

SERVICE MANUAL



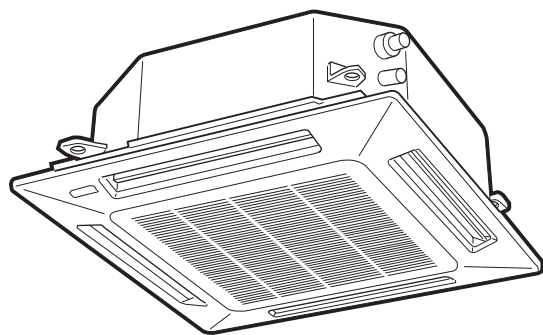
FILE NO.

XHS2432 / CH2432
XHS3632 / CH3632

SPLIT SYSTEM AIR CONDITIONER

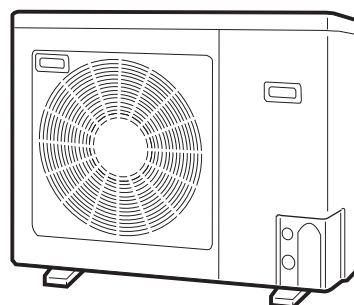
INDOOR MODEL No.	PRODUCT CODE No.	OUTDOOR MODEL No.	PRODUCT CODE No.
XHS2432	854 013 40	CH2432	854 013 42
XHS3632	854 015 45	CH3632	854 014 57

Indoor Unit

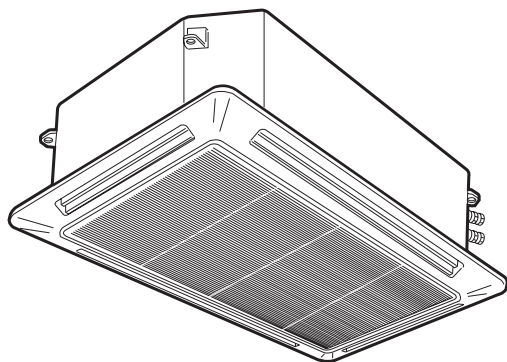


XHS2432

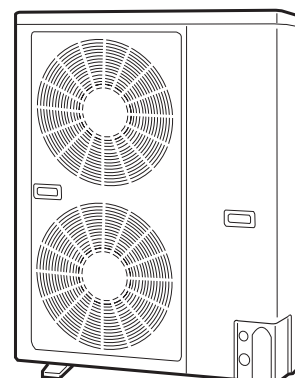
Outdoor Unit



CH2432



XHS3632



CH3632

Section
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2

3

4

Important

Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

For safe installation and trouble-free operation, you must :

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.



WARNING

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.



CAUTION

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

SPECIAL PRECAUTIONS

When Wiring



ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidental injury or death**.
- **Ground the unit** following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When Installing

...In a Room

Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

...In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

...In an area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

...In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

When Connecting Refrigerant Tubing

- Ventilate the room well, in the event that refrigerant gas leaks during the installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of poisonous gas.
- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

NOTE

Depending on the system type, liquid and gas lines may be either narrow or wide. Therefore, to avoid confusion the refrigerant tubing for your particular model is specified as either "narrow" or "wide" rather than as "liquid" or "gas".

When Servicing

- Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site when installation is finished. Check that no metal scraps or bits of wiring have been left inside the unit.



CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Contact of refrigerant gas with fire or heat can produce poisonous gas.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of poisonous gas.

WHO SHOULD USE THIS MANUAL

This service manual is made to assist the service technician apply his knowledge and training to this model air conditioner. This manual is written both for **experienced service persons** and **those who are new** to air conditioning service. To help those with less experience or who are new to this kind of unit we have included more explanations of basic procedures in simple language than is usual in some service manuals. The **experienced technician** will of course find he knows many of these things already and can go directly to the procedures and information he needs; the less experienced technician will better understand what to do even before he arrives on the job, and therefore be better able to work by himself as well as assist the more experienced technician.

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Introduction: *Read Me First!*

This manual will help you understand and service the air conditioner. To help you find the information you need, we have divided it into 5 main sections. Each section is divided into chapters with charts, tables and explanations to help you find and repair problems.

- ❑ **Section 1: Specifications**, tells you about the physical and electrical make up of the unit, as well as its heating and cooling capacities. Look in this section to find the correct values for components and functions.
- ❑ **Section 2: Processes and Functions**, explains each different part of the cooling and heating cycle, and how each control function reacts to changing conditions to keep the room at the set temperature range.
- ❑ **Section 3: Electrical Data**, which has fold-out schematic and wiring diagrams so you can find the parts you need to check when something is wrong, and see how they should be connected.
- ❑ **Section 4: Service Procedures**, has two main parts, a *diagnostic* chapter to help you find the specific component to replace or adjust, and a chapter with specific procedures and values to guide you in checking the electrical components in the unit.

HOW TO USE THIS MANUAL

You can use this manual both as a reference to find specific information about the capacity, functions and construction of this unit, and as a source of information to help you set up and maintain the unit. When this unit is not working properly, and the cause is not known, you can use the procedures in **Section 3: Servicing Procedures** to find the problem, fix it, and restore the unit to its proper functioning. This air conditioner has many helpful self diagnostic features to help you identify problem areas quickly.

So you will be ready when a problem happens, we suggest you look this manual over and become familiar with it by following these steps:

1. **Look at the TABLE OF CONTENTS** to get an idea of what is in this manual and where to find it.
2. **Look at the chapter about TROUBLE SHOOTING**, so you are familiar with the way the flow charts work. They are designed to guide you quickly through the possible causes for each kind of problem that is likely to happen to the Unit. Particularly read the introduction to this section, and the parts about the self-diagnosis and error codes which show on the display.
3. **Look at the chapter about CHECKING ELECTRICAL COMPONENTS**. You already know about most of these procedures. This chapter gives you the specific values and methods for these components. If you don't know some of these procedures, you can easily learn them here.
4. **Read the Instruction Manual!** The Instruction Manual is included here because it helps you help the user to set the temperature controls properly and know how to take care of any simple problems that may happen, as well as know when to call for service. The Instruction Manual also has illustrations, care, and installation information not found in the rest of the service manual. It is short, and if you read it carefully, you will be able to answer the customers questions easily, and also know the most efficient ways for setting times and temperatures.

Please use this manual to make your work easier, keep the air conditioner functioning well, and keep your customers satisfied.

1. SPECIFICATIONS

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1-1 Unit Specifications

MODEL No.		Indoor Unit	XHS2432			
		Outdoor Unit	CH2432			
POWER SOURCE		230 - 208 V / 1 Phase / 60 Hz				
PERFORMANCE		Cooling		Heating		
Capacity*	(17°F)**	BTU / h	24,000	23,400	25,000 16,400	24,300 15,800
Moisture removal (High)		Pints / h	8.6	8.4	—	
Air circulation (Hi)		cu.ft. / min.	540 / 510			
S.E.E.R. (H.S.P.F.)		BTU / Wh	10.0	10.2	(7.0)	(7.0)
ELECTRICAL RATINGS						
Voltage rating		VAC	230	208	230	208
Available voltage range		VAC	187 - 253		187 - 253	
Running amperes		A	11.2	11.6	11.7	12.3
Max. running amperes		A	—	—	—	—
Power input*	(17°F)**	W	2,450	2,350	2,500 2,150	2,450 2,020
Buck-up heater		kW	—	—	—	—
Maximum fuse size		A	30			
FEATURES						
Controls	Microprocessor					
Fan speeds Indoor / Outdoor	3 and Automatic control / 2 (Auto)					
Timer	ON / OFF 24-hours & Program					
Air deflection	Horizontal / Vertical		— / Automatic			
Air filter	Washable, easy access, long life filter (2,500 hr)					
Operation sound Hi / Me / Lo	Indoor Outdoor - Hi	dB - A dB - A	37 / 35 / 31 53			
Refrigerant control	Electronic Refrigerant Control Valve					
REFRIGERANT PIPING						
Limit of piping length		ft. (m)	165 (50)			
Limit of piping length at shipment		ft. (m)	100 (30)			
Limit of elevation difference between the two units		ft. (m)	Outdoor unit is higher than indoor unit: 165 (50) Outdoor unit is lower than indoor unit: 100 (30)			
Refrigerant piping Flare type	Narrow pipe Wide pipe	in. (mm) in. (mm)	1 / 4 (6.35) 3 / 4 (19.05)			

1-1 Unit Specifications

DIMENSIONS & WEIGHT			Indoor unit		Outdoor unit	
Unit dimensions	Height	in. (mm)	9-27/32	(250)	28-30/32	(735)
	Width	in. (mm)	29-29/32	(760)	37	(940)
	Depth	in. (mm)	29-29/32	(760)	13-12/32	(340)
Net weight		lbs. (kg)	49	(22)	157	(71)
Indoor grille dimensions PNR-XHS2432	Height	in. (mm)	3-1/16	(78)		
	Width	in. (mm)	33-27/32	(860)		
	Depth	in. (mm)	33-27/32	(860)		
Net weight		lbs. (kg)	11	(5)		
Indoor / Outdoor unit Package dimensions	Height	in. (mm)	11-6/32	(284)	32-17/32	(826)
	Width	in. (mm)	32-14/32	(824)	40	(1,016)
	Depth	in. (mm)	32-25/32	(833)	16-12/32	(416)
Shipping weight		lbs. (kg)	60	(27)	170	(77)
Shipping volume		cu.ft. (m ³)	6.9	(0.195)	12.3	(0.349)
Indoor grille Package dimensions PNR-XHS2432	Height	in. (mm)	4-3/32	(104)		
	Width	in. (mm)	38-2/32	(967)		
	Depth	in. (mm)	39-11/32	(999)		
Shipping weight		lbs. (kg)	18	(8)		
Shipping volume		cu.ft. (m ³)	3.5	(0.100)		

DATA SUBJECT TO CHANGE WITHOUT NOTICE

Cooling :

Rating conditions (*) : Room temperature 80 °F DB / 67 °F WB, Ambient temperature 95 °F DB / 75 °F WB

Heating :

Rating conditions (*) : Room temperature 70 °F DB / 60 °F WB, Ambient temperature 47 °F DB / 43 °F WB

Low temp conditions (**): Room temperature 70 °F DB / 60 °F WB, Ambient temperature 17 °F DB / 15 °F WB

1-1 Unit Specifications

MODEL No.		Indoor Unit	XHS3632			
		Outdoor Unit	CH3632			
POWER SOURCE		230 - 208 VAC / 1 Phase / 60 Hz				
PERFORMANCE		Cooling		Heating		
Capacity* (17°F)**	BTU / h	34,500	33,500	37,500 25,000	36,500 23,500	
Moisture removal (High)	Pints / h	11.1	11.1	—		
Air circulation (Hi)	cu.ft. / min.	980 / 880				
S.E.E.R. (H.S.P.F.)	BTU / Wh	10.7	11.0	(7.0)	(7.0)	
ELECTRICAL RATINGS						
Voltage rating	VAC	230	208	230	208	
Available voltage range	VAC	187 - 253		187 - 253		
Running amperes	A	15.4	15.8	18.2	19.3	
Max. running amperes	A	—	—	—	—	
Power input* (17°F)**	W	3,350	3,200	3,850 3,150	3,750 2,950	
Buck-up heater	kW	—	—	—	—	
Maximum fuse size	A	30				
FEATURES						
Controls	Microprocessor					
Fan speeds Indoor / Outdoor	3 and Automatic control / 2 (Auto)					
Timer	ON / OFF 24-hours & Program					
Air deflection	Horizontal / Vertical	— / Automatic				
Air filter	Washable, easy access, long life filter (2,500 hr)					
Operation sound Hi / Me / Lo	Indoor Outdoor - Hi	dB - A dB - A	43 / 40 / 36 56			
Refrigerant control	Electronic Refrigerant Control Valve					
REFRIGERANT PIPING						
Limit of piping length	ft. (m)	165 (50)				
Limit of piping length at shipment	ft. (m)	100 (30)				
Limit of elevation difference between the two units	ft. (m)	Outdoor unit is higher than indoor unit: 165 (50) Outdoor unit is lower than indoor unit: 100 (30)				
Refrigerant piping Flare type	Narrow pipe Wide pipe	in. (mm) in. (mm)	3 / 8 (9.52) 3 / 4 (19.05)			

1-1 Unit Specifications

DIMENSIONS & WEIGHT			Indoor unit		Outdoor unit	
Unit dimensions	Height	in. (mm)	11-1/32	(280)	48-20/32	(1,235)
	Width	in. (mm)	41-11/32	(1,050)	37	(940)
	Depth	in. (mm)	29-29/32	(760)	13-12/32	(340)
Net weight		lbs. (kg)	60	(27)	203	(92)
Indoor grille dimensions PNR-XHS3632	Height	in. (mm)	3-1/6	(78)		
	Width	in. (mm)	33-27/32	(1,150)		
	Depth	in. (mm)	33-27/32	(860)		
Net weight		lbs. (kg)	15	(7)		
Indoor / Outdoor unit Package dimensions	Height	in. (mm)	12-14/32	(316)	52-7/32	(1,326)
	Width	in. (mm)	43-27/32	(1,114)	40	(1,016)
	Depth	in. (mm)	32-25/32	(833)	16-12/32	(416)
Shipping weight		lbs. (kg)	71	(32)	227	(103)
Shipping volume		cu.ft. (m ³)	10.3	(0.293)	19.8	(0.56)
Indoor grille Package dimensions PNR-XHS3632	Height	in. (mm)	4-3/32	(104)		
	Width	in. (mm)	49-16/32	(1,257)		
	Depth	in. (mm)	39-11/32	(999)		
Shipping weight		lbs. (kg)	29	(13)		
Shipping volume		cu.ft. (m ³)	4.6	(0.131)		

DATA SUBJECT TO CHANGE WITHOUT NOTICE

Cooling :

Rating conditions (*) : Room temperature 80 °F DB / 67 °F WB, Ambient temperature 95 °F DB / 75 °F WB

Heating :

Rating conditions (*) : Room temperature 70 °F DB / 60 °F WB, Ambient temperature 47 °F DB / 43 °F WB

Low temp conditions (**): Room temperature 70 °F DB / 60 °F WB, Ambient temperature 17 °F DB / 15 °F WB

1-2 Major Component Specifications

(A) Indoor Unit

MODEL No.		XHS2432	
Source		230 - 208 VAC / 1 phase / 60 Hz	
Remote controller (Accessory)		RCS - 5HPS4U	
Controller P. C. B Ass'y		CR - THS2432	
Control circuit fuse		250 VAC, 3 A	
Controller Ass'y		CR - 3XHS	
Fan (Number ... diameter)	in. (mm)	Turbo (1...19-9/32 (490))	
Fan motor			
Model		SFG6X - 41A5P	
Source		230 - 208 V / 1 phase / 60 Hz	
No. of pole ... r.p.m. (230 V, High)	rpm	6 ... 451	
Nominal output	W	40	
Coil resistance (Ambient temperature 68 °F)	Ω	BRW - WHT : 114.0 , ORG - YEL : 66.4 WHT - VLT : 23.9 , WHT - PNK : 77.4 VLT - ORG : 12.4 , YEL - BLK : 82.1	
Safety device			
Operating temperature	Open °F	266 ± 14.4	
	Close °F	174.2 ± 27	
Run capacitor	VAC, μF	440 V, 4 μF	
Electronic expansion valve			
Coil		DKV - MOZS582E0	
Coil resistance (at 20°C)	Ω	ORG - GRY : 46 , YEL - GRY : 46 RED - GRY : 46 , BLK - GRY : 46	
Valve body		IKV - 24D12	
Heat exchanger			
Coil		Aluminum plate fin / Copper tube	
Rows ... Fins per inch		2 ... 14.9	
Face area	ft. ² (m ²)	3.18 (0.295)	
Panel			
Model No.		PNR - XHS2432	
Indicator Lamp Ass'y		IND - 3THS	
Auto louver motor		MT8 - 3C	
Auto louver motor ... Rated	V, W, rpm	240 VAC, 3 W, 3 rpm	
Coil resistance (Ambient temperature 77 °F)	Ω	16.430 Ω ± 8 %	

DATA SUBJECT TO CHANGE WITHOUT NOTICE



1-2 Major Component Specifications

(A) Indoor Unit

MODEL No.		XHS3632	
Source		230 - 208 VAC / 1 phase / 60 Hz	
Remote controller (Accessory)		RCS - 5HPS4U	
Controller P. C. B Ass'y		CR - THS2432	
Control circuit fuse		250 VAC, 3 A	
Controller Ass'y		CR - 3XHS	
Fan (Number ... diameter)	in. (mm)	Turbo (1...19-9/32 (490))	
Fan motor			
Model		SFG6X - 61A3P	
Source		230 - 208 V / 1 phase / 60 Hz	
No. of pole ... r.p.m. (230 V, High)	rpm	6 ... 560	
Nominal output	W	60	
Coil resistance (Ambient temperature 68 °F)	Ω	BRW - WHT : 71.1 , ORG - YEL : 22.7 WHT - VLT : 8.7 , VLT - PNK : 43.2 VLT - ORG : 13.3 , YEL - BLK : 54.32	
Safety device			
Operating temperature	Open °F	266 ± 14.4	
	Close °F	174.2 ± 27	
Run capacitor	VAC, μF	440 V, 6 μF	
Electronic expansion valve			
Coil		EKV - MOZS584E0	
Coil resistance (at 20°C)	Ω	ORG - GRY : 46 , YEL - GRY : 46 RED - GRY : 46 , BLK - GRY : 46	
Valve body		HKV - 30D16	
Heat exchanger			
Coil		Aluminum plate fin / Copper tube	
Rows ... Fins per inch		2 ... 14.9	
Face area	ft. ² (m ²)	5.17 (0.48)	
Panel			
Model No.		PNR - XHS3632	
Indicator Lamp Ass'y		IND - 3THS	
Auto louver motor		MT8 - 3C	
Auto louver motor ... Rated	V, W, rpm	240 VAC, 3 W, 3 rpm	
Coil resistance (Ambient temperature 77 °F)	Ω	16.430 Ω ± 8 %	

DATA SUBJECT TO CHANGE WITHOUT NOTICE

1-2 Major Component Specifications

(B) Outdoor Unit

MODEL No.		CH2432	
Source		230 - 208 VAC / 1 phase / 60 Hz	
Controller P.C.B. Ass'y		CR - CH2432 (Microprocessor)	
Control circuit fuse		250 VAC, 3 A	
Compressor		Rotary (Hermetic)	
Model		C - 2R160H6T	
Source		230 - 208 VAC / 1 phase / 60 Hz	
Nominal output	W	1,700	
Compressor oil	cc	800	
Coil resistance (Ambient temperature 77 °F)	Ω	C - R : 0.885 , C - S : 1.773	
Safety device		Internal type	
Overload relay models		—	
Operating temperature	Open °F	297 ± 9	
	Close °F	198 ± 20	
Operating ampere (at 77 °F)	A	—	
Run capacitor	VAC, μF	400 VAC, 40 μF	
Crank case heater	VAC, W	230 VAC, 30 W	
Refrigerant amount charged at shipment	lbs. (kg)	R22 : 6.17 (2.8)	
High pressure switch		ACB - 1UB11	
Set pressure	OFF lb/in ² (kg/cm ²)	426.6 ^{+28.44} _{+7.11} (30 ^{+2.0} _{+0.5})	
	ON lb/in ² (kg/cm ²)	341.3 ± 28.44 (24 ± 2.0)	
Fan		Propeller	
Number...diameter	in. (mm)	1 ... 18 - 3/32 (460)	
Fan speeds		2 (AUTO)	
Fan motor			
Model		KFC6T - 91D6P	
Source		230 - 208 VAC / 1 phase / 60 Hz	
No. of pole rpm (230 V, High)		6 ... 879	
Nominal output	W	110	
Coil resistance (Ambient temperature 68 °F)	Ω	BRN - WHT : 67.14 , VLT - YEL : 11.42 WHT - VLT : 64.85 , YEL - PNK : 10.60	
Safety device		Internal type	
Operating temperature	Open °F	248 ± 9	
	Close °F	171 ± 27	
Run capacitor	VAC, μF	440 VAC, 4 μF	
Heat exchange			
Coil		Aluminum plate fin / Copper tube	
Rows Fins per inch		2 ... 14.1	
Face area	ft. ² (m ²)	6.78 (0.63)	

DATA SUBJECT TO CHANGE WITHOUT NOTICE



1-2 Major Component Specifications

(B) Outdoor Unit



MODEL No.		CH3632	
Source		230 - 208 VAC / 1 phase / 60 Hz	
Controller P.C.B. Ass'y		CR - CH2432 (Microprocessor)	
Control circuit fuse		250 V, 3 A	
Compressor		Rotary (Hermetic)	
Model		C - R221H6R	
Source		230 - 208 VAC / 1 phase / 60 Hz	
Nominal output	W	2,200	
Compressor oil	cc	1,500	
Coil resistance (Ambient temperature 77 °F)	Ω	C - R : 0.549 , C - S : 1.525	
Safety device		Internal type	
Overload relay models		—	
Operating temperature	Open °F	320 ± 9	
	Close °F	189 ± 20	
Operating ampere (at 77 °F)	A	—	
Run capacitor	VAC, μF	400 VAC, 40 μF	
Crank case heater	VAC, W	230 VAC, 30 W	
Refrigerant amount charged at shipment	lbs. (kg)	R22 : 8.82 (4.0)	
High pressure switch		ACB - 1UB11	
Set pressure	OFF lb/in ² (kg/cm ²)	426.6 ^{+28.44} / _{+7.11} (30 ^{+2.0} / _{+0.5})	
	ON lb/in ² (kg/cm ²)	341.3 ± 28.44 (24 ± 2.0)	
Fan		Propeller	
Number...diameter	in. (mm)	2 ... 18 - 3/32 (460)	
Fan speeds		2 (AUTO)	
Fan motor			
Model		KFC6T - 91D6P × 2	
Source		230 - 208 V / 1 phase / 60 Hz	
No. of pole rpm (230 V, High)		6 ... 879	
Nominal output	W	110 × 2	
Coil resistance (Ambient temperature 68 °F)	Ω	BRN - WHT : 67.14 , VLT - YEL : 11.42 WHT - VLT : 64.85 , YEL - PNK : 10.60	
Safety device		Internal type	
Operating temperature	Open °F	248 ± 9	
	Close °F	171 ± 27	
Run capacitor	VAC, μF	440 VAC, 4 μF × 2	
Heat exchange			
Coil		Aluminum plate fin / Copper tube	
Rows Fins per inch		2 ... 14.1	
Face area	ft. ² (m ²)	11.63 (1.08)	

DATA SUBJECT TO CHANGE WITHOUT NOTICE

1-3 Other Component Specifications

(A) Indoor Unit

MODEL No.		XHS2432	
Power Transformer		ATR – II174B	
Rated	Primary	220 VAC, 60 Hz	
	Secondary	14.8 VAC 0.55 mA, 14.8 VAC 0.6 mA	
	Capacity	—	
Coil resistance (Ambient temperature 77 °F)	Ω	WHT - WHT : 101 , BRN - BRN : 0.42	
Thermistor cut off temperature	°F	277	
Thermistor (Coil sensor) : TH2, 3		PBC - 41E - S26	
Coil resistance	kΩ	14 °F : 23.7	41 °F : 12.1
		23 °F : 18.8	50 °F : 9.7
		32 °F : 15.0	59 °F : 8.0
Thermistor (Room sensor) : TH1		KTEC - 35 - S6	
Coil resistance	kΩ	32 °F : 16.5	104 °F : 2.7
		41 °F : 12.8	113 °F : 2.2
		50 °F : 10.0	122 °F : 1.8
		68 °F : 6.3	131 °F : 1.5
		86 °F : 4.0	
Drain pump		WP20SL - 21	
Rated		230 / 208 VAC, 12.5 W	
Float switch		FS - 0218 - 102	
MAX Rated (Contact rated)		50 W, DC 5V, 0.1 mA	
Solenoid control valve or coil			
Solenoid control valve		IKV - 24D12	
Solenoid coil		DKV - MOZS582E0	
Indicator Lamp Ass'y		IND - 3THS	
Synchronized Motor		MT8 - 3C	



1-3 Other Component Specifications

(A) Indoor Unit

MODEL No.		XHS3632	
Power Transformer		ATR – II174B	
Rated	Primary	220 VAC, 60 Hz	
	Secondary	14.8 VAC 0.55 mA, 14.8 VAC 0.6 mA	
	Capacity	—	
Coil resistance (Ambient temperature 77 °F)	Ω	WHT - WHT : 101 , BRN - BRN : 0.42	
Thermistor cut off temperature	°F	277	
Thermistor (Coil sensor) : TH2, 3		PBC - 41E - S36	
Coil resistance	kΩ	14 °F : 23.7	41 °F : 12.1
		23 °F : 18.8	50 °F : 9.7
		32 °F : 15.0	59 °F : 8.0
Thermistor (Room sensor) : TH1		KTEC - 35 - S6	
Coil resistance	kΩ	32 °F : 16.5	104 °F : 2.7
		41 °F : 12.8	113 °F : 2.2
		50 °F : 10.0	122 °F : 1.8
		68 °F : 6.3	131 °F : 1.5
		86 °F : 4.0	
Drain pump		WP20SL - 21	
Rated		230 / 208 VAC, 12.5 W	
Float switch		FS - 0218 - 103	
MAX Rated (Contact rated)		50 W, DC 5V, 0.1 mA	
Solenoid control valve or coil			
Solenoid control valve		HKV - 30D16	
Solenoid coil		EKV - MOZS728E0	
Indicator Lamp Ass'y		IND - 3THS	
Synchronized Motor		MT8 - 3C	

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1-3 Other Component Specifications

(B) Outdoor Unit

MODEL No.		CH2432	
Compressor Motor Magnetic Contactor		FMCA - 1UL	
Coil rated		240 VAC, 60 Hz	
Coil resistance (at 77 °F)	Ω	580 ± 15 %	
Contact rated (Main)		230 VAC, 20 A	
Contact rated (Auxiliary)		230 VAC, 3 A	
Power Relay		HH62S	
Coil rated		240 VAC, 60 Hz	
Coil resistance (at 77 °F)	kΩ	17.2	
Contact rated		220 VAC, 5 A	
Power Transformer		ATR - I65C	
Rated			
Primary		220 VAC, 60 Hz	
Secondary		14 V, 0.4 A	
Capacity		5.6 VA	
Coil resistance (at 73 °F)	Ω	WHT – WHT : 395.5 , BRN – BRN : 2.19	
Thermal cut off temperature	°F	266	
Thermistor (Coil sensor) : TH6, 7		PBC - 41E - S4 , PBC - 41E - S26	
Coil resistance	kΩ	14 °F : 23.7 , 50 °F : 9.7	
		23 °F : 18.8 , 68 °F : 6.5	
		32 °F : 15.0 , 86 °F : 4.4	
		41 °F : 12.1 , 104 °F : 3.1	
		113 °F : 2.6	
Thermistor (Comp. discharge gas sensor) : TH8		PTC - 51H - S1	
Coil resistance	kΩ	140 °F : 13.8 , 194 °F : 5.1	
		158 °F : 9.7 , 212 °F : 3.8	
		167 °F : 8.2 , 230 °F : 2.8	
		176 °F : 7.0 , 248 °F : 2.2	
		185 °F : 5.9 , 266 °F : 1.7	
Solenoid control valve or coil			
Solenoid control valve		V 389100	
Solenoid coil		LB 59005	
Thermistor (PTC)		TDK – 101YV	
Rated			
Max. voltage		400 VAC	
Max. ampere		11.5 A	
Resistance (at 77 °F)	Ω	100 ⁺³⁰ ₋₂₀ %	

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1-3 Other Component Specifications

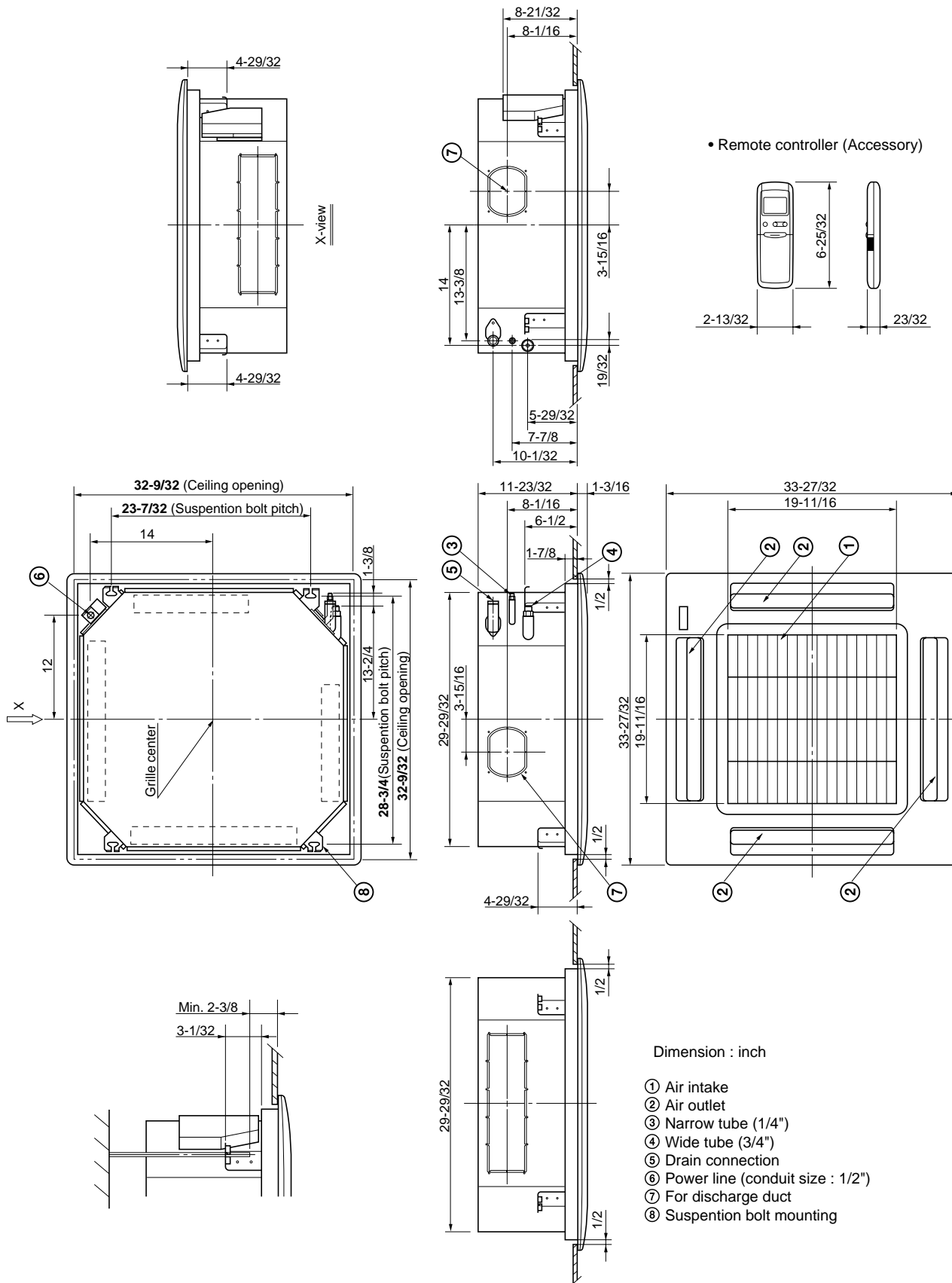
(B) Outdoor Unit

MODEL No.		CH3632	
Compressor Motor Magnetic Contactor		FMCA - 1SUL	
Coil rated		240 VAC, 60 Hz	
Coil resistance (at 68 °F)	Ω	588 ± 10 %	
Contact rated (Main)		240 VAC, 26 A	
Contact rated (Auxiliary)		240 VAC, 3 A	
Power Relay		HH62S	
Coil rated		240 VAC, 60 Hz	
Coil resistance (at 77 °F)	kΩ	17.2	
Contact rated		220 VAC, 5 A	
Power Transformer		ATR - I65C	
Rated			
Primary		220 VAC, 60 Hz	
Secondary		14 V, 0.4 A	
Capacity		5.6 VA	
Coil resistance (at 73 °F)	Ω	WHT – WHT : 395.5 , BRN – BRN : 2.19	
Thermal cut off temperature	°F	266	
Thermistor (Coil sensor) : TH6, 7		PBC - 41E - S4 , PBC - 41E - S36	
Coil resistance	kΩ	14 °F : 23.7 , 50 °F : 9.7	
		23 °F : 18.8 , 68 °F : 6.5	
		32 °F : 15.0 , 86 °F : 4.4	
		41 °F : 12.1 , 104 °F : 3.1	
		113 °F : 2.6	
Thermistor (Comp. discharge gas sensor) : TH8		PTC - 51H - S1	
Coil resistance	kΩ	140 °F : 13.8 , 194 °F : 5.1	
		158 °F : 9.7 , 212 °F : 3.8	
		167 °F : 8.2 , 230 °F : 2.8	
		176 °F : 7.0 , 248 °F : 2.2	
		185 °F : 5.9 , 266 °F : 1.7	
Solenoid control valve or coil			
Solenoid control valve		V 389100	
Solenoid coil		LB 59005	
Thermistor (PTC)		TDK – 101YV	
Rated			
Max. voltage		400 VAC	
Max. ampere		11.5 A	
Resistance (at 77 °F)	Ω	100 ⁺³⁰ ₋₂₀ %	

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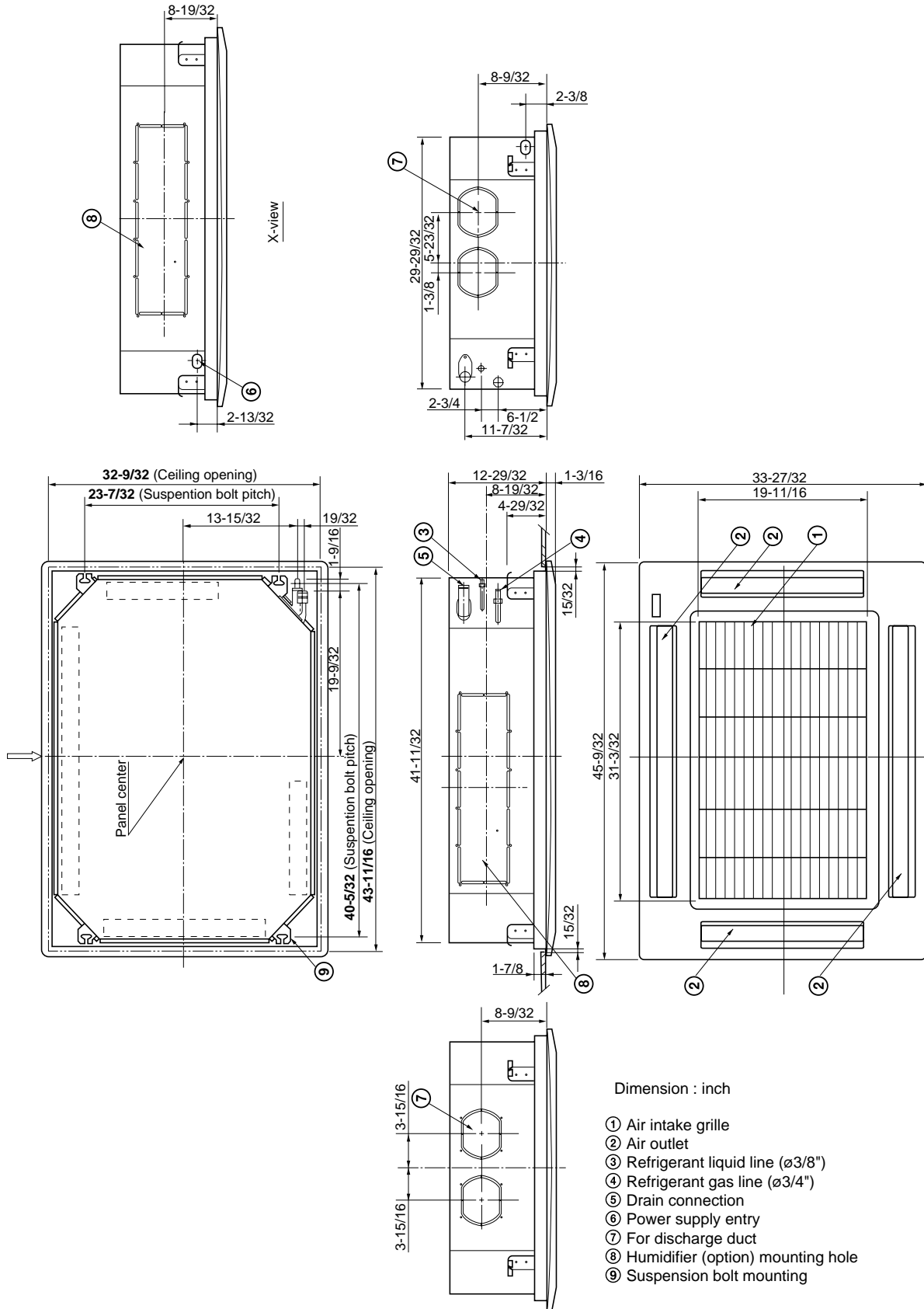
1-4 Dimensional Data

(A) Indoor Unit: XHS2432



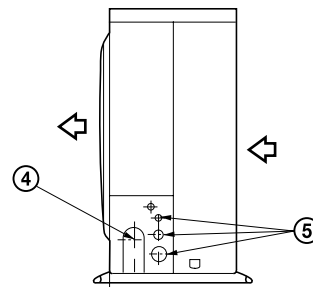
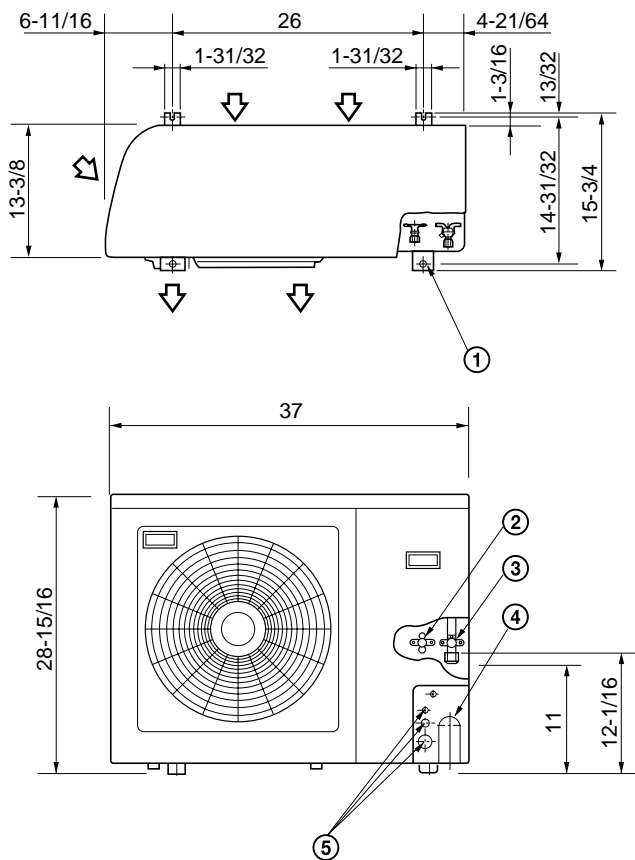
1-4 Dimensional Data

(A) Indoor Unit: XHS3632



1-4 Dimensional Data

(B) Outdoor Unit: CH2432



Dimension : inch

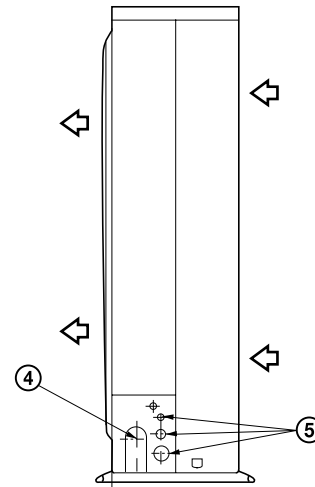
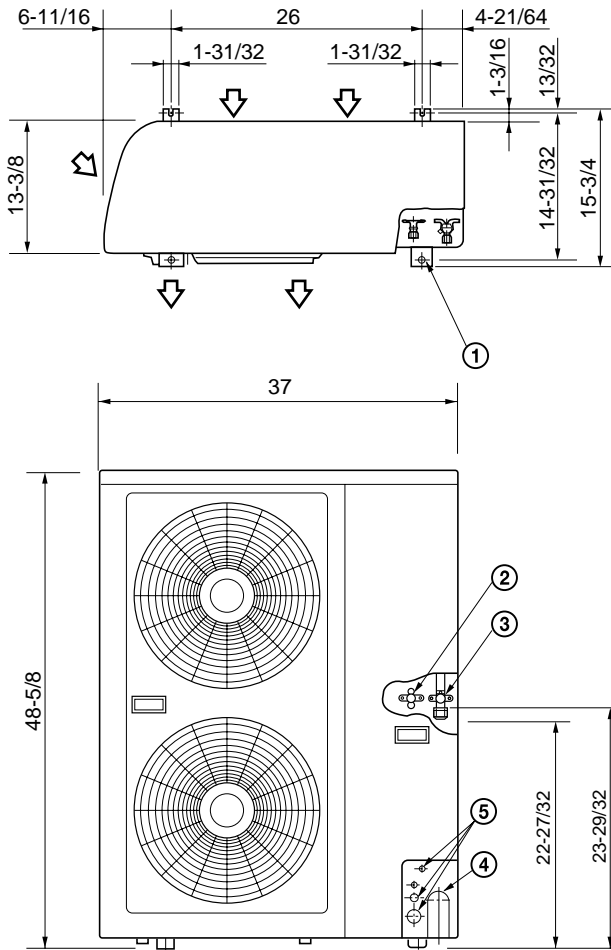
- ① Hole for anchor bolt (4- ϕ 1/2)
- ② Refrigerant tube joint (narrow tube)
Flare connection 1/4 in (6.35 mm)
- ③ Refrigerant tube joint (wide tube)
Flare connection 3/4 in (19.05 mm)
- ④ Refrigerant tubing inlet
- ⑤ Power supply inlet

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1-4 Dimensional Data

(B) Outdoor Unit: CH3632



Dimension : inch

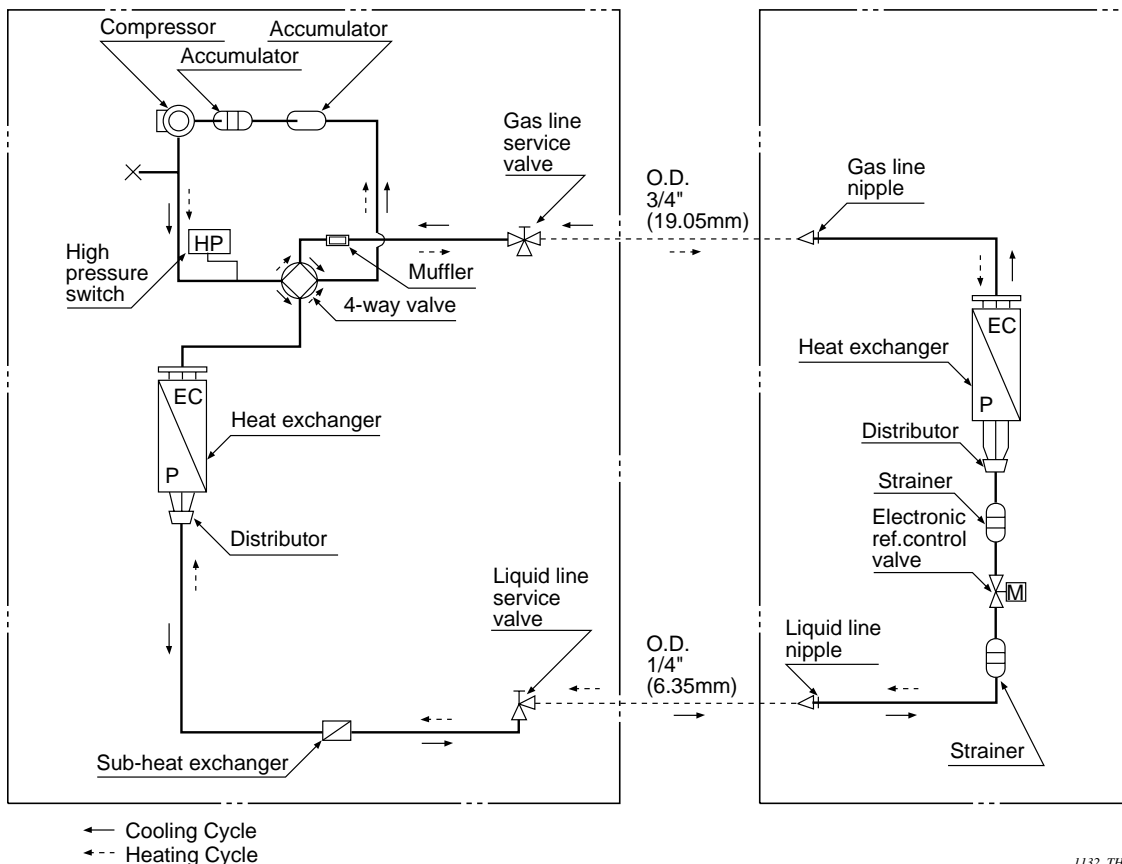
- ① Hole for anchor bolt (4- ϕ 13)
- ② Refrigerant tube joint (narrow tube)
Flare connection 3/8 in (9.52 mm)
- ③ Refrigerant tube joint (wide tube)
Flare connection 3/4 in (19.05 mm)
- ④ Refrigerant tubing inlet
- ⑤ Power supply inlet

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1-5 Refrigerant Flow Diagram

Outdoor Unit: CH2432

Indoor Unit: XHS2432



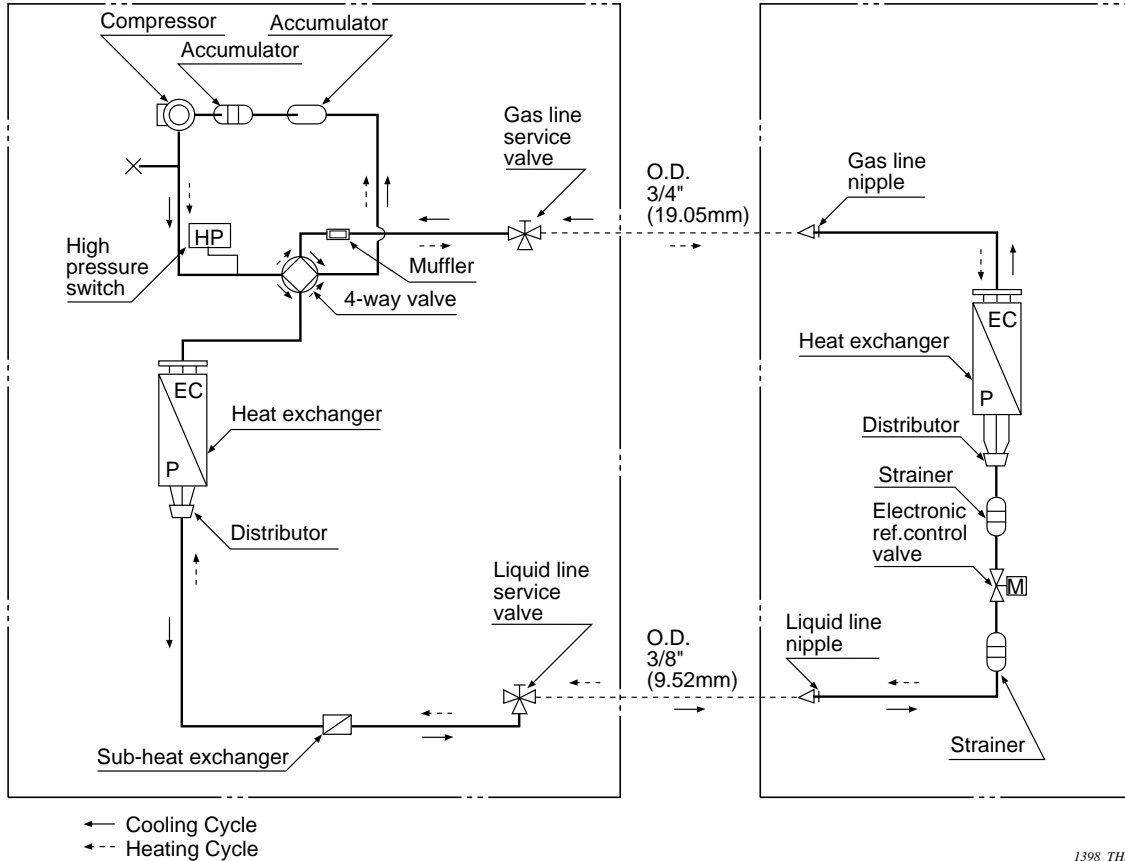
1-6 Operating Range

	Temperature	Indoor Air Intake	Outdoor Air Intake
Cooling	Maximum	95 °F DB, 71 °F WB	115 °F DB
	Minimum	67 °F DB, 57 °F WB	23 °F DB
Heating	Maximum	80 °F DB, 67 °F WB	75 °F DB, 65 °F WB
	Minimum	-DB / -WB	17 °F DB / 15 °F WB

1-5 Refrigerant Flow Diagram

Outdoor Unit: CH3632

Indoor Unit: XHS3632



1-6 Operating Range

	Temperature	Indoor Air Intake	Outdoor Air Intake
Cooling	Maximum	95 °F DB, 71 °F WB	115 °F DB
	Minimum	67 °F DB, 57 °F WB	23 °F DB
Heating	Maximum	80 °F DB, 67 °F WB	75 °F DB, 65 °F WB
	Minimum	-DB / -WB	17 °F DB / 15 °F WB

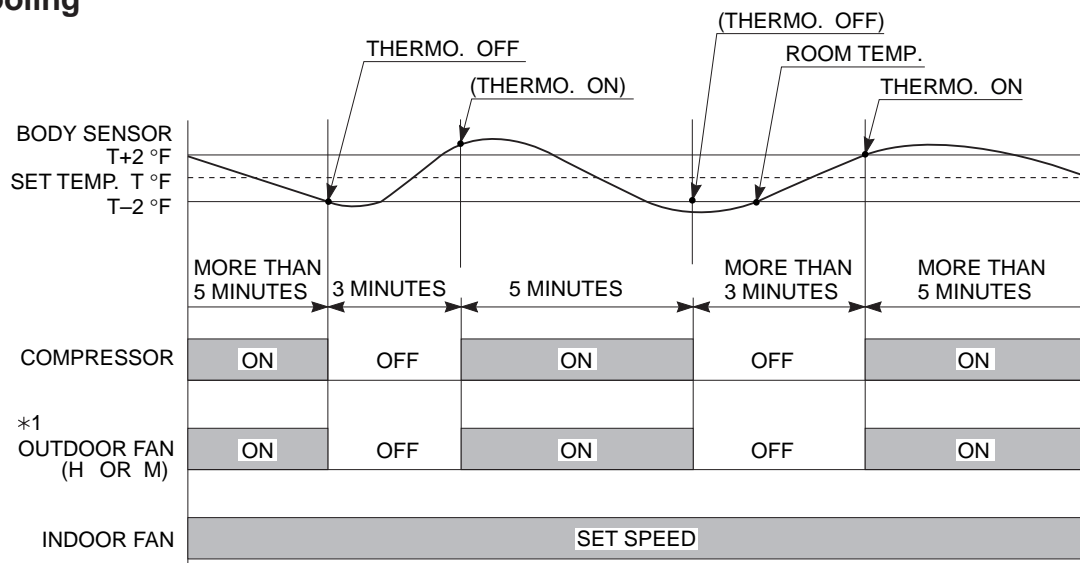
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2-1 Room Temperature Control

The Unit adjusts room temperature by turning the outdoor unit's compressor ON and OFF. This process is controlled by the **thermostat** located in the remote control unit. The figures on this and the next pages show how each part of the system performs when the room temperature changes and the thermostat activates the compressor to start (**thermo ON**) or stop (**thermo OFF**). Fig. 1 shows about the cooling cycle, and Fig. 2 shows about the heating cycle.

(A) Cooling



*1. Refer to 2-4 Outdoor Fan Speed Control

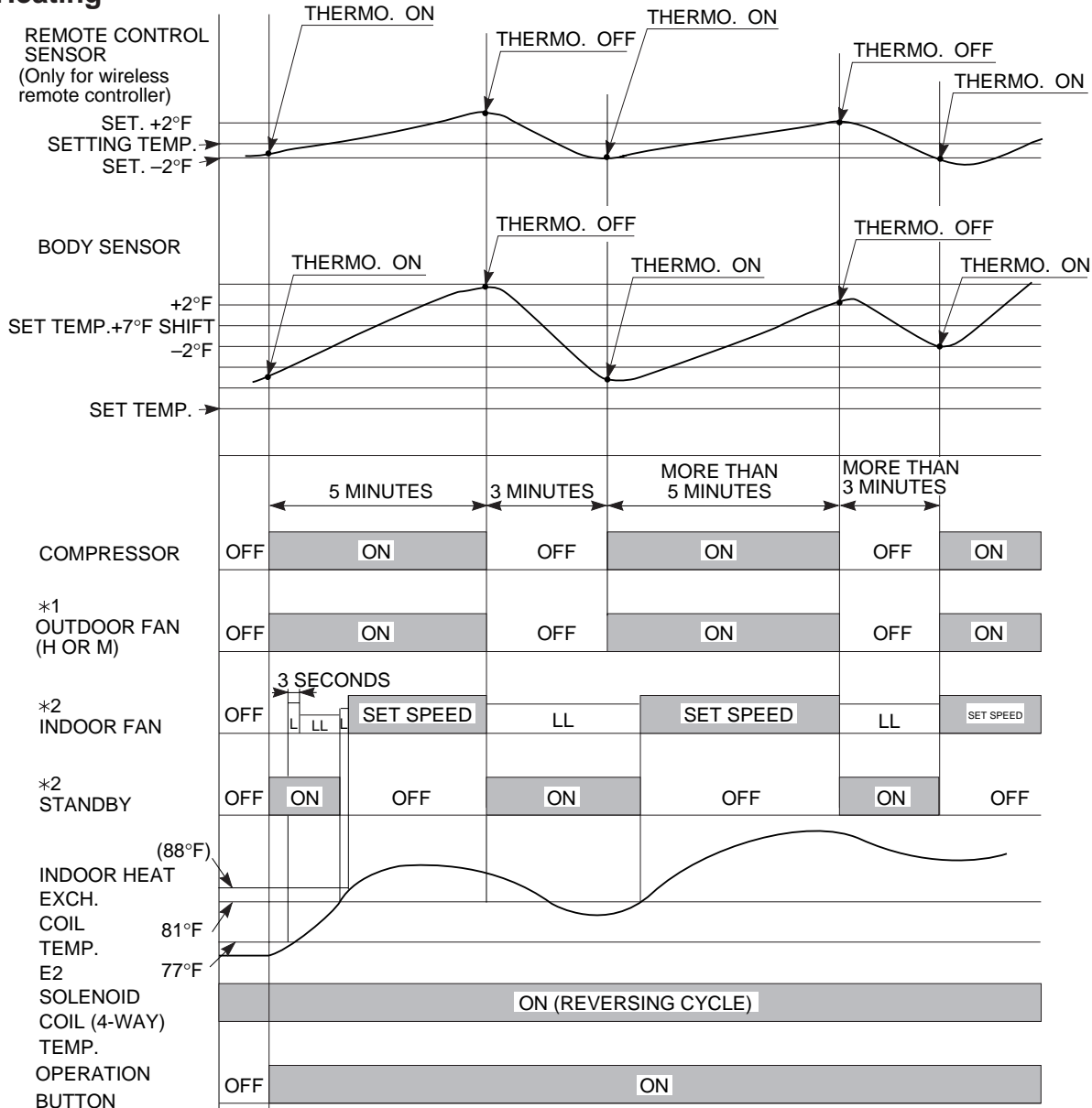
1133_THS_1

Fig. 1

Chart Summary and Explanations

- Once the compressor **starts**, it keeps running for 5 minutes.
- Once the compressor **stops**, it will not start running again for 3 minutes.
- If you **change** the operation mode (**HEAT, COOL, or FAN**) during the cooling cycle, the control circuit **stops** the compressor for 3 minutes.
- For 5 minutes after the compressor is first turned on, and for 3 minutes after it is turned off, the compressor is not controlled by the room sensor.
- Thermo ON:** When room temperature rises 2°F (4°F when set on body sensor) above the set temperature T , ($T + 2^\circ\text{F}$ or $T + 4^\circ\text{F}$ when set on body sensor):
Compressor → **ON**
- Thermo OFF:** When the room temperature is -2°F below the set temperature T :
Compressor → **OFF**

(B) Heating



*1. Refer to 2-4 Outdoor Fan Speed Control
 *2. Refer to 2-2 Cold Draft Prevention (Heating)

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Fig. 2

Chart Summary and Explanations

- Once the compressor starts, it keeps running for 5 minutes.
 - Once the compressor stops, it will not start running again for 3 minutes.
 - If you change the operation mode (**HEAT, COOL** or **FAN**) during the heating cycle, the control circuit **stops** the compressor for **3 minutes**.
 - For 5 minutes after the compressor is first turned on, and for 3 minutes after it is turned off, the compressor is not controlled by the room sensor.
- When set on remote control sensor
- Thermo ON:** When room temperature is -2°F below the set temperature T°. Compressor → ON
- Thermo OFF:** When the room temperature is 2°F above the set temperature T°, (T°+2°F) Compressor → OFF
- When set on body sensor
- NOTE:** In case of Body sensor, operating temperature is shifted to setting temperature +7°F.



2-2 Cold Draft Prevention (Heating Cycle)

The cold draft prevention function controls indoor fan speed so a strong draft of cold air will not blow out before the indoor heat exchange coils have warmed up.

- ❑ STANDBY shows on the remote controller when the indoor fan speed is LL (very low) or OFF. This condition occurs in the following 3 cases:
 - During Thermo OFF (refer to 2-1 B). Room Temperature Control, Heating)
 - During the defrosting operation (refer to 2-10 Defrosting Control, Heating)
 - Until either the coil temperature E2 reaches 81°F or when a maximum of 6 minutes has past.
- ❑ The indoor fan motor operates in L instead of LL for 3 seconds as it starts to give the fan an initial boost.

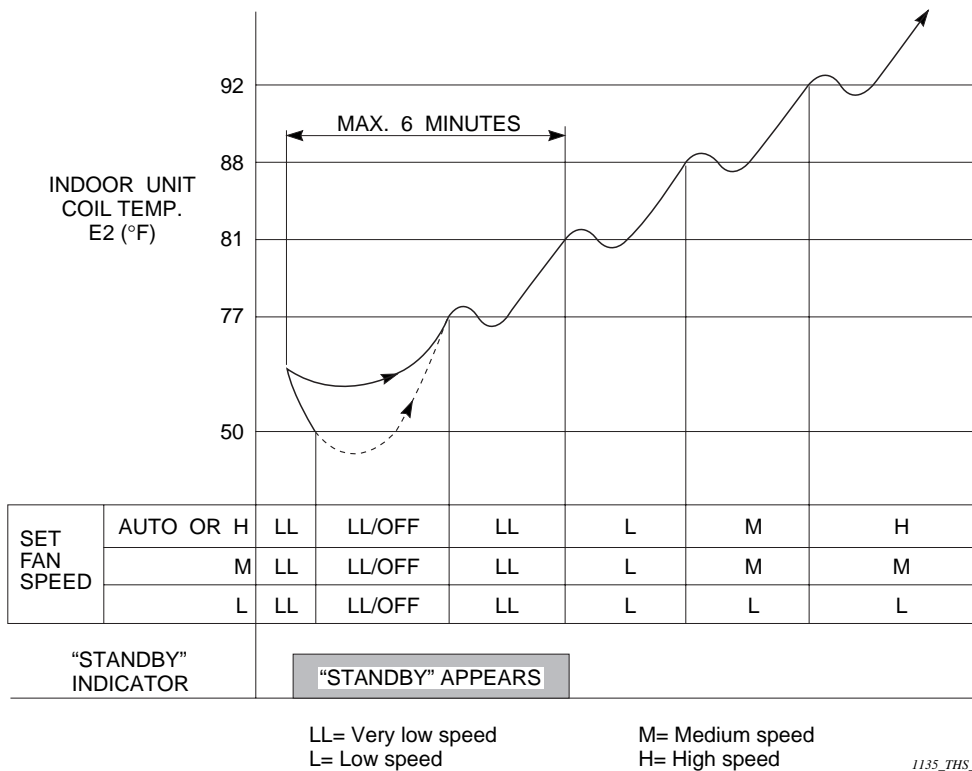


Fig. 3

Chart Summary and Explanations

- ❑ The main idea of this chart is to show that the indoor fan speed increases and gets closer to the set fan speed as the coil temperature **E2** rises.
- ❑ The indoor unit’s coil temperature is taken from sensor **E2** located in the middle of the indoor heat exchange coil.
- ❑ The dotted line shows that the indoor fan motor is **OFF**. When the temperature at sensor **E2** falls below 50°F, the indoor fan motor stops running.

2-3 Automatic Fan Speed (Indoor Unit)

By pressing the FAN SPEED button on the remote controller, the fan speed can be set at one of four steps: AUTO., HI., MED., or LO. When set at AUTO. the indoor unit fan speed will be automatically adjusted to the room temperature as the two charts shown below.

(A) Cooling

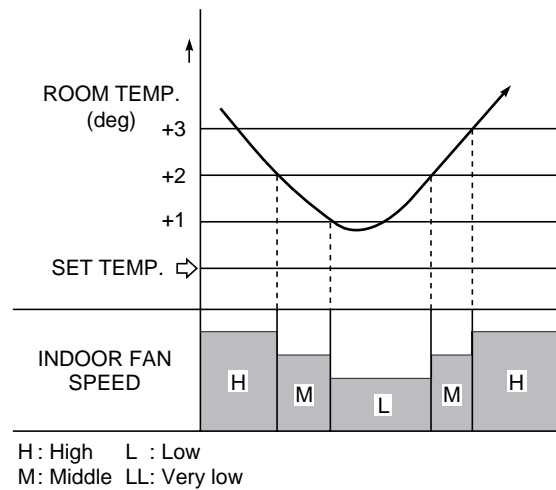


Fig. 4

Chart Explanations and notes

- When the fan speed changes, it keeps the speed step for at least 3 minutes, even if the temperature changes to another speed step during the time.

(B) Heating

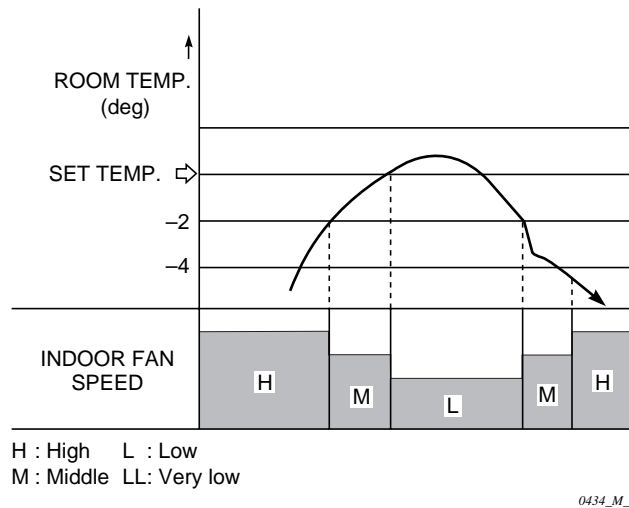


Fig. 5

Chart Explanations and notes

- When the fan speed changes, it keeps the speed step for at least 1 minute, even if the temperature changes to another speed step during the time.

2-4 Outdoor Fan Speed Control

To optimize the performance of air conditioner, the outdoor fan speed is selected automatically according to the outdoor temperature.

- ❑ Note that in both **Cooling** and **Heating** modes, the fan comes on at first at high speed (H mode) for 5 seconds. Since outdoor conditions sometimes make it difficult for the fan to start, this sudden surge of power may be necessary.
- ❑ The outdoor fan operates in H mode for 3 minutes after the compressor stops (excluding defrosting operation period).
- ❑ Charts below show how the outdoor fan speed changes with the change in outdoor temperature.

(A) Cooling

Outdoor unit coil temperature [C2]	Outdoor fan motor (FMo)
or more 77°F	H
less than 77°F	M

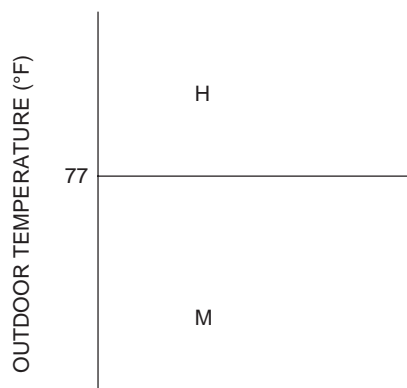


Fig. 6

(B) Heating

Outdoor coil temperature [C2]	Outdoor fan motor (FMo)
or more 57°F	M
less than 57°F	H

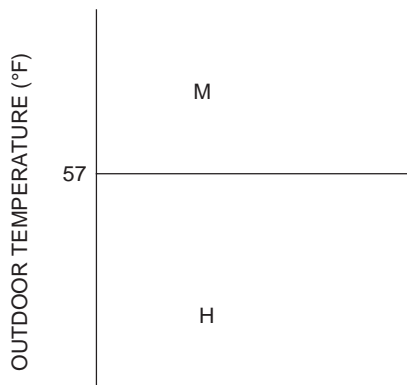


Fig. 7

2-5 Freeze Prevention (Cooling)

Freeze Prevention keeps the indoor heat exchange coil from freezing. Freezing reduces the efficiency of the unit, and frost buildup on the coil blocks cool air circulation from the indoor unit's fan.

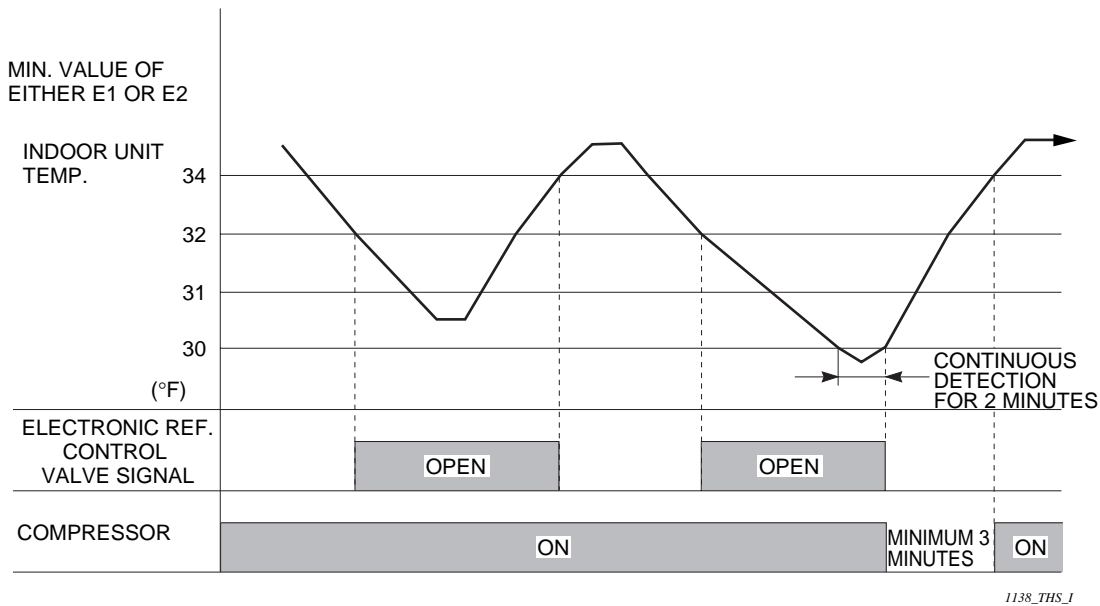


Fig. 8

Note: Freeze prevention is controlled by the temperature at the indoor heat exchanger coil as sensed by either sensor **E1** (located at the entrance of the coil) or sensor **E2** (located on the middle of the coil). Freeze prevention cycle is controlled by the lower temperature sensed at either of the two sensors.

Chart Explanations and notes

- ❑ This chart shows when the **electronic refrigerant control valve** opens to regulate the temperature of the indoor unit coil to prevent freezing.
- ❑ If the refrigerant control is not effective and the temperature continues to drop and stays below 30°F for 2 minutes continuously, the control circuit stops the compressor. The compressor does not start again until the temperature rises above 34°F. The compressor stops for 3 minutes minimum.

2-6 Condensing Temperature Control (Cooling)

Condensing temperature is controlled by the outdoor heat exchanger coil temperature as sensed by sensor **C2**.

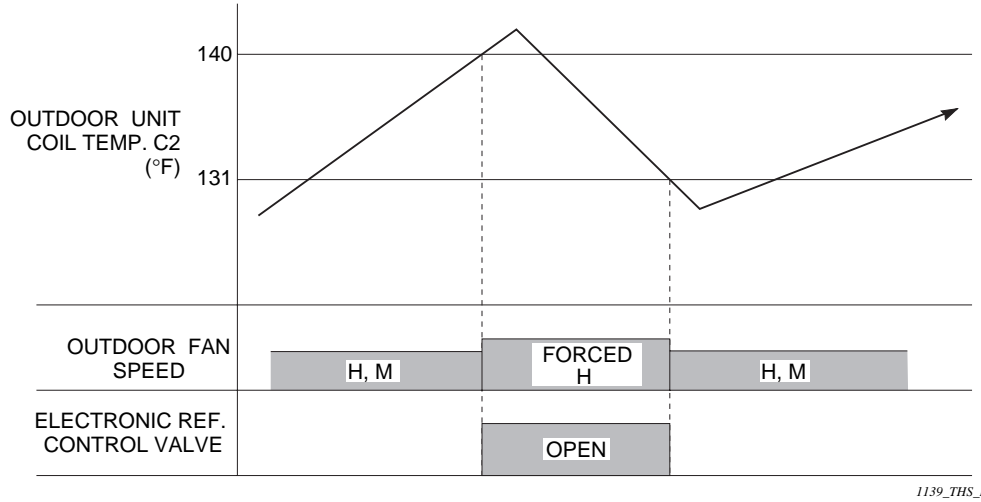


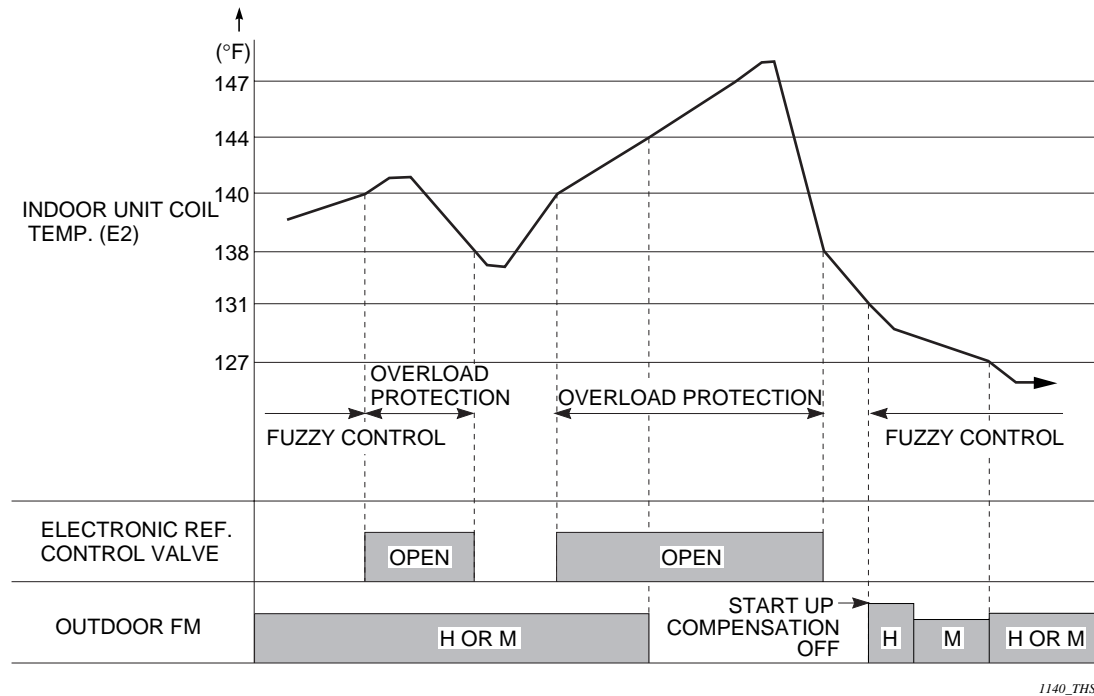
Fig. 9

Chart Explanations and notes

- ❑ This chart shows how the outdoor fan speed and the electronic refrigerant control valve react to coil temperature to control condensing temperature.
- ❑ Sensor **C2** is located in the middle of the outdoor unit heat exchange coil.
- ❑ When **C2** rises above 140°F the electronic refrigerant control valve opens at 50 steps/30 seconds, and the outdoor fan speed is forced to change to high (H) until **C2** falls below 131°F.

2-7 Overload Protection (Heating)

This function prevents the air conditioner from overloading.



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Fig. 10

Chart Explanations and notes

- ❑ This chart shows how the outdoor fan speed and the electronic refrigerant control valve react to coil temperature to keep the indoor heat exchanger coil from overloading.
- ❑ When sensor **E2** rises above 140°F the electronic refrigerant control valve opens at 50 steps/30 seconds until **E2** falls below 138°F.
- ❑ Sensor **E2** is located in the middle of the indoor unit heat exchange unit.
- ❑ When sensor **E2** rises above 144°F, the control circuit stops the outdoor fan motor till the temp. drops to 131°F
- ❑ Fuzzy control controls the electronic refrigerant control valve.

2-8 Discharge Temperature Control (Cooling and Heating)

This function prevents the compressor motor from burnout by overheating.

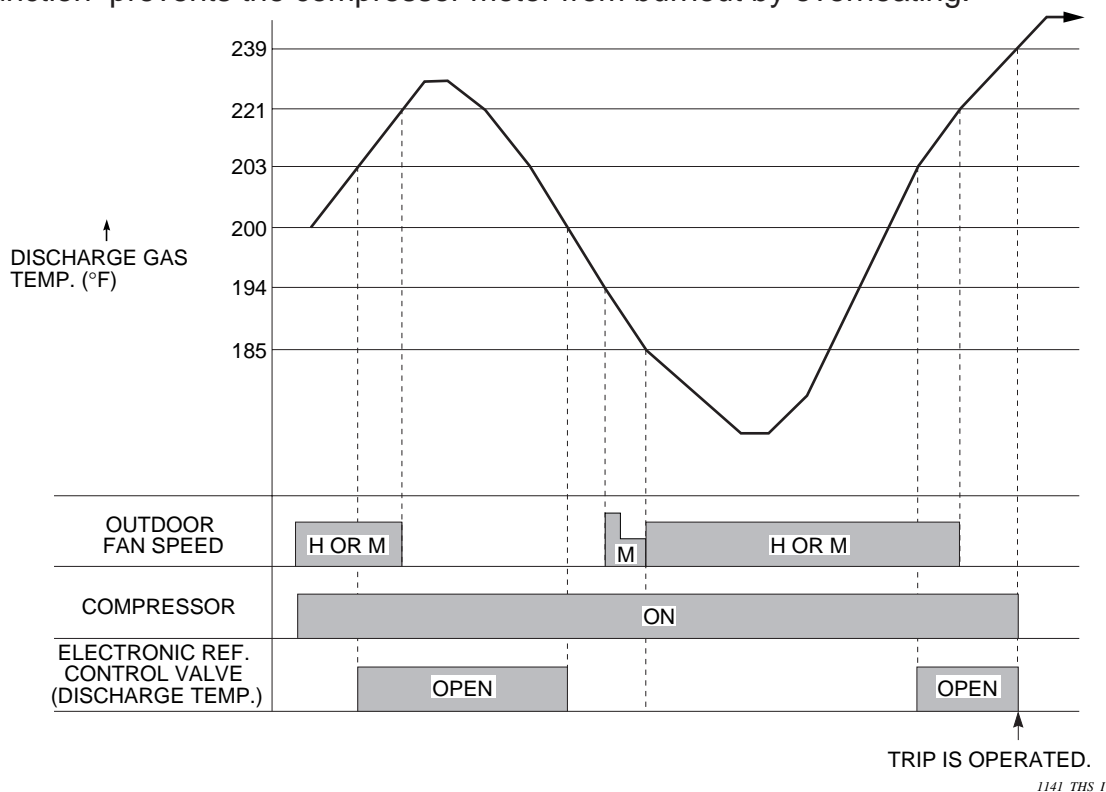


Fig. 11

Chart Summary and Explanations

- Discharge temperature is sensed by **TH8** (discharge gas sensor).
- When the temperature rises **above 203°F** the electronic refrigerant control valve opens at 50 steps/30 seconds until the temperature falls **below 200°F**.
- During **HEATING** operation, when the temperature rises **above 221°F**, the control circuit stops the outdoor fan motor until the temperature falls below 194°F. Please note that this control does not function during **COOLING** operation.
- For both **COOLING** and **HEATING** modes, if the temperature reaches **239°F** the operation shuts down and alarm **P3** appears on the remote controller.
- The outdoor fan speed is controlled on discharge temp. at heating mode.

2-9 Auto. Mode for Automatic Heating/Cooling Switching

- When the AUTO mode is selected, the microprocessor calculates the difference between the set temperature and the room temperature, and automatically switches to the COOLING or HEATING mode to maintain the desired temperature.

Room temp. \geq Set temp. \rightarrow COOLING

Room temp. $<$ Set temp. \rightarrow HEATING

This means that if the room temperature is **higher or equal** to the set temperature, **COOLING** operation starts. If the room temperature is **lower** than the set temperature, **HEATING** operation starts.

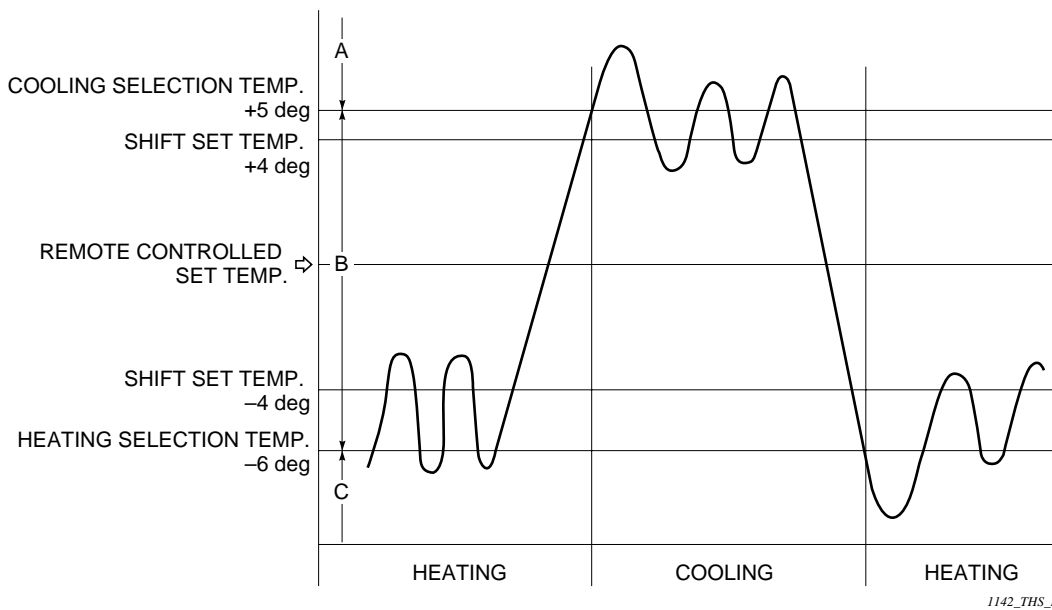


Fig. 12



Chart summary and Explanations

- ❑ This chart shows how the Operation Mode (**COOLING** or **HEATING**) is determined by the microprocessor taking the room temperature into consideration. It also shows the temperature points at which the cooling or heating mode is switched, when the AUTO mode is selected.
- ❑ After operation starts, the set temperature shifts automatically by +4 deg. at cooling and by -4 deg. at heating. For example, if cooling is selected, the set temperature changes from 68°F to 72°F.
(The display of the remote controller remains 68°F.)
- ❑ The change of the operation mode (heating to cooling, cooling to heating) by the change of the room temperature during the operation is as follows.

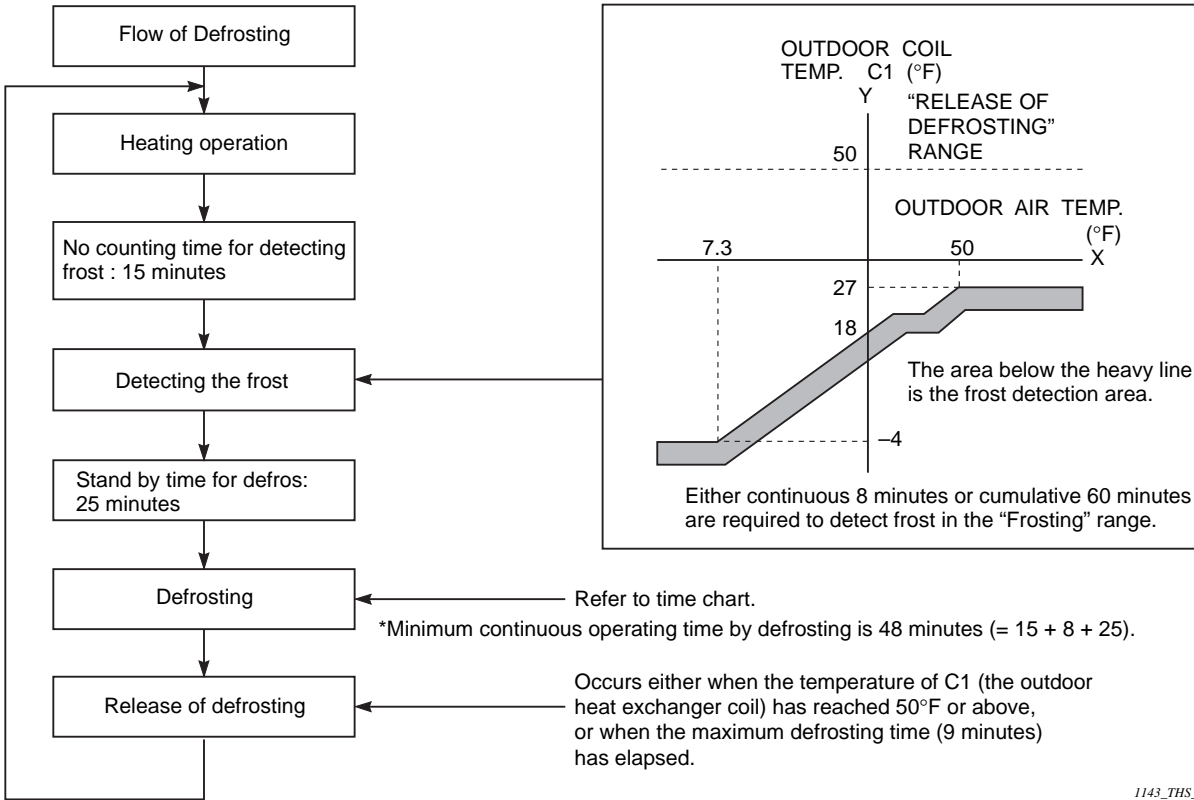
Heating to Cooling; Room temp. \geq Shifted temp +1.0 deg.

Cooling to Heating; Room temp. \leq Shifted temp -2.0deg.

For example, if the room temperature rises above 73°F (=72+1) during the cooling operation at the room temperature 68°F set by the remote controller, the operation changes to cooling. When the room temperature lowers below 63°F (=65-2) thereafter, the operation changes to heating again.
- ❑ In heating operation, using the body sensor, room temperature control is designed so that room air temp. is sensed as 8 deg. lower than suctioned air at indoor unit taking into account of the temperature gap between upper part and lower part of the room.
- ❑ Within 10 minutes after the compressor turns OFF, the operation does not change to cooling (heating), even when the room temperature changes from C to A (A to C).
- ❑ When switching from cooling (heating) to heating (cooling), the actuation of the 4 way valve will delay about 30-50 seconds after the compressor turns ON.

2-10 Defrosting Control, Outdoor Heat Exchanger Coil (Heating)

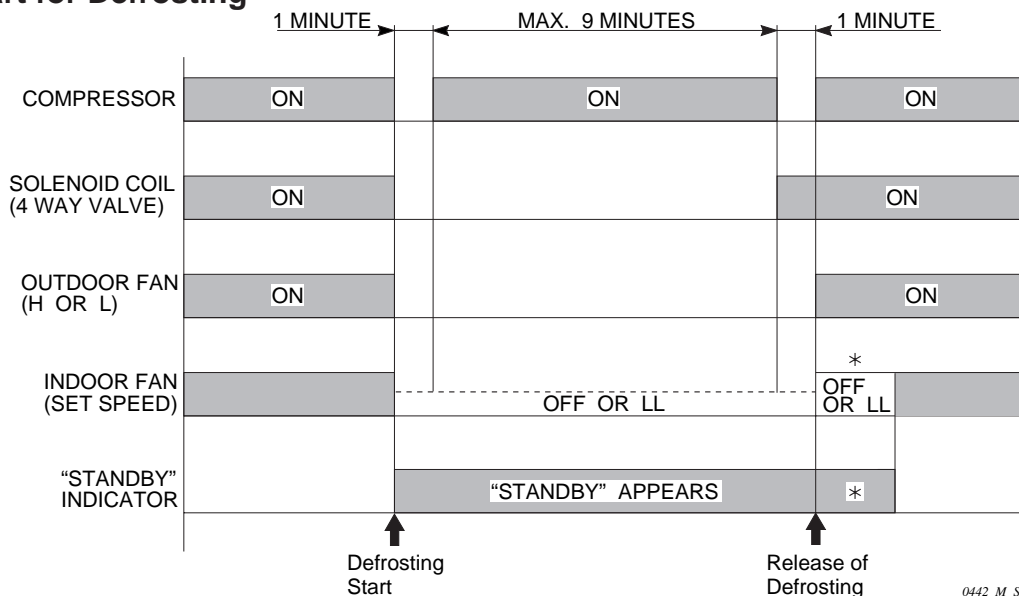
When the outdoor temperature is low, frost may form on the outdoor heat exchanger coil. When this occurred, the defrosting system operates. The microprocessor in the outdoor unit monitors the relationship between the temperature of the outdoor heat exchanger coil and the outdoor temperature so it can defrost when necessary.



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Fig. 13

Time Chart for Defrosting



0442_M_S

Fig. 14

- During the defrost cycle, **STANDBY** appears on the remote controller.
- *.....**Cold Draft Prevention** may operate occasionally

2-11 4-Way Valve, Solenoid Control

The basic function of the 4-way valve is to direct the refrigerant in the correct direction according to the Operation Mode (**COOLING** or **HEATING**) selected.

The following two charts show conditions of the controls and functions listed in the left hand column when the solenoid is **ON** or **OFF**. Chart (A) on this page shows the relationships when the temperature control is in **NORMAL** mode, and Chart (B) on the next page shows the relationships when the remote controller is set to **AUTO** mode.

(A) Normal Control Mode

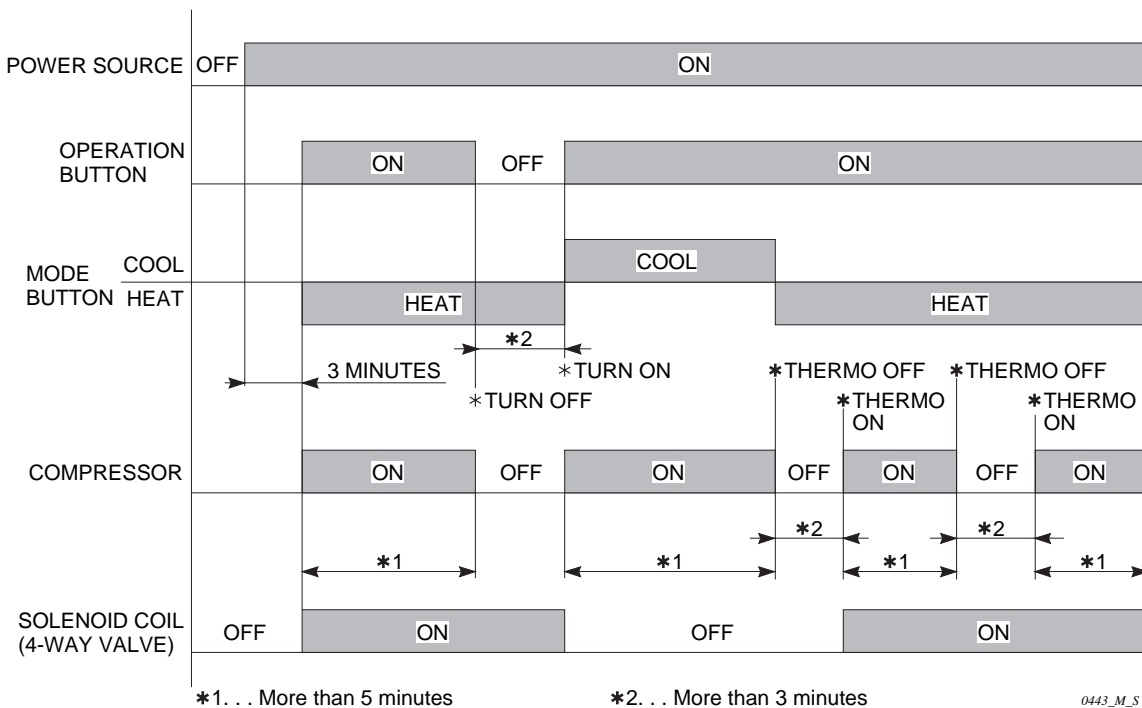


Fig. 15

Chart Summary and Explanations

- For the first 3 minutes after power is applied, the 4-way valve remains OFF and the compressor will not operate, even if the ON button is pushed.
- If the 4-way valve is turned OFF with the compressor operating, the air conditioner operates in COOLING mode. See Table below.
- If the 4-way valve is turned ON with the compressor operating, the air conditioner operates in HEATING mode. See Table below.

Operation Mode	4-way valve solenoid	Compressor
COOLING	OFF	ON
HEATING	ON	

(B) AUTO Control Mode

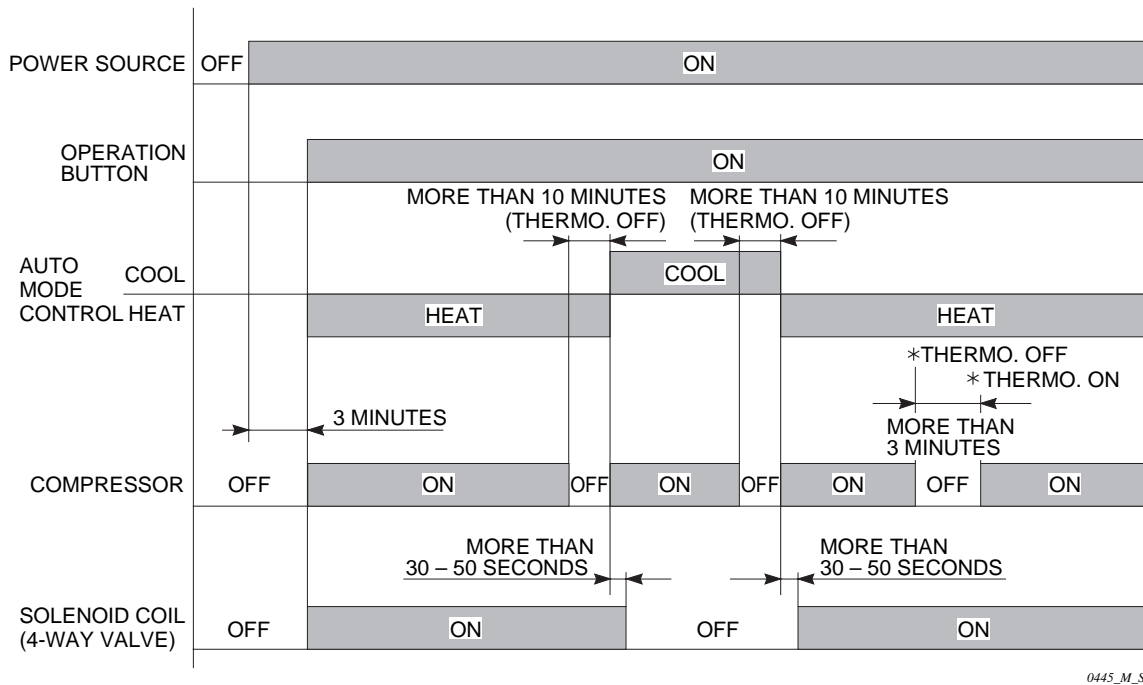
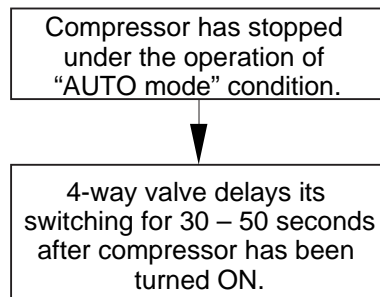


Fig. 16

When the Compressor has stopped while in **AUTO** mode, the 4-way valve switches on (heating) or off (cooling) within 1 minute according to the following conditions:



0446_M_S

Fig. 17

2-12 Automatic Restart after Power Interruption

This air conditioner has a power failure recovery function.



2-13 Electronic Expansion Valve

- This valve allows very precise and smooth control of the amount of refrigerant flow in the system. Since the valve is operated by a step motor, the control circuits can open or close it in very exact amounts, so the degree of heating or cooling can be changed by just a little, or changed very quickly or slowly.

(Completely close 0 step)

(Full open 480 step)

Model	Min. open		Max. open
	Heating	Cooling	
24 type	100 step	120 step	480 step
36 type	90 step	90 step	480 step

□ Fuzzy Control

Fuzzy Control is a controlling system to control electronic refrigerant control valve using fuzzy logic. It regulates the functions of heating and cooling, as well as some of the processes inside the unit, by taking account of many different conditions of temperature, fan speed, etc. These control circuits work automatically to send just the right amount of refrigerant through the **Electronic Refrigerant Control Valve**.

2-14 Compressor Discharge Gas Temperature

(A) Cooling

Indoor temp. (°F)	68 – 77		79 – 82	84 – 90
Outdoor temp. (°F)	55 or below	57 – 61	81 – 95	97 – 109
Compressor discharge gas temp. (°F)	104 – 176	104 – 194	140 – 212	158 – 221

(B) Heating (Except During Defrosting)

Indoor temp. (°F)	64 – 70		72 – 77			79 – 86		
Outdoor temp. (°F)	32 or below	34 – 50	32 or below	34 – 50	52 – 70	32 or below	34 – 50	52 – 70
Compressor discharge gas temp. (°F)	104 – 176	122 – 194	122 – 194	122 – 212	140 – 221	122 – 194	140 – 212	158 – 221

- Operate the unit at least 30 minutes to stabilize the discharge temperature.
- The above discharge temperature was measured with a 15m tubing length. The temperature may vary with tubing length.

2-15 Compressor Current Detection Circuit

- ❑ The Compressor Current Detection Circuit detects the compressor current and, depending on the current range, can stop the compressor motor so it will not be damaged by overcurrent.
- ❑ Overcurrent can be caused by several factors, particularly mechanical seizing of the compressor or liquid backflow. Either of these conditions can hold the compressor to run, and thus drawing so much current that the motor can burn out.

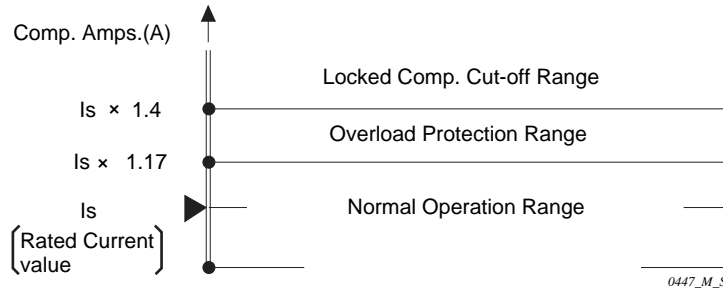


Fig. 18



Outdoor Model	Rated Current Value I_s (A)	Overload Protection $I_s \times 1.17$ (A)	Locked Compressor Cut-off $I_s \times 1.4$ (A)
CH2432	17.1	20.0	23.9
CH3632	27.5	32.0	38.5

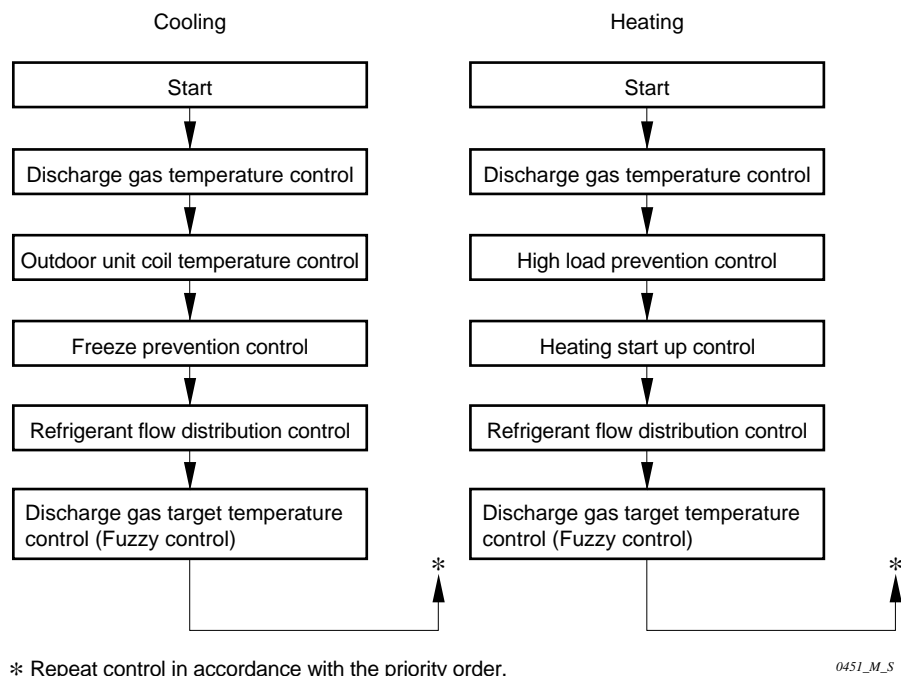
Chart Summary and Explanations

- ❑ **Overload Protection**
 - When the detected current is 1.17 – 1.4 times greater than the rated current value (I_s) and continues for 30 seconds, both compressor and outdoor fan stop (Thermostat **OFF**).
 - After 3-minute pause, if the air conditioner is ready for Thermostat **ON**, it starts again. However, if the condition mentioned above repeats **twice within 30 minutes**, the remote controller displays the alarm message **H01, compressor overload**.
- ❑ **Locked Compressor Cut-off**
 - When the detected current is **1.4 times greater** than the rated current value (I_s) and **continues for 2 seconds**, both compressor and outdoor fan stop (Thermostat **OFF**).
 - After 3-minute pause, if the air conditioner is ready for Thermostat **ON**, it starts again. However, if the condition mentioned above repeats **twice**, the remote controller displays the alarm message **H02, compressor locked**.
- ❑ **Failure of Compressor Current Detection**
 - When the Compressor Current Detection Circuit fails to detect the compressor current **within 2 seconds after compressor starts**, both compressor and outdoor fan stop (Thermostat **OFF**).
 - After 3-minute pause, if the air conditioner is ready for Thermostat **ON**, it starts again. However, when the circuit fails to detect the current twice in a row, the remote controller displays alarm message **H03, Failure of compressor Current Detection**.

2-16 Electronic Expansion Valve Control

The circulation volume of the refrigerant is controlled by a pulse type electronic control valve. When the power is switched ON, the opening degree of the electronic control valve is controlled between 90 and 480 steps after setting the initial step at the time when the thermostat is ON.

Contents and Order of control



Even though the operation is performed every 30 seconds, the control of discharge gas temperature, high load prevention, outdoor unit coil temperature and freeze prevention activates when it occurs.

(1) Refrigerant flow distribution control

At the control of flexible combination (a plural number of indoor units are set), the opening degree of the electronic control valve is controlled by the indoor unit coil temperature.

Cooling: indoor unit coil E2 temperature (located at the middle of coil)

Heating: indoor unit coil E1 temperature (located at the outlet of coil)

(2) Fuzzy control (optimal refrigerant flow rate control)

By outputting the fuzzy estimation result corresponding to the fuzzy input variables (the indoor unit coil temp., the deviation between the actual discharge gas temp. and the target discharge gas temperature calculated from the outdoor unit coil temperature and the change thereof), the electronic refrigerant valve is controlled so that the unit can perform its maximum ability in accordance with the indoor and outdoor temperature conditions at the operation.

2-17 Voltage Detection Control

When the power voltage falls below 160 V or rises above 260 V, operation lamp and stand-by lamp flash alternately to protect the compressor and electrical components.

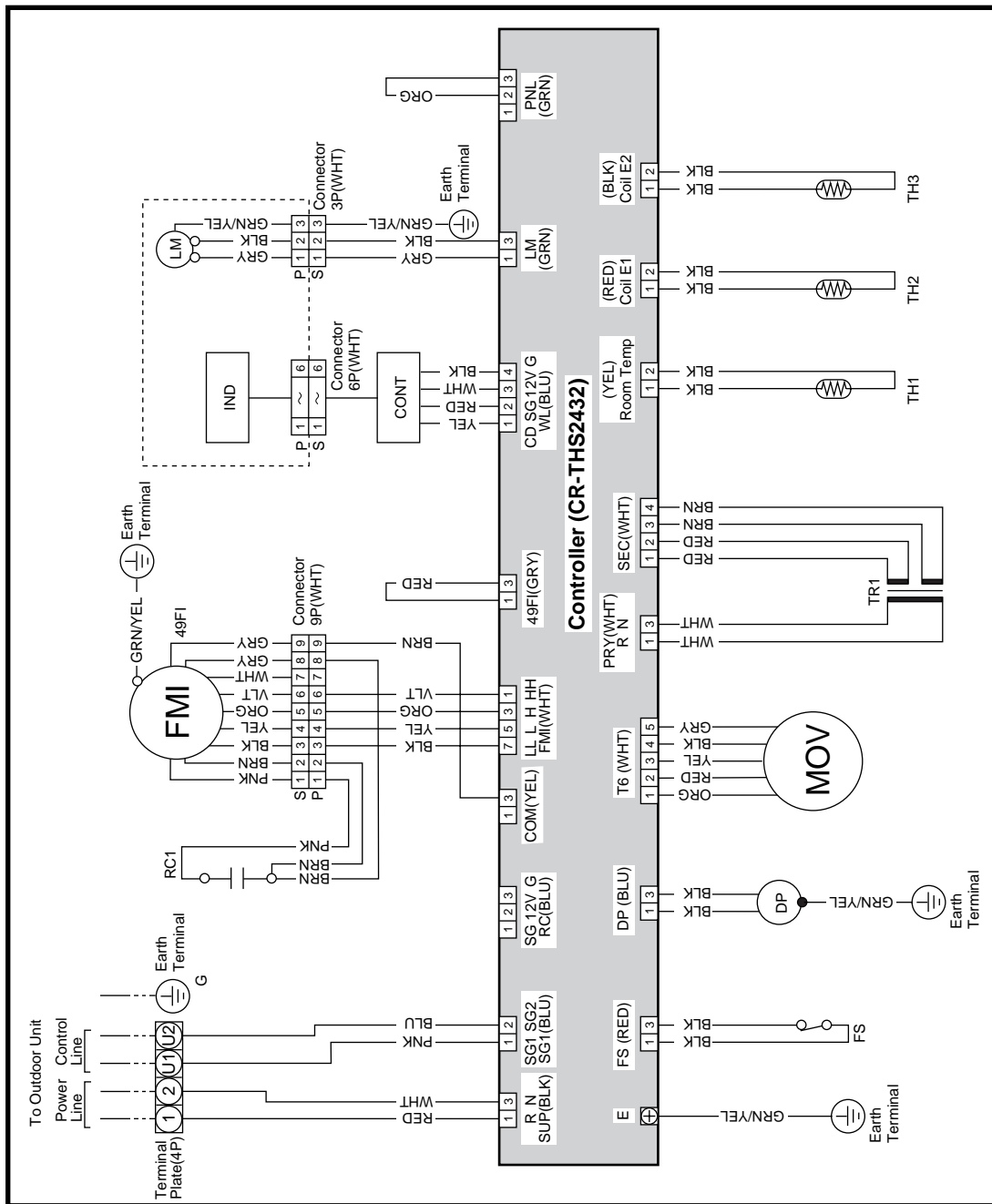
3. ELECTRICAL DATA

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3-1 Indoor Unit

① XHS2432, XHS3632

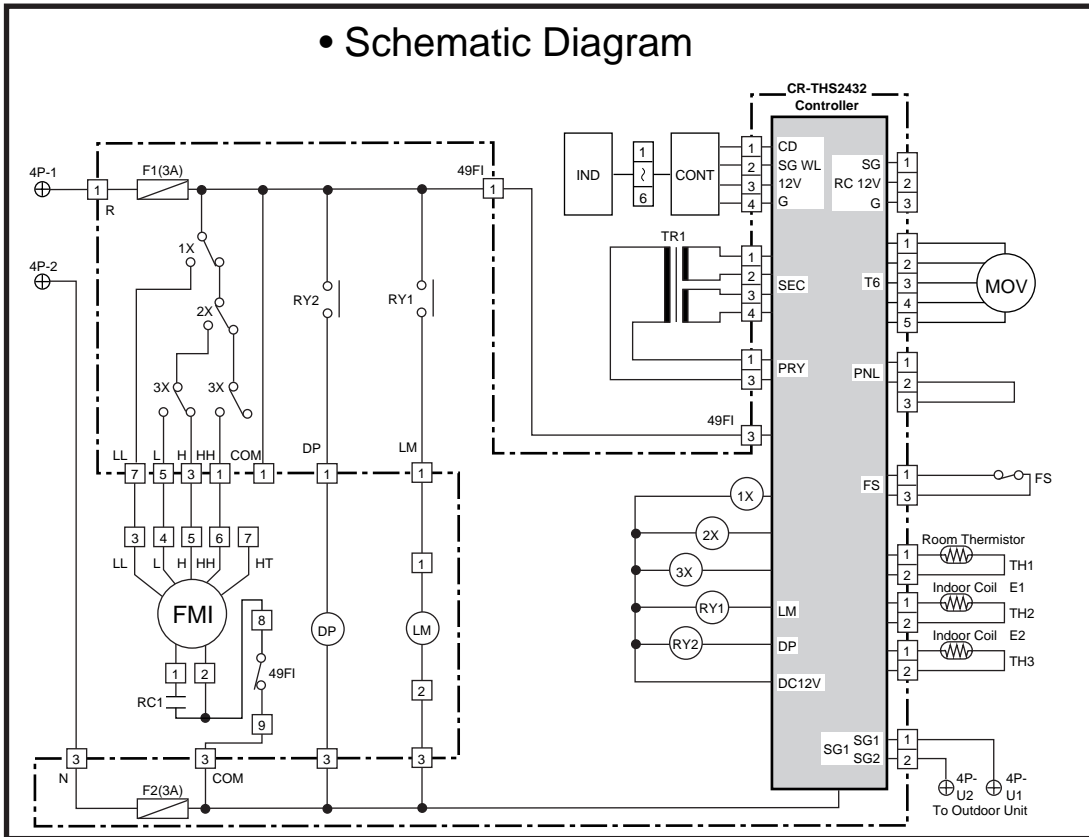
• Electric Wiring Diagram



② 854-2-5268-772-00-0 (XHS)

3-1 Indoor Unit

① XHS2432, XHS3632



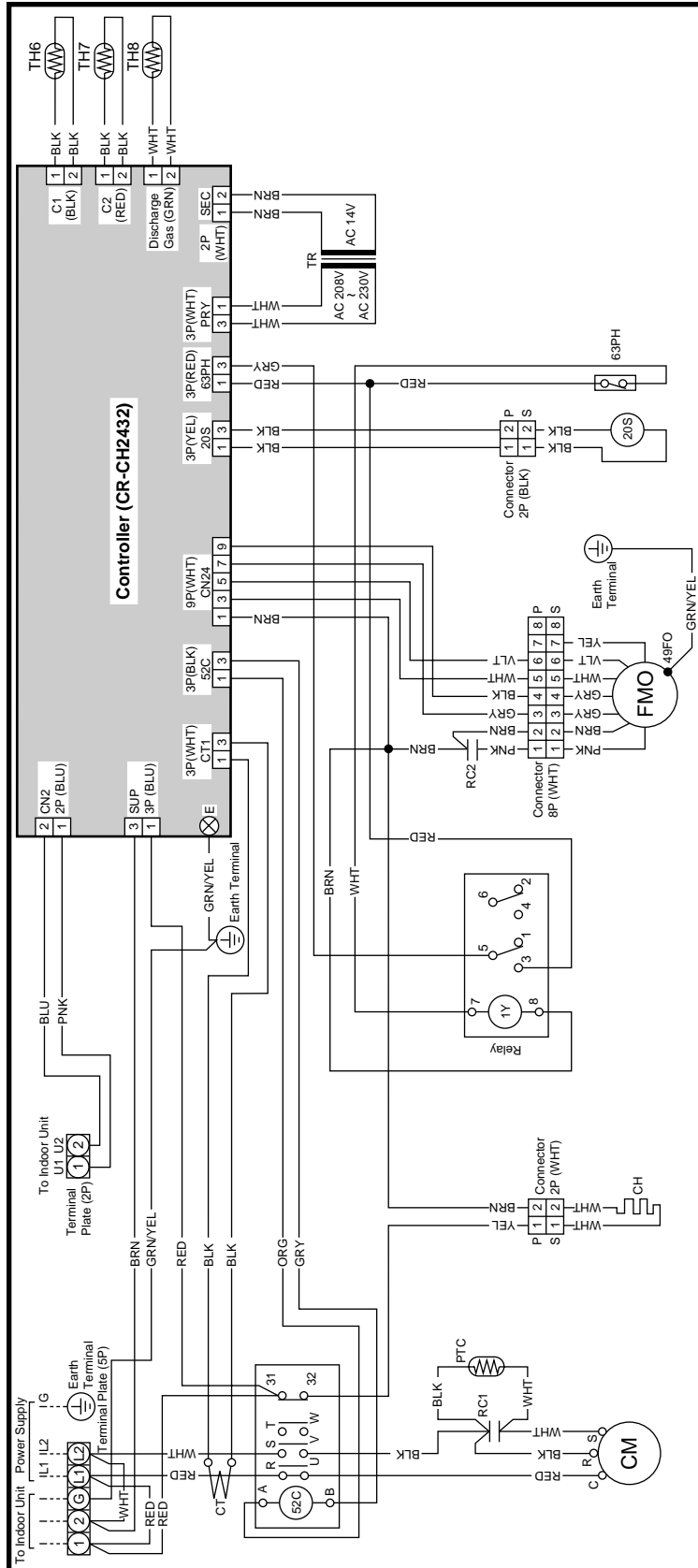
Symbols	Description	Symbols	Description
FMI	Indoor Fan Motor	TH1	Room Thermistor
49FI	Indoor Motor Thermal Protector	TH2	Thermistor (Indoor Coil E1)
RC1	Running Capacitor	TH3	Thermistor (Indoor Coil E2)
F1,2	Fuse	CR-THS2432	Indoor Controller
DP	Drain Pump	CONT	Controller
LM	Auto Louver Motor	IND	Indicator Lamp Assy
TR1	Power Transformer	⊕	Terminal Plate
1X-3X	Auxiliary Relay	□	Connector
RY1-RY2	Auxiliary Relay	⊕	Terminal
MOV	Motor Operated Valve		
FS	Float Switch		

© 854-2-5268-772-00-0 (XHS)

3-2 Outdoor Unit

① CH2432

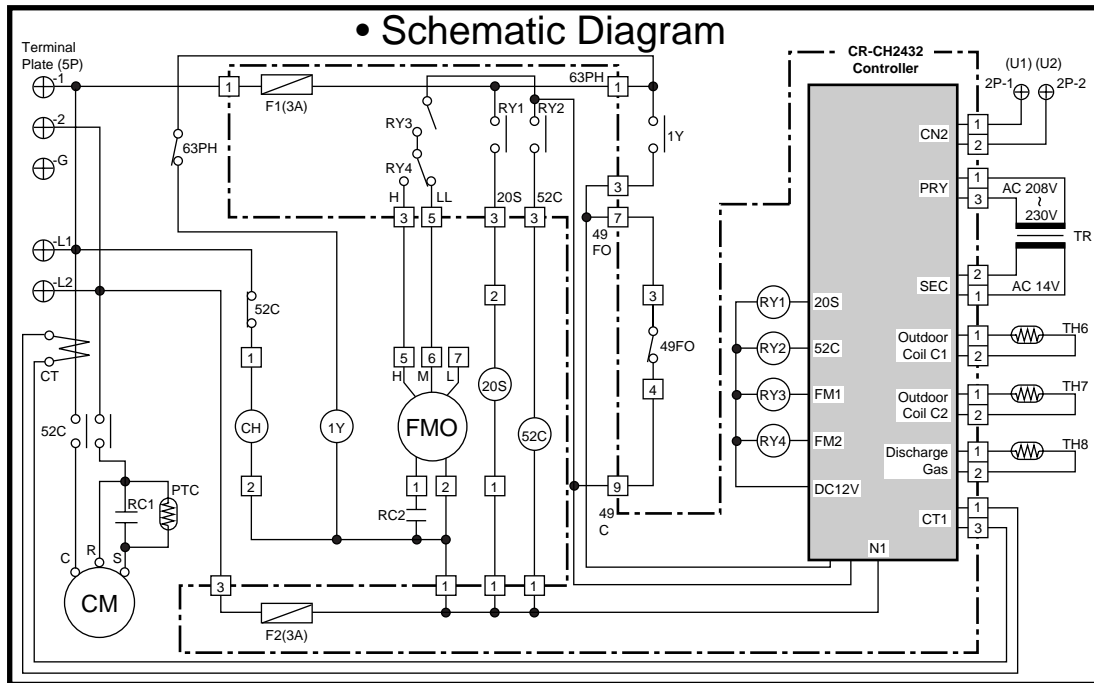
• Electric Wiring Diagram



⑧ 854-2-5268-582-00-2 (CH2432)

3-2 Outdoor Unit

① CH2432



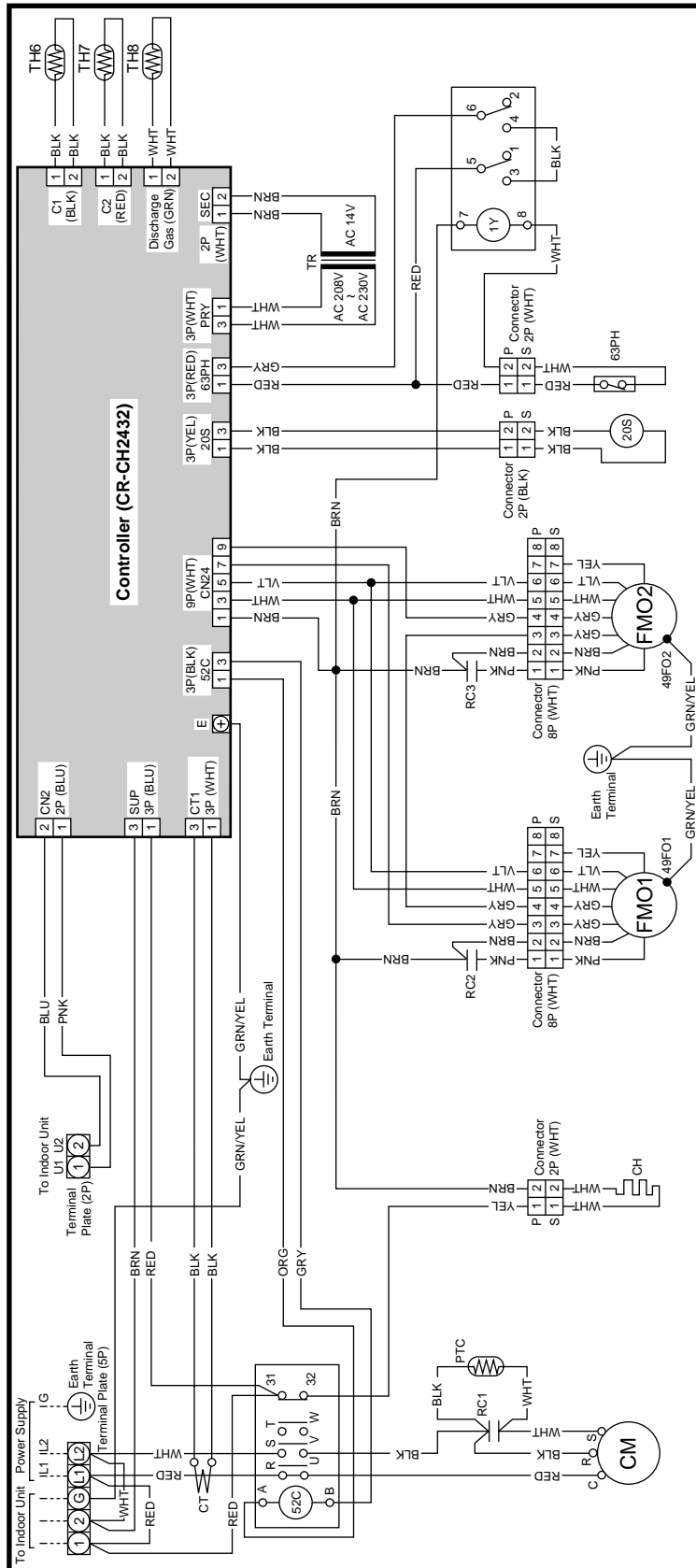
Symbols	Description	Symbols	Description
CM	Compressor Motor	TH6	Thermistor (Outdoor Coil C1)
FMO	Outdoor Fan Motor	TH7	Thermistor (Outdoor Coil C2)
52C	Compressor Motor Magnetic Contactor	TH8	Thermistor (Discharge Gas)
49FO	Outdoor Fan Motor Thermal Protector	PTC	PTC Thermistor
63PH	High Pressure Switch	CR-CH2432	Outdoor Controller
CT	Current Transmitter	RY1~RY4	Auxiliary Relay
RC1, RC2	Running Capacitor	1Y	Auxiliary Relay
TR	Power Transformer	⊕	Terminal Plate
CH	Crank Case Heater	⊗	Terminal
20S	Four Way Valve	□	Connector
F1, F2	Fuse		

© 854-2-5268-582-00-2 (CH2432)

3-2 Outdoor Unit

② CH3632

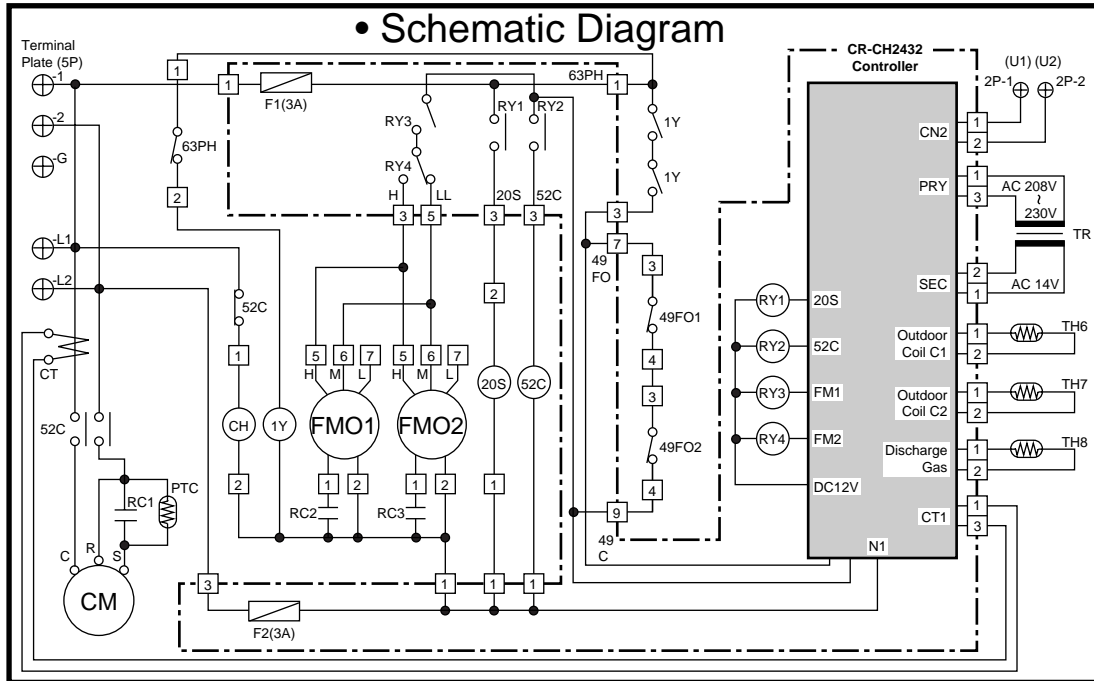
• Electric Wiring Diagram



⑧ 854-2-5268-621-00-0 (CH3632)

3-2 Outdoor Unit

② CH3632



Symbols	Description	Symbols	Description
CM	Compressor Motor	TH6	Thermistor (Outdoor Coil C1)
FMO1, 2	Outdoor Fan Motor	TH7	Thermistor (Outdoor Coil C2)
52C	Compressor Motor Magnetic Contactor	TH8	Thermistor (Discharge Gas)
49FO1, 2	Outdoor Fan Motor Thermal Protector	PTC	PTC Thermistor
63PH	High Pressure Switch	CR-CH2432	Outdoor Controller
CT	Current Transmitter	RY1-RY4	Auxiliary Relay
RC1, 2, 3	Running Capacitor	1Y	Auxiliary Relay
TR	Power Transformer	⊕	Terminal Plate
CH	Crank Case Heater	⊙	Terminal
20S	Four Way Valve	□	Connector
F1, F2	Fuse		

© 854-2-5268-621-00-0 (CH3632)

4. SERVICE PROCEDURES

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4-1 Troubleshooting

This section explains:

- What the LED codes mean
- What the remote control unit display screen messages mean
- How to use the flow charts to find and solve problems
- How to use the self-diagnostic tests to find parts that aren't working right

This unit is made to be trouble free, and not need much service. However, with time, moving parts wear out, electronic components break down, and sometimes misuse damages the unit. The purpose of this section is to help you when the unit is not working properly. Sometimes your experience will tell you right away where to look for a problem, and when you find it you will know how to fix it at once.

Often, however, all you have is a symptom like “poor cooling” or “outside fan doesn’t come on.” Now you must find out the cause of the problem, and then how to fix it. This section provides several ways to help you go from the symptom to the cause and then the solution. The first chart, **General Troubleshooting Flow Chart** is divided into two sections: Poor heating and Poor Cooling. Under each heading you will find the main things that can go wrong and cause either of these problems. Sometimes you can start with this chart and find the problem right away, but often you will come here for more suggestions after you have looked at the error code on the remote control unit display. This chart gives you the “big picture” of problems and solutions.

The other main tool we explain here is the use of the **Alarm Messages**. When a certain part fails or a safety device has shut the unit down, any alpha-numeric codes appears on the display to guide you to the problem.

By understanding the code you can often go right to the problem area and then, with this manual and your knowledge of air conditioning, find the solution.

(1) Check before and after Troubleshooting

Many problems may happen because of wiring or power supply problems, so you should check these areas first. Problems here can cause false results in some of the other tests, and so should be corrected first.

①. Check power supply wiring

- Check the power supply wires are correctly connected between terminal No. 1 & 2 on the 5P terminal plates in the indoor unit and the outdoor unit.

②. Check inter-unit wiring

- Check that inter-unit control wiring (DC low voltage) is correctly connected between the indoor unit and outdoor unit.

Power Supply: 60 Hz, single-phase, 230/208 V

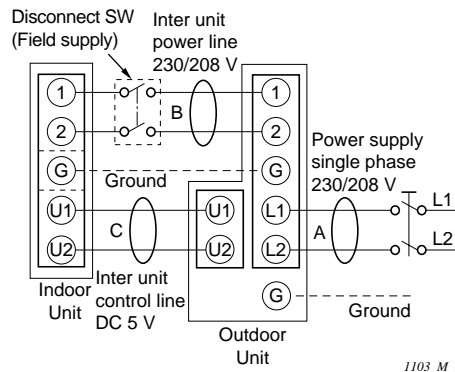


Fig. 19

③. Check power supply

- Check that voltage is within the specified range ($\pm 10\%$ of the rating).
- Check that power is being supplied.



WARNING

If the following troubleshooting must be done with power being supplied, be careful not to touch any uninsulated live part that can cause **ELECTRIC SHOCK**.

④. Check the lead wires and connectors in indoor and outdoor units.

- Check that the sheath of lead wires is not damaged.
- Check that the lead wires are firmly connected at the terminal plate.
- Check that the wiring is correct.

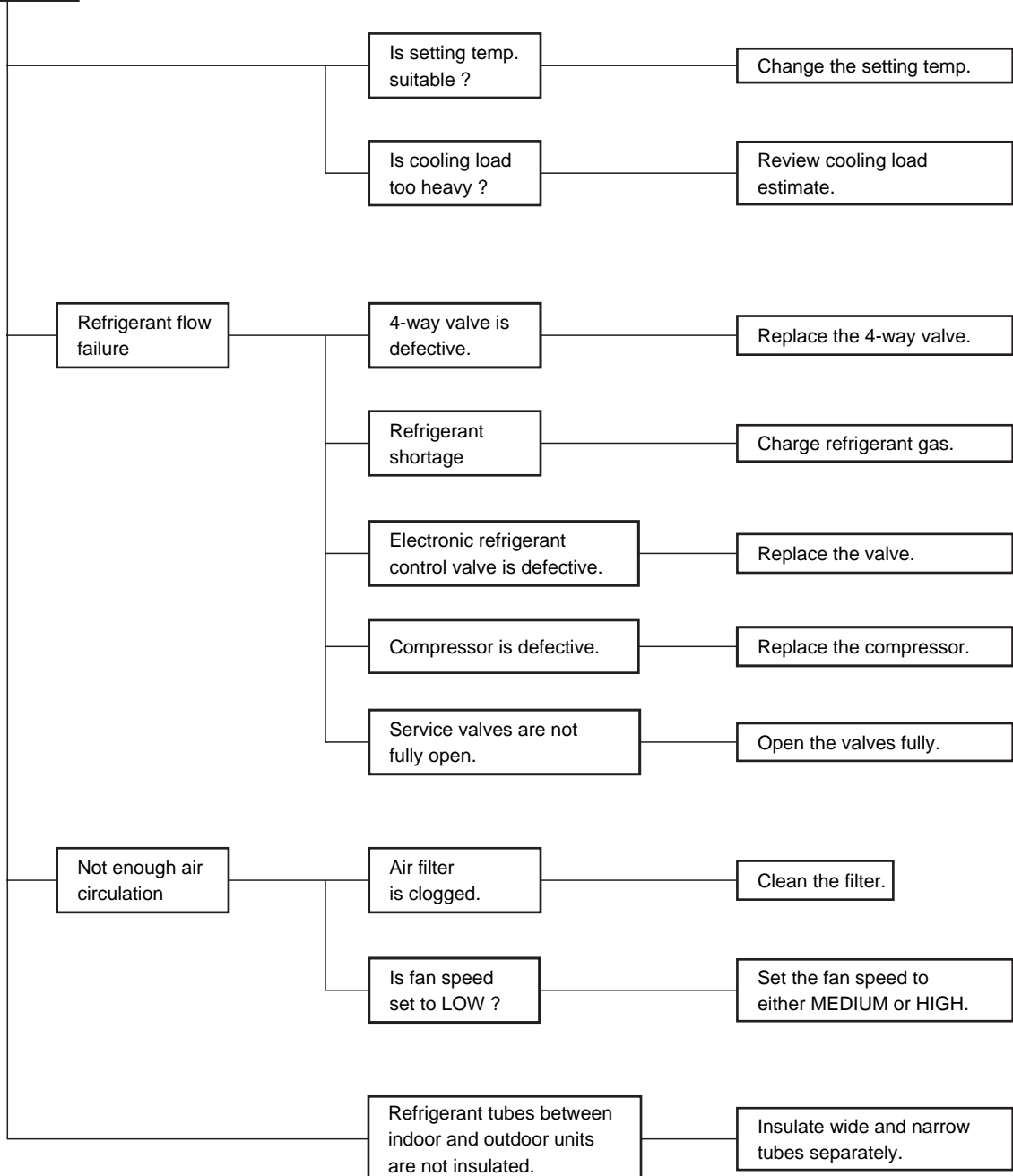
(2) General Troubleshooting Flow Chart: Diagnosis and Remedy

When you have found a major problem, such as refrigerant not flowing in the system or reduced air circulation, come to this section and find the box listing the problem. Connected to the box are the main causes of the problem and their remedies. To find out which malfunction is happening in your case, check the remote controller for an Alarm Message, and follow the steps in section 3).

(A) Cooling

a. Cooling

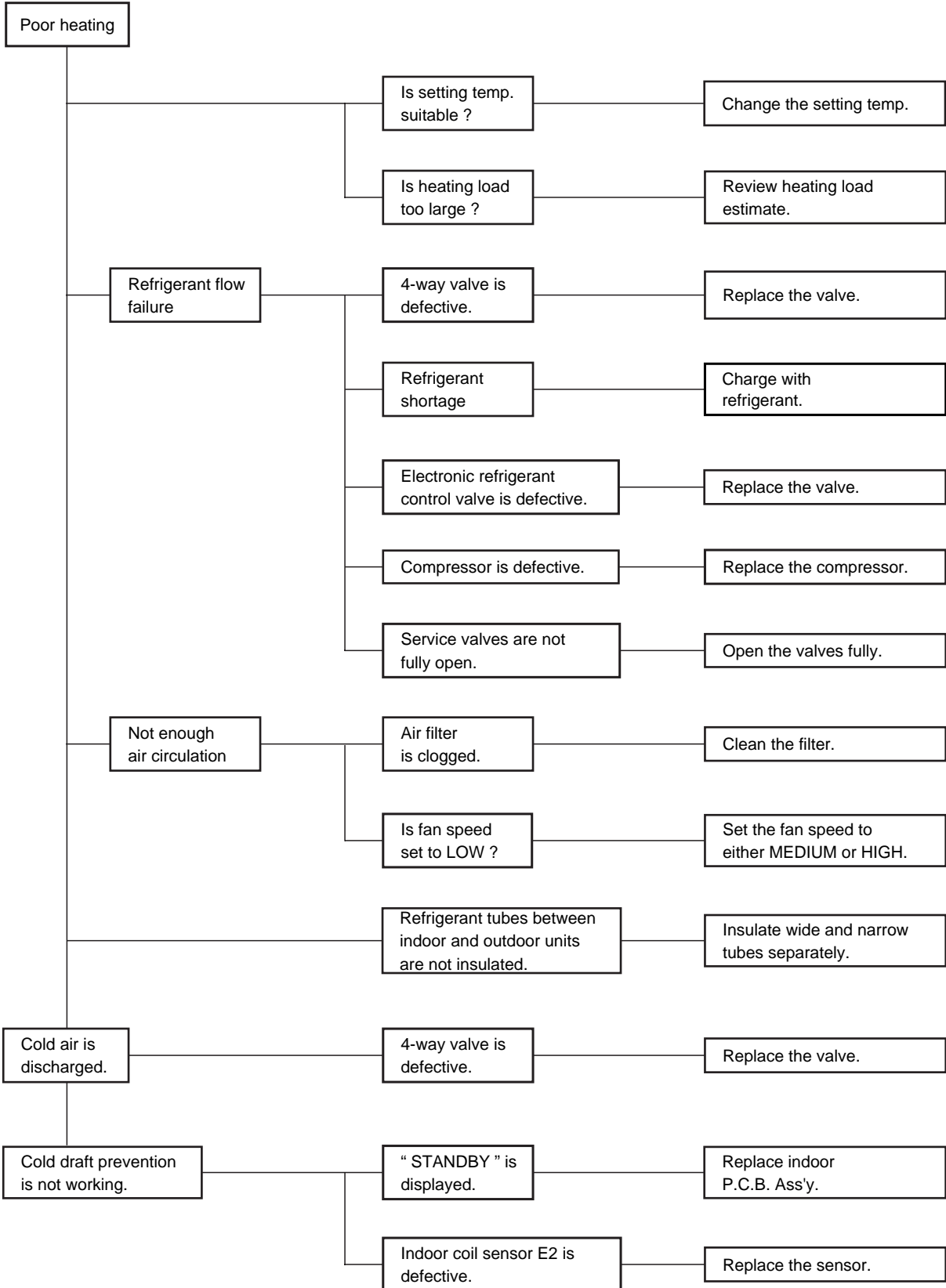
Poor cooling



0458_M_1

(B) Heating

b. Heating



0459_M_1

(3) Meanings of alarm messages

If an error occurred in the air conditioner, the error condition is presented by indicating the error code in the wired remote controller display or by the combination of lamp statuses for operation, timer and heat stand-by (OFF status and flashing status).

Possible causes of troubles		Wired remote controller display	Wireless remote controller display	
Serial communication errors	Remote controller is detecting unusual signal from indoor unit.	Error receiving of serial communications signal.	E01	
		Error transmitting of serial communications signal.	E02	
	Improper setting of indoor unit or remote controller.	Indoor unit address setting is duplicated.	E08	
		Remote controller address (RCU.ADR) is duplicated.	E09	
	Indoor unit is detecting unusual signal from signal option.	Error transmitting of serial communications signal	E10	
		Error receiving of serial communications signal.	E11	
	Improper setting of indoor unit or remote controller.	When using flexible combination control, main indoor unit address setting is duplicated. (judged by outdoor unit.)	E14	
	Indoor unit is detecting unusual signal from outdoor unit.	Error receiving of serial communications signal.	E04	
		Error transmitting of serial communications signal	E05	
	Outdoor unit is detecting unusual signal from indoor unit.	Error receiving of serial communications signal. (Confirmation error of unit numbers included)	E06	
		Error transmitting of serial communications signal.	E07	
	Auto. address setting is not correct.	No. of judged indoor units or total capacity of indoor units is small.	E15	
		No. of judged indoor units or total capacity of indoor units is large.	E16	
	Indoor unit is detecting unusual signal from another indoor unit.	Error transmitting of serial communications signal	E17	
Error receiving of serial communications signal.		E18		
Mis-setting	Improper setting of indoor unit or remote controller.	Indoor unit group address is not correct.	L01	
		Model setting of indoor unit is not matching the outdoor unit.	L02	
		When using group control, main indoor unit address setting is duplicated. (judged by indoor unit.)	L03	
		Outdoor unit address is duplicated.	L04	
		Improper wiring between indoor units. (There is a group connection wiring in case of individual control.)	L07	
		Indoor unit address (or group address) is not set.	L08	
		Capacity code of indoor unit is not set.	L09	
		Improper wiring of group control wiring.	L11	
		Indoor unit model setting is improper (capacity)	L13	
Improper wiring connections of ceiling panel.		P09	●: Operation lamp ✧: Timer lamp ✧: Heat stand-by lamp	
Activation of protective device	Protective device in indoor unit is activated.	Thermal protector in indoor fan motor is activated.	P01	
		Float switch is activated.	P10	
	Protective device in outdoor unit is activated.	• Thermal protector in outdoor fan motor is activated. • Compressor thermal protector is activated. • Power supply voltage is unusual. (The voltage is more than 260 V or less than 160 V.)	P02	Operation lamp and heat stand-by lamp flash alternately. ✧: Operation lamp
		Discharge gas temperature of comp. is unusual.	P03	●: Timer lamp
		High pressure switch is activated.	P04	✧: Heat stand-by lamp
		Voltage drops.	P05	
		Other indoor unit is warning.	P31	

4. Service procedures

Possible causes of troubles			Wired remote controller display	Wireless remote controller display
• Thermistor failure	Indoor thermistor is either open or short.	Indoor coil temp. (E1) cannot be detected.	F01	Operation lamp and heat stand-by lamp flash alternately. ✨: Operation lamp ✨: Timer lamp ●: Heat stand-by lamp
		Indoor coil temp. (E2) cannot be detected.	F02	
		Indoor room temperature cannot be detected.	F10	
	Outdoor thermistor is either open or short.	Discharge gas temp. cannot be detected.	F04	
		Outdoor coil liquid temp. (C1) cannot be detected.	F06	
		Outdoor coil gas temp. (C2) cannot be detected.	F07	
• Non volatile memory IC (EEPROM) is abnormal (Indoor control panel)			F29	
• Fault with compressor and its circuit	Protective device for compressor is activated.	Compressor motor is overloaded.	H01	●: Operation lamp ✨: Timer lamp ●: Heat stand-by lamp
		Compressor motor is locked.	H02	
		Compressor current detection circuit is defective.	H03	
		Power supply voltage between phases is unbalanced.	H17	
		Standard comp. contactor (Mg SW) is chattering.	H18	

✨: flashes

●: OFF

(4) LED Indication on the Outdoor Unit's P.C.B. Ass'y

If something goes wrong with the outdoor unit, **LED** lamps on the **outdoor P.C.B. Ass'y** light up to show the cause of the trouble, in addition to the Alarm message on the remote controller.

LED 2 on P.C. board	LED 1 on P.C. board	Remote controller	Possible cause of trouble
●	●	No message	Normal
●	○	E06, E07, L04	Outdoor unit serial communication signal is abnormal. Outdoor unit address is duplicated.
●	*	No message	Other outdoor units are performing auto address and detecting refrigerant shortage.
○	●	P02	FMo • CM thermal protection is in operation. Power supply voltage is abnormal.
○	○	P04, P05	High voltage SW activates Negative phase protector activates.
○	*	F04~F09	Sensor is abnormal. (Open or short)
*	●	H01, H02	Abnormal compressor current value is detected.
*	*	E15, E16	Auto address failure
Flash at the same time			
*	*	"SETTING" flashes.	Auto address is in operation.
Flash alternately			

NOTE ●: LED lamps OFF ○: LED lamps ON (lights up) *: LED lamps ON (flashes)

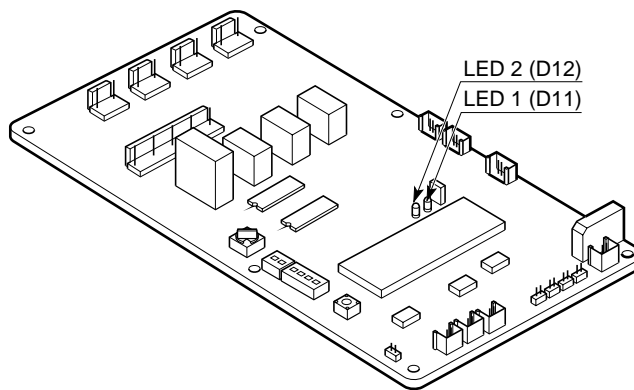


Fig. 20

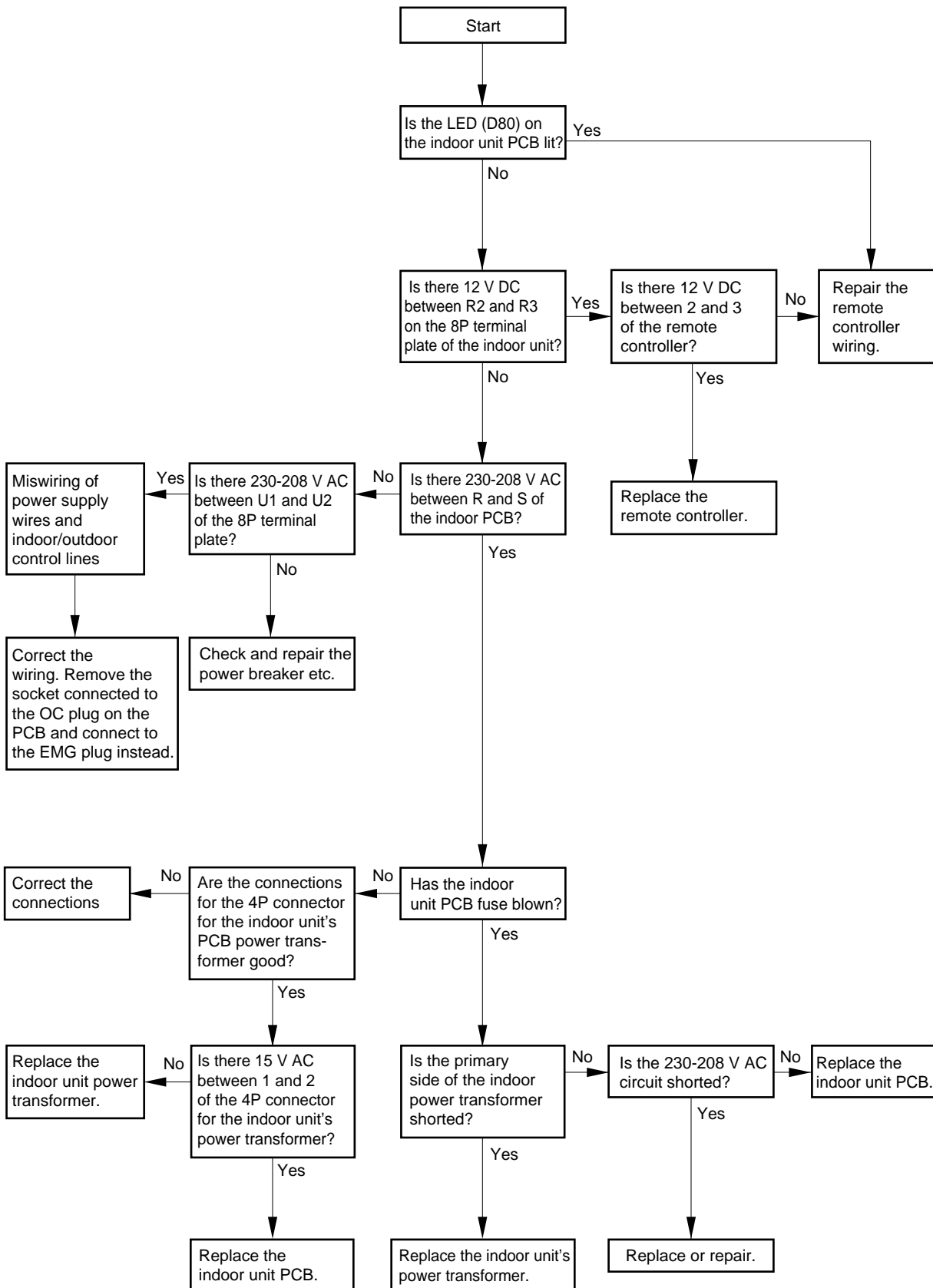


*** REFRIGERANT SHORTAGE**

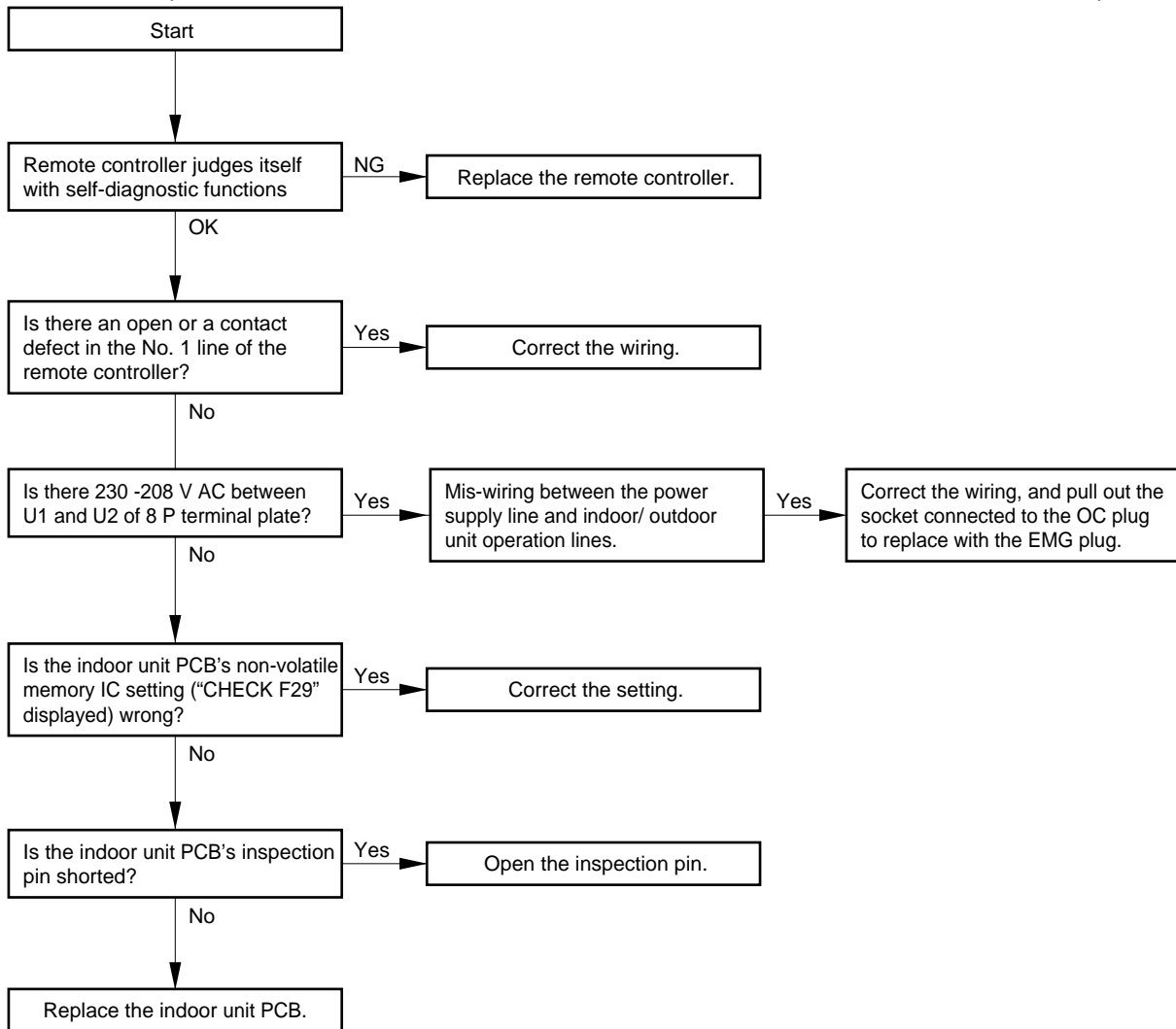
Note particularly that a **shortage of refrigerant** is only shown by the **outdoor P.C.B. Ass'y LEDs** and the Alarm Message does not appear on the Indoor Remote Controller . The compressor keeps running even when the refrigerant is less, so when you find the LED indication on the **outdoor P.C.B. Ass'y**, stop the air conditioner immediately to avoid the compressor damage.

(5) Symptoms and parts to inspect

- Symptom: LCD on the remote controller does not display and remote controller does not operate.

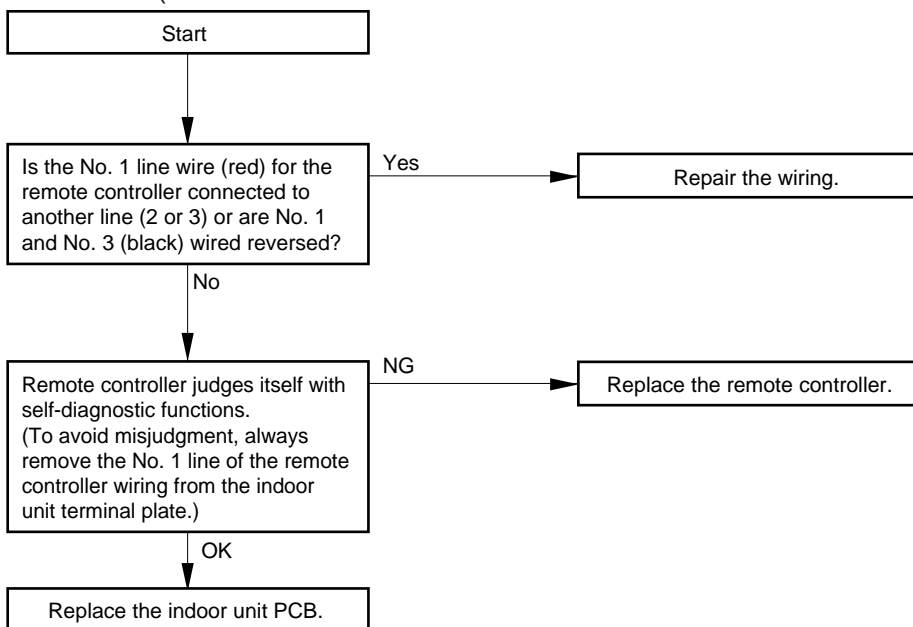


2) Symptom: LCD on the remote controller displays "CHECK E01".
(Unusual communication between remote controller and indoor unit.)



1145_THS_I

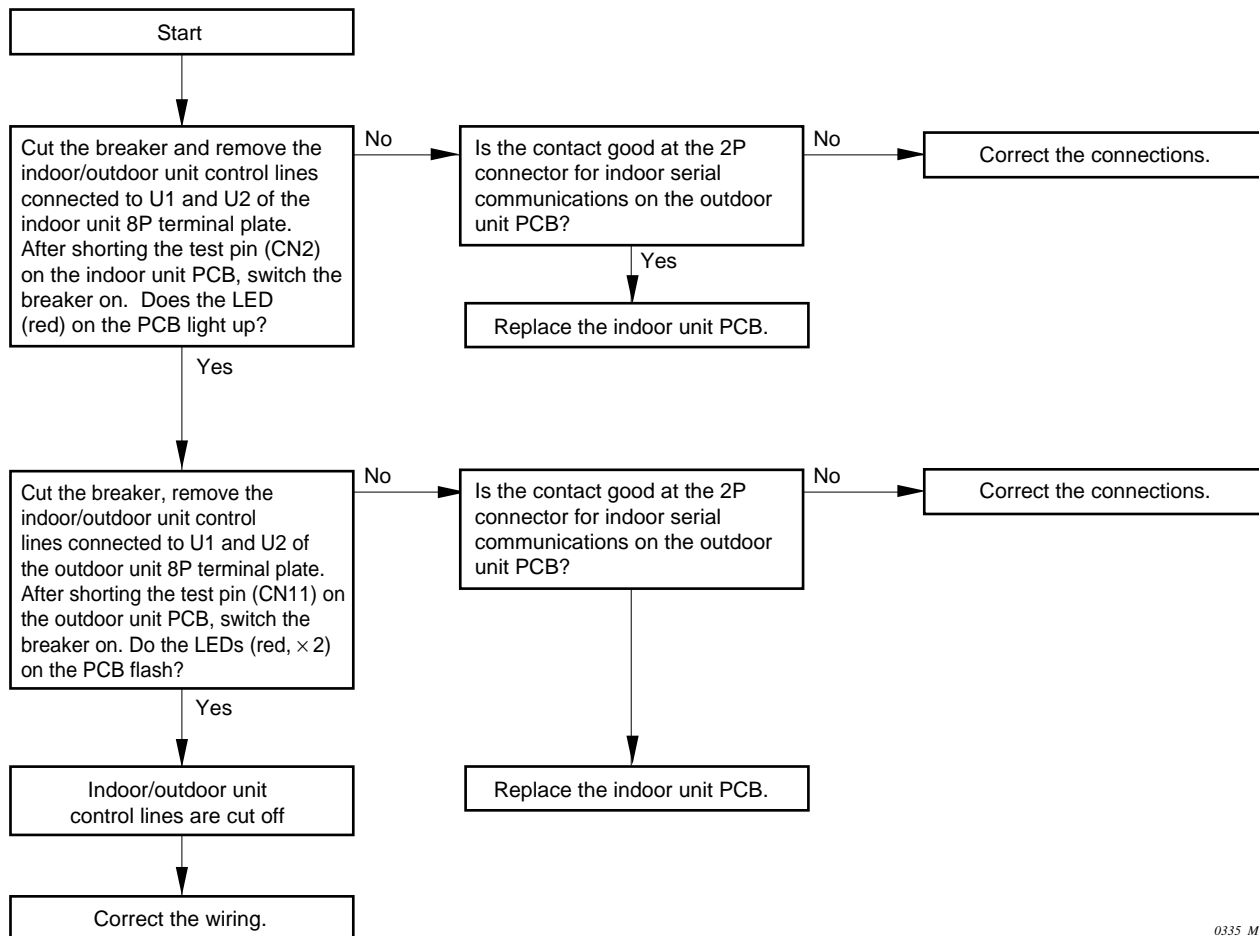
3) Symptom: LCD on the remote controller displays "CHECK E02".
(Unusual communication between remote controller and indoor unit)



0334_M_I

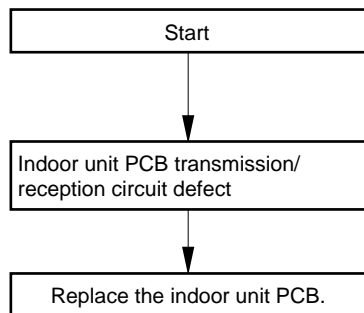
SM830076

- 4) Symptom: LCD on the remote controller is displaying “CHECK E04”.
(Unusual communication between the indoor and outdoor units.)



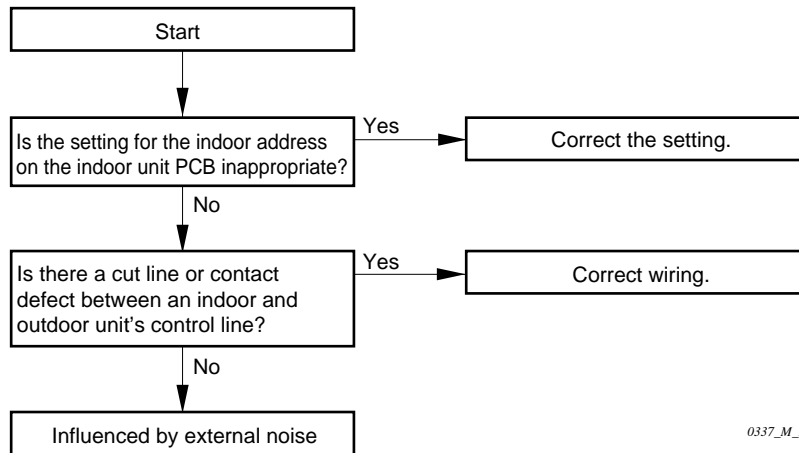
0335_M_I

- 5) Symptom: LCD on the remote controller is displaying “CHECK E05”.
(Unusual communication between the indoor and outdoor units)



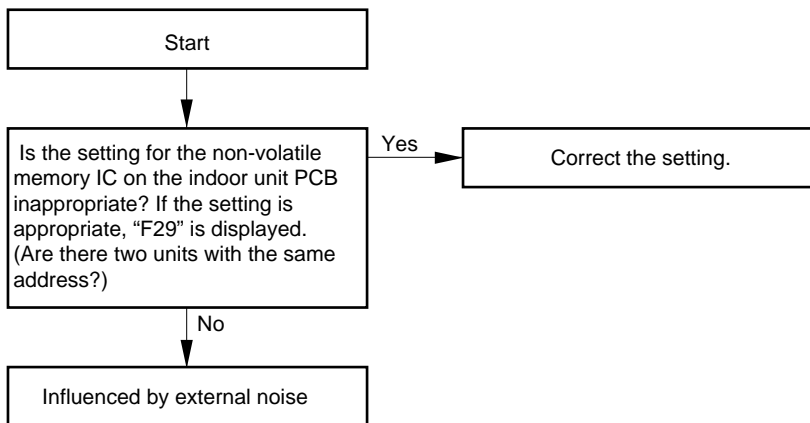
0336_M_I

- 6) Symptom: LCD on the remote controller is displaying “CHECK E06”.
(Unusual communication between the indoor and outdoor units)



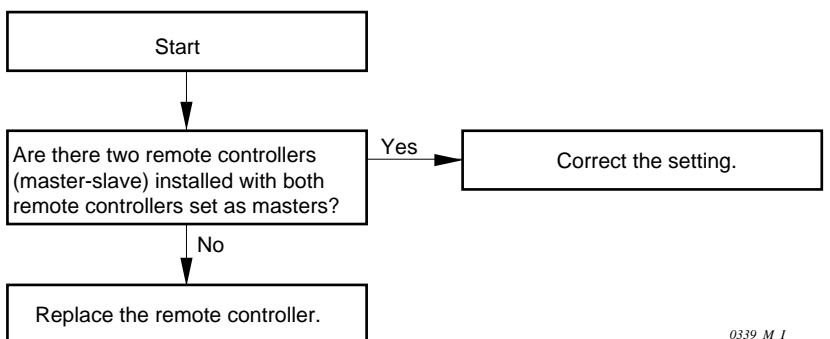
* See the section of INSTALLATION INSTRUCTION concerning with flexible combination system.

- 7) Symptom: LCD on the remote controller is displaying “CHECK E08”.
(Duplicate indoor unit address setting)



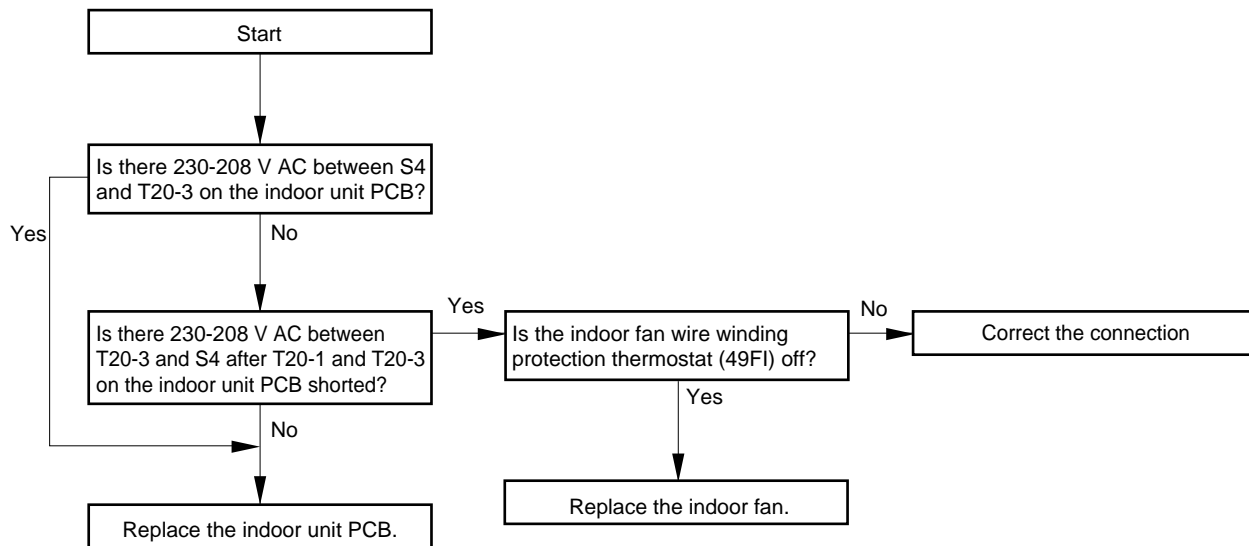
* See the section of INSTALLATION INSTRUCTION concerning with flexible combination system.

- 8) Symptom: LCD on the remote controller is displaying “CHECK E09”.
(Duplicate setting of RCU address switch of remote controllers)



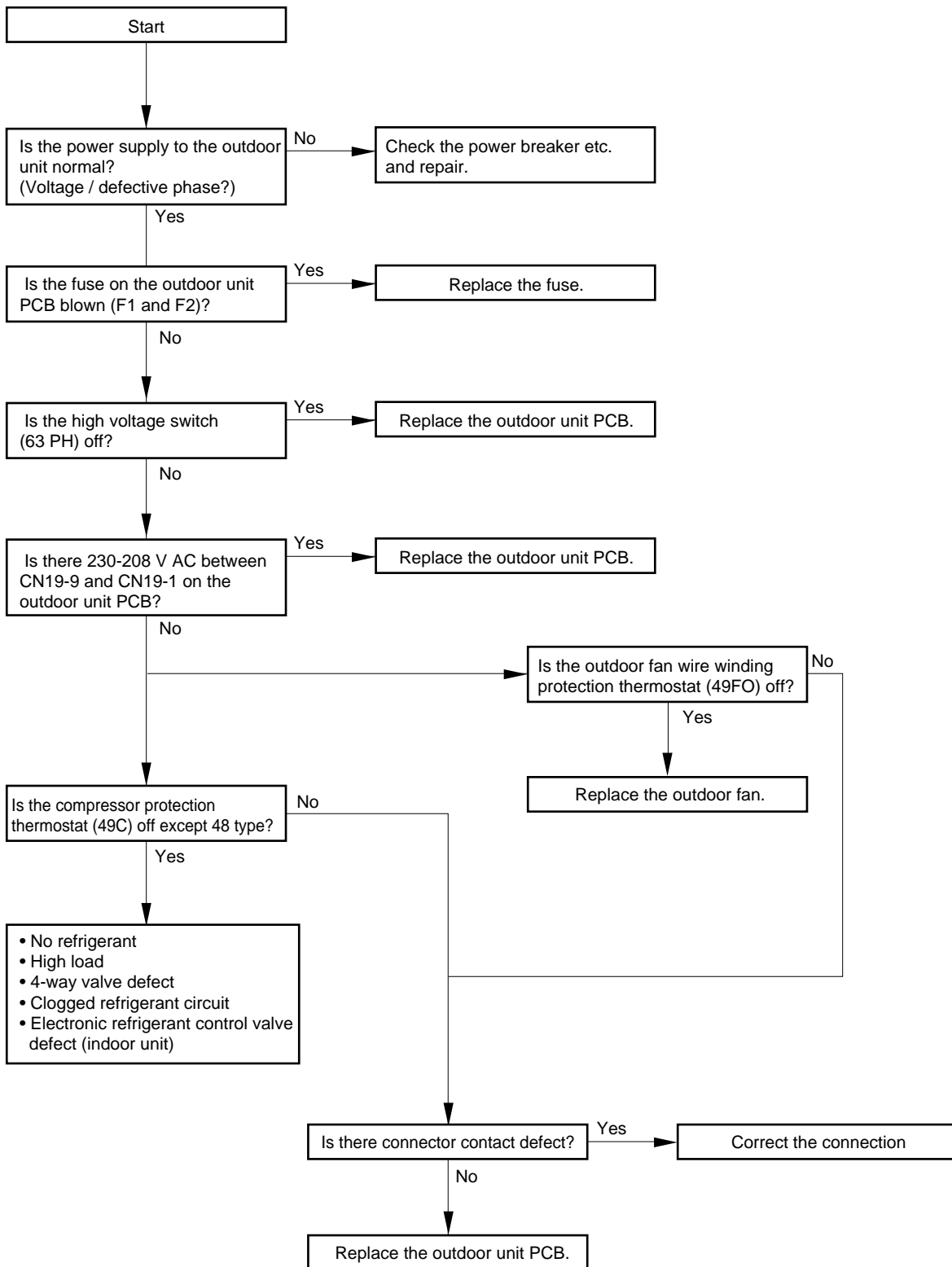
* See the section of INSTALLATION INSTRUCTION concerning with controlling remote controller switches when there are two remote controllers.

- 9) Symptom: LCD on the remote controller displays “CHECK P01”.
 (Indoor fan protection thermostat operation warning)



1146_THS_1

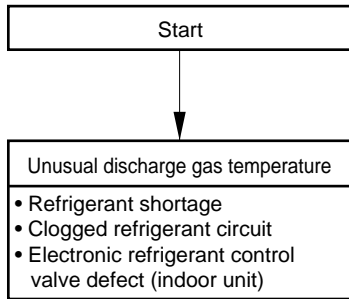
10) Symptom: LCD on the remote controller displays “CHECK P02”.
 (Compressor / outdoor fan protection thermostat operation warning / power supply voltage abnormality)



4

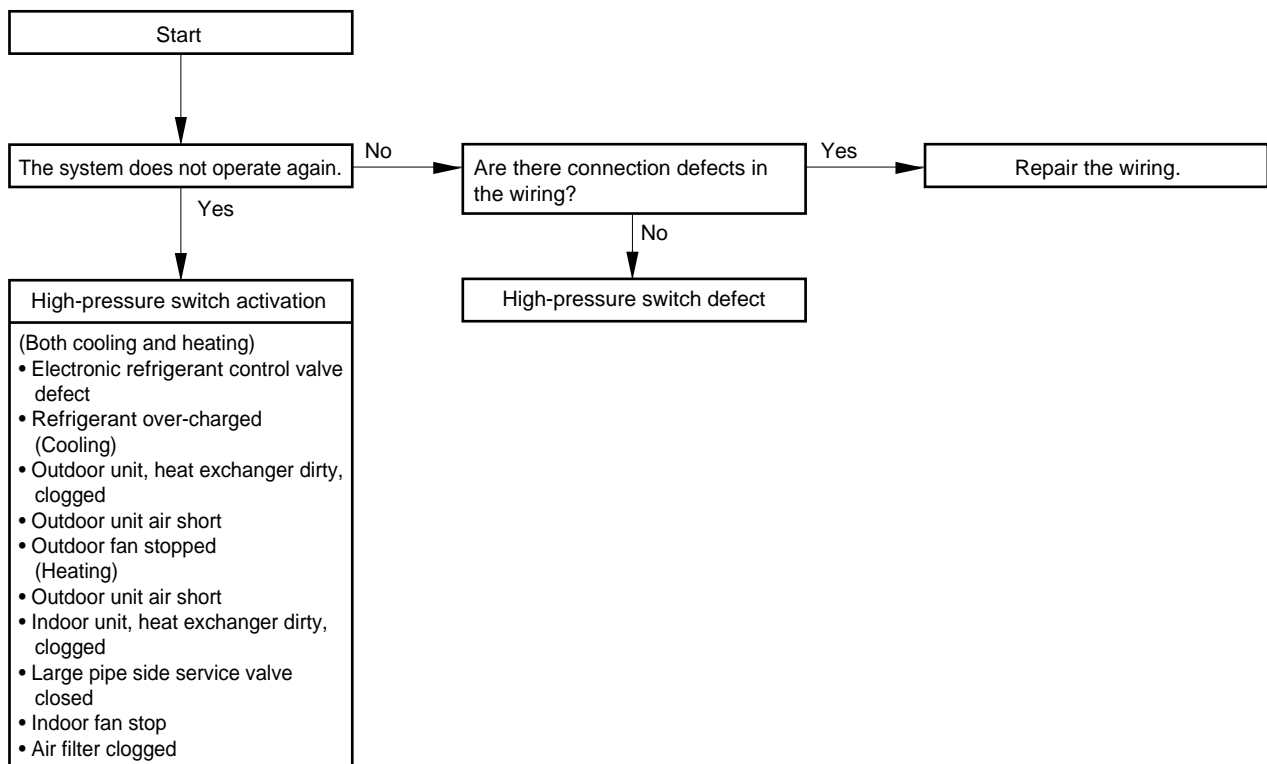
1147_THS_1

11) Symptoms: LCD on the remote controller displays “CHECK P03”.
(Alarm for unusual discharge temp. of compressor)



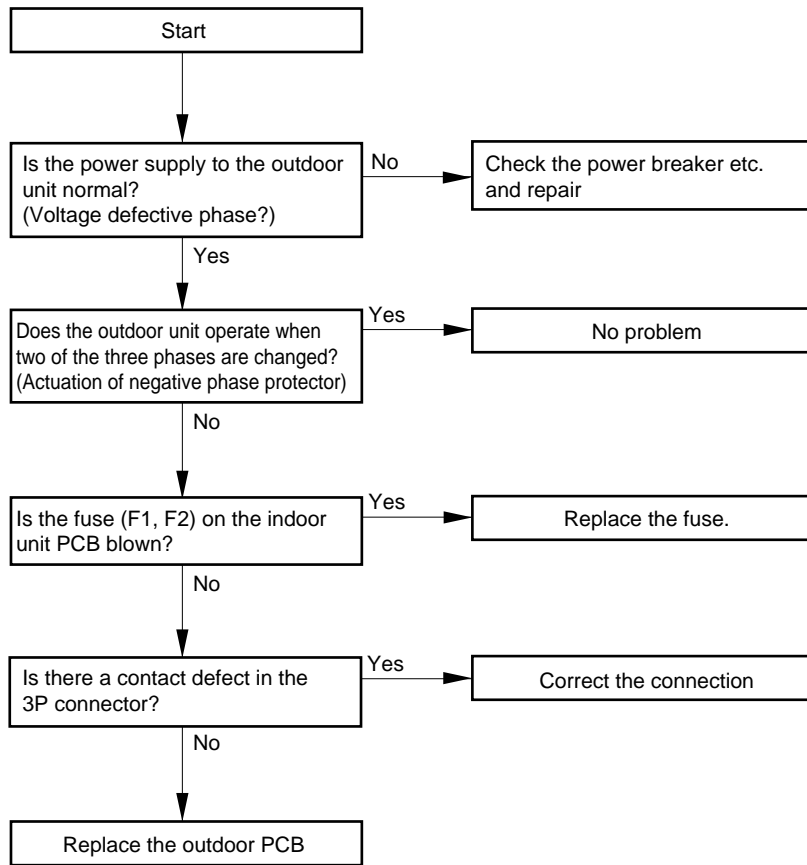
0343_M_I

12) Symptom: LCD on the remote controller displays “CHECK P04”.
(High-pressure switch activation warning)



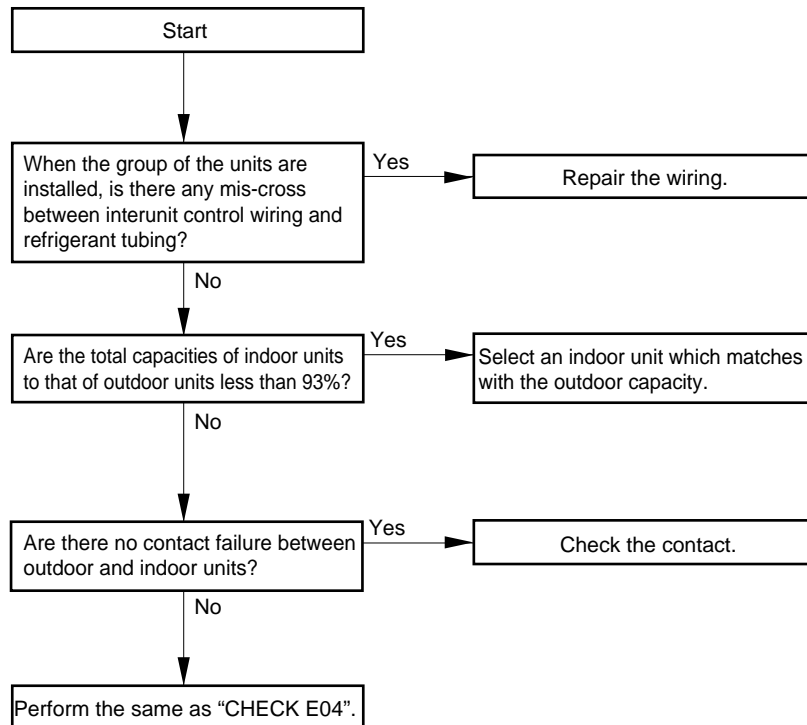
0344_M_I

13) Symptom: LCD on the remote controller displays “CHECK P05”.
(Negative phase detection operation warning)



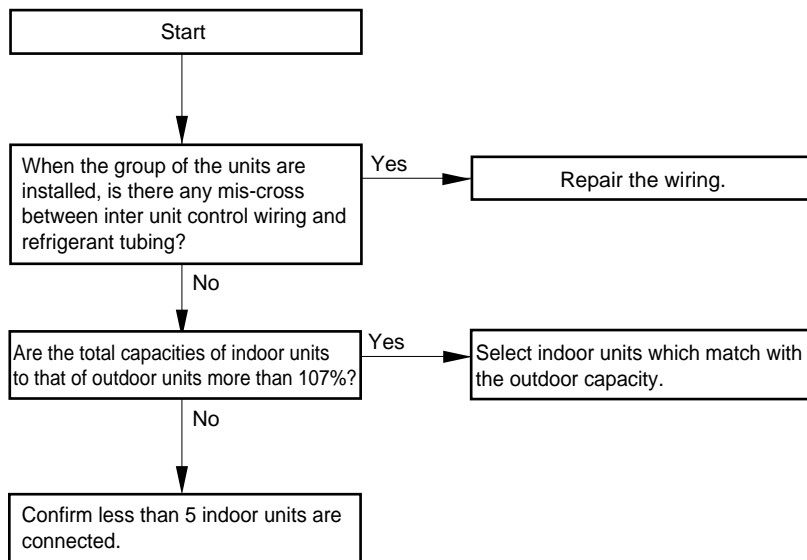
0345_M_1

14) Symptom: LCD on the remote controller displays “CHECK E15”.



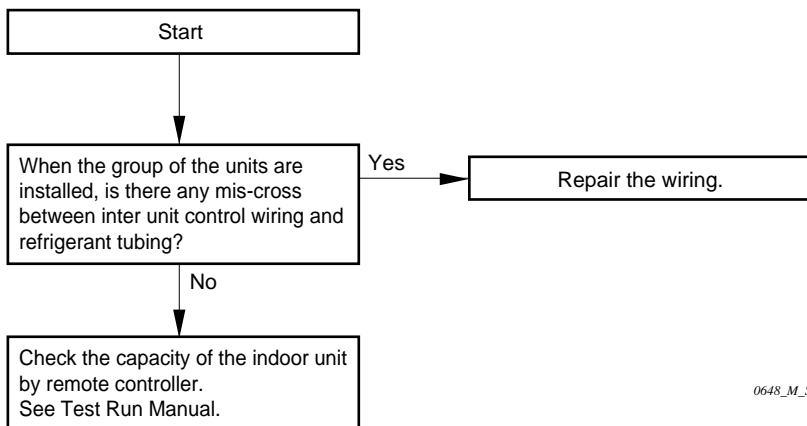
0646_M_S

15) Symptom: LCD on the remote controller displays “CHECK E16”.



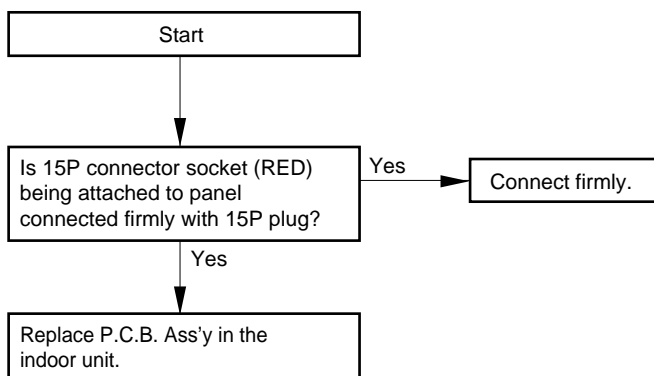
0647_M_S

16) Symptom: LCD on the remote controller displays “CHECK L13”.



0648_M_S

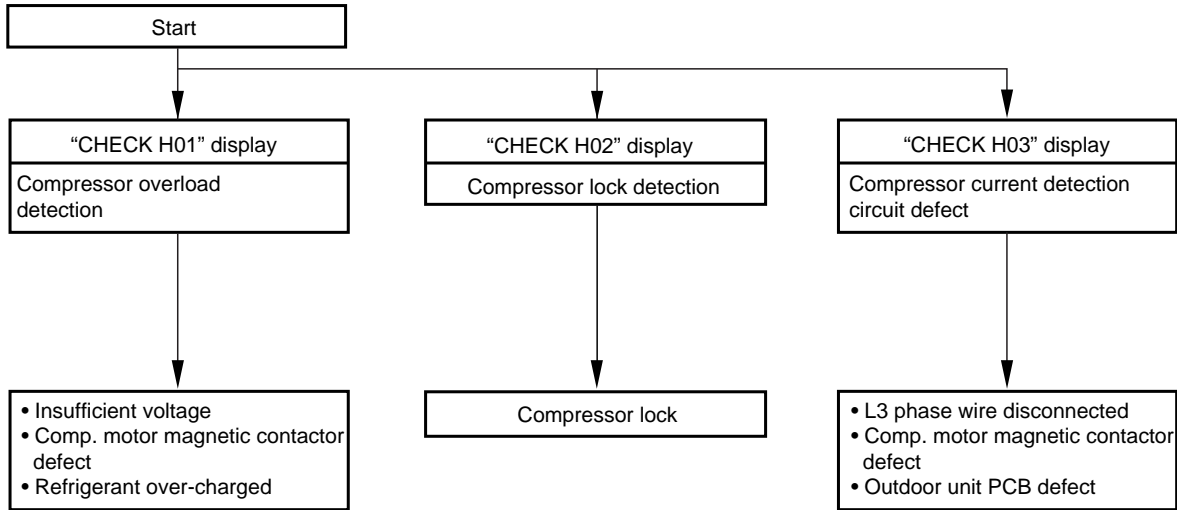
17) “Check P9” is displayed on the remote control unit.



0649_M_S

18) Symptom: LCD on the remote controller displays “CHECK H01, H02, H03”.
(compressor current detection)

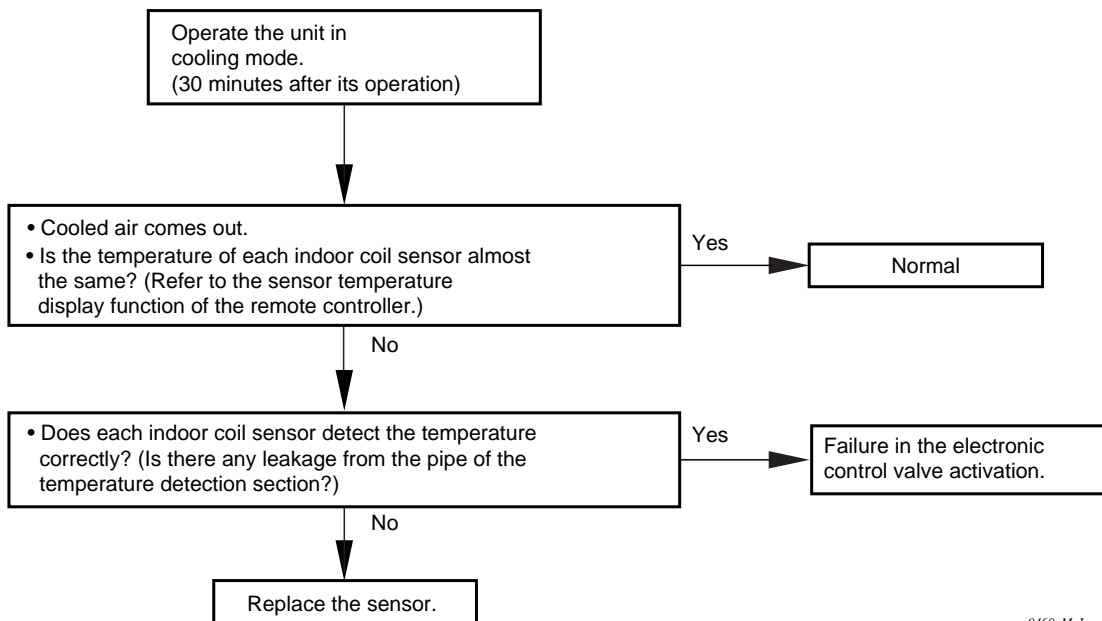
* Please check the related part described in the following chart after confirming the code setting (S4) of the outdoor unit’s capacity on the PCB in the outdoor unit.



0346_M_1

19) Check the indoor unit (When the alarm of communication failure is not activated)

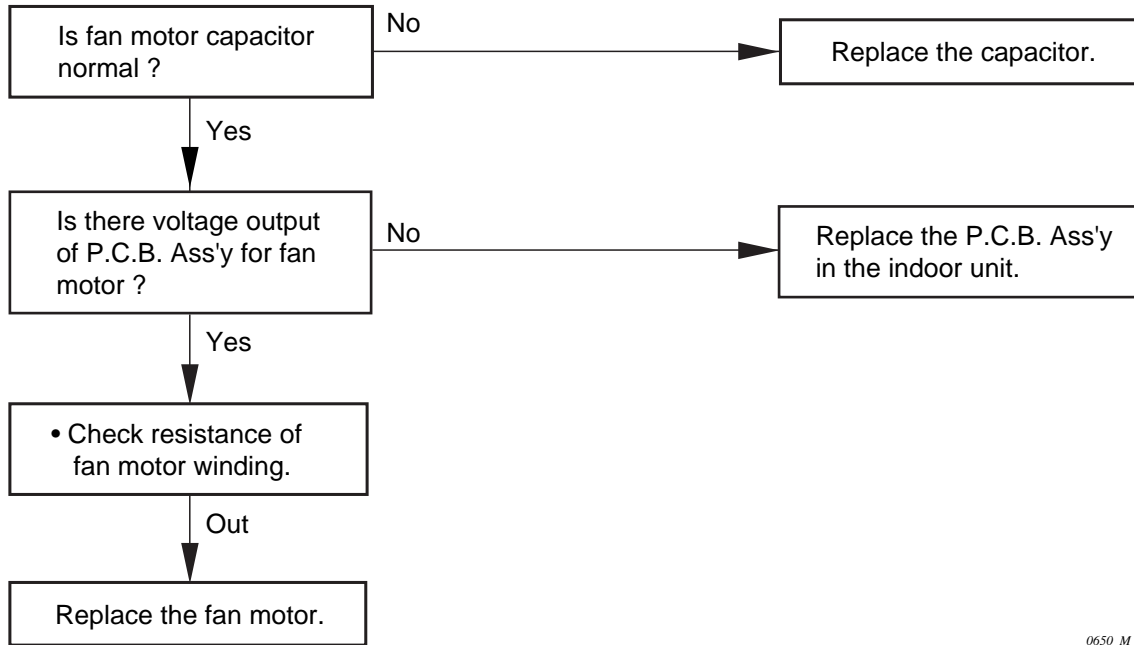
- If the electronic control valve failure occurred in Flexible Combination system (simultaneous operation system), one indoor unit would not be operated normally, then the other units won't be operated either. Due to this, try to detect the troubled unit and correct it.



0460_M_1

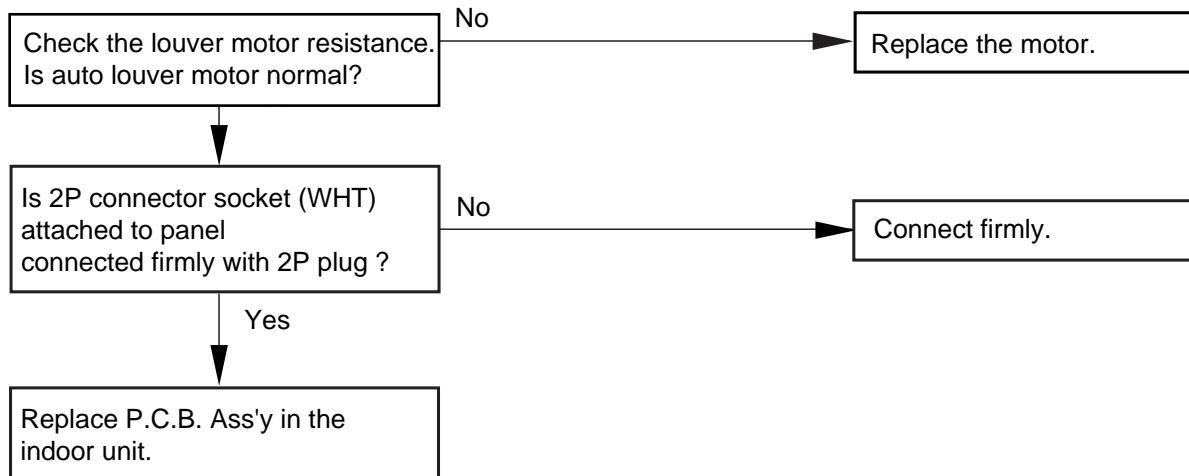
(6) Procedures When a Specific Component Does Not Work

1) Indoor fan does not operate.



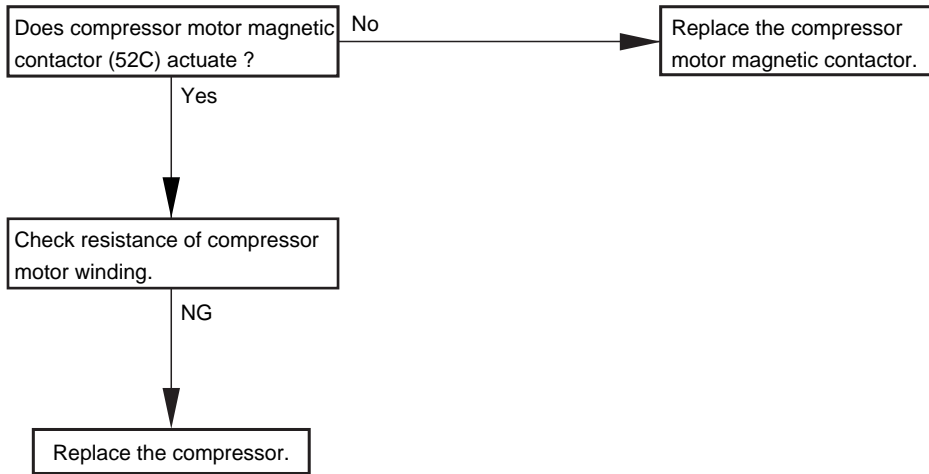
0650_M_S

2) Flaps in indoor unit's air outlet does not operate, when you press SWEEP button.



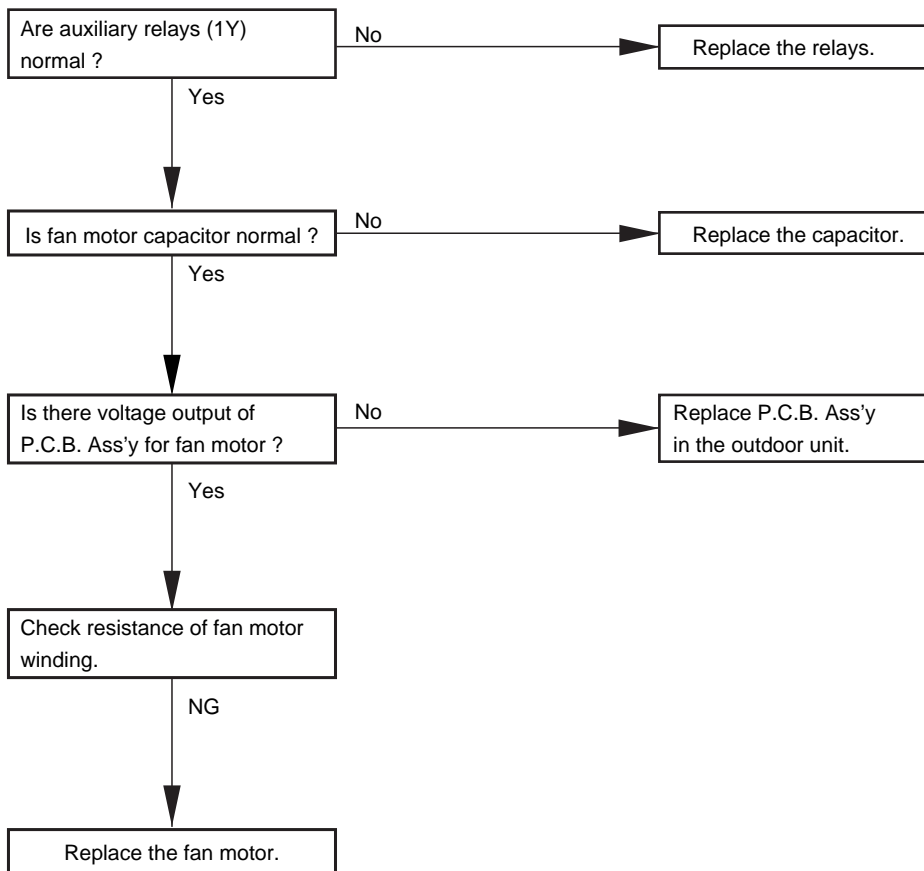
1200_M_S

3) Compressor motor does not operate.



0461_M_1

4) Outdoor fan does not operate.



1148_THS_1

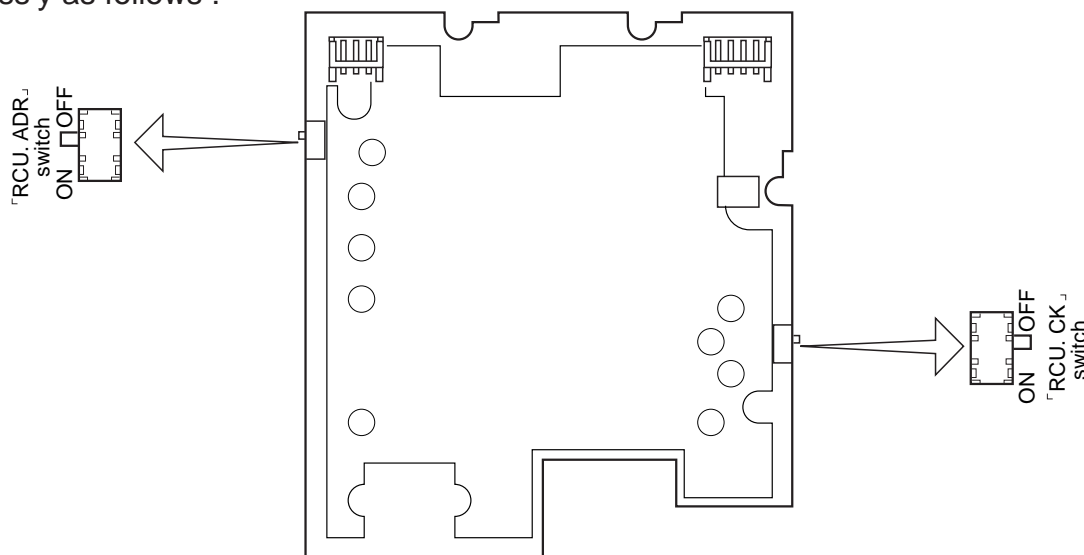
(7) Service Functions of Optional Wired Remote Controller (Temperature displayed on the screen is not °F but °C.)

From the remote controller you can control both the operation and settings of the unit as well as perform several useful service checks. This section explains how to use the remote controller on the following items from (A) to (J).

- (A) Set service check switches.
- (B) Use the test run procedure.
- (C) Check the sensor temperature readings.
- (D) Find out about past service problems.
- (E) Check the remote controller itself for correct operation.
- (F) Execute the auto. address operation.
- (G) Confirm and change the indoor unit address.
- (H) Change the shift temperature in heating mode
- (I) Set the indoor unit address.
- (J) Change the period of the filter timer

(A) Set service check switches

The service check switch (RCU.CK) is located on the back of the remote controller's P.C.B. Ass'y as follows :



0354_M_I

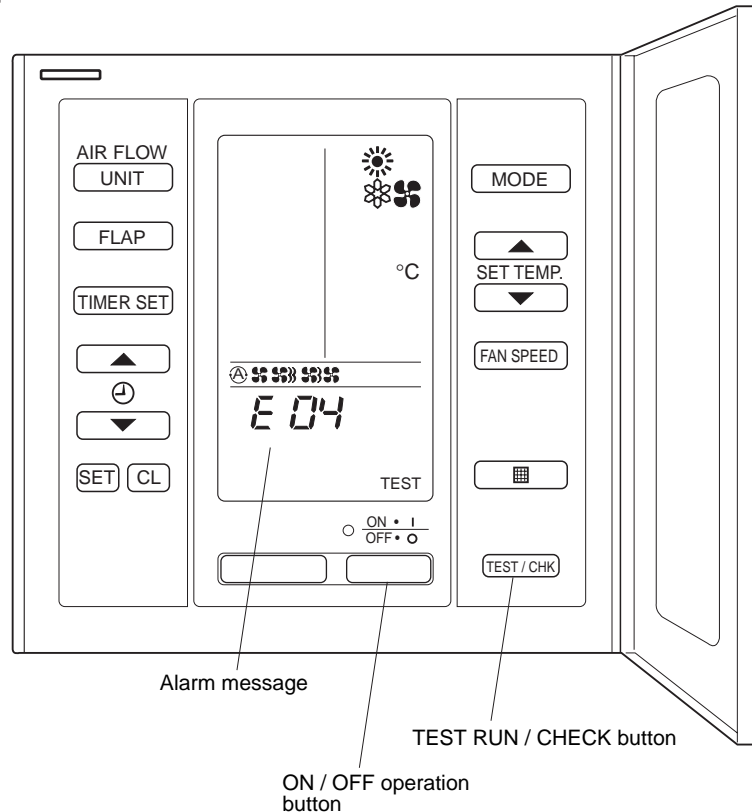
The followings are the correct switch settings for ordinary use of the unit. Only change the settings temporarily for making service checks. When you finish the settings, **be sure to return them to the standard settings** shown here.

- RCU.CK** switch - Refer to section (E) “ **Checking the remote controller for correct operation**”
(Remote Control Unit, Check)
- RCU.ADR** switch - Keep the switch **OFF** all the time except in case of sub remote controller
(Remote Control Unit, Address)

(B) Use the test run procedure

- ❑ The purpose of the test run function is to let you control the operation of the unit directly without turning the unit on or off by thermostat. As indicated in the following procedure, be sure to stop test run operation when you finish the procedure, or the air conditioner may be damaged.
- ❑ To protect the air conditioner from overloading, the outdoor unit will not start running for 3 minutes after power is applied or the unit is turned OFF.

- a Press the **TEST / CHK** button at the bottom right on the remote controller.
- b Press the **ON / OFF** operation button to start the test run.
- c Press the **MODE** button to select either **COOLING** or **HEATING** mode.
- d When the test run starts, “**TEST**” shows on the remote controller’s display.
- e During the test run, the air conditioner runs continuously and the thermostat does not control the system.
- f After the test run, be sure to press the **TEST / CHK** button once again to finish this mode and make sure “**TEST**” is not shown on the display.



1152_THS_J

4



The TEST RUN button is used only for servicing the air conditioner. Do not press this button in normal operation, or the system may be damaged.

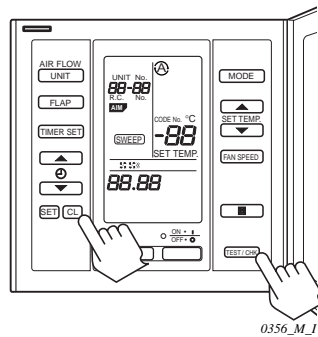
(C) Check the sensor temperature readings

The air conditioner has thermo sensors which are used to control the unit.

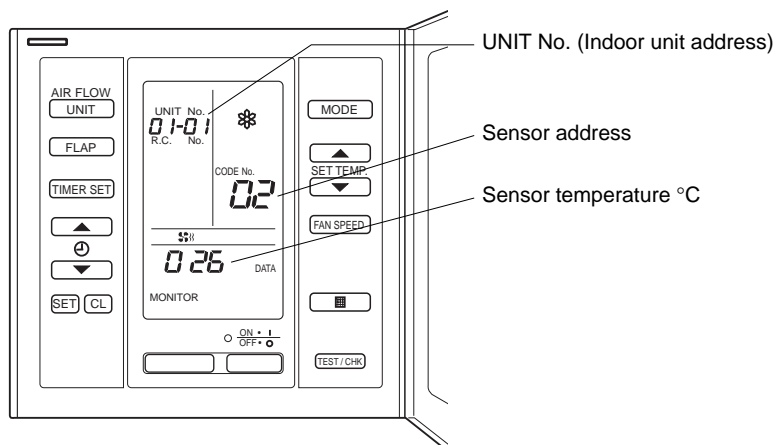
- ❑ Each sensor has an address which is made up of the indoor unit address, and the sensor address. The indoor unit address is used only when several units are hooked up to one remote controller (group control). If there is only one unit, made up of one indoor and one outdoor unit, then only the sensor address should be put in, as shown in the procedure below.

Follow this procedure to display the temperature of each sensor:

- a) On the remote controller, press both **TEST / CHK** and **CL** buttons at the same time for more than 4 seconds.



- b) The UNIT No., the address and temperature of the sensors instead of its usual information will flash on the display.
 - ❑ Following example shows the UNIT No. (Indoor unit address) is fixed at **01-01**.
 - ❑ In case of group control, select the UNIT NO. (Indoor unit address) which you want to check with **UNIT** button.
 - ❑ Each time you press the **▲**, **▼** (SET TEMP.) button you can select a different sensor, and the display shows the sensor address and temperature as shown below.



NOTE

Do not press **TIMER SET** button during the procedure.

Refer to the table below for the relationship between the sensor address and the location of the sensor.

Relationship between the sensor address and the location of sensor

Sensor Address (CODE No.)		Location of Sensor (Themistor)	
Indoor Unit	01	—	
	02	TH1	Indoor air suction Temp.
	03	TH2	Indoor coil Temp. (E1)
	04	TH3	Indoor coil Temp. (E2)
	05	—	
	06	—	
	07	—	
	08	Electronic expansion valve open	
	09	—	
Outdoor Unit	0A	TH8	Discharge gas Temp.
	0B	—	
	0C	—	
	0D	TH7	Outdoor coil liquid Temp. (C2)
	0E	TH6	Outdoor coil liquid Temp. (C1)
	0F	—	
	10	—	
	11	—	
	12	—	
	13	—	
	14	—	

NOTE

In case there are no sensor equipped with the unit, “- -” is shown on the display.

© Resetting the remote controller display to previous mode.

- To reset the display, press **TEST / CHK** button, then the remote controller will return to previous mode.

(D) Find out about past service problems

The remote controller can memorize the **max. 4 most recent alarm messages**, so you can see problems the unit has had, if any. Knowing what has already occurred and been fixed helps you to know what to check at present.

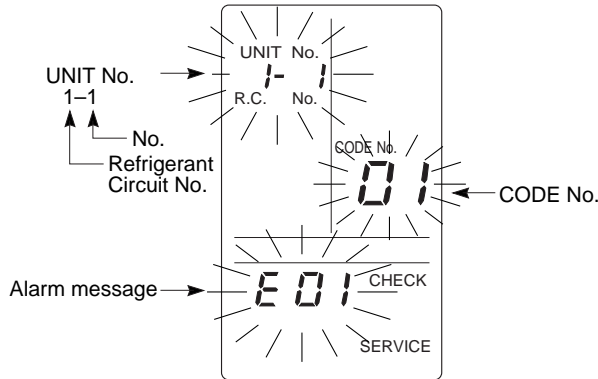
- This function is usable even if the unit is not working.
- To display the past error codes, follow the procedure below.

Procedure:

- Ⓐ On the remote controller, press both **TEST / CHK** and **SET** buttons at the same time for more than 4 seconds.
- Ⓑ Once in this mode, display changes from the normal display to service check display as shown in the table below:

NORMAL DISPLAY	Display Change (→)	SERVICE CHECK DISPLAY
Set temp.	→	Code No.
UNIT No.	→	UNIT No. (Indoor unit address)
Hours, Minutes	→	Alarm Message

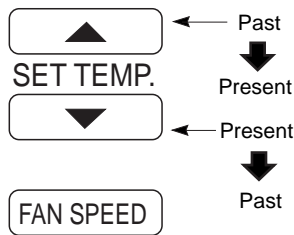
This picture shows the service check display.



0358_M_1

- ©. A maximum of 4 alarm messages can be accessed by pressing either **SET TEMP** button ▲ or ▼ as follows.

MODE



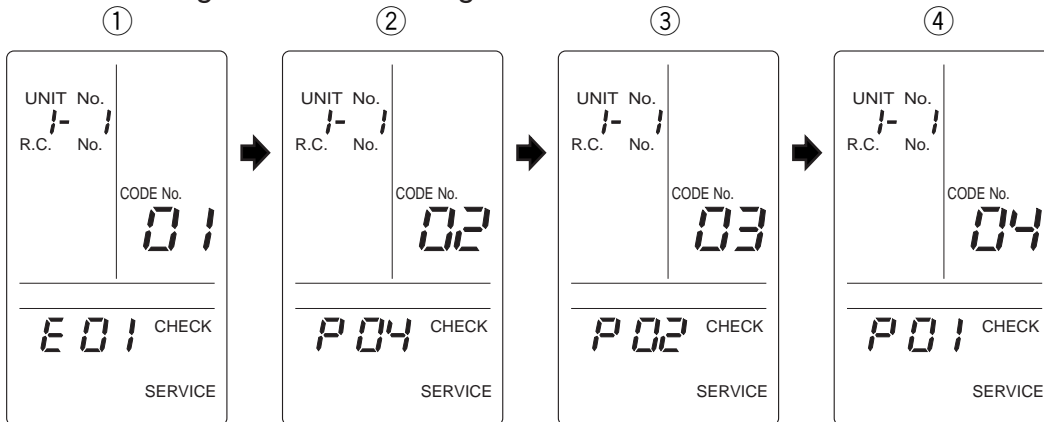
NOTE Pressing **CL** (Clear) button will clear all the service history.

▲ ... accessed in order of "Past → Present".

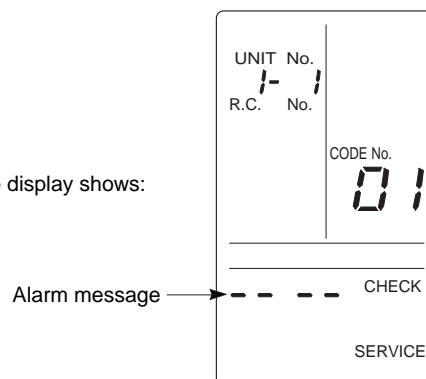
▼ ... accessed in order of "Present → Past".

0359_M_1

For example, if the last four alarm messages were, in order of occurrence from oldest to most recent, **P01**, **P02**, **P04**, and most recently **E01**, then the display will be shown as below when you press ▼ button four times. The 5th time you press ▼ button you can repeat the display, then the first message will be shown again.



If there are no alarm messages, the display shows:



0360_M_1

SM830076

Important

Never press **CL** (clear) button unless you want to erase the accessed data in memory. Follow the procedure below only when erasing is necessary.

- To erase accessed data, press the **CL** button.
- When erasing is finished, “----” mark appears on the controller’s display.



After checking the alarm messages, be sure to press the **TEST / CHK** button.

(E) Check the remote controller itself for correct operation

The remote controller has a **self-diagnostic** function to check if it works properly. Use this procedure to find out if the remote controller itself is in trouble.

- a) Turn ON the **RCU.CK** switch on the back of the **P.C.B.** Ass’y in the remote controller. See section **(A)** for exact location.
- b) The appearance of the display will tell you whether or not the remote controller is working correctly or not.
 - Normal condition** – All displays appear for 10 seconds, then disappear.
 - Unusual condition** – All displays flash ON and OFF for 10 seconds, then disappear.

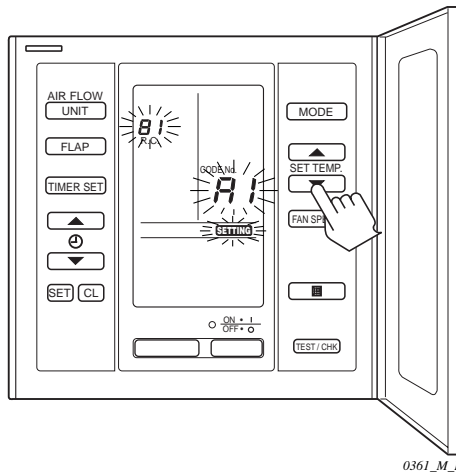


After checking the panel, be sure to set the **RCU.CK** switch to this original **OFF** position.

(F) Execute the auto. address operation

- Auto. address operation is executed by pressing the A. ADD (S1) button of outdoor unit's PCB usually.
For your convenience it can be executed by remote controller also.

- a) Press the **TEST / CHK** and ▲ (⏻) buttons at the same time for more than 4 seconds.
- b) Set CODE No. A1 with ▲, ▼ (**SET TEMP**) button.



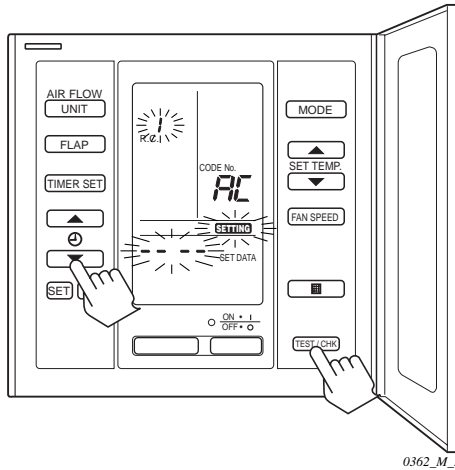
In this mode, the auto. address operation is executed at each R.C. (Refrigerant Circuit) line one by one.

- c) Select R.C. No. which you want to execute the auto. address operation with **UNIT** button.
- d) Press the **SET** button. The auto. address operation will start. CODE No. changes from flashing to ON state.
- e) If an error occurs during operation, the alarm message will be displayed. Check and remove the cause. If you want to stop the operation, press the **CL** button then the unit stands in waiting mode (Press the **SET** button again.)
- f) If the automatic address operation finishes, the display will disappear.
- g) Execute the operation of the other R.C. line in the same way by following the above steps c) to d) .
- h) Complete the automatic address operation by pressing the **TEST / CHK** button.

(G) Confirm and change the indoor unit address

□ The purpose of the above function is to let you confirm the indoor unit address after the auto. address operation, and change the indoor unit address if it is needed.

Ⓐ Press the **TEST / CHK** and **▼ (⊖)** buttons at the same time for more than 4 seconds.



0362_M_I

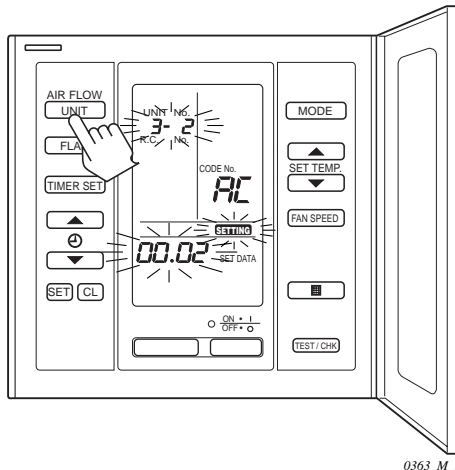
Ⓑ Select the R.C. No. which you want to change with the **UNIT** (up) or **FLAP** (down) buttons.

Ⓒ Press the SET button (to confirm the R.C. No.).
The smallest registered indoor No. and the selected R.C. No. will be displayed.

Ex:

R.C. No. 3 is selected.

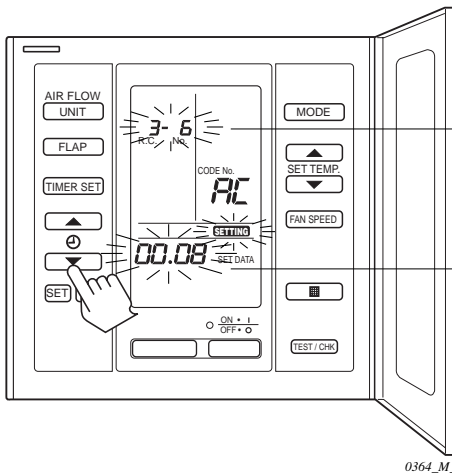
Indoor No. 2 is the smallest indoor No. of the R.C. No. 3.



0363_M_I

Ⓓ Select the indoor No. which you want to change with **UNIT** button. Once in this mode, **the fan motor of selected indoor unit will turn on and let you confirm the indoor unit address.**

- Ⓔ Set the required new indoor unit's No. by pressing the ▲ , ▼ (⊕) button.



Ex: UNIT No. 3-6: currently registered indoor unit address

Required new indoor No.8: SET DATA

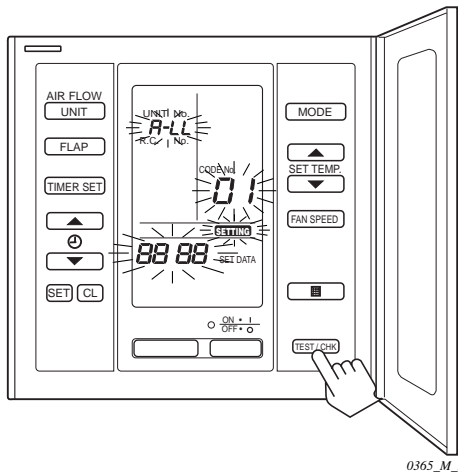
* In this case, UNIT No. 3 – 6 (current)
≠
3 – 8 (NEW : after pressin the
TEST / CHK button)

- Ⓕ Press the SET button.
UNIT No, SET DATA (0008) and **SETTING** changes from flashing to ON state.
- Ⓖ If you made a mistake, press the **CL** button.
- Ⓗ Finally, press the **TEST / CHK** button.
- Ⓙ If you want to change the indoor unit address of the other R.C. No., follow the step Ⓐ to Ⓗ in the same way.

(H) Change the shift temperature in heating mode

- ❑ If the indoor unit is installed at high location (ex. ceiling level), the thermostat tends to turn off at heating mode because of the hot air temperature around ceiling level. In order to solve the problem, the shift temp. (valid while heating only) is set when shipped from factory.
- ❑ If the shift temp. is not enough (ex. the indoor unit is installed at position higher than 3 m), the shift temp. can be set with remote controller from +1 to +10 deg (°C) <from +2 to 20 deg (°F)>. manually as follows:

a) Press the **TEST / CHK** button for more than 4 seconds.

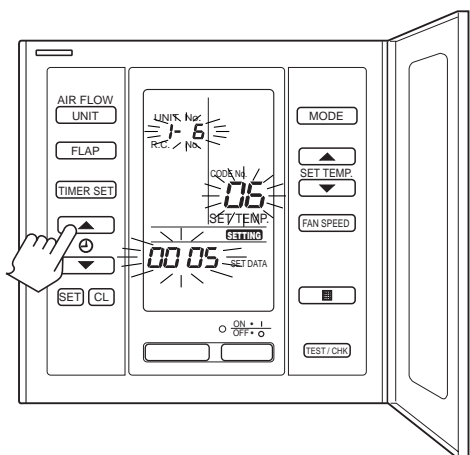


0365_M_I

b) In case of group control, if you want to change all units in group control collectively, proceed next step remaining ALL displayed. If you want to change a unit individually, select the indoor unit address (UNIT No.) with **UNIT** button.

c) Select the CODE No. 06 with ▲ , ▼ (**SET TEMP**) button.

d) Choose the shift temp with ▲ , ▼ (⊕) button.



0366_M_I

EX:
 UNIT No. 1–6
 CODE No. 06
 Shift temp. +5 deg (°C)
 <+10 deg (°F)>

e) Press the SET button. CODE No. 06, SET DATA and **SETTING** change from flashing to ON state.

f) If you made a mistake, press the **CL** button.

g) Finally, press the **TEST / CHK** button.

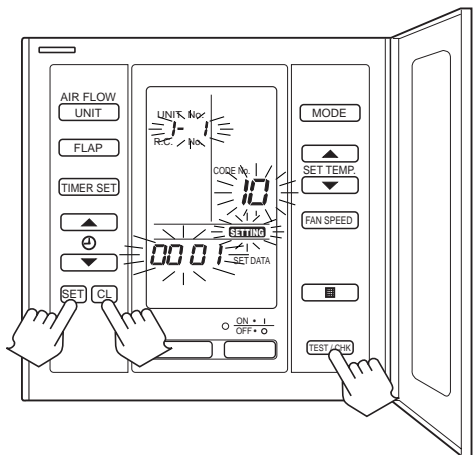
(I) Set the indoor unit address

- ❑ This function is usable if the auto. address operation is not available. Indoor unit address can be set one by one by remote controller in such case.

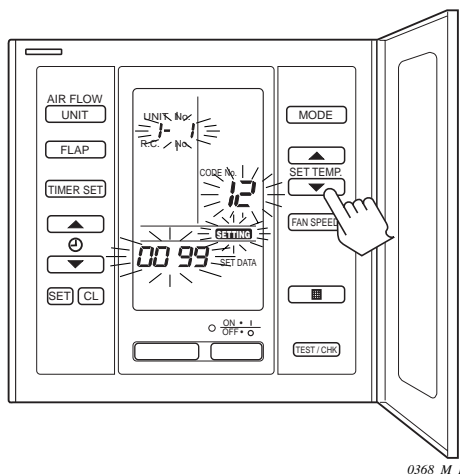
NOTE

- 1) In case of group control, branch wiring for group control should be removed temporarily.
- 2) In case of remote controllerless system, remote controller should be connected with the indoor unit temporarily.

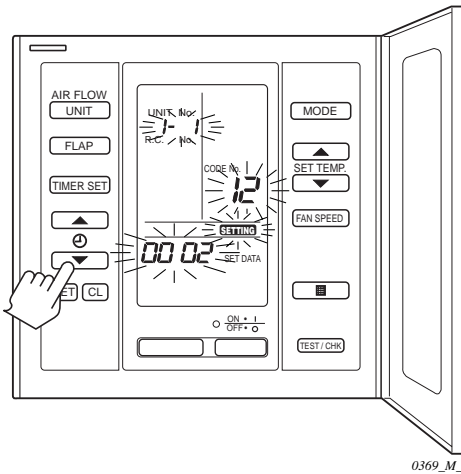
- a) Short the two terminals of DISP PIN on indoor unit PCB.
(DISP PIN : Refer to P. VI-2)
- b) Press the **TEST / CHK** , **SET** and **CL** buttons at the same time for more than 4 seconds.



- c) Set the CODE No. 12 to set the No. of R. C. with the ▲ , ▼ (**SET TEMP**) button.



- d) Set the No. of R. C. which you want to set with ▲ , ▼ (⊕) button.

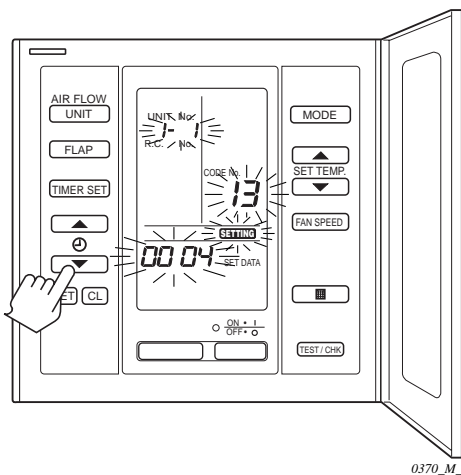


Ex. No. of R. C. will be set 2.

- e) Press the **SET** button.
UNIT No., CODE No. 12, **SETTING** and SET DATA (0002) change from flashing to ON state.

- f) Select the CODE No. 13 to set the indoor unit No. with the ▲ , ▼ (**SET TEMP**) button.

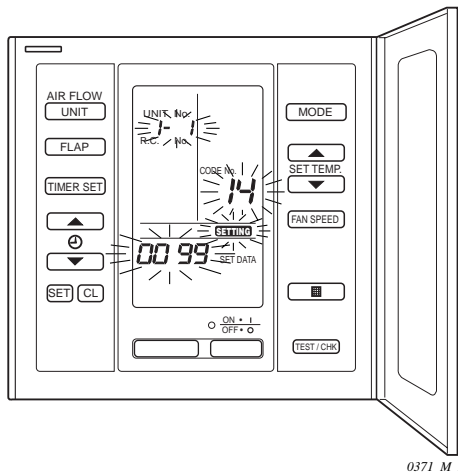
- g) Set the indoor unit No. which you want to set with the ▲ , ▼ (⊕) button.



Ex. Indoor unit No. 4 will be set.
In this example, indoor unit address (UNIT No.) will be set 2-4.

- h) Press the **SET** button.
UNIT No., CODE No. 13, **SETTING** and SET DATA (0004) change from flashing to ON state.

- ① Select the code No. 14 to set group setting with the ▲ , ▼ (SET TEMP) button.
- ② Set the No. of group setting as shown below with the ▲ , ▼ (⊕) button.



0371_M_1

Nos. of group setting.

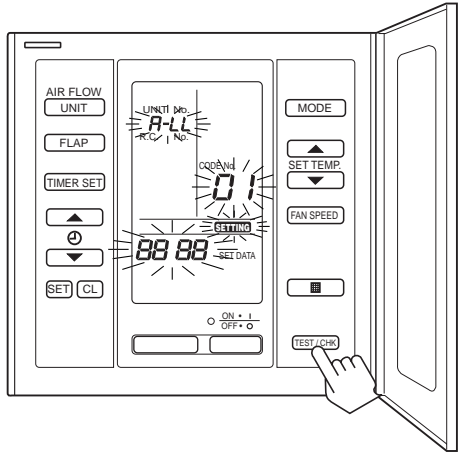
- 0 : Standard system (except group control)
- 1 : Main indoor unit in case of group control
- 2 : Sub indoor unit in case of group control
- 99: No setting (at factory shipment)

- ③ Press the **SET** button.
UNIT No., CODE No. 14, **SETTING** and SET DATA change from flashing to ON state.
- ④ If you made a mistake, press the **CL** button so that setting returns to the initial state.
- ⑤ Press the **TEST / CHK** button to finish this mode.
The display is disappeared.
- ⑥ Confirm the indoor unit address (UNIT No.) with the **UNIT** button after pressing the **ON / OFF** button.
- ⑦ Finally, remove the short circuit of DISP PIN.
And in case of group control, be sure to restore the branch wiring to its original wiring. In case of remote controller-less system, remove the remote controller.

(J) Change the period of the filter timer

□ If the period of filter timer is not suitable (for example in case of dirty environment), the period can be shortened to half as follows:

Ⓐ Press the **TEST / CHK** button for more than 4 seconds.

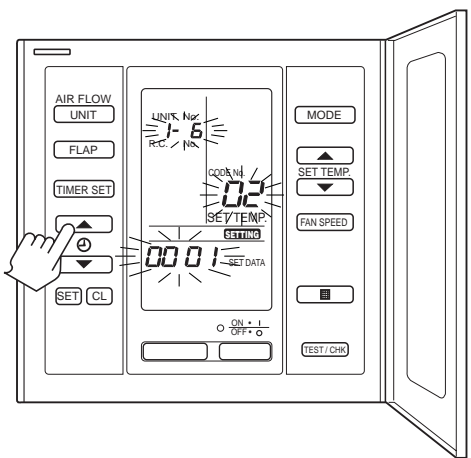


0213_M_J

Ⓑ In case of group control, if you want to change all units in group control collectively, proceed next step remaining "ALL" displayed. If you want to change a unit individually, select the indoor unit address (UNIT No.) with **UNIT** button.

Ⓒ Select the CODE No. 02 with ▲ , ▼ (**SET TEMP**) button.

Ⓓ Change the No. from 0 to 1 with ▲ , ▼ (⊕) button.



0214_M_J

EX:
 UNIT No. 1-6
 CODE No. 02
 K type 150 hr → 75 hr

Ⓔ Press the **SET** button.
 CODE No. 06, SET DATA and **SETTING** change from flashing to ON state.

Ⓕ If you made a mistake, press the **CL** button.

Ⓖ Finally, press the **TEST / CHK** button.

4-2 Checking the Electrical Components

(1) Measurement of Insulation Resistance

- The electrical insulation is acceptable when the resistance exceeds 1 MΩ.

① Power Supply Wires

Clamp the earthed wire of the Power Supply wires with a lead clip of the insulation resistance tester and measure the resistance by placing a probe on either of the power wires. (Fig. 21)

Then measure the resistance between the earthed wire and the other power wires. (Fig. 21)

② Indoor Unit

Clamp an aluminum plate fin or copper tube with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on the terminal plate (Fig. 22)

③ Outdoor Unit

Measure the resistance by placing a probe on the terminal plate in the same manner as explained above ②. (Fig. 22)

④ Measurement of Insulation Resistance for Electrical parts

- Disconnect the connector of the desired electric part from terminal plate, P.C.B. Ass'y, etc. (Fig. 23)
- Similarly, disconnect the lead wires from compressor, capacitor, etc. (Fig. 24)
- Measure the resistance in the same manner as illustrated on the right.

Refer to Electrical Wiring Diagram.

NOTE

If the probe does not enter the hole because the hole is too narrow, use a probe with a thinner pin.

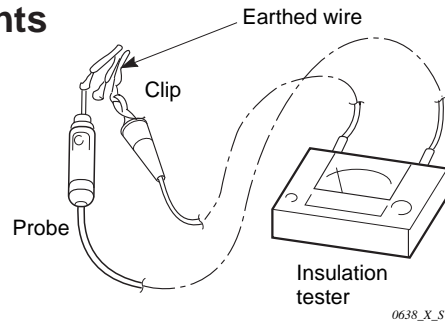


Fig. 21

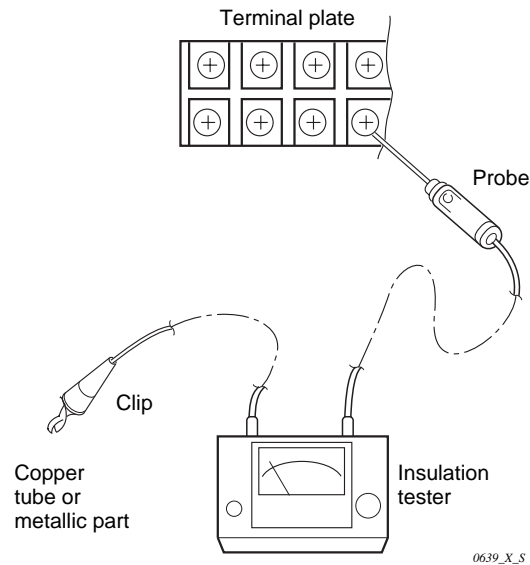


Fig. 22

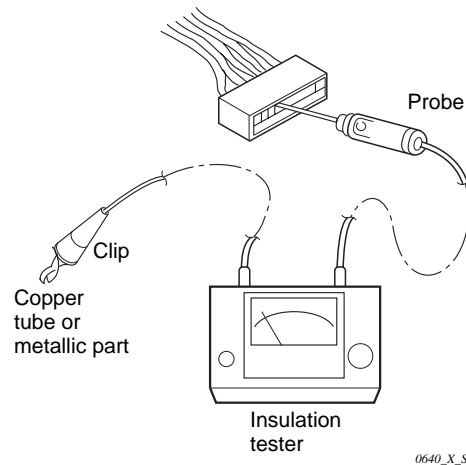


Fig. 23

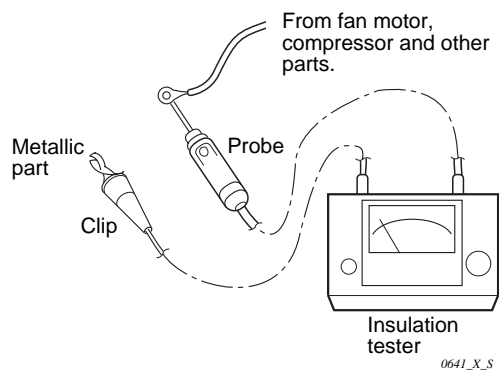


Fig. 24

(2) Checking the Protective Devices

- Disconnect the connector, which consists of P (plug) and S (socket) when you want to check the protective device.
- Then check continuity among plug's (and/or socket's) terminal as in **Fig. 25**.
- Normality of the protective device can be judged by the following table.
The Protective Device is proved normal if there is a continuity between terminals.

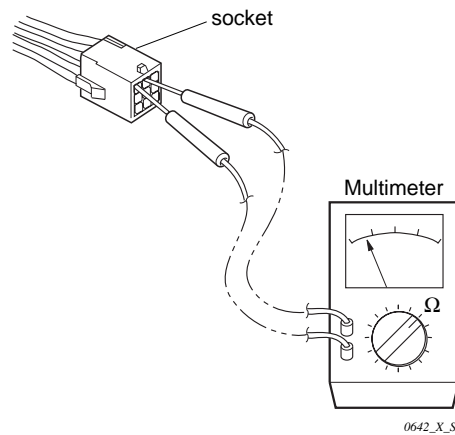


Fig. 25

- ① **Indoor fan motor thermal protector (49FI) Indoor unit**
 - Disconnect the connector which leads to the indoor fan motor (FMI).
 - Check the socket's terminals.
- ② **Compressor motor thermal protector Outdoor unit**
 - Disconnect the wires from terminals of compressor.
 - Check the terminals of compressor.
- ③ **Outdoor fan motor thermal protector (49FO) Outdoor unit**
 - Disconnect both the connector which leads to the outdoor fan motor (FMO).
 - Check socket's terminal.

(3) Checking the Electrical Parts

- ① **Power transformer (TR1) Indoor unit** *Measure the coil resistance.
- Primary 230-208V ; Measure the resistance between No.1 and No.3 (WHT lead wires) terminals of 3P (WHT) socket connected to power transformer.
 - Secondary 14.8V ; Measure the resistance between No.1 and No.2 (RED lead wires).
 - 14.8V ; Measure the resistance between No.3 and No.4 (BRN lead wires).

Refer to “1-3 Other component specifications”.

- ② **Power transformer (TR) Outdoor unit** *Measure the coil resistance.
- Primary 230-208V ; Measure the resistance between No.1 and No.3 (WHT lead wires) terminals of 3P(WHT) socket jointed to power transformer.
 - Secondary 14 V ; Measure the resistance between No.1 and No.2 (BRN lead wires).

Refer to “1-3 Other component specifications”.

- ③ **Indoor fan motor (FMI) Indoor unit** *Measure the coil resistance.
- Measure the resistance between each terminal of 7P (WHT) socket and 3P (YEL) socket connected to the indoor fan motor.

Refer to “1-2-(A) Major component specifications”.

- ④ **Outdoor fan motor (FMO)Outdoor unit** *Measure the coil resistance.
- Measure the resistance in the same manner as explained above ③.

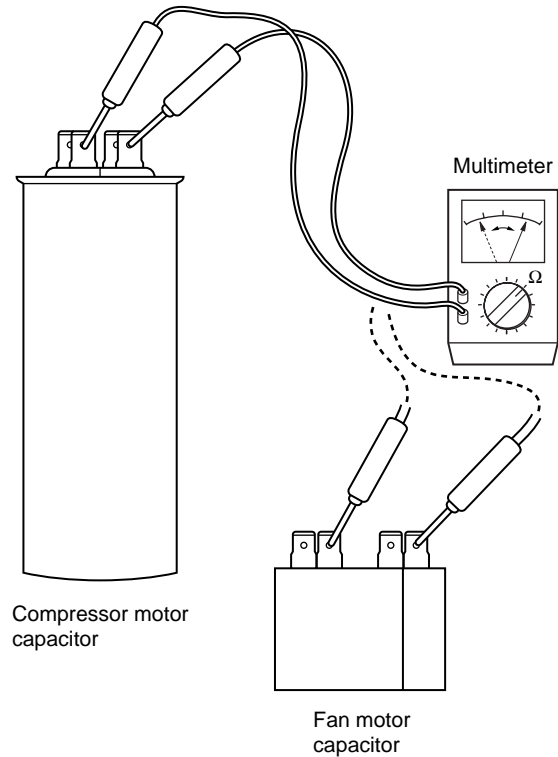
Refer to “1-2-(B)Major component specifications”.

⑤ **Motor capacitor Both in indoor and outdoor unit**

- Remove the lead wires from the capacitor terminals, and then place a probe on the capacitor terminals as shown in **Fig. 26**. Observe the deflection of the pointer, setting the resistance measuring range of the multimeter to the maximum value.
- The capacitor is "good" if the pointer bounces to a great extent and then gradually returns to its original position.

NOTE

The range of deflection and the deflection time differ according to the capacity of the capacitor.



1041_X_S

Fig. 26

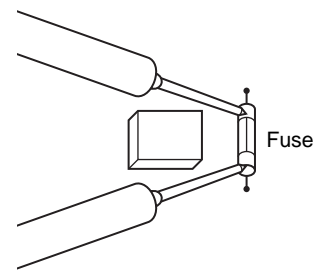
⑥ **Continuity of fuse on P.C.B. Ass'y**

- Check for continuity using a multimeter as shown in Fig. 27.

NOTE

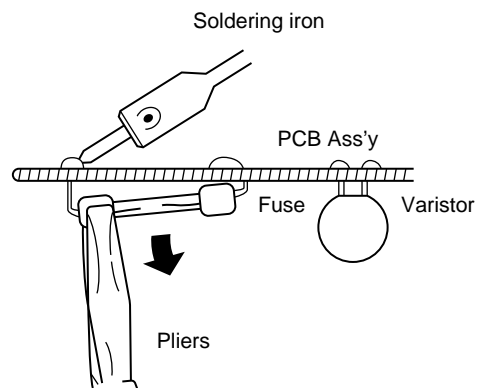
Method Used to Replace Fuse on PCB Ass'y

1. Remove the PCB Ass'y from the electrical component box.
2. Remove the fuse from PCB Ass'y using pliers while heating the soldered leads on the back side of the PCB Ass'y with a soldering iron (30W or 60W). (Fig. 28)
3. For replacement, insert a fuse of the same rating to the intended position and solder it. (Allow time to radiate heat during soldering so that the fuse does not melt.)



1042_X_S

Fig. 27



1043_X_S

Fig. 28



CAUTION

When replacing the fuse, be sure not to break down the varistor.

⑦ **Solenoid coil of the electronic refrigerant control valve (ERCV) Indoor unit** *Measure the coil resistance.

- Measure the resistance between No. 5 (GRY lead wire) and other terminals (another color of lead wires) of 5P (WHT) plug connected to the solenoid coil.
Refer to “1-2-(A) Major component specifications”.

⑧ **Compressor motor (CM) Outdoor unit** *Measure the coil resistance.

- **In case of single -phase compressor**
Remove the cover of compressor terminal and measure the resistance between terminals.
Refer to “1-2 Major component specifications”.

⑨ **Compressor motor magnetic contactor (52C) Outdoor unit**

- Measure the resistance between A (ORG lead wire) and B (GRY lead wire) terminals on the compressor motor magnetic contactor.
Refer to “1-3 Other component specifications”.
- Check the continuity between contactors.

MODEL	FMCA-1UL			
Push button on the magnetic contactor	Pair of terminals			
	R – U	S – V	T – W	31 – 32
no press	—	—	—	YES
press	YES	YES	YES	—

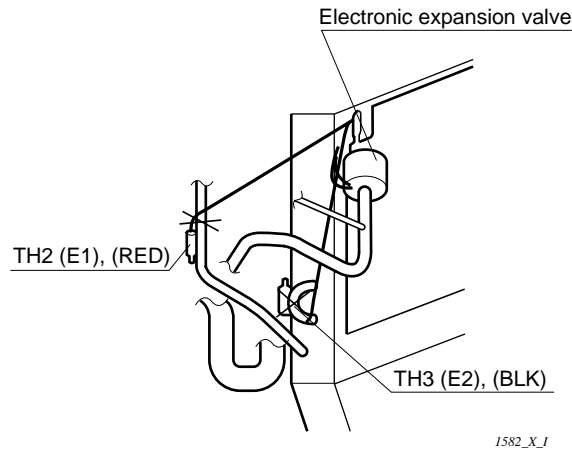
⑩ **Solenoid coil of 4-way valve (20S) ... Outdoor unit** *Measure the coil resistance.

- Measure the resistance between No.1 (BLK lead wire) and No.2 (BLK lead wire) terminals of 2P (BLK) socket connected to the solenoid coil.
Refer “1-3 Other component specifications”.

(4) Sensor and Solenoid Layout Diagram

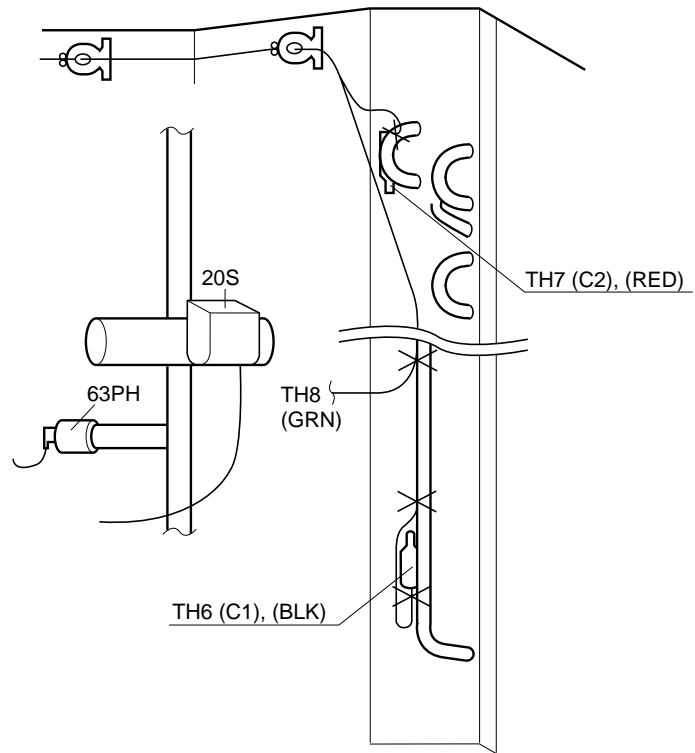
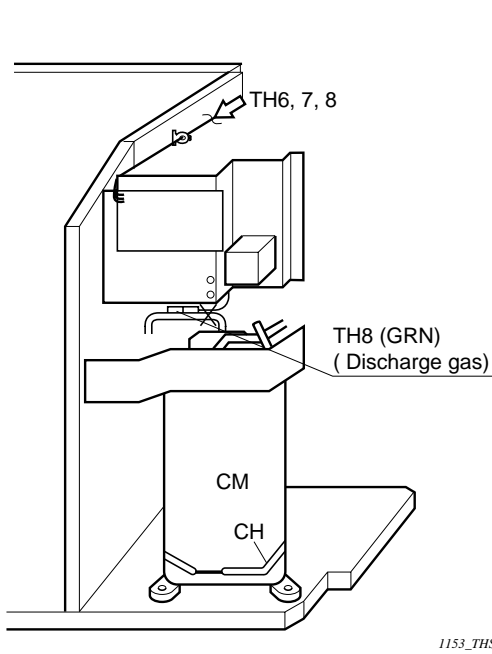
Indoor Unit

- XHS2432



Outdoor Unit

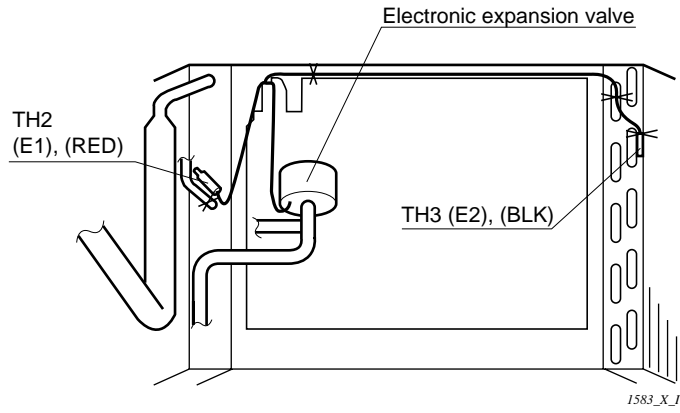
- CH2432



(4) Sensor and Solenoid Layout Diagram

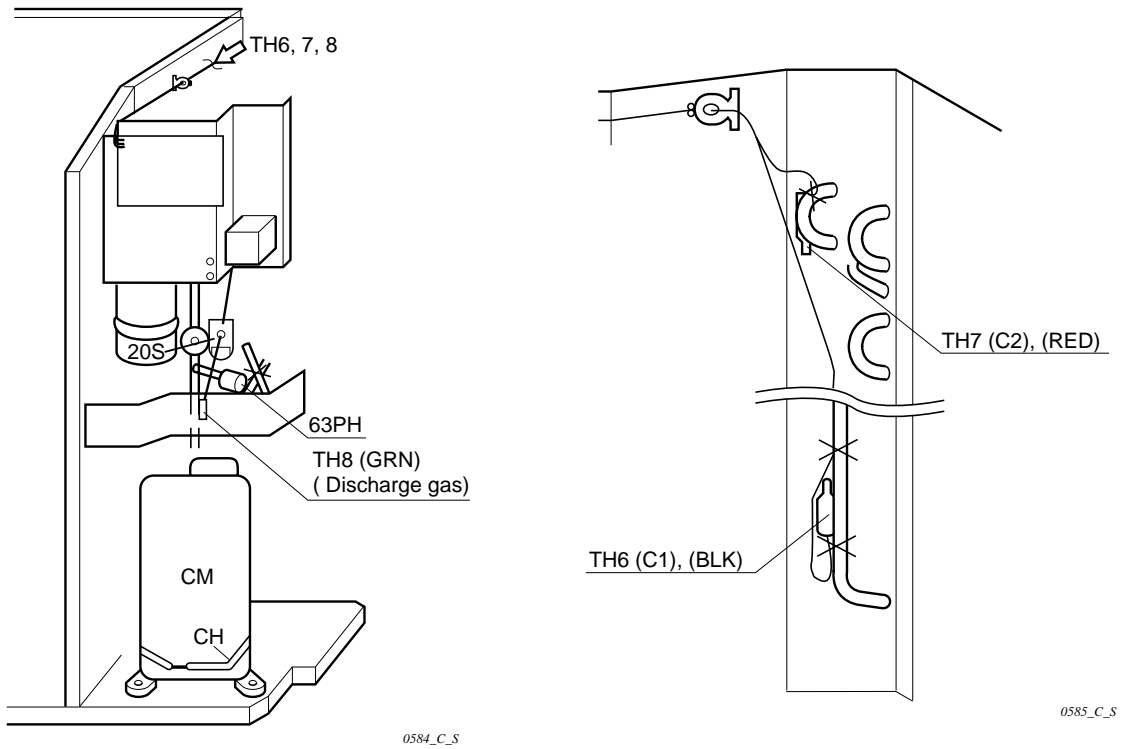
Indoor Unit

- XHS3632



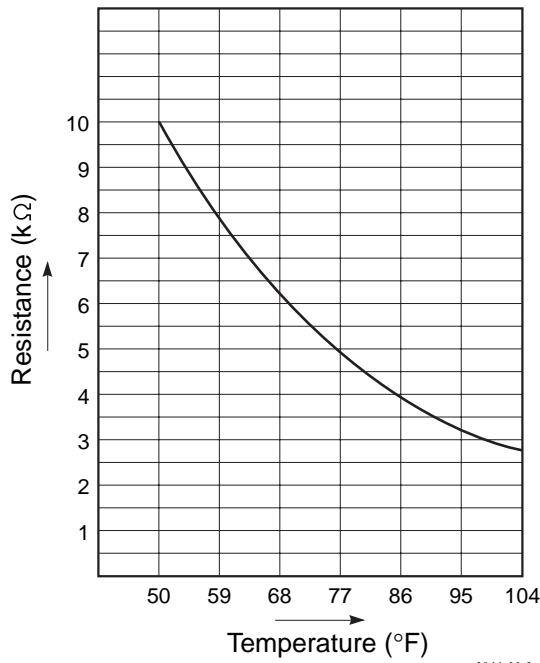
Outdoor Unit

- CH3632

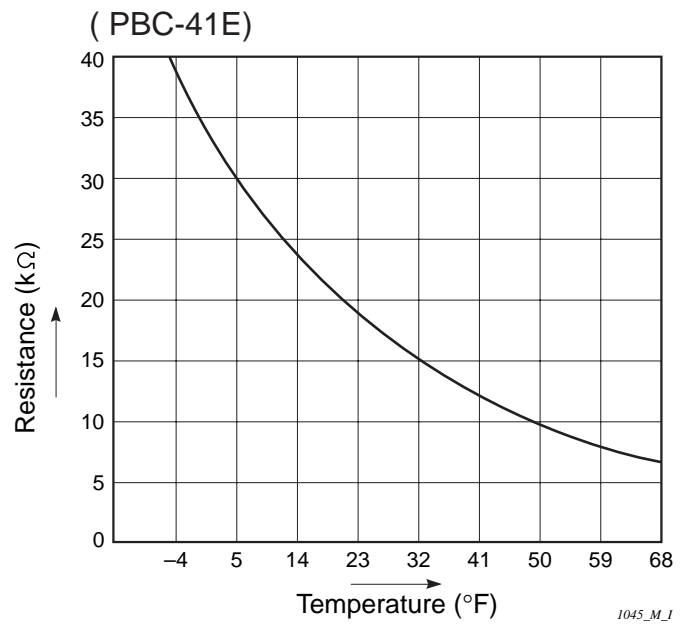


(5) Thermistor Characteristic Curve

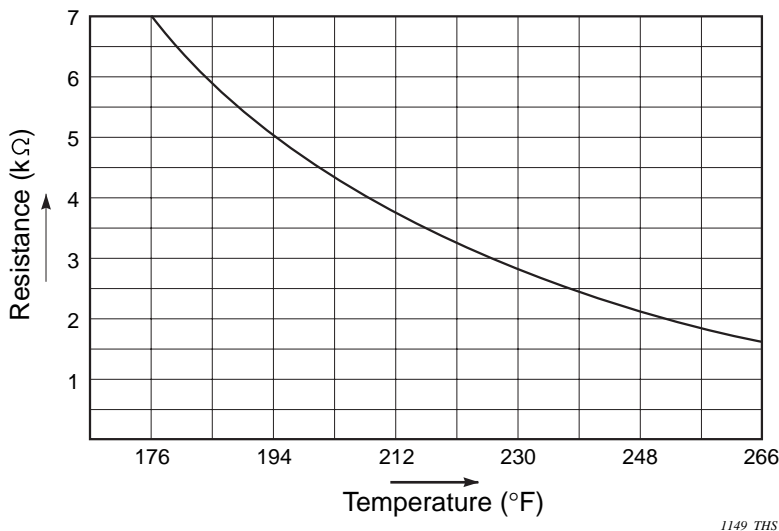
(1) Room temp. sensor : TH1 (KTEC-35)



(2) Indoor heat exch. coil sensor : TH2(E1), TH3(E2)
Outdoor heat exch. coil sensor : TH6(C1), TH7(C2)



(3) Compressor discharge gas temp. sensor : TH8 (PTC-51H)



(6) P.C.B. Setting

● **Setting of outdoor control P.C.B.**

(A) Standard control (single outdoor unit)

In case of single outdoor unit installation, no indoor unit's setting is necessary for twin, triple or quartet types (2, 3 or 4 indoor units).

Leave R.C. address setting at "0" as factory shipment state.

In this case, auto. address operation is performed automatically for the first time when the power is switched on. This operation takes about a few minutes.

(B) Group control (Multiple outdoor units)

In case of group control (up to 8 indoor units can be connected with one *wired remote controller), before turning on the power supply, set the R.C. address with S2, S3 on the outdoor control P.C.B..

R.C. address: Refrigerant circuit address 1 ~ 30.

Regarding the example of R.C. address for group control, please refer to R.C. Address Setting Method.

(C) Central control (when using the *system controller)

In case of central control (when using the system controller, that is, when linking outdoor units in a network),

(a) Before turning the power supply on, set the R.C. address with S2, S3 on the outdoor control P.C.B..

(b) Remove the short plug (CN4, 2P Black) from all outdoor units except one outdoor unit.

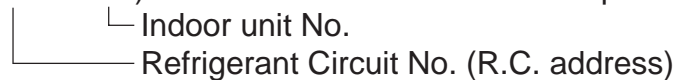
Regarding the example of R.C. address for central control and the position of CN4, please refer to R.C. Address Setting Method.

* Temperature displayed on both controllers are not °F but °C.

● **Setting of indoor control P.C.B.**

No setting is necessary.

Each indoor unit address (UNIT No.: R.C. – No.) is decided after auto. address operation.

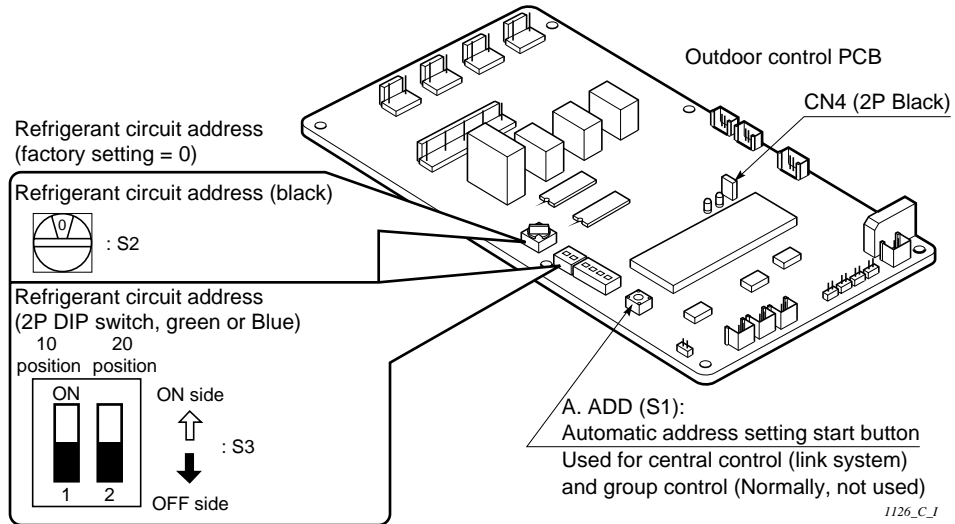




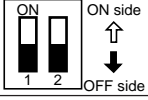



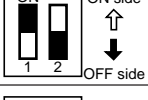





Manual setting for indoor unit address can be performed also by remote controller.

(7) R.C. Address Setting Method

Outdoor unit R.C. address setting method

In case of group control or central control, set the R.C. address to 1, 2, 3, ... according to the No. of outdoor units.



R.C. address	R.C. address (S3: 2P dip switch, green or Blue)	R.C. address (S2: Rotary switch, Black)
00 auto address ("0" when shipped from factory)	Both OFF 	 Set to 0
02 (In case of No. 2 outdoor unit)	Both OFF 	 Set to 2
03 (In case of No. 3 outdoor unit)	Both OFF 	 Set to 3
11 (In case of No. 11 outdoor unit)	10's SW is ON 	 Set to 1
21 (In case of No. 21 outdoor unit)	20's SW is ON 	 Set to 1
30 (In case of No. 30 outdoor unit)	Both 10's and 20's switches are ON 	 Set to 0

(8) Automatic Address Setting Method

— For group control and central control with multiple outdoor units —

Carry out automatic address setting with the remote controller.

- 1) All auto. address operation
 - ① Press the **TEST / CHK** and **▲ (⊕)** buttons at the same time for more than 4 seconds.
 - ② Press the **SET** button after confirming the CODE No. AA (CODE No. AA: All Auto. address operation).
After addresses are automatically set in order for the outdoor units from No. 1 to No. 30, the system returns to the normal stopped state.
- 2) Individual auto. address operation for each refrigerant circuit
 - ① To select each refrigerant circuit individually and set addresses automatically, press the **TEST / CHK** and **▲ (⊕)** buttons at the same time for more than 4 seconds, then press the **▲ , ▼ (SET TEMP)** button once to set CODE No. A1. (CODE No. A1: Auto. address operation)
 - ② Select R.C. No. which you want to execute the auto. address operation with **UNIT** button.
 - ③ Press the **SET** button. The auto. address operation will start. CODE No. changes from flashing to ON state.
 - ④ If the error occurred during the operation, the alarm message will be displayed. Check and remove the cause. If you want to interrupt the operation, press the **CL** button then the unit stands in waiting mode (Press the **SET** button).
 - ⑤ If the auto. address operation finishes, the display will disappear.
 - ⑥ Execute the operation of the other R.C. line in the same way by following the above steps ② to ③.
 - ⑦ Complete the auto. address operation by pressing the **TEST / CHK** button.

NOTE

Required time for auto. address operation:

In case of group control : a few minutes for each R.C.

In case of central control : max. about 20 min. for each R.C.

(9) Displaying Indoor / Outdoor Unit Combination Numbers

Display the indoor / outdoor unit address after automatic address setting.

- 1) When installing multiple units, match the indoor unit address numbers and the outdoor R.C. address numbers and display them at an easy-to-check location (near the nameplate) with an oil-based magic marker or other indelible marker so that the individual indoor and outdoor unit combinations can be checked.

Example:

Outdoor Unit 1 – Indoor Units 1-1, 1-2, 1-3, ...

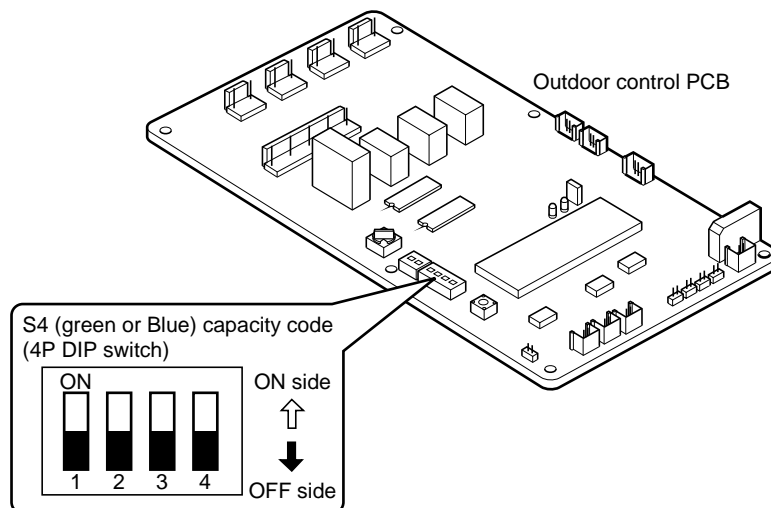
Outdoor Unit 2 – Indoor Units 2-1, 2-2, 2-3, ...

- 2) Displaying indoor / outdoor unit address is necessary for maintenance. Always label numbers.
*Check indoor unit address with the remote controller. Press the **TEST / CHK** button for at least 4 seconds and check the indoor unit address with the **UNIT** button. (Each time you press the **UNIT** button, the address changes 1-1, 1-2, ... 2-1, 2-2, ...) The fan for only the selected indoor unit turns on at high speed, so check which indoor unit runs and label the indoor unit address.
(If there is 1 outdoor unit, the addresses are 1-1, 1-2, ...)

When you press the **TEST / CHK** button again, the system returns to normal remote control mode.

(10) Items to Check Prior to Test Run

- 1) Turn on the power supply switch more than 5 hours before in order to charge the crank case heater.
- 2) Fully open the outdoor service valve after making the leak inspection of field connected tubing, vacuuming, and gas charging if necessary.
- 3) Check the capacity code setting.
 - * The factory setting is as shown in the table below check it.
 - * The capacity code is set by S4 (green or Blue 4P DIP switch) on outdoor control P.C.B..



1127_C-1

4

S4. Capacity code

Model No.	No.	Outdoor PCB			
		1	2	3	4
24 type (1 phase)		ON	ON	ON	OFF
36 type (1 phase)		OFF	ON	OFF	ON

(11) Test Run

(11)-1. Preparing for Test Run

Before starting the air conditioner, check the followings:

- (1) Remove all loose matter from the cabinet especially metal filings, bits of wire, and clips.
- (2) Connect the control wiring correctly and tighten all electrical connections.
- (3) Remove the protective spacer for the compressor used for transportation.
- (4) Connect the power to the unit **for at least 5 hours** before starting the compressor. The bottom of the compressor should be warm to the touch and the crankcase heater around the feet of the compressor should be hot to the touch. For Ceiling mounted and Recessed Type indoor units, the flap(s) move(s) for one minute when the power is connected to the unit. This is not the malfunction.
- (5) Open both the wide and narrow tube service valves after air purge.
- (6) Remove the transportation cardboard protection for the indoor fan.

(11)-2. Performing Test Run



CAUTION

Be careful since the fan will start when performing Test Run.

For XHS models

- (1) For XHS models, the Operation Selector is located above the electrical component box inside the indoor unit. To access the Operation Selector, press the two latches of the air intake grille in the direction of the arrow to open the grille. Open the air intake grille downward. (Fig. 11-1)
- (2) Set the TEST RUN switch of the SERVICING switches on the Operation Selector (housed inside the indoor unit) to the ON position. (Fig. 11-1)
- (3) Press the ON/OFF operation button on the remote control unit and start the air conditioner in Cooling or Heating mode.
- (4) Let the unit run for about 30 minutes and check that the unit operates normally.
- (5) After the test run, be sure to set the TEST RUN switch back to the OFF position to cancel the test run mode. Then stop the air conditioner.

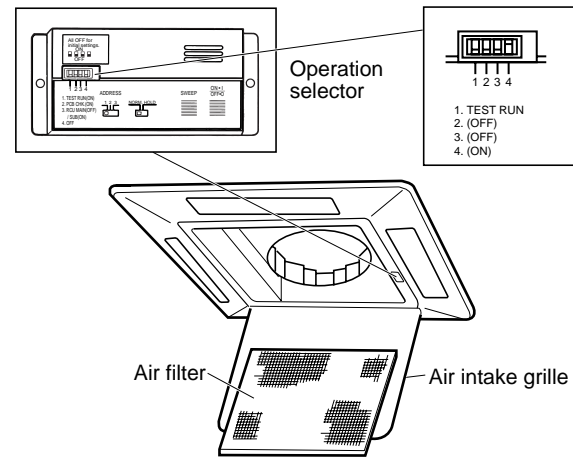


Fig. 11-1

1584_M_1

Important

Set the Operation Selector at the "ON" position. Otherwise the unit will stop or will not run correctly.



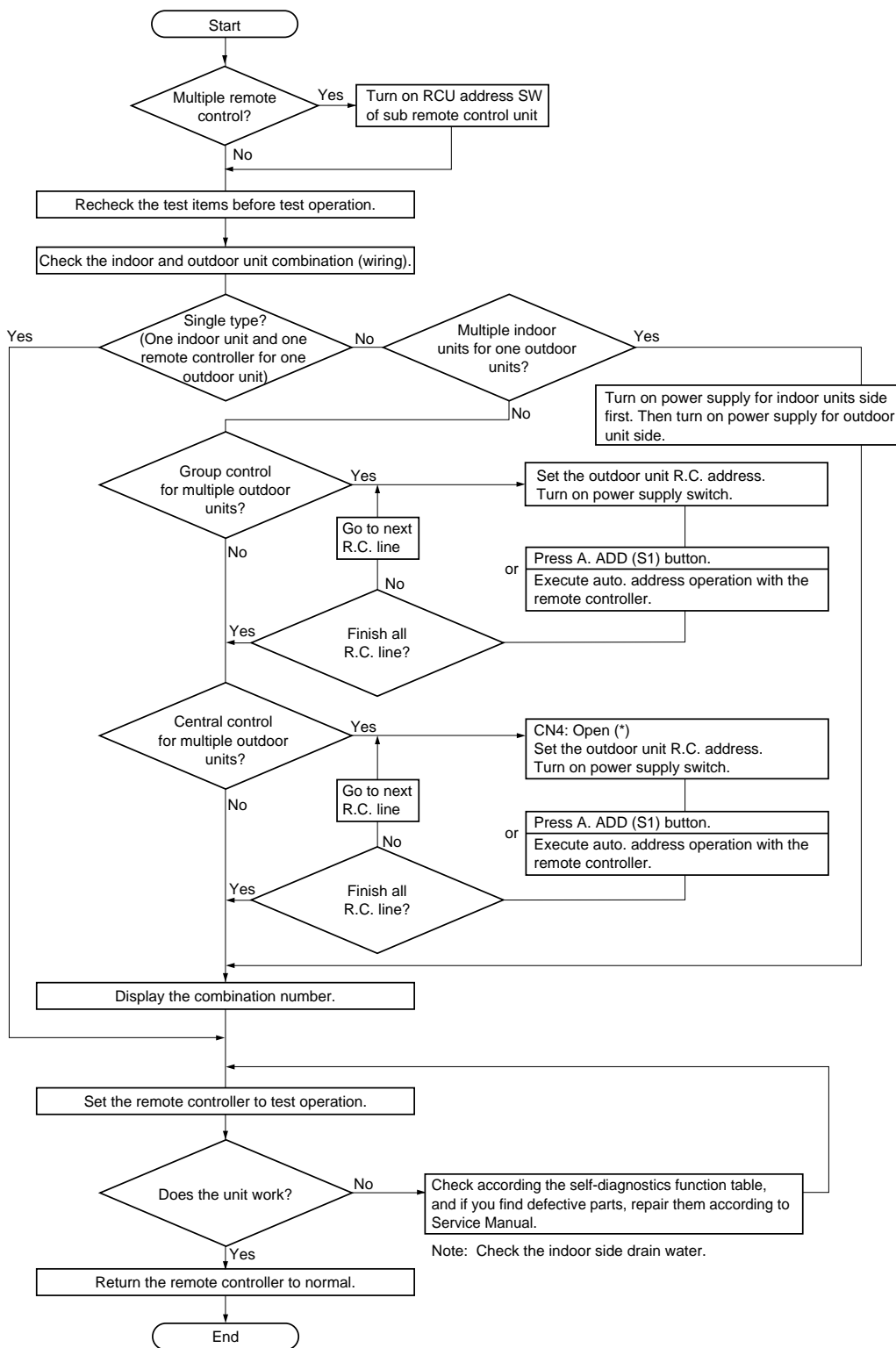
CAUTION

The TEST RUN switch is used only for servicing the air conditioner. DO NOT use this switch for normal operation. Otherwise, it may put stress on the system.

NOTE

- During the test run, all of the 3 indicator lamps on the indoor unit will flash.
- During the test run, the air conditioner runs continuously and the thermostat does not control the system.
- To protect the air conditioner from overloading, the outdoor unit will not start running for 3 minutes after power is applied or the air conditioner is turned off and then back on.
- When the air conditioner fails to start the test run, 1 or more of the 3 alarm indicator lamps on the indoor unit will flash.

(11)-3. Test Run Procedure

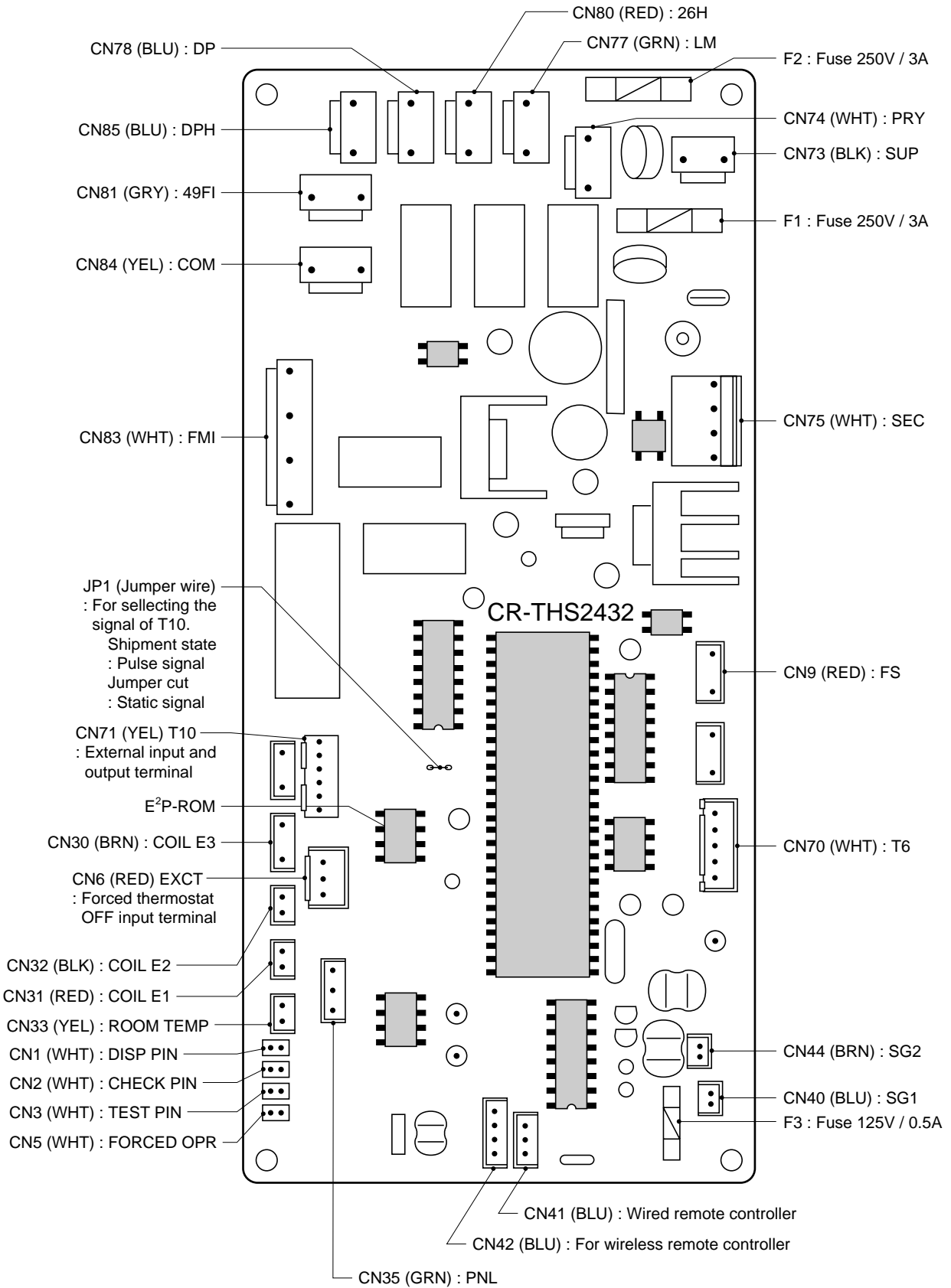


NOTE

- 1) One of CN4 of all linked outdoor units should be short.
- 2) In case of using system controller, zone registration is required after finishing Test run. Regarding the zone registration, please refer to Installation Instructions attached with system controller.

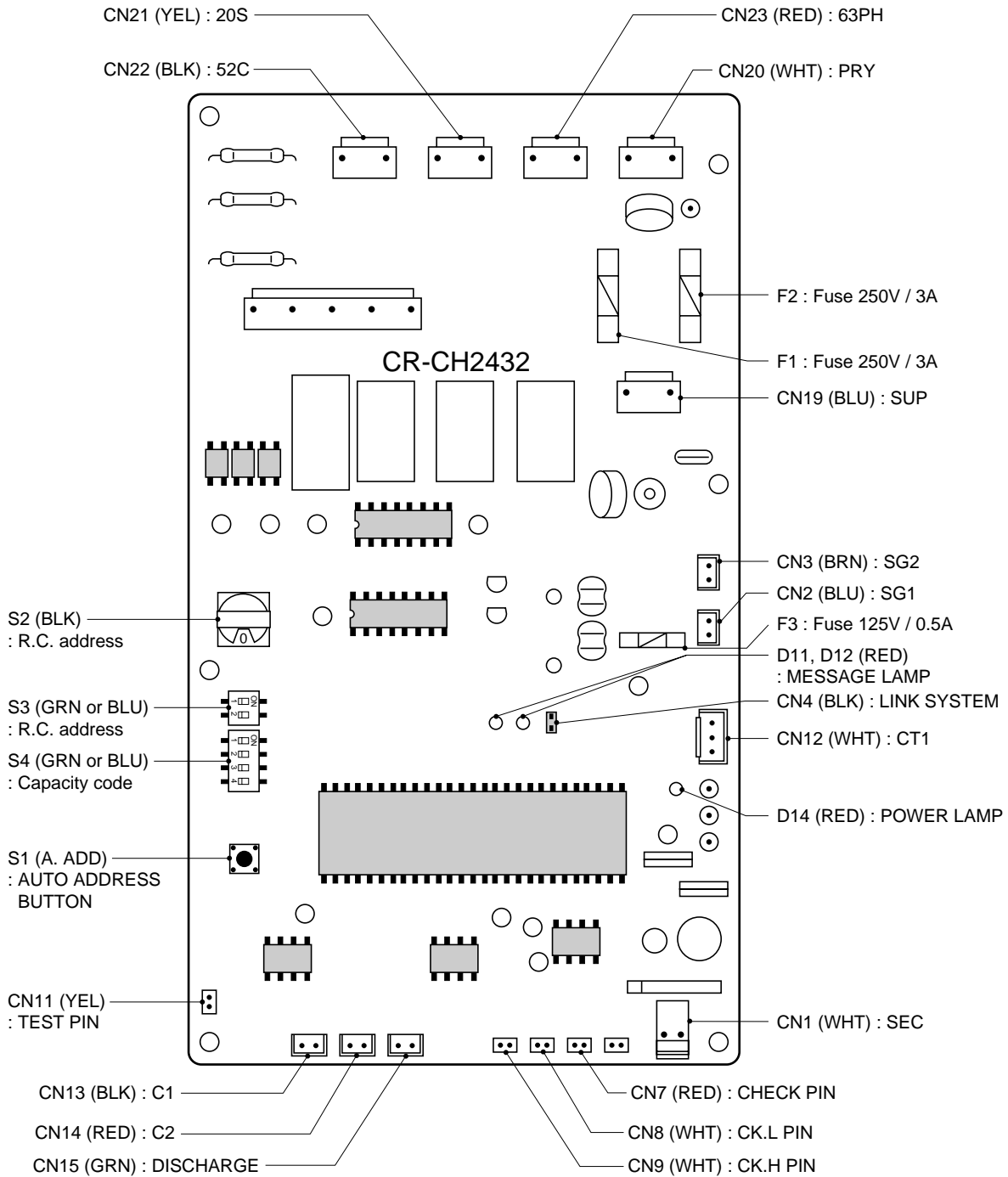
(12) P.C.B. and Parts Location

● P.C.B. (CR-THS2432) FOR INDOOR UNITS



(12) P.C.B. and Parts Location

● P.C.B. (CR-CH2432) FOR OUTDOOR UNITS



1129_THS_I



(13) Checking procedure for each P.C.B.

The indoor and outdoor P.C.B. have functions to check the signal transmission and reception of the serial circuit and to check the microcomputer operation. (Self-diagnosis function)

● Precautions required when checking

1. After turning off the power to the indoor (outdoor) unit, remove the inter-unit control wiring (U1-U2) and create a short-circuit between U1 and U2.
2. Short the CHECK PIN on the PC board of the indoor (outdoor) unit and turn on the power.
3. When checking the Outdoor controller, remove the compressor wiring from the compressor electromagnetic contactor.

4-1. Checking the serial circuit

Indoor controller: A lighted LED indicates normal. A blinking LED indicates abnormal.

Outdoor controller: Blinking LEDs (D11 and D22) indicate normal. If one of the LEDs (D11 and D22) goes off, it indicates abnormal.

4-2. Checking microcomputer operation

When the microcomputer works normally, the relays are switched in sequence as below.

Indoor controller

	Output	ON time
Operation order	Indoor fan Very high fan speed (HH)	0.5 seconds
	Indoor fan High fan speed (H)	0.5 seconds
	Indoor fan Low fan speed (L)	0.5 seconds
	Indoor fan Very low fan speed (LL)	0.5 seconds
	Flap motor	0.5 seconds
	Drain pump	0.5 seconds
	Electric heater	0.5 seconds
	Operation signal	0.5 seconds
	In a lump	0.5 seconds
	Electronic control valve A	0.5 seconds
	Electronic control valve B	0.5 seconds
	Electronic control valve \bar{A}	0.5 seconds
	Electronic control valve \bar{B}	0.5 seconds

Outdoor controller

	Output	ON time
Operation order	Outdoor fan High fan speed (H)	0.5 seconds
	Outdoor fan Low fan speed (L)	0.5 seconds
	4-way valve	0.5 seconds
	Compressor	0.5 seconds

(14) Check Pins

When shorting check pins on the indoor and outdoor PCBs, operations shown on the above table will be performed on each indoor and outdoor unit. Use check pins to perform a quick check.

NOTE

- When checking pin operation, stop the indoor and outdoor units with the remote control unit.

(14)-1. FORCED OPR pin of the indoor controller

- Switch the pin from normal operation to check operation
 - Relay RY6 turns ON → Indoor fan motor operates at the “H” fan speed.
 - Relay RY2 turns ON → Dew prevention heater (DPH) turns ON.
 - Indoor flap motor moves to the F1 position.
 - Electronic control valve opens fully. (480 steps)

NOTE

- Even if the remote control unit is not connected, the indoor unit operates independently.

(14)-2. Shorting CK.L or CK.H pin of the outdoor PCB

- When shorting the cooling pin (CN8) with normal operation
 - Relay RY3 is turned ON for 3 seconds → The outdoor fan motor operates at the “LL” fan speed.
 - Relay RY4 is turned ON for 3 seconds → The outdoor fan motor operates at the “H” fan speed.
 - Turn ON relay RY2 under the above condition → The magnet switch (52C) turns ON.

※ It will take about 18 seconds before cooling operation begins.
- Shorting the heating pin (CN9) with normal operation
 - Relays RY3 and RY4 are turned ON for 3 seconds → The outdoor fan motor operates at the “H” fan speed.
 - Relay RY3 is turned ON for 3 seconds → The outdoor fan motor operates at the “LL” fan speed.
 - Turn ON relay RY2 under the above conditions → The magnet switch (52C) turns ON. If relay RY1 is turned ON, the 4-way valve (20S) turns ON.

※ It will take about 18 seconds before heating operation begins.

NOTE

- The outdoor unit operates independently regardless of the indoor unit's operation. However, the outdoor unit does not defrost.
- The indoor and outdoor units stop when the outdoor protection apparatus activates during the checking operation, and automatically restarts, unlike in normal operation.

- The specifications, designs, and information in this brochure are subject to change without notice.

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Jan. / 2000

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