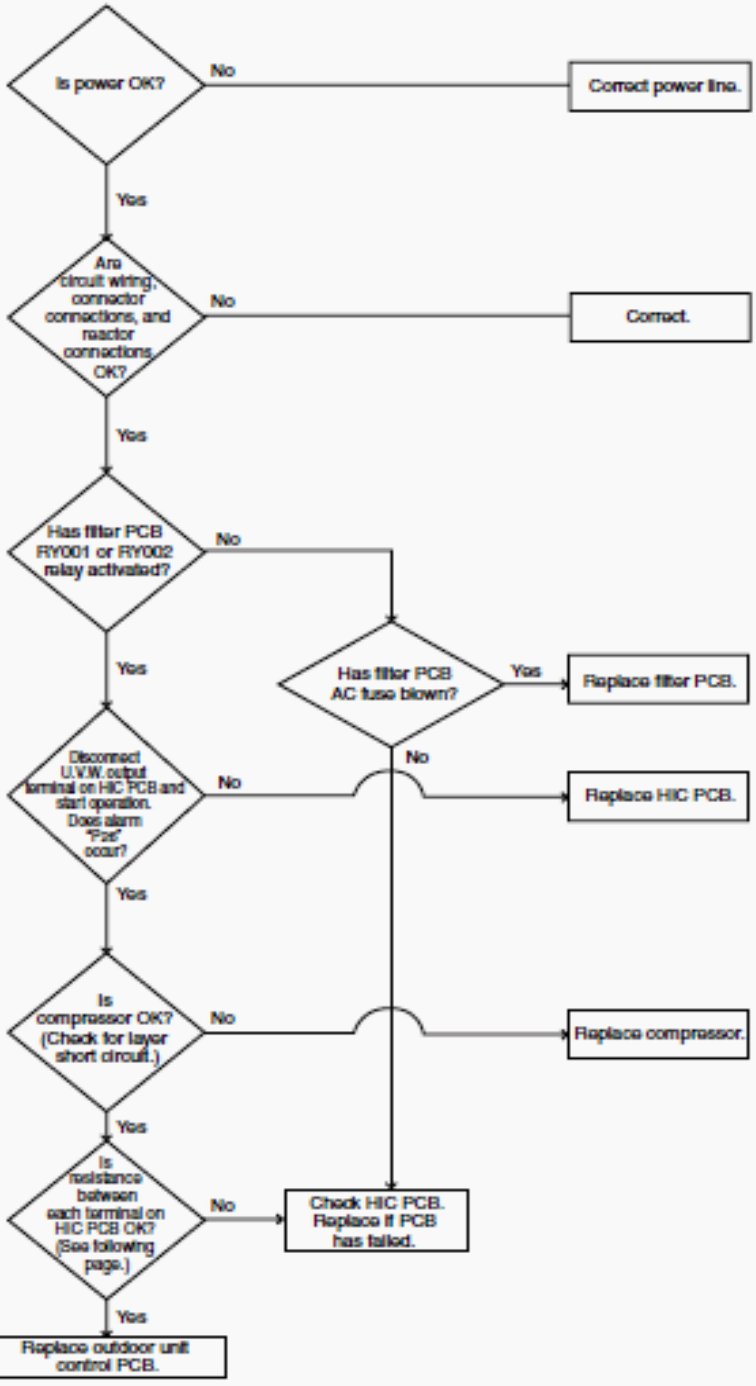
Remote controller alarm display	Alarm contents	Judgment condition	Clear condition	Judgment and correction
F31	EEPROM trouble	Reading/writing failure	Recovery at power reset	1. Check EEPROM (IC007). 2. Check outdoor unit control PCB.
L02	Mismatch of indoor and outdoor unit types (Espacio, Multi)	Indoor unit judges that type does not match outdoor unit type.	Recovery at power reset	1. Check indoor unit EEPROM. 2. Check indoor unit control PCB.
L04	Settings failure	Duplicated outdoor unit address (system address)	Automatic recovery	1. Check outdoor unit system address. 2. Check inter-unit control wiring.
L07	Settings failure	Group control wiring is connected to an independent-control indoor	Recovery at power reset	1. Check inter-unit control wiring. 2. Check indoor unit EEPROM.
L10	Settings failure	Outdoor unit capacity not set.	Recovery at power reset	Check outdoor unit EEPROM.
L13	Indoor-outdoor unit types	Outdoor unit judges that type does not match indoor unit type.	Recovery at power reset	1. Check indoor unit EEPROM. 2. Check outdoor unit control PCB.
E06	Outdoor unit detected abnormal signal from indoor unit.	Serial signal receiving failure (including failure to verify No. of units)	Automatic recovery	1. Check inter-unit control wiring. 2. Check outdoor unit
E07	Outdoor unit sending failure to indoor unit	Serial signal sending failure	Automatic recovery	1. Check inter-unit control wiring. 2. Check outdoor unit control PCB.
E14	Settings failure	Duplicated master unit in simultaneous-operation multi control (Detected by outdoor unit)	Recovery at power reset	1. Check inter-unit control wiring. 2. Check indoor unit combination.
E15	Automatic address setting failure	Indoor unit capacity too low.	Recovery at power reset	1. Check inter-unit control wiring. 2. Check outdoor unit control PCB.
E16	Automatic address setting failure	Indoor unit capacity too high.	Recovery at power reset	1. Check inter-unit control wiring. 2. Check outdoor unit control PCB.
E20	Automatic address setting failure	Outdoor unit cannot receive any serial signals from indoor units.	Recovery at power reset	1. Check inter-unit control wiring. 2. Check outdoor unit control PCB.
E31	Communications trouble within unit	No communication possible with MDC for 3 minutes or longer.	Automatic recovery	Check outdoor unit control PCB.
H01	Overcurrent	Inverter stops after alarm is detected.	Recovery at restart	1. Refrigerant cycle trouble, overload operation 2. Loose screws between HIC control PCB and radiating plate 3. Cooling failure of radiating plate 4. Check outdoor unit PCB wiring.

Details of alarm messages



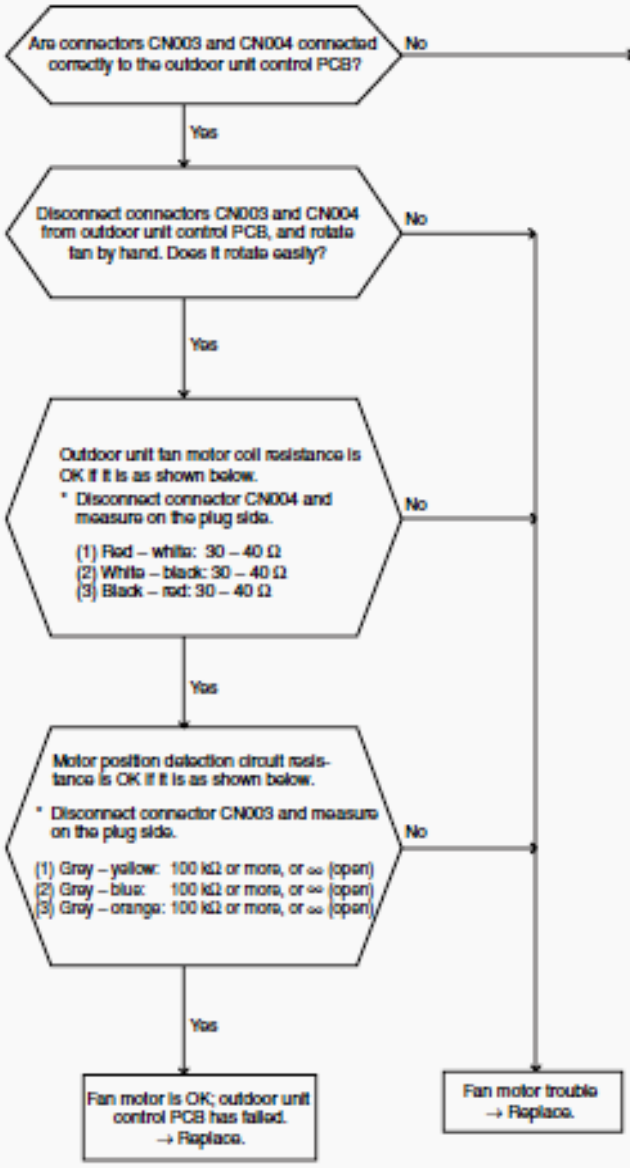
Details of alarm messages

[Alarm "P26"] ——— IGBT short-circuit protection on inverter control (IPDU) PCB
HIC PCB trouble)



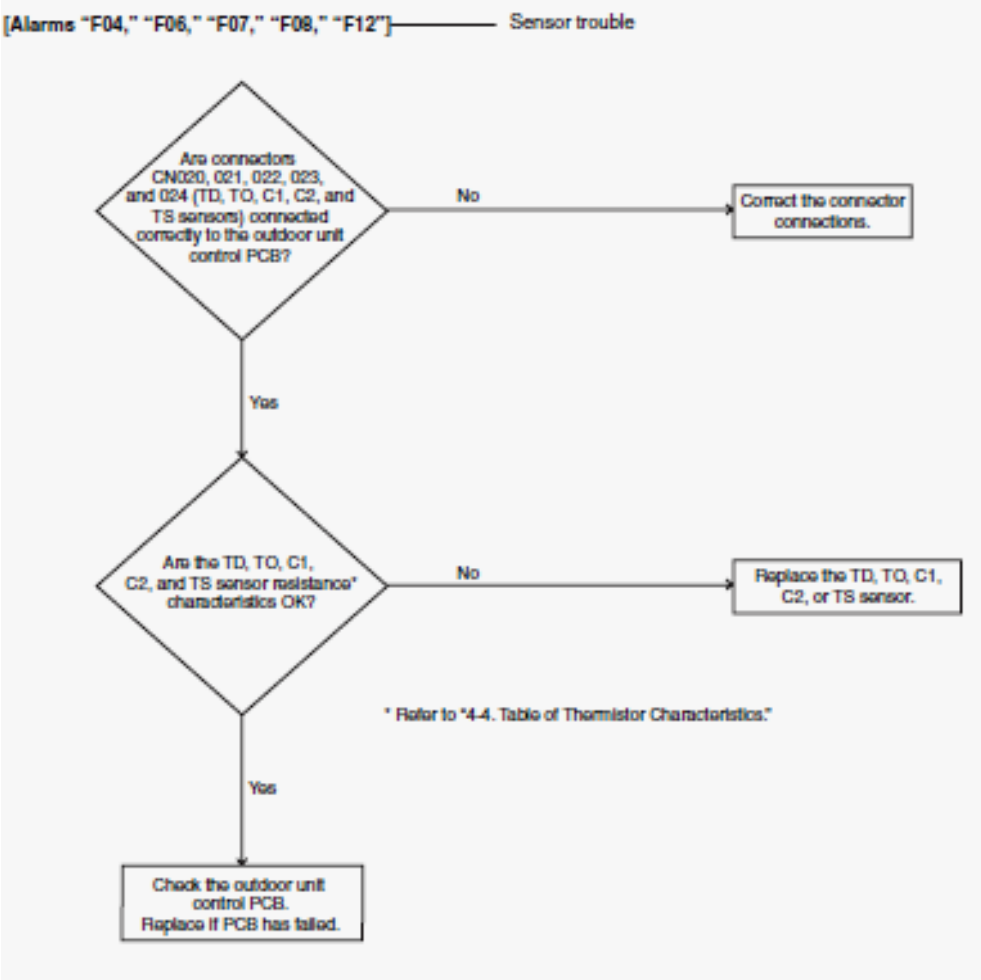
Details of alarm messages

[Alarm "P22"] —— Outdoor unit fan motor drive circuit trouble

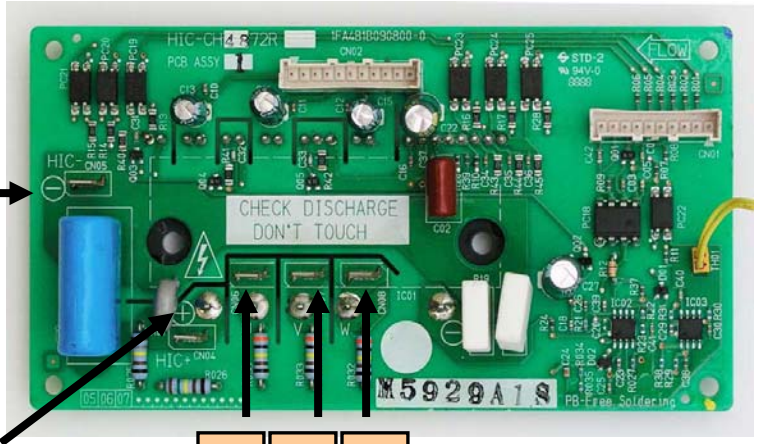


Note:
In the case of a GND circuit failure inside the motor, the results of the above check may be OK.
If operation is not OK after the outdoor unit control PCB has been replaced, then replace the outdoor unit fan motor.

Details of alarm messages



Troubleshooting
(HIC PCB assembly)



NEGATIVE DISCHARGE POST

POSITIVE DISCHARGE POST

U V W

COMPRESSOR WIRES

COMPRESSOR TERMINALS

- **U= Run winding (Red wire)**
- **V= Common winding (White wire)**
- **W= Start winding (Blue wire)**

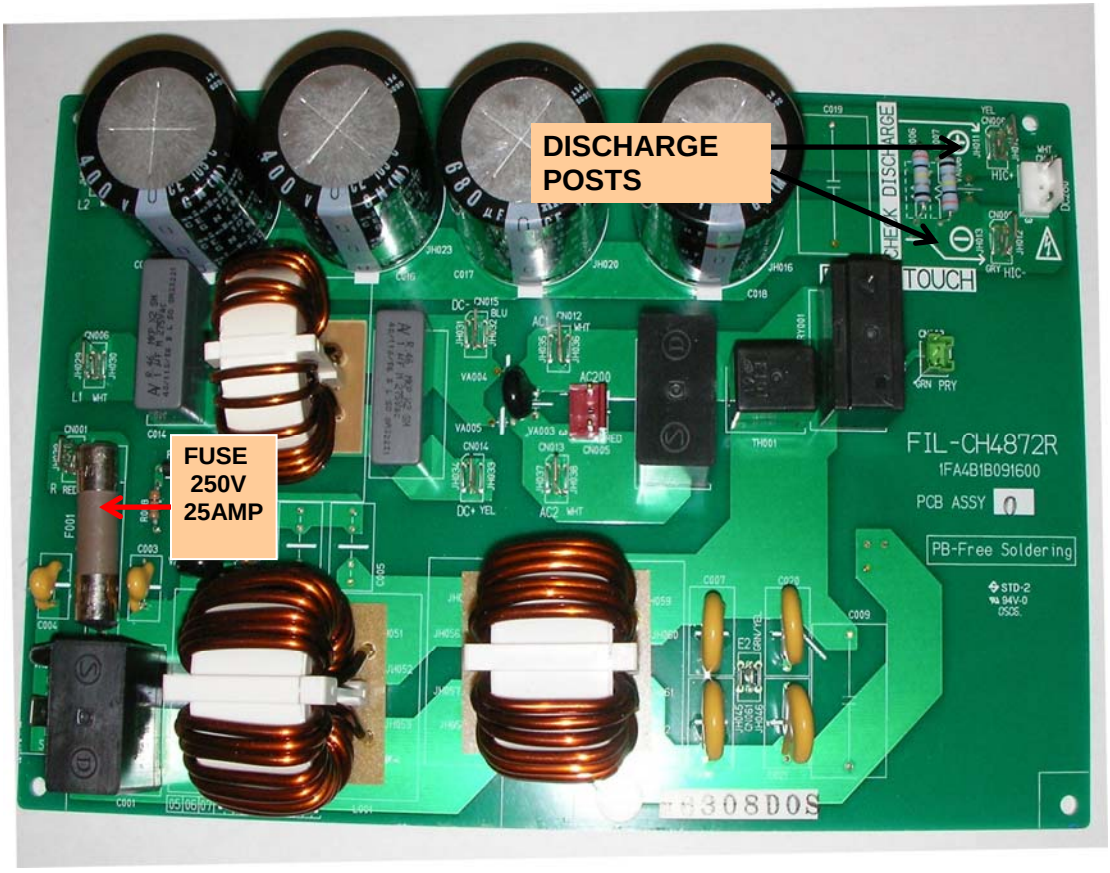
Heat sink paste is applied to the back when replacing the board

Between Terminals	Resistance
HIC + ----------HIC-	200 K ohms or more
HIC + ----------U	300 K ohms or more
HIC + ----------V	300 K ohms or more
HIC + ----------W	300 K ohms or more
HIC - ----------U	200 K ohms or more
HIC - ----------V	200 K ohms or more
HIC - ----------W	200 K ohms or more

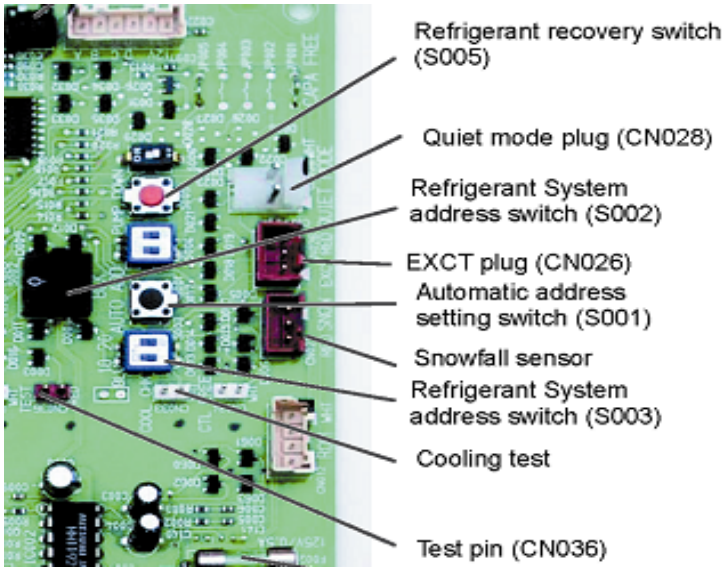
Filter Board
(26,000-42,000 Btu Models)

Safety Note:

- The filter board holds an electrical charge
- Use the discharge posts when servicing



One Remote Can Control Up To Eight Systems



Example: The first indoor is set as the MAIN and up to 7 more are set to SUB.

Setting the outdoor unit system addresses

For basic wiring diagram 2 (Set the system addresses: 1, 2, 3...)

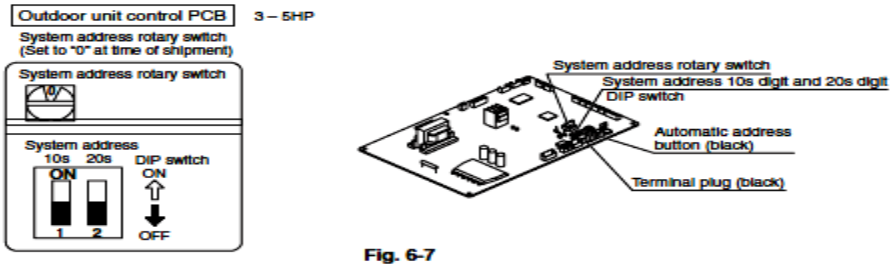
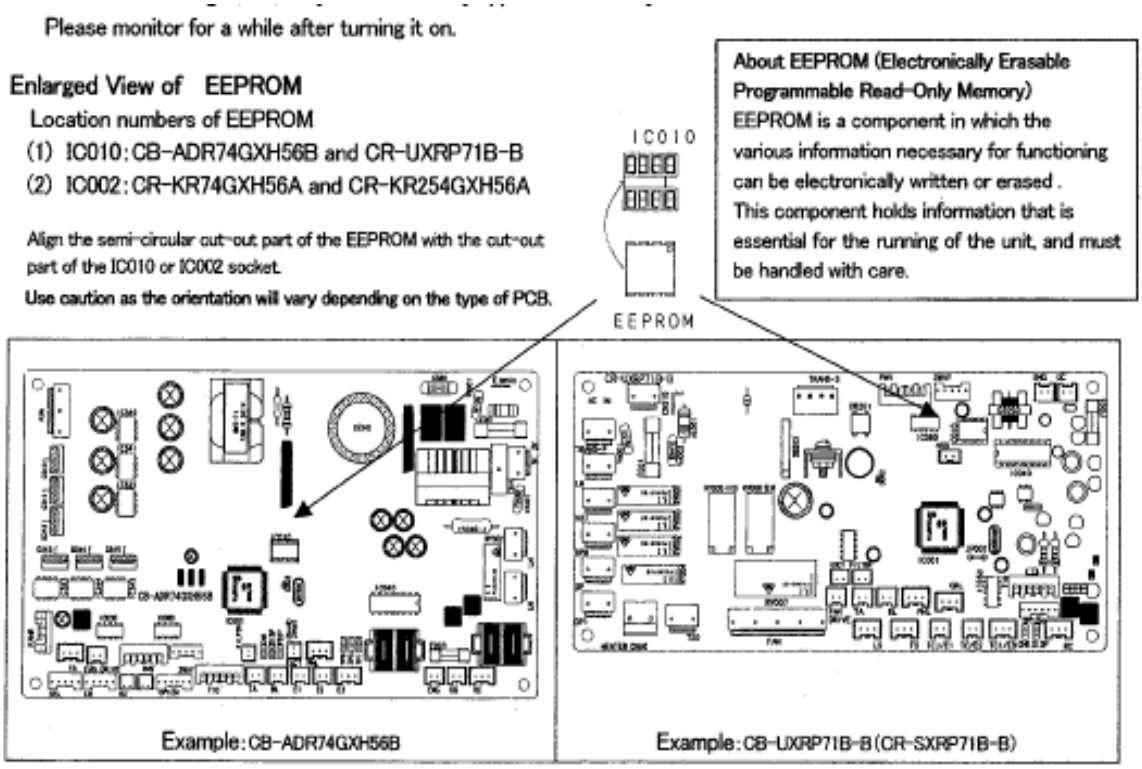


Fig. 6-7

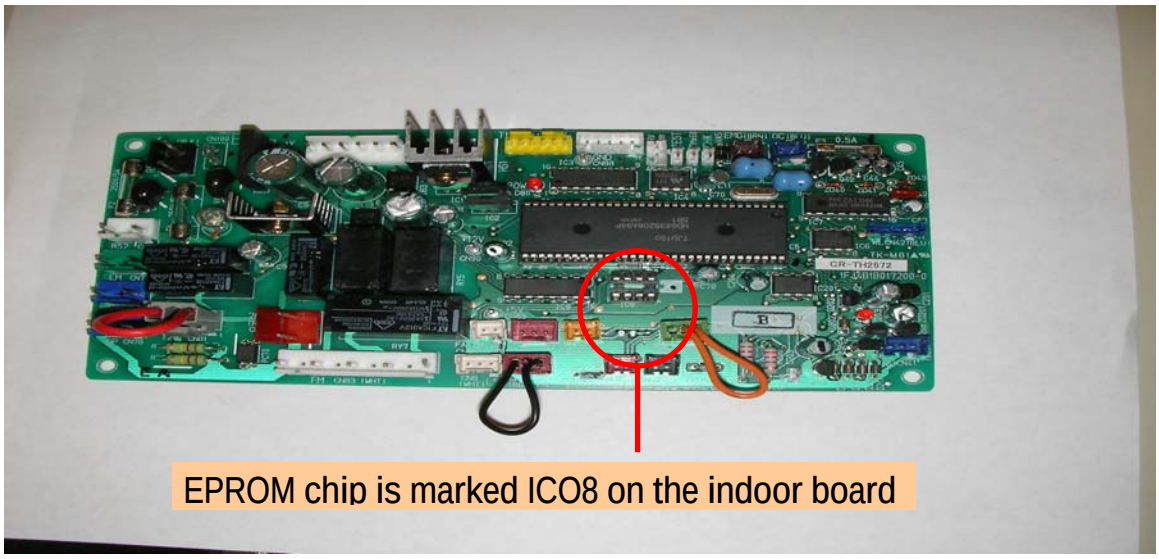
System address No.	System address 10s digit (2P DIP switch)	System address 1s place (Rotary switch)
0 Automatic address (Setting at shipment = "0")	Both OFF	"0" setting
1 (If outdoor unit is No. 1)	Both OFF	"1" setting
2 (If outdoor unit is No. 2)	Both OFF	"2" setting
11 (If outdoor unit is No. 11)	10s digit ON	"1" setting
21 (If outdoor unit is No. 21)	20s digit ON	"1" setting
30 (If outdoor unit is No. 30)	10s digit and 20s digit ON	"0" setting

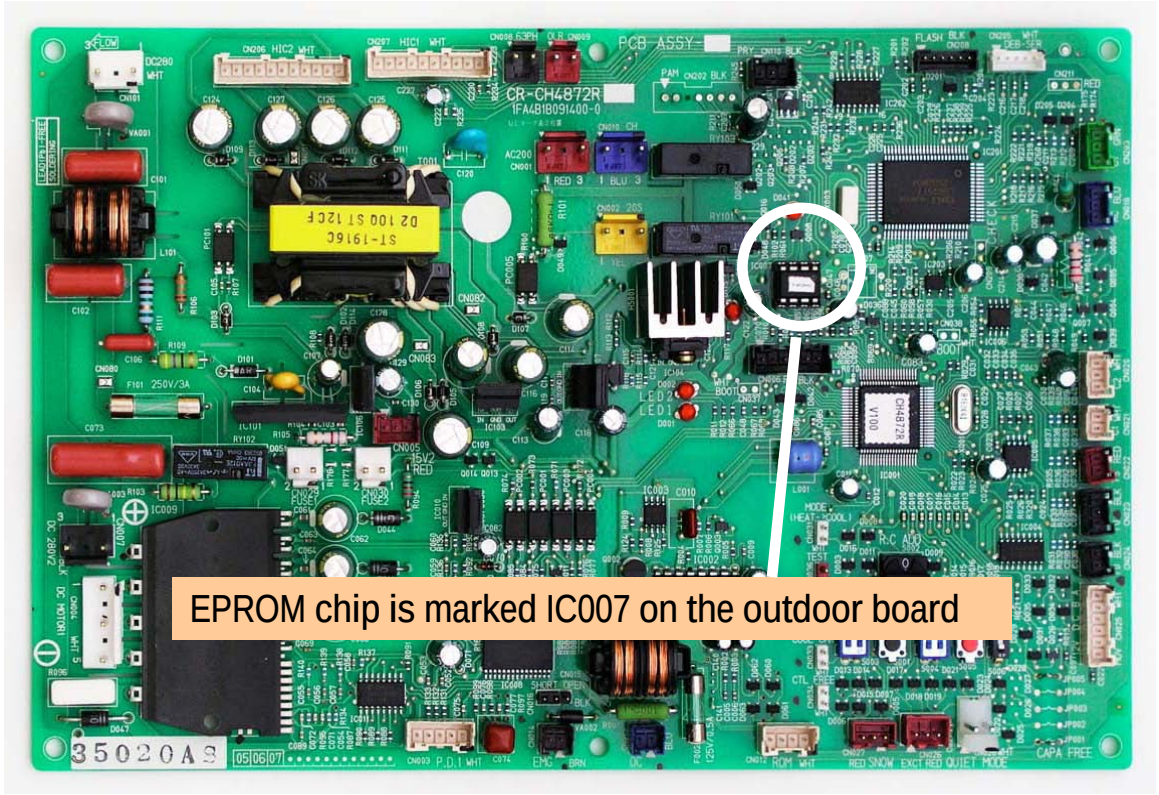
Replacing an Indoor or Outdoor
(PCB Board)



- **Instructions are included with your replacement board.**
- **The <u>EPROM</u> chip on the replacement board is <u>BLANK.</u>**
- **You must <u>RE-USE</u> the <u>EPROM</u> chip from the old board**
- **Remove the chip from the old board and place in the new board**
- **If the chip is not changed a common error code will be a <u>"L"</u> or unit mismatch error code**

Indoor & outdoor unit PCB assembly (26,000-42,000 Btu's)

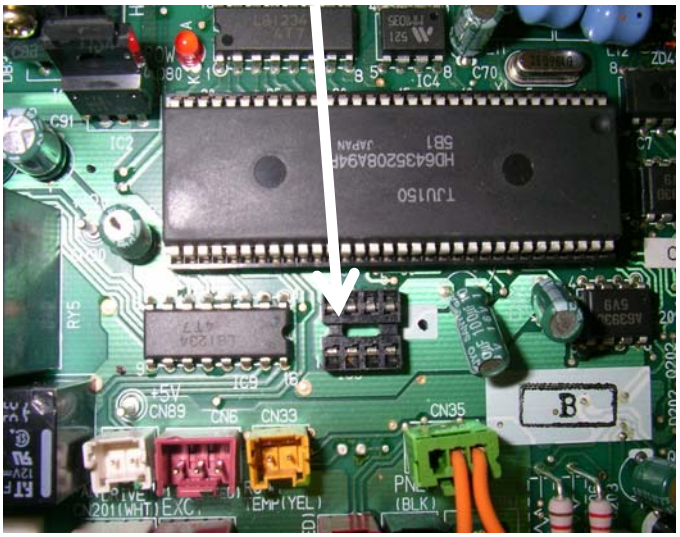




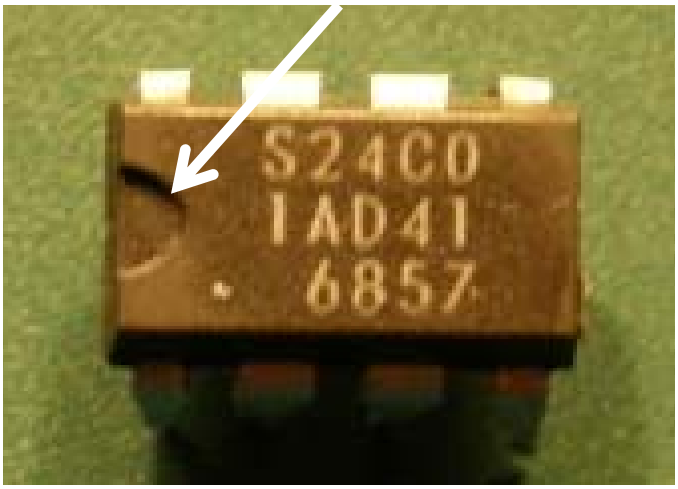
EPROM Chip Installation

Match the "Half Moon" on the socket and the "Half Moon" on the face of the chip

"Half Moon" in the socket

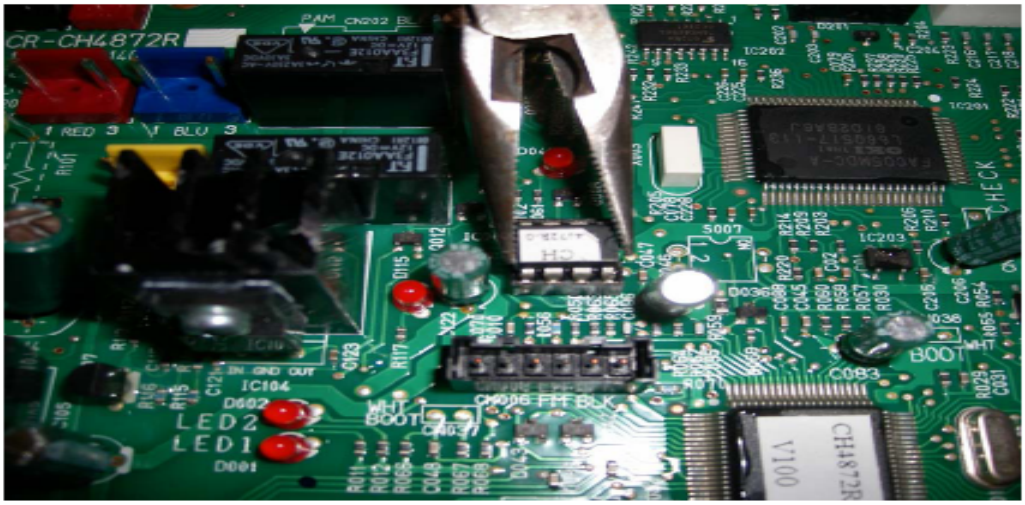


"Half moon" on the face of the chip

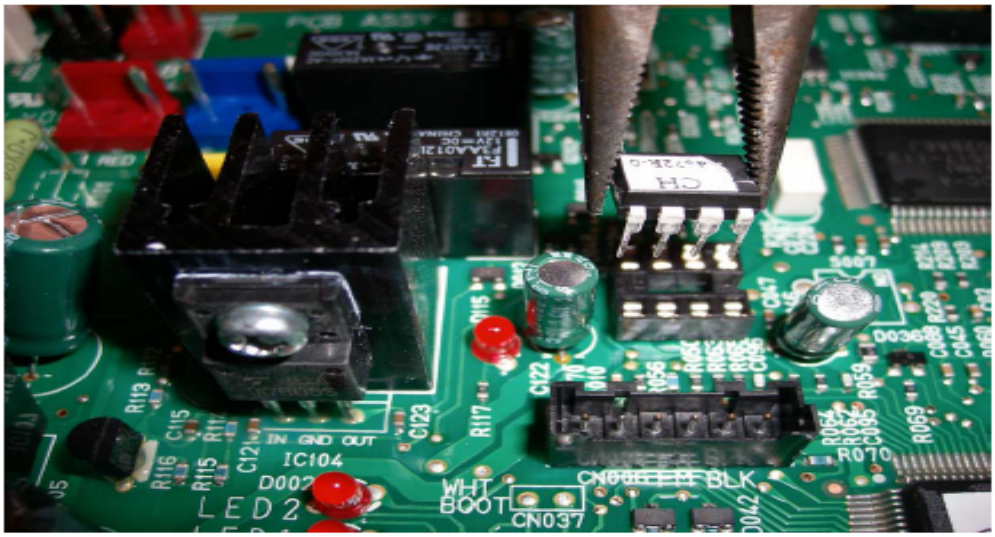


EPROM Chip Installation

1. Carefully remove EEPROM from defective control board.



2. Insert EEPROM into new board, take care that EEPROM is facing the same direction as it was in the defective board. Please ensure that all of the connectors on the EEPROM are all seated properly.



- **If error occurs remove chip and check for proper rotation and seating.**

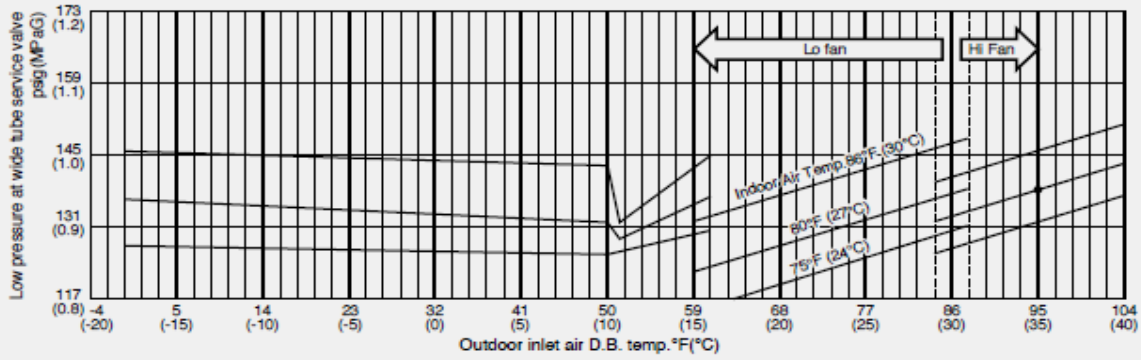
Performance Data

Cooling characteristics:

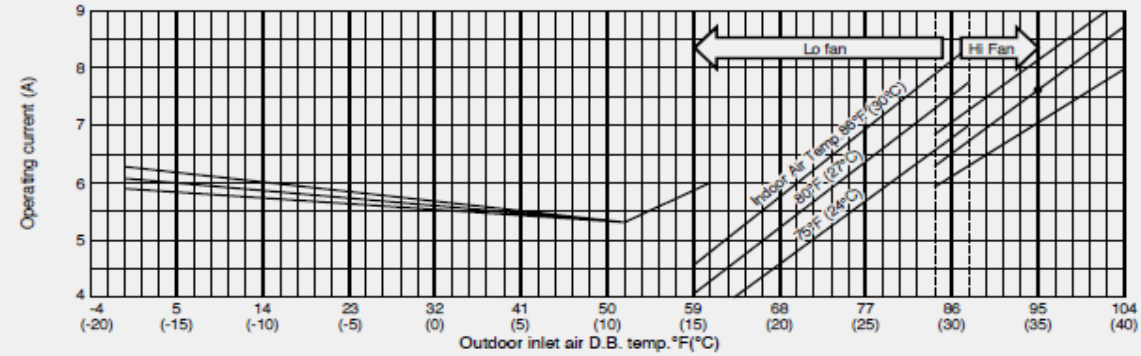
Indoor Unit: KHS0971
Outdoor Unit: CH0971

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

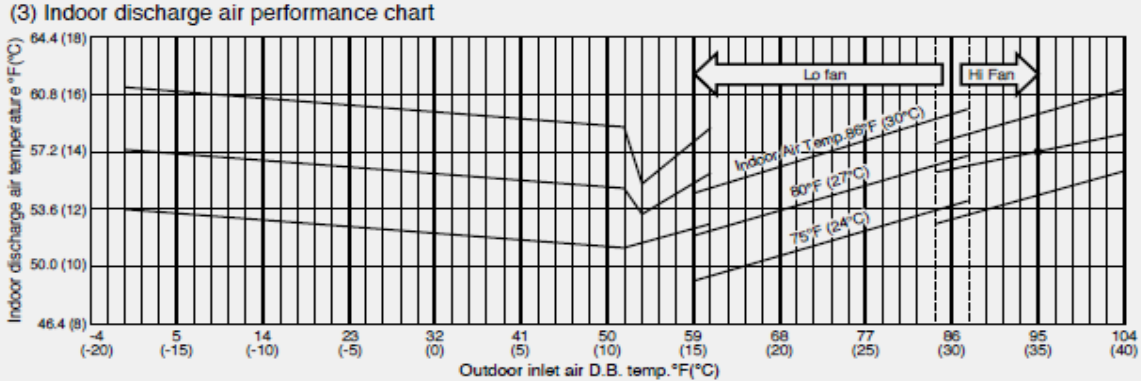
(1) Low pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in the test-run mode. Electrical performance values represent a combined indoor/outdoor value.

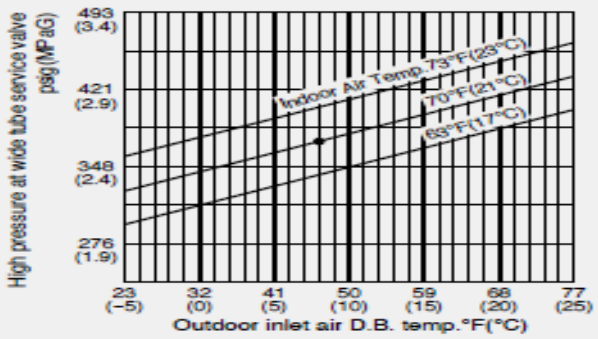
Performance Data

Heating characteristics:

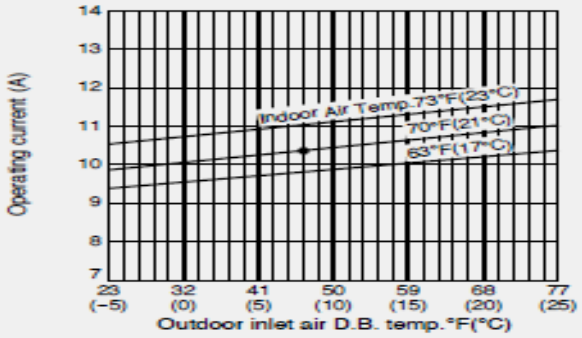
Indoor Unit: KHS0971
Outdoor Unit: CH0971

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

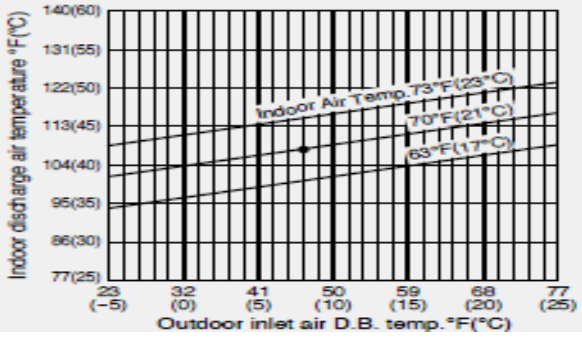
(1) High pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

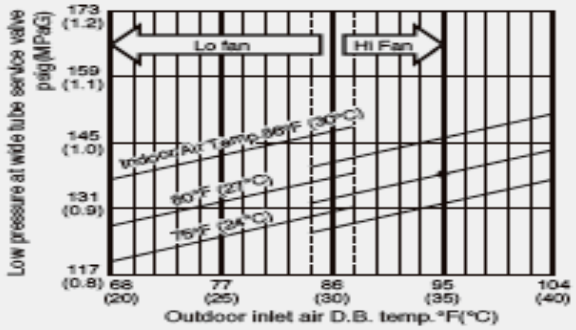
Performance Data

Cooling characteristics:

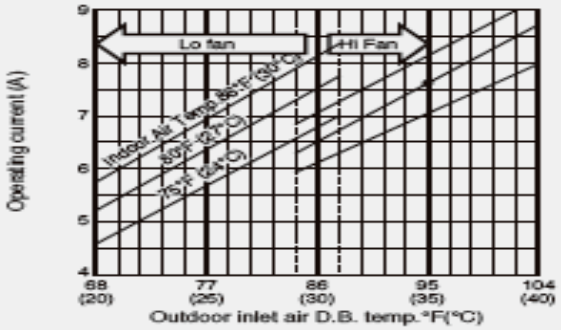
Indoor Unit: KS0971
Outdoor Unit: C0971

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

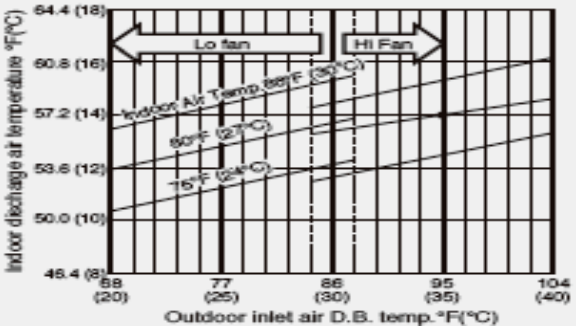
(1) Low pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



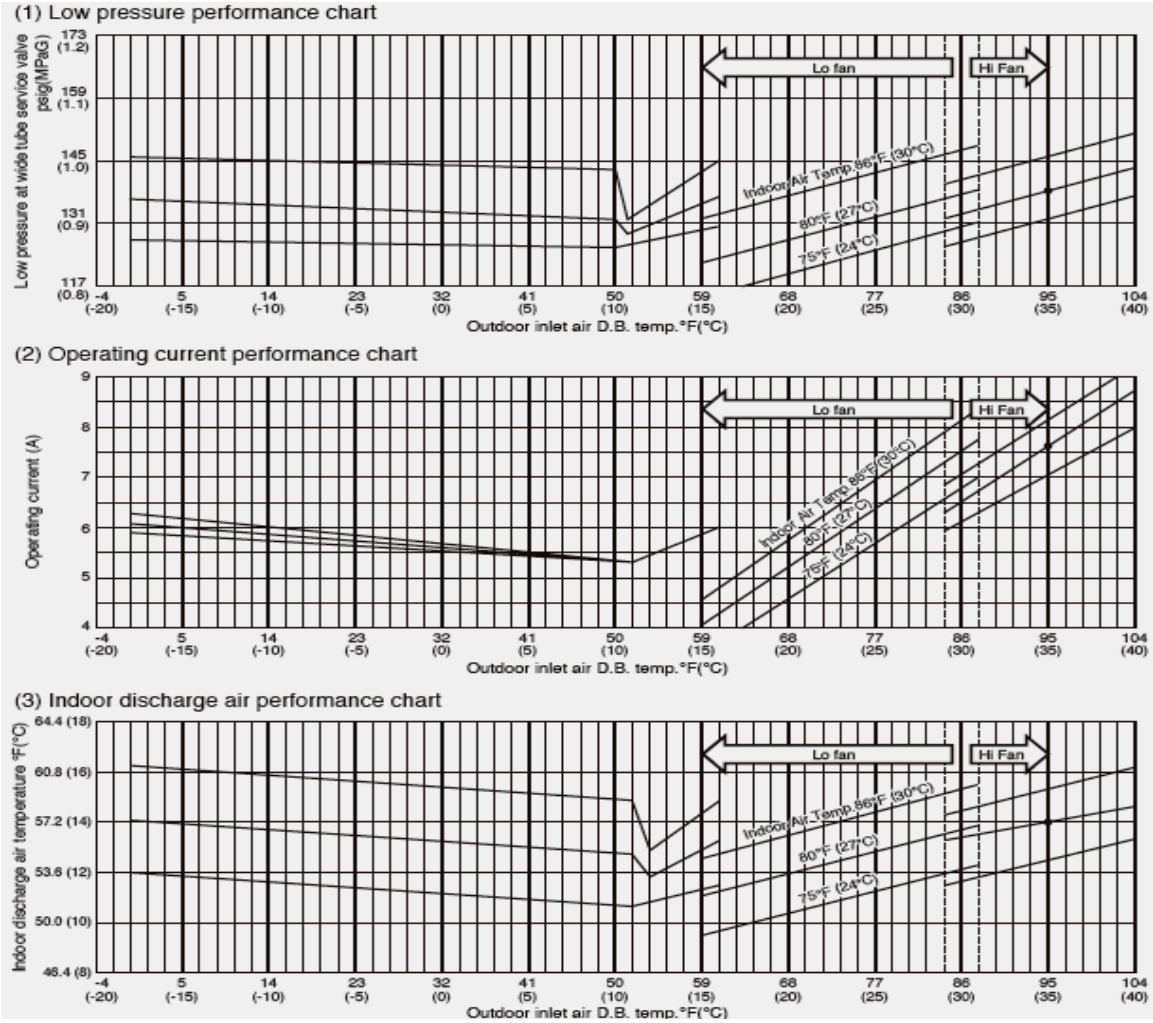
Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

Performance Data

Cooling characteristics:

Indoor Unit: K0971
Outdoor Unit: CL0971

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)



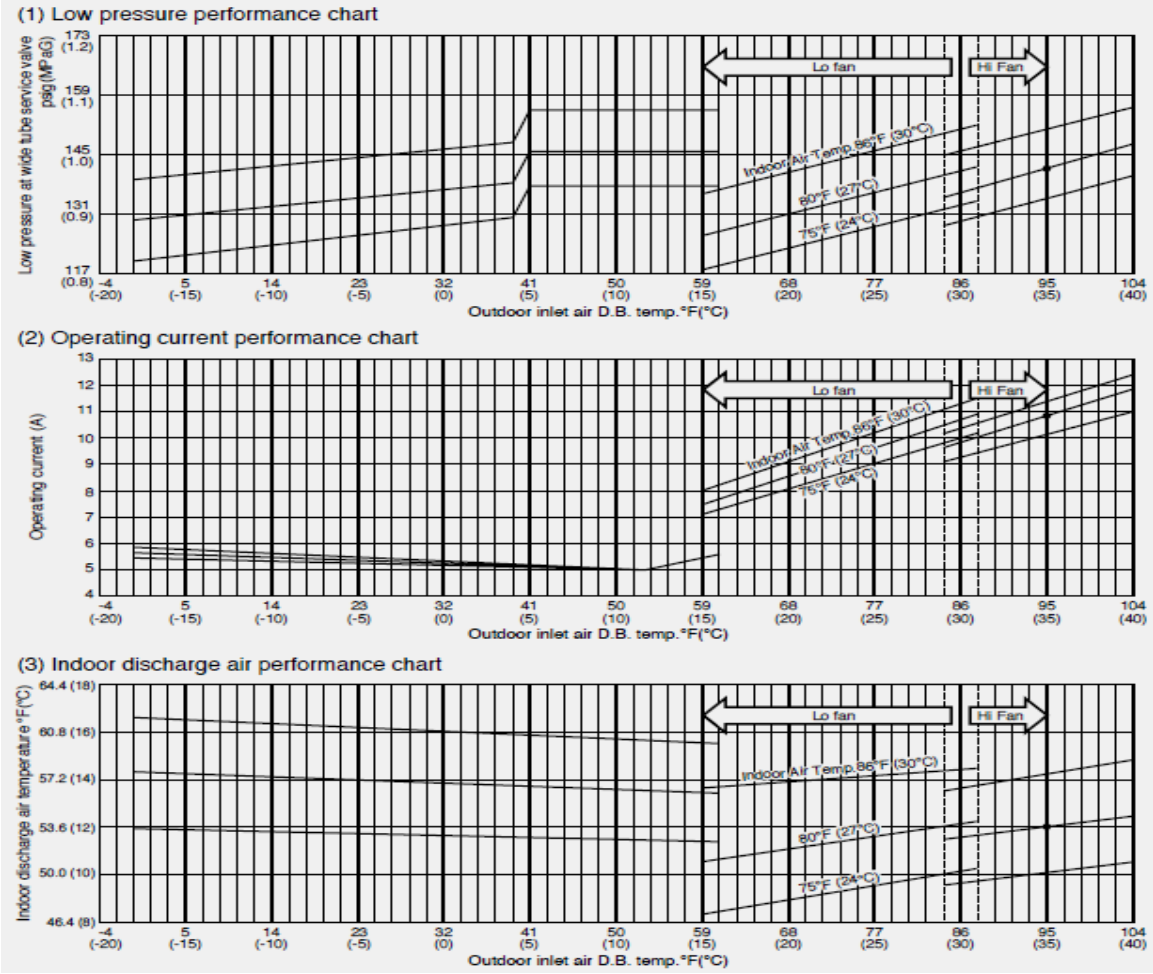
Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

Performance Data

Cooling characteristics:

Indoor Unit: KHS1271
Outdoor Unit: CH1271

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

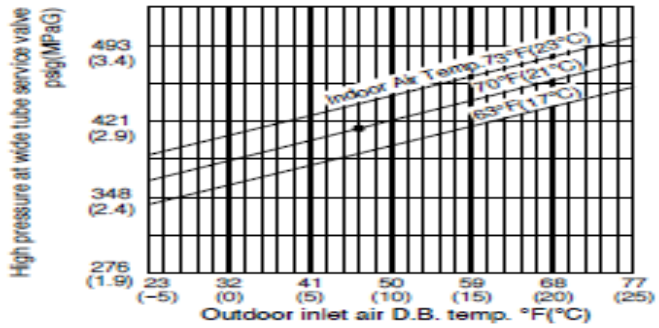
Performance Data

Heating characteristics:

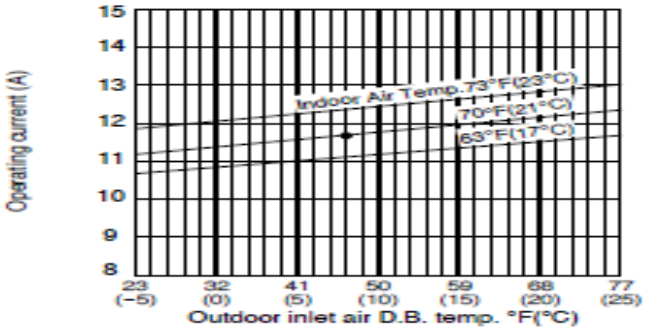
Indoor Unit: KHS1271
Outdoor Unit: CH1271

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

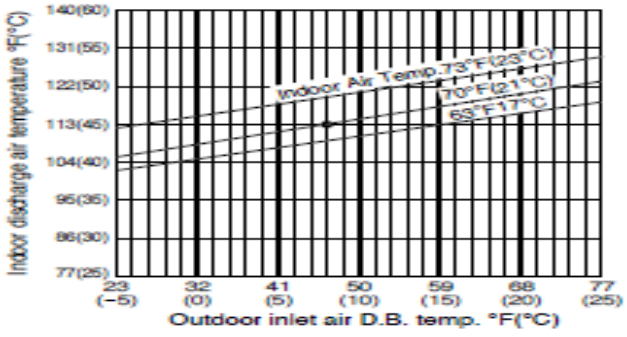
(1) High pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

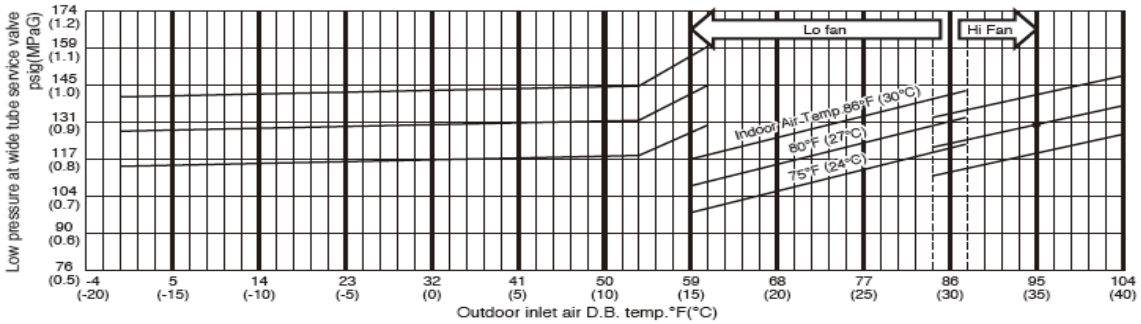
Performance Data

Cooling characteristics:

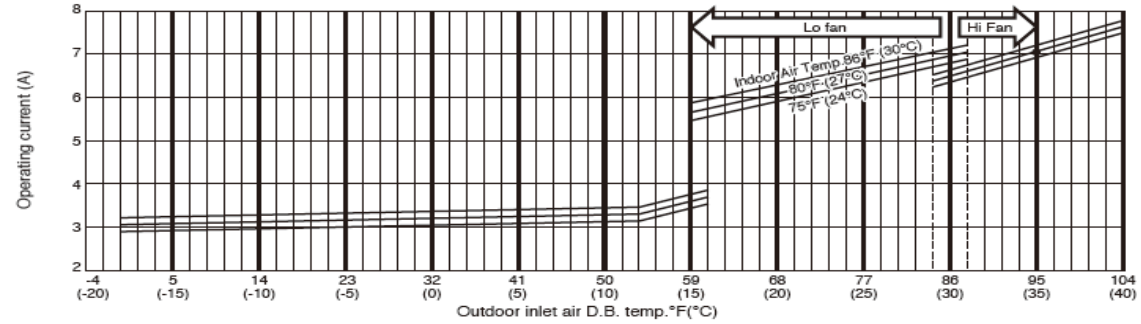
Indoor Unit: KHS1872
Outdoor Unit: CH1872

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

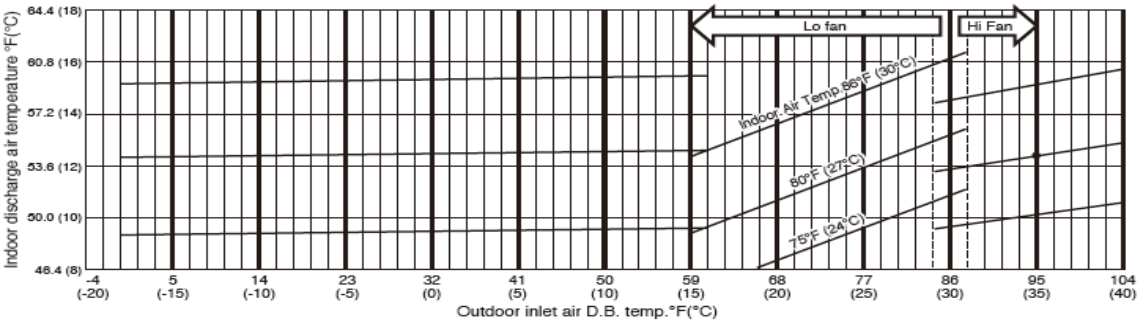
(1) Low pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

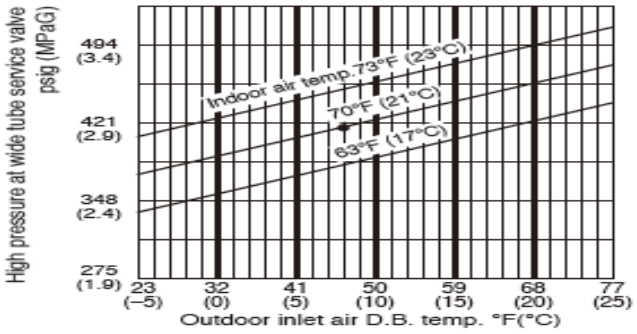
Performance Data

Heating characteristics:

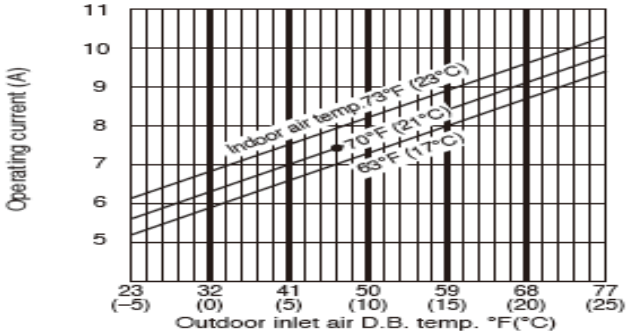
Indoor Unit: KHS1872
Outdoor Unit: CH1872

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

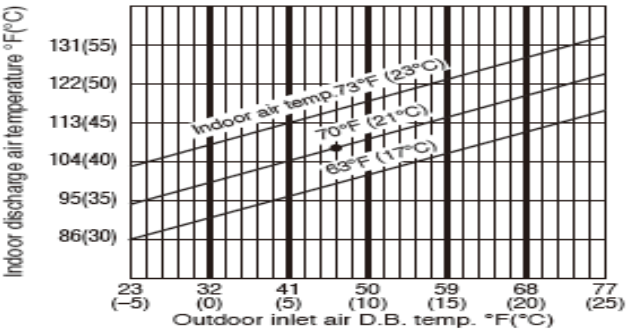
(1) High pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

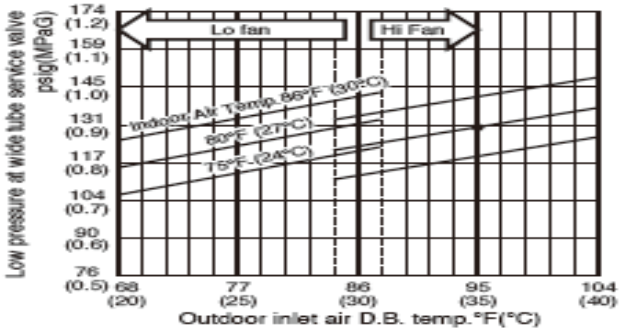
Performance Data

Cooling characteristics:

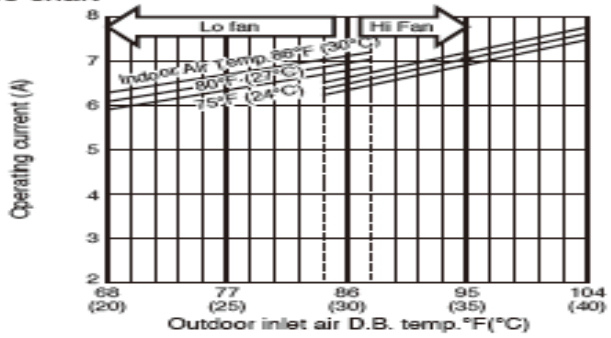
Indoor Unit: KS1872
Outdoor Unit: C1872

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

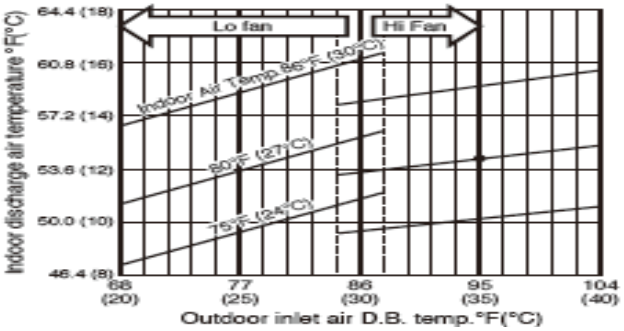
(1) Low pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

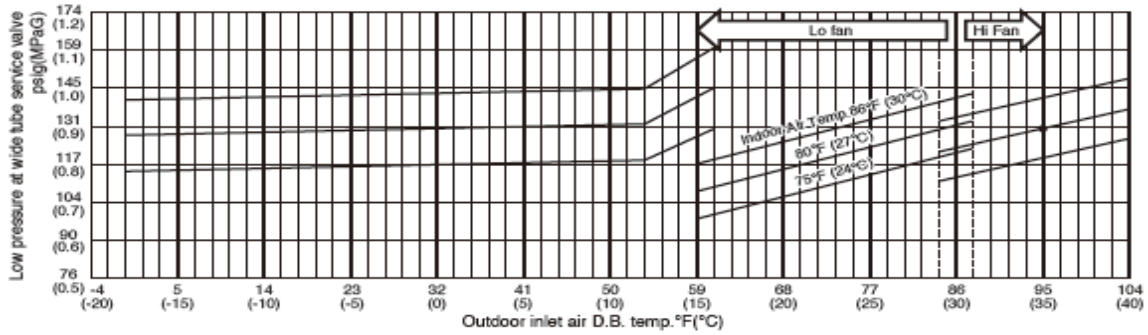
Performance Data

Cooling characteristics:

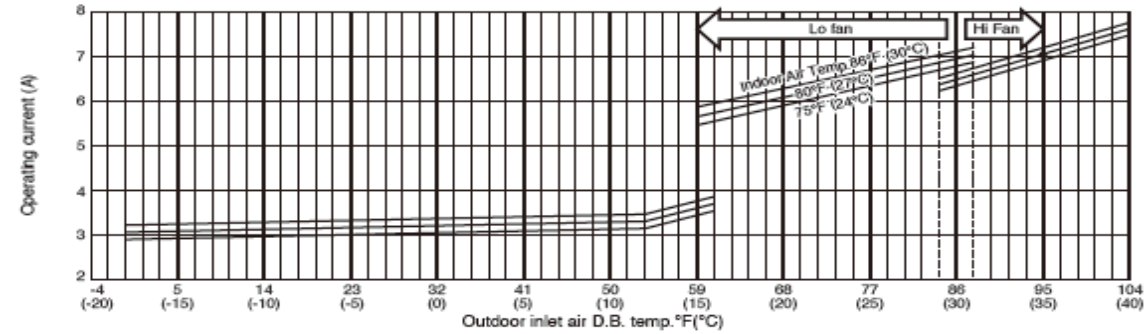
Indoor Unit: KS1872
Outdoor Unit: CL1872

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

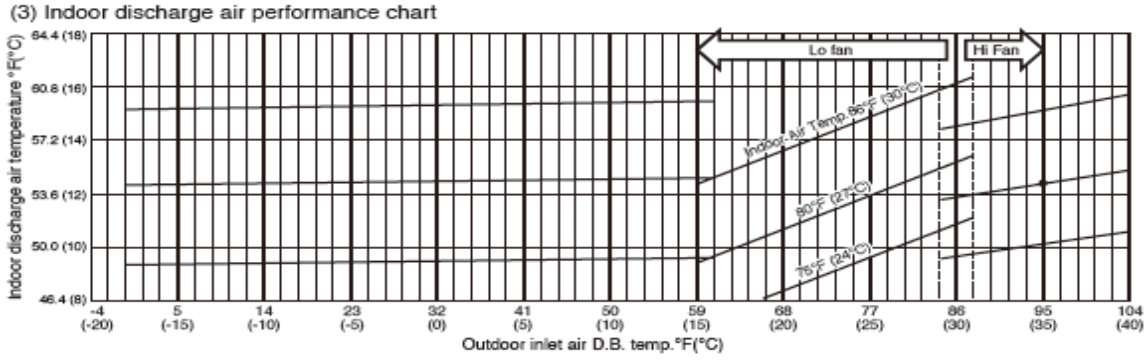
(1) Low pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

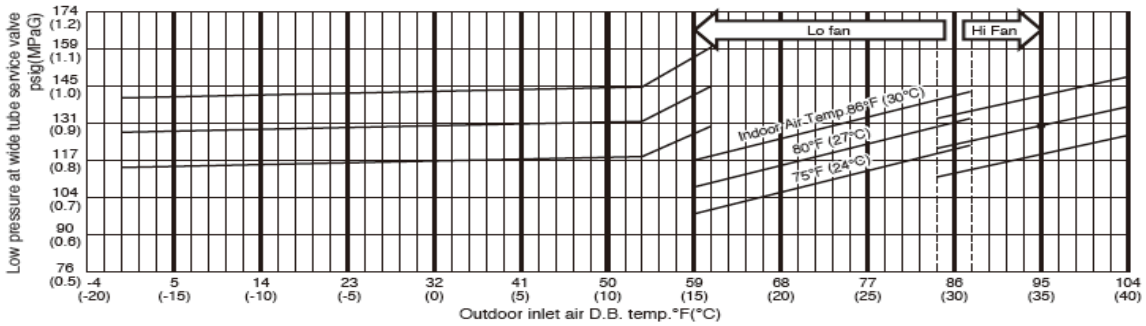
Performance Data

Cooling characteristics:

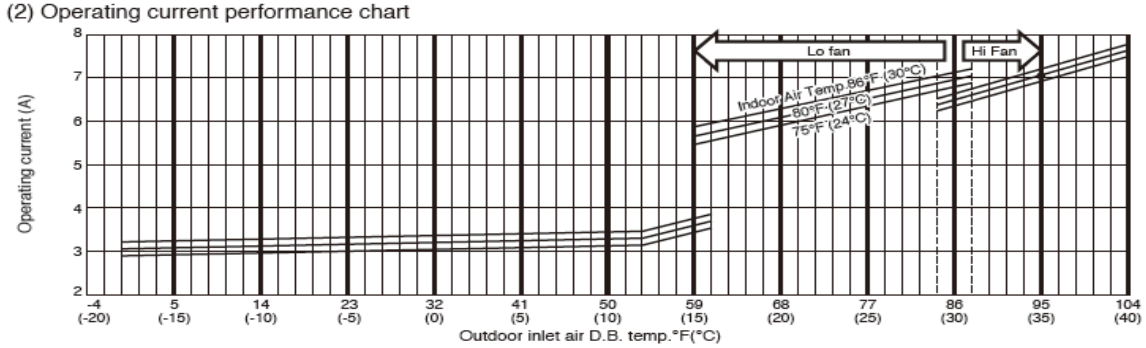
Indoor Unit: KHS2472
Outdoor Unit: CH2472

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

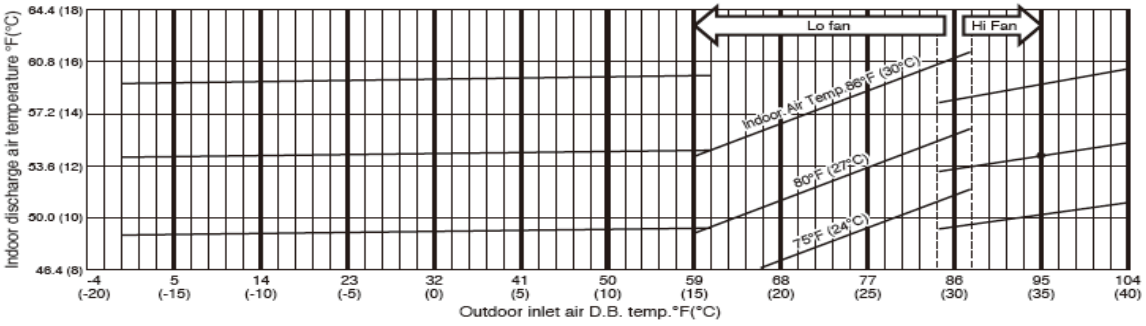
(1) Low pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

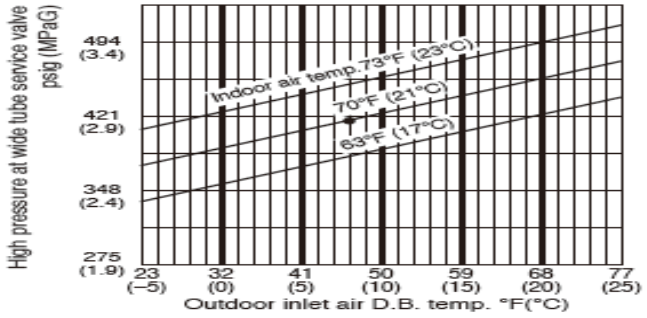
Performance Data

Heating characteristics:

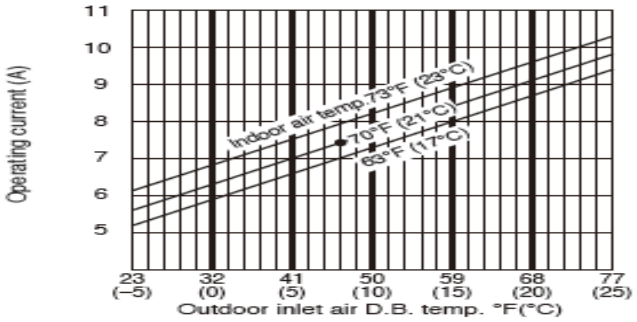
Indoor Unit: KHS2472
Outdoor Unit: CH2472

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

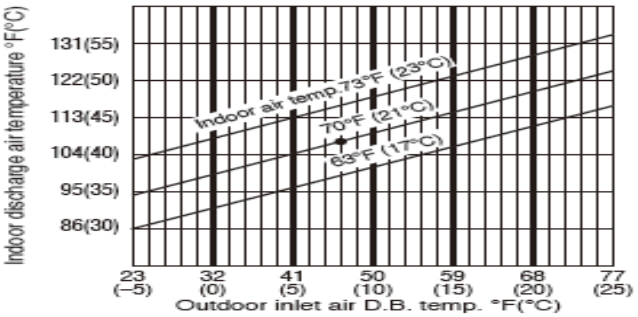
(1) High pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value.

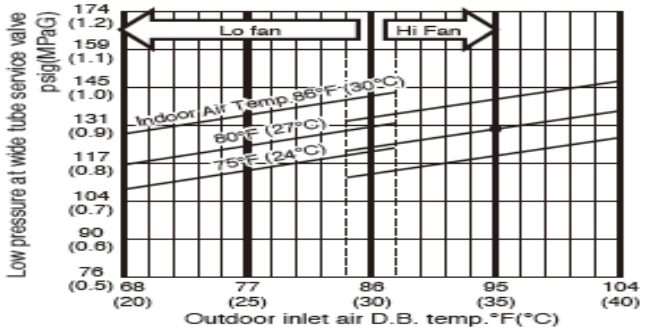
Performance Data

Cooling characteristics:

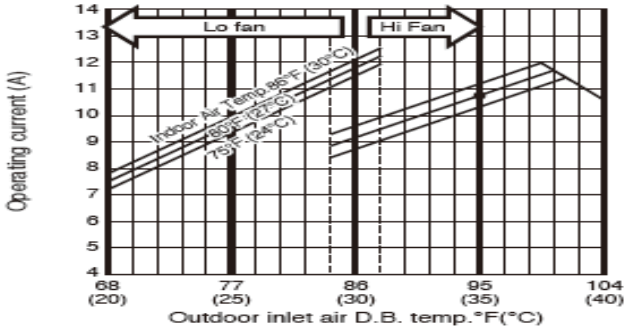
Indoor Unit: KS2472
Outdoor Unit: C2472

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

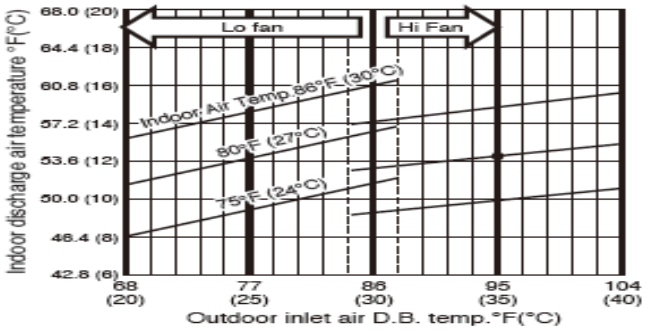
(1) Low pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value

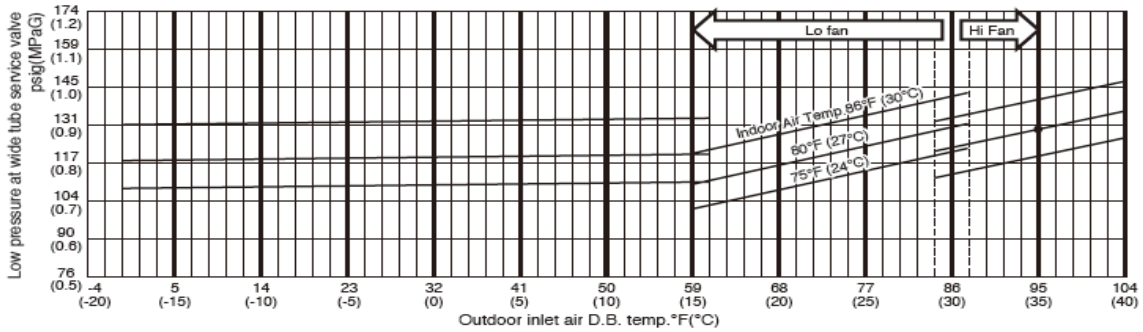
Performance Data

Cooling characteristics:

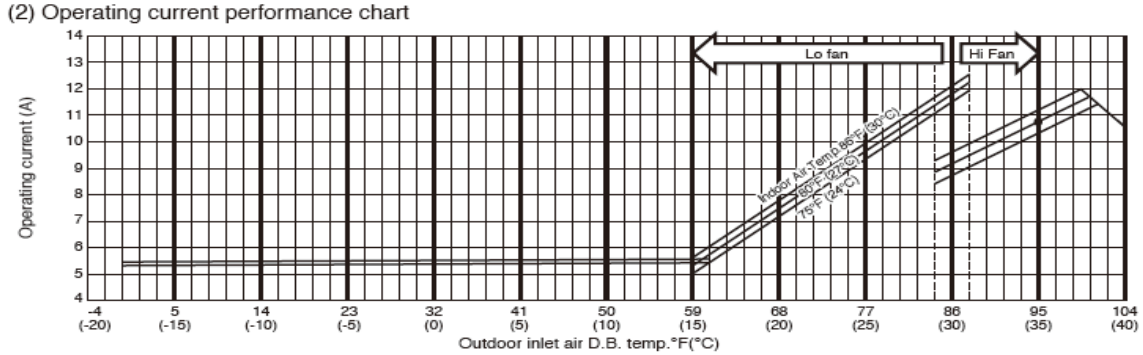
Indoor Unit: KS2472
Outdoor Unit: CL2472

(RH: 46%, indoor fan speed: High fan, 60hz. 115v)

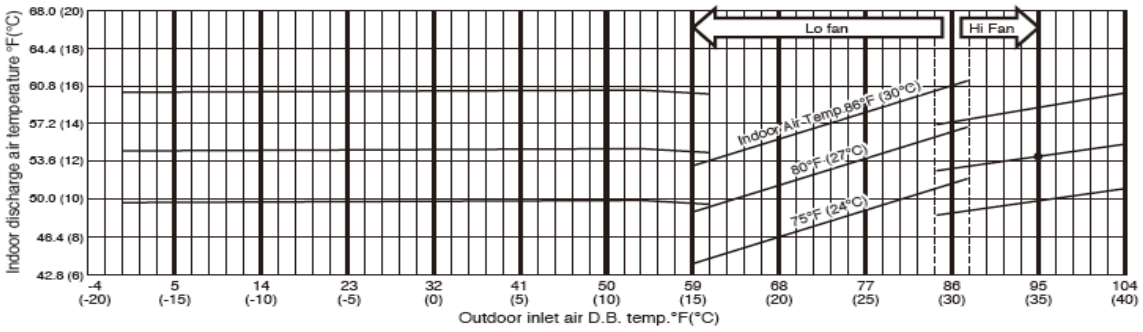
(1) Low pressure performance chart



(2) Operating current performance chart



(3) Indoor discharge air performance chart



Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value

Thank You!