



SANYO HVAC (Division of SANYO Commercial Solutions)

Think GAIA
For Life and the Earth



Building life.

SANYO HVAC is recognized as a world leader in split-air conditioning technology. Our focus on efficiency and reliability demonstrates our commitment to our customers and our planet.

Technical Tips

RAC/PAC

Table of contents

Page 3	Check list before you call
Page 4	Inverter technology
Page 5	26 thru 42k Btu units dual wiring diagram
Page 6	9 thru 24k Btu units wiring diagram
Page 7	Flexi Multi wiring diagram
Page 8	Trouble shooting for 9-24k Btu units
Page 9	Fault code retrieval procedure
Page 10-14	Indoor/Outdoor board trouble shooting procedure
Page 15	Trouble shooting for 26-42k Btu units
Page 16	EPROM replacement procedure

Check the items below before calling Tech Support+

Description of Problem and date:

1) Verify there is a matching set. On PAC make sure it was not changed from a C to a CH.

2) Mod# & Serial# _____

3) New Install? ___ If not how long did it run? _____

4) Wrong unit installed in a low ambient application? _____

5) Verify wiring is correct. Was shielded control wire used (PAC)? _____

6) What are the code/codes? _____

7) What is the voltage with load and no load? _____

8) What is VDC between 2&3 (RAC)? _____

9) Are the service valves open? _____

10) When power is first applied, does the expansion valve Tick? _____

11) Are the power lights on boards lit? _____

12) How long does the unit run before locking out? _____

13) What are the pressures & super heat while the unit is running? _____

14) Does the indoor unit beep when a command is sent by the remote? Is it in the correct mode?

15) Is the powers relay energized (RAC) in condenser? _____

16) Is the transformer on the indoor unit good (PAC)? _____

17) Is there a condensation pump and is it wired correctly? Is the safety used and how is it wired?

18) Have you put the unit into diagnostic mode (RAC)? If so what is the code?

19) Is there a red power light on the outdoor board (RAC)? _____

20) What lights are on and are they flashing? _____

*RAC is any 9-24,000 BTU model or any Flexi Multi model.

*PAC is any 26-42,000 BTU model.

How was the problem resolved?

Caution for Installation

Higher Pressure (R410A is 1.6 times higher than R22.)

Compressor oil is different.

R410A uses Polyol Esther Oil (Synthetic fluid)

Different Gauge-manifold, Charge hose, etc., must be used for R410A.

Near-Azeotrope Type Refrigerant

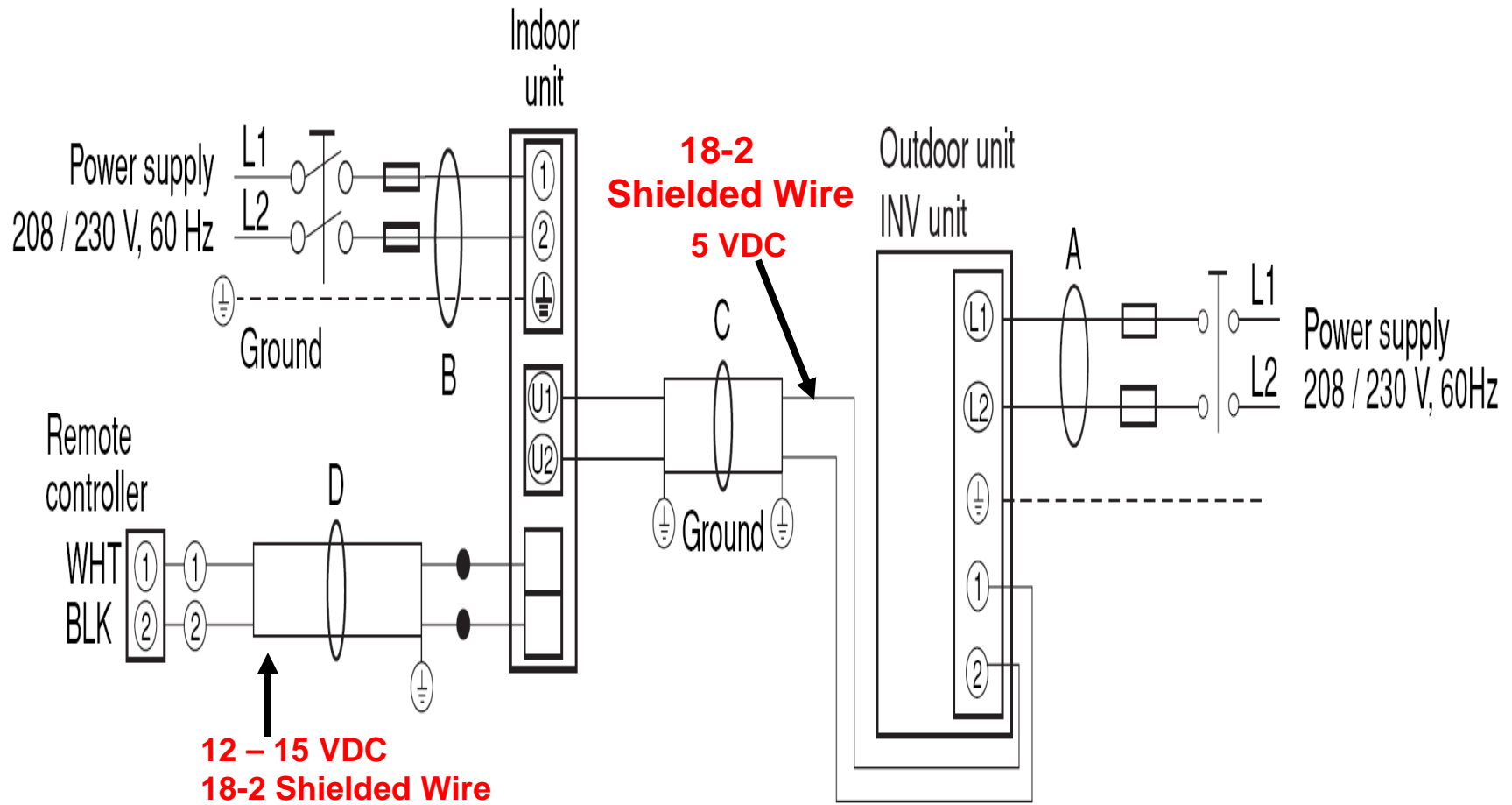
Only charge the refrigerant in liquid form.

For Technical Information or Parts: call 1-800-851-1235 or visit our website: www.sanyohvac.com

INVERTER TECHNOLOGY

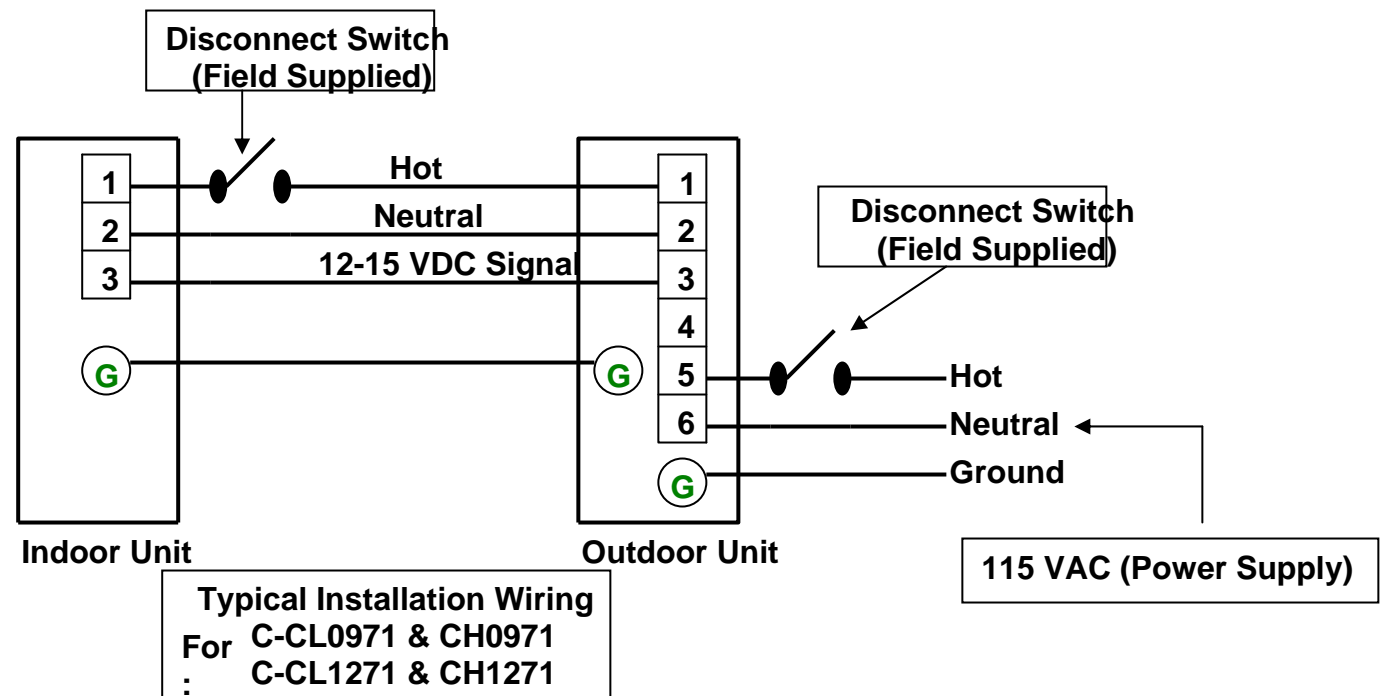
- The DC motor uses powerful Neodymium magnets, which are approximately 15-20 times stronger than the ferrite magnets used in conventional AC compressors. This, combined with precise digital control gives the SANYO DC compressor an operation rate of 15-20% higher than that of a conventional AC compressor.
- The SPW outdoor units utilize the latest SANYO twin rotary compressor in which **perfectly balanced dual rotors** revolve smoothly and efficiently to **provide powerful, quiet and vibration free performance.**
- **Can operate down as low as 23% of total outdoor unit capacity.**
- An Inverter compressor is designed to vary its speed as the demands in the room change. Inverter compressors are designed to **Soft Start** therefore causing no dips in power supply.
- **Single phase AC power is supplied to the outdoor unit where it is rectified and converted into DC power to drive the compressor the input frequency is then modified to allow the compressor to run at a variety of speeds.**
- As the compressor speed decreases, the amount of refrigerant entering the indoor unit also decreases. This results in a more comfortable environment as the unit only produces the appropriate amount of cooling or heating required at that time - no more temperature swings.
- Inverter compressors have been shown to reduce power consumption by as much as 60% when compared to conventional fixed speed equivalents.
- **Taking inverter technology to a new level of comfort**

DUAL – CIRCUIT WIRING (26 - 42,000 BTU's Models)



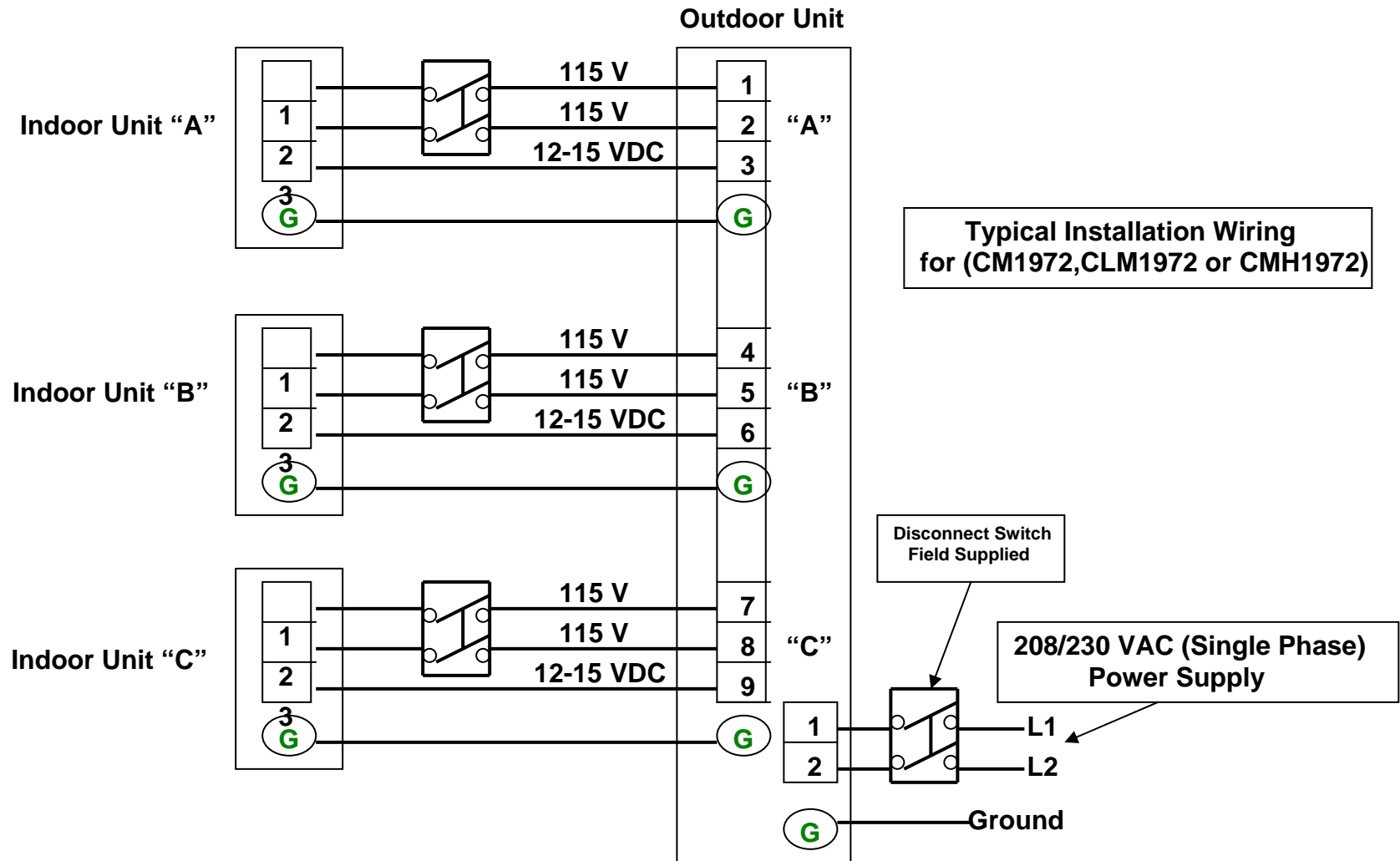
RAC Single Split System (A/C & HP)

- Installation wiring for **115** volt single split systems
- Note: The 9,000 & 12,000 BTU models in a single split Combination requires a **115** volt power supply.



Flexi-Multi (Cooling Only & HP)

- Installation wiring for the **230** volt flexi-multi split systems.
- These **230** volt systems are polarity sensitive.



TROUBLESHOOTING FOR 9,000-24,000 BTU MODELS

- **Always verify the correct voltage is at terminals 1&2 of the indoor unit. This will be 115 or 208/230 depending on the model. Note: the 208/230 volt models are polarity sensitive.**
- **Always verify the interconnecting wires, which run from the outdoor to the indoor unit. Make sure none of these wires are grounded.**
- **If a "C" or "CH" model condenser is utilized is it below 60 degrees Fahrenheit outside ambient? If yes the outdoor unit will be locked out. (In the case of a heat pump this is just in cooling mode.)**
- **Is the indoor unit generating a 12-15VDC signal going out to the condenser on terminals 2 & 3 when unit is calling for heating or cooling?**
- **If the indoor unit is not running is there voltage present at the coil of the power relay located at the outdoor unit? This will be 115 or 208/230. If not check HP and OLR circuit for open circuit.**
- **Is there a "blinking operation light" on the indoor unit? If yes, the unit is in a faulted condition. To determine the existing problem the unit will have to be put into a self-diagnostic mode the procedure is written on the inside of the front cover of the indoor unit.**
- **On the 9,000-24,000 BTU models there is a power lamp which will be illuminated if the outdoor PCB is being powered up. If light is not lit check fuses on PCB board.**

(PROCEDURE FOR RETRIEVING FAULT CODES INDOOR UNIT)

After turning on power to the air conditioner, use the remote controller and follow the steps below to execute self-diagnostics.

- Step 1:** Press and hold the remote controller ION button and 1HR TIMER button. At the same time, press the ACL (reset) button. Use a pointed object such as the tip of a pen to press the ACL button.
- Step 2:** Next, press the 1HR TIMER button once to change the display from “oP-1” to “oP-3” (self-diagnostics). (The display continues to blink.)
- Step 3:** Finally press the ON/OFF button to engage self-diagnostics mode.

E01: Indoor/Outdoor Communication Failure

	Lamps	Quiet	Timer	Operation
Condition	(3)	(2)	(1)	
E01	X	X	0	

X = OFF
0 = ON

Perform the following check

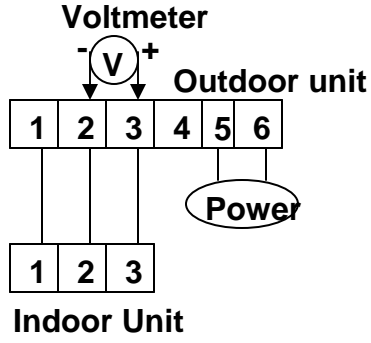
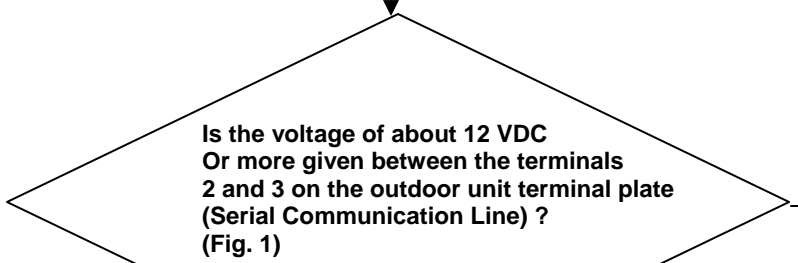


Fig.1

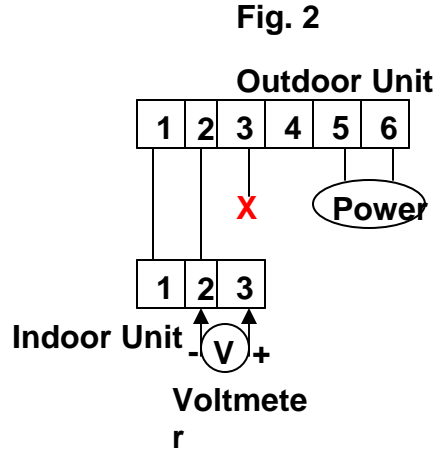
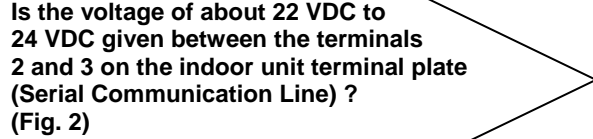


Fig. 2

1. Turn OFF the power and wait until the power lamp (LED) Of the outdoor unit controller is turned OFF.
2. Disconnect the wire from the terminal 3 on the indoor unit Terminal plate. (Fig. 2)
3. Turn ON the power.

YES

Defect or connection error
In the inter-connecting wires.



NO

Defect in the indoor unit
P.C. board

Cont.

(Cont. from previous page)

1. Turn OFF the power and wait until the power lamp (LED) Of the outdoor unit controller is turned OFF.
2. Short-circuit between the terminals 2 and 3 on the outdoor Unit terminal plate. (Fig. 3)

1. Turn ON the power and operate the system using the Remote controller or the operation button on the indoor unit.
2. Perform self-diagnostics using the remote after the unit has Operated for five seconds.

What is the latest self-diagnostic result? **Result: E12** → Defect in outdoor unit P.C. board

Result: E01

1. Turn off the power and wait until the power (LED) Of the outdoor unit controller is turned OFF.
2. Remove the short-circuit between the terminals 2 & 3 on The outdoor unit terminal plate.
3. Disconnect the wire from the terminal 3 on the indoor unit Terminal plate. (Fig. 4)

Short-circuit between terminals 2 & 3 on the indoor unit Terminal plate. (Fig. 5)

Cont.

(Jumper Wire)

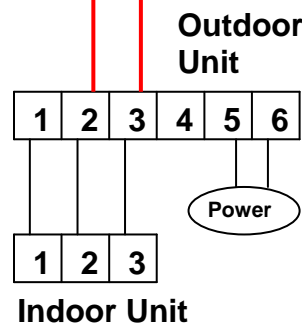


Fig. 3

Defect in outdoor unit P.C. board

Fig. 4

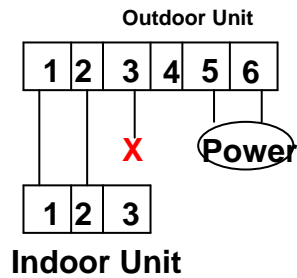
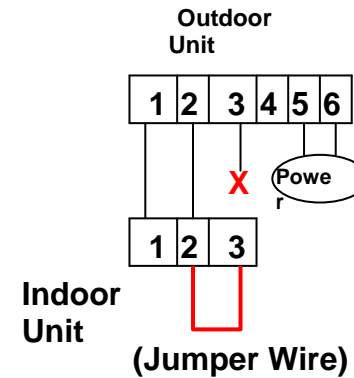
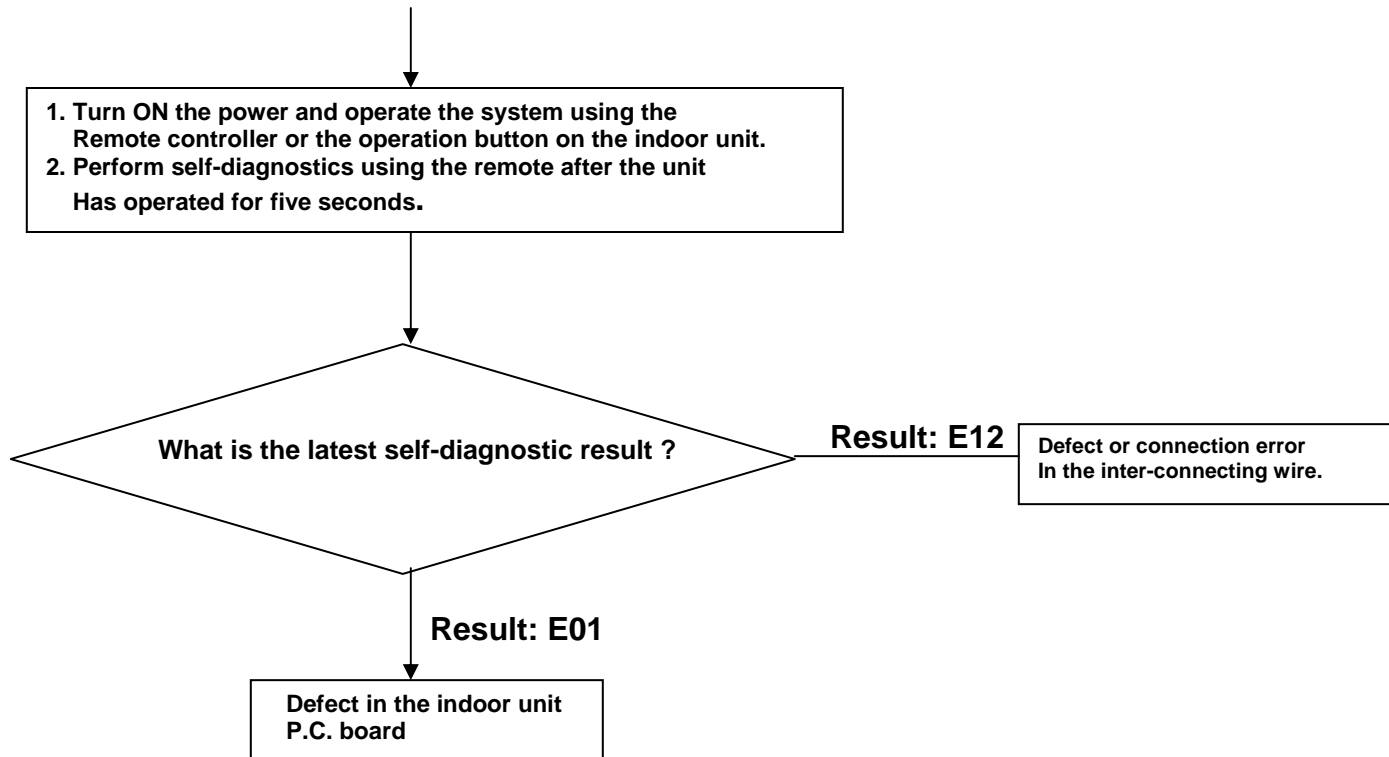


Fig. 5



Cont.



E12: Outdoor Systems Communication Failure

Lamp Condition	Quiet (3)	Timer (2)	Operation (1)
E12)	⚡	○

○

○ = ON
 ⚡ = Blinking

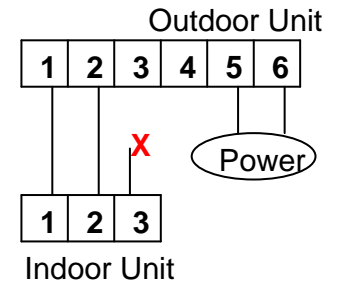
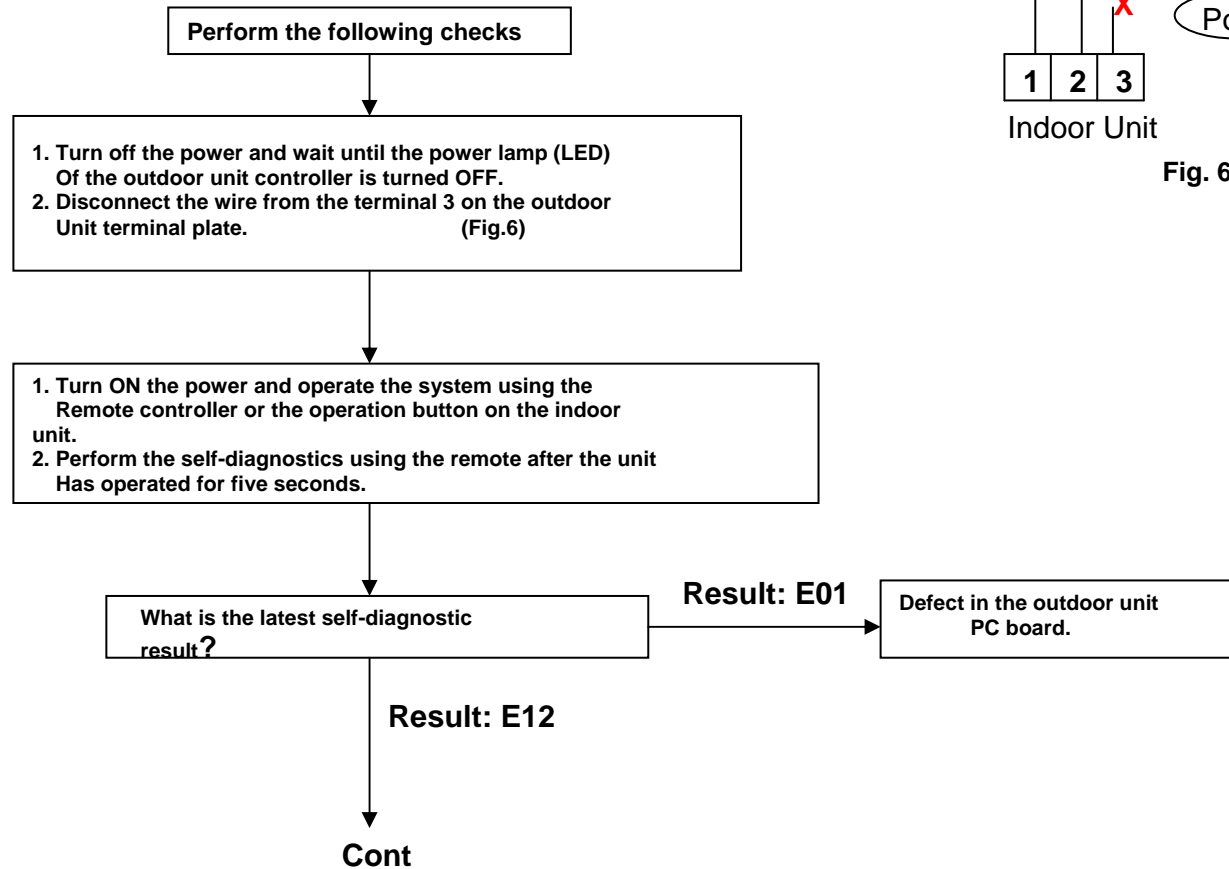


Fig. 6



Cont.

1. Turn off the power and wait until the power lamp (LED) Of the outdoor unit controller is turned OFF.
2. Disconnect the wire from the terminal 3 on the indoor Unit terminal plate. (Fig. 7)

1. Turn ON the power and operate the system using the Remote controller or the operation button on the indoor unit.
2. Perform self-diagnostics five seconds after the unit is put in Operation.

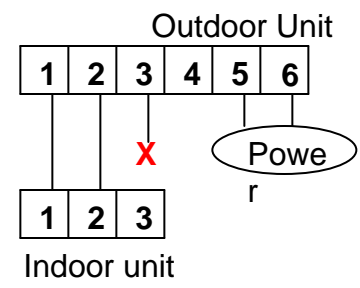
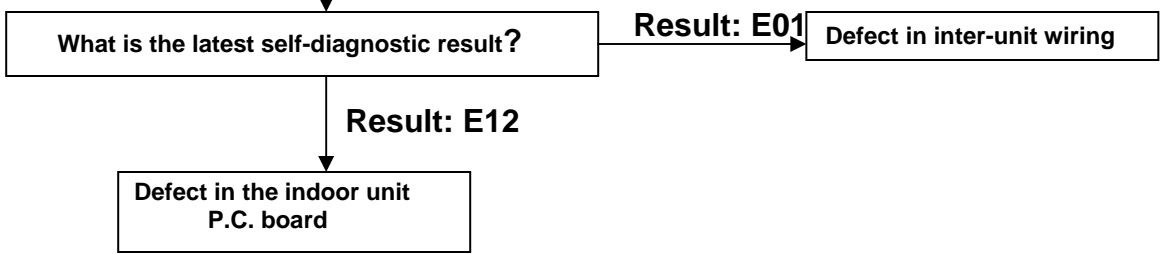


Fig. 7

Troubleshooting for the 26,000- 42,000 BTU Models

- If no operation of indoor or outdoor unit exists. Always check at terminals 1&2 of the indoor unit to verify 208/230 volts are present.
- Check indoor board to see if power led is illuminated. If light is not lit, check transformer for secondary voltages as follows:
- (2 red wires = 14.8 VAC) (2 brown wires = 14.8 VAC) (2 orange wires = 20 VAC).
- If all indoor voltages are confirmed with no operation, then proceed to the outdoor unit. On the outdoor unit circuit board there are 2 led lights marked LED 2 and LED 1 these are the error lamps. The lamps should be "off" in normal operation. If the lamps are lit or blinking this is indicative of an error code. A "blinking light" on both leds 1 & 2 at the same time represents an "auto address failure". When this failure occurs power will need to be cycled to outdoor unit, when applying power back to the outdoor unit the "black button" on the board marked "AUTO ADD" will have to be pushed. After pushing the black button the leds 1& 2 will start alternating back and forth then release button and wait for lights to go completely out. Then go to indoor unit and start using the remote. Always refer to these lights when no lights are "blinking" at the indoor unit.

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

- **When determining if a 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. Note: 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.**
- **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 and 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 a "auto address failure". If the lamps are blinking separately you must count the number of blinks on each lamp to determine the precise code.**
- **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**

Instructions for Replacing Indoor Unit Control PCB

Information for the Person in Charge of Replacing Indoor Unit PCB

1. These replacement instructions apply to 7-series indoor units. Please follow them only after confirming the model you are using and its service code.

(1) CR-TH2672

Service Parts: 854-9-9536-053-06

2. Verify that the following parts are included in this service pack:

(1) Indoor unit control PCB (2) EEPROM (3) Replacement instructions (these instructions)

3. Replace the PCB by following the instructions "How to Replace Indoor Unit Control PCB" on the next page.

Pay special attention to the following points:

(1) Before replacing the indoor unit PCB, be sure to turn off the power source (at mains).

(2) When replacing the PCB for an indoor unit, be sure to install the EEPROM that was attached to the original indoor unit PCB.

(3) Some connectors (such as PNL and FS) on the PCB may include jumper wires. When removing the PCB of a malfunctioning indoor unit, disconnect these wires together with the EEPROM, and install them onto the new PCB.

(4) Be careful when handling the EEPROM, as its pins are easily bent.

(5) Securely install the EEPROM in the location and orientation shown in the figure below.

(6) The alarm message (F29) may not necessarily appear immediately in cases of malfunctions in the EEPROM.

Please monitor for a while after turning it on.

Enlarged View of EEPROM

Location numbers of EEPROM

(1) ICB: CR-TH2672

Align the semi-circular cut-out part of the EEPROM with the cut-out part of the ICB socket.

Use caution as the orientation will vary depending on the type of PCB.

About EEPROM (Electrically Erasable Programmable Read-Only Memory)

EEPROM is a component in which the

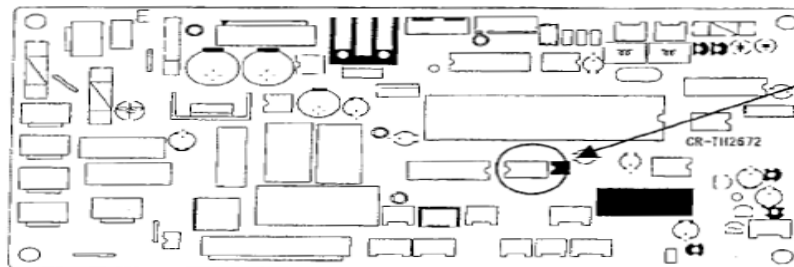
various information necessary for functioning

can be electronically written or erased.

This component holds information that is

essential for the running of the unit, and must

be handled with care.



Example: CR-TH2672

